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FINAL RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION REPORT FOR SOLID WASTE MANAGEMENT UNIT 32 FORMER OIL TANK FARM AREA NSA CRANE IN
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TETRA TECH

Resource Conservation and Recovery Act Facility Investigation Report

for

SWMU 32 – Former Oil Tank Farm Area

Naval Support Activity Crane
Crane, Indiana

Naval Facilities Engineering Command Midwest
Great Lakes, Illinois

Contract Number N62470-08-D-1001
Contract Task Order F273/F27H

February 2013

FINAL

RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION REPORT FOR SWMU 32 – FORMER FUEL OIL TANK FARM

NAVAL SUPPORT ACTIVITY CRANE
CRANE, INDIANA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAME (CLEAN) CONTRACT

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ACRONYMS

ADAF	Age Dependent Adjustment Factor
amsl	Above Mean Sea Level
AST	Above Ground Storage Tank
ATSDR	Agency for Toxic Substances and Disease Registry
AWQC	Ambient Water Quality Criteria
BAF	Bioaccumulation Factor
BERA	Baseline Ecological Risk Assessment
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Total Xylenes
°C	Degrees Celsius
Cal EPA	California Environmental Protection Agency
CCC	Calibration Check Compound
CCV	Continuing Calibration Verification
CD	Compact Disk
CDI	Chronic Daily Intake
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-Term Environmental Action Navy
CLP	Contract Laboratory Program
CMS	Corrective Measures Study
COC	Chemical of Concern
COPC	Chemical of Potential Concern
COPEC	Constituent of Potential Ecological Concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CSF	Cancer Slope Factor
CSM	Conceptual Site Model
CTE	Central Tendency Exposure
CTO	Contract Task Order
CWAP	Comprehensive Work Approval Process
%D	Percent Difference or Percent Drift
DAF	Dilution Attenuation Factor
DCL	Default Closure Level
DO	Dissolved Oxygen
DoD	Department of Defense
DPT	Direct-Push Technology

DQI	Data Quality Indicator
DQO	Data Quality Objective
DVM	Data Validation Manager
Eco SSL	Ecological Soil Screening Level
EEQ	Ecological Effects Quotient
EMR	Environmental Monitoring Report
Empirical	Empirical Laboratories, LLC
EPD	NSA Environmental Protection Department
ERA	Ecological Risk Assessment
ERSM	Environmental Restoration Site Manager
ESL	Ecological Screening Level
EPC	Exposure Point Concentration
EU	Exposure Unit
^{o}F	Degrees Fahrenheit
FD	Field Duplicate
FID	Flame Ionization Detector
FOL	Field Operations Leader
FTMR	Field Task Modification Request
g	Gram
GC/MS	Gas Chromatograph/Mass Spectrometer
G-DCL	Groundwater Default Closure Levels
GPS	Global Positioning System
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEAST	Health Affects Assessment Summary Tables
HCl	Hydrochloric Acid
HDOP	Horizontal Dilution of Precision
HHRA	Human Health Risk Assessment
HI	Hazard Index
HMW	High Molecular Weight
HQ	Hazard Quotient
HSM	Health and Safety Manager
IA	Installation Assessment
IAS	Initial Assessment Study
ICAL	Initial Calibration
ICV	Initial Calibration Verification
IDEM	Indiana Department of Environmental Management

IDNR	Indiana Department of Natural Resources
IDQTF	Intergovernmental Data Quality Task Force
IDW	Investigation-derived Waste
ILCR	Incremental Lifetime Cancer Risk
IM	Interim Measures
IMR	Interim Measures Report
IMWP	Interim Measures Work Plan
IRIS	Integrated Risk Information System
IS	Internal Standard
IUR	Inhalation Unit Risk
IUPPS	Indiana Underground Plant Protection Services
L	Liter
LBGR	Lower Bound of the Gray Region
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOQ	Limit of Quantitation
LUC	Land Use Control
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
mg/L	Milligram Per Liter
mg/kg	Milligram Per Kilogram
mL	Milliliter
MPC	Measurement Performance Criterion
MRL	Minimal Risk Level
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MTBE	Methyl Tertiary Butyl Ether
NAVFAC	Naval Facilities Engineering Command
NCEA	National Center for Environmental Assessment
NDIR	Non-dispersive Infrared
NFA	No Further Action
NFESC	Naval Facilities Engineering Service Center
NOAA	National Oceanic and Atmospheric Administration
NOAEL	No Observed Adverse Effects Level
NOEC	No Observed Effects Concentration
NSA	Naval Support Activity
NTU	Nephelometric Turbidity Unit

ORP	Oxidation Reduction Potential
OSHA	Occupational Safety and Health Administration
oz	Ounce
PAH	Polycyclic Aromatic Hydrocarbon
PARCCS	Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity
PEF	Particulate Emissions Factor
PCB	Polychlorinated Biphenyl
PDF	Portable Document Format
PM	Project Manager
PPE	personal protective equipment
ppm	Part Per Million
PPRTV	Provisional Peer Reviewed Toxicity Values
PQLG	Project Quantitation Limit Goal
PQO	Project Quality Objective
PSL	Project Screening Level
PT	Proficiency Test
QA	Quality Assurance
QAM	Quality Assurance Manager
QC	Quality Control
QL	Quantitation Limit
QSM	Quality Systems Manual
%R	Percent Recovery
R5 Sed ESL	Region 5 Sediment Ecological Screening Level
R5 Soil ESL	Region 5 Soil Ecological Screening Level
RAGS	Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RDCL	Residential Default Closure Level
RfC	Reference Concentration
RfD	Reference Dose
RF	Response Factor
RFI	Resource Conservation and Recovery Act Facility Investigation
RI	Remedial Investigation
RISC	Risk Integrated System of Closure
RME	Reasonable Maximum Exposure
RPD	Relative Percent Difference
RPM	Remedial Project Manager
RQD	Rock Quality Designation

RBSSL	Risk-Based Soil Screening Levels
% RSD	Relative Standard Deviation
RSL	Regional Screening Level
R-RSL	Residential Regional Screening Level
SAIC	Science Applications International Corporation
SAP	Sampling and Analysis Plan
SDG	Sample Delivery Group
SERA	Screening-level Ecological Risk Assessment
SIM	Selected Ion Monitoring
SMC	System Monitoring Compound
SOP	Standard Operating Procedure
SPCC	System Performance Check Compound
SQL	Structured Query Language
SSL	Soil Screening Level
SSO	Site Safety Officer
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
TBD	To Be Determined
TCLP	Toxicity Characteristic Leaching Procedure
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
T-RSL	Tapwater Regional Screening Level
TRV	Toxicity Reference Value
Tetra Tech	Tetra Tech NUS, Inc.
UFP-QAPP	Uniform Federal Policy for Quality Assurance Project Plan
UFP-SAP	Uniform Federal Policy for Sampling Analysis Plan
UCL	Upper Confidence Limit
µg/kg	Microgram Per Kilogram
µg/L	Microgram Per Liter
USCS	Unified Soil Classification System
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	Underground Storage Tank
VOC	Volatile Organic Compound
VSP	Visual Sample Plan

EXECUTIVE SUMMARY

Tetra Tech NUS, Inc. (Tetra Tech) originally prepared this Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at Solid Waste Management Unit (SWMU) 32 – Former Fuel Oil Tank Farm at Naval Support Activity (NSA) Crane, located in Crane, Indiana under Contract Task Order (CTO) F273, Contract No. N62470-08-D-1001, Comprehensive Long-Term Environmental Action Navy (CLEAN). The report was updated under CTO F27H of the same contract.

PURPOSE OF THE REPORT

The purpose of this RFI Report is to describe the site investigation activities conducted at SWMU 32, present the results and interpretation, and to conduct a baseline human health risk assessment (HHRA) and a screening-level ecological risk assessment (SERA) to evaluate the human health and ecologic risks posed by chemicals at the site.

SWMU 32 DESCRIPTION

SWMU 32, the Former Fuel Oil Tank Farm (site) operated from 1947 to 1996 as an on-site bulk storage facility for fuel oil to heat buildings located at NSA Crane. The site primarily consisted of multiple above ground storage tanks (ASTs) that were generally located within concrete walls that formed containment cells. In 1987, approximately 3,700 gallons of virgin Fuel Oil No. 2 was released from the site, and an unknown quantity of the oil discharged to the ditch south of the site and flowed into Culpepper Branch and then into First Creek. The remaining fuel oil presumably soaked into the ground at Cell 6, one of the containment cells.

The fuel oil tanks and associated piping and structures were removed between 1977 and 1999 due to decreased use of fuel oil at NSA Crane. Multiple environmental investigations, removal and demolition projects, and soil excavation projects were performed at SWMU 32 between 1989 and 1999 to investigate the 1987 fuel oils spill as well as potential impacts from routine AST activities. In 1997, approximately 3,000 cubic yards of fuel-contaminated soil and sand were removed from the site and disposed off site. Additionally, approximately 2,750 cubic yards of soil were removed, temporarily stockpiled, and returned to the southeastern portion of the containment area. Following these activities, the site was plowed to enhance biodegradation of the soil and the site was regraded. Groundwater was not evaluated in the previously identified investigations. In 1999 the Navy proposed No Further Action (NFA) at the site, however, in 2000, Science Applications International Corporation (SAIC), a Navy consultant, recommended further investigation to delineate impacted groundwater.

FIELD INVESTIGATION

The sampling for this RFI was conducted in April 2010 and September 2010. The investigation included the collection of surface soil, subsurface soil, groundwater, and sediment samples. A total of 63 borings were drilled and 62 surface and 72 subsurface soil samples were collected. The surface soil samples were analyzed for select semivolatile organic compounds (SVOCs) and the subsurface soils were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and select SVOCs. Five sediment samples were collected from Culpepper Branch and analyzed for BTEX and select SVOCs. Six groundwater samples were collected and analyzed for BTEX and select SVOCs.

NATURE / EXTENT OF CONTAMINATION

The nature and extent of contamination is a result of spills and leaks from routine operations and the one reported release event in 1987. Surface soil, subsurface soil, groundwater, and sediment may have been affected. The RFI results indicate that naphthalene and carcinogenic polycyclic aromatic hydrocarbons (cPAH) were detected in two surface soil samples. Benzo(a)anthracene and benzo(a)pyrene were the specific cPAHs detected in the surface soil samples and exceeding at least one of the Project Screening Levels (PSLs). Subsurface soil sampling and analysis indicates naphthalene concentrations in four samples that exceed the PSLs. In the sediment samples only benzo(a)pyrene and benzo(b)fluoranthene were detected at two sample locations at concentrations exceeding one of the PSLs. Groundwater sampling and analysis indicates only one sample exceeded PSLs for benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene.

RISK ASSESSMENTS

A screening level human health risk assessment and a baseline ecological risk assessment were conducted. Findings from these assessments are summarized in Table ES-1 for each receptor group and all media to which the receptors in the groups are exposed. The findings are also described in the text below.

Screening Level Human Health Risk Assessment

The HHRA was conducted to determine whether detected concentrations of chemicals within the study areas pose a significant threat to potential human receptors under current and/or future land use. The potential risks to human receptors were estimated based on the assumption that no actions were taken to control contaminant releases. Actual or potential exposures at SWMU 32 were determined based on the most likely pathways of contaminant release and transport, as well as human activity patterns.

The HHRA generated quantitative estimates of non-carcinogenic and carcinogenic risks (Hazard Indexes [HIs] and Incremental Lifetime Cancer Risks [ILCRs], respectively) for potential human receptors. HIs for all receptors exposed to soils and groundwater indicate that adverse non-carcinogenic effects are not anticipated under the defined exposure conditions. Cumulative ILCRs for all receptors exposed to soil and groundwater at SWMU 32 were less than or within the United States Environmental Protection Agency's (USEPA) and the Indiana Department of Environmental Management's (IDEM) target risk range.

Screening Level Ecological Risk Assessment

An Ecological Risk Assessment (ERA) for SWMU 32 was performed to evaluate the potential for adverse ecological impacts due to site-related contamination. This was accomplished by identifying Chemicals of Potential Concern (COPCs) detected at concentrations that exceed screening levels, identifying their locations, and recommending whether or not further investigation and/or remedial action at SWMU 32 is warranted from an ecological perspective.

In performing SERA for SWMU 32, several PAHs were identified as COPCs. Several PAHs were retained as COPCs as a result of the initial screening of surface soil for plants and wildlife. These chemicals were further evaluated as a part of the ERA refinement. No chemicals were retained for further evaluation for sediments. It was determined the COPCs posed no ecological risks to plants, soil invertebrates, sediment invertebrates, or terrestrial wildlife. It was also determined that ecological risks are not expected from the chemicals detected in SWMU 32 surface soil and sediment.

CONCLUSIONS

Data collected during the RFI were adequate for developing screening level human health and baseline ecological risk assessments for SWMU 32 and for establishing the nature and extent of contamination to support the risk assessments. Results of the risk assessments are presented above. Table ES-1 summarizes receptor-specific human health risks and hazards, ecological risks, critical exposure pathways, and Chemicals of Concern (COCs) for SWMU 32. The results of the human health risk assessment indicate that potential human health risks calculated for soil and sediment were less than or within IDEM / USEPA goals. The results of the ecological risk assessment determined that there were no significant ecological risks.

Based on the risk assessments, the May, 2011 draft RFI Report proposed no further action (NFA) for the site. Although the risks were acceptable, the draft RFI Report identified an area on the site that had benzo(a)pyrene contamination greater than the IDEM Residential Default Closure Level (RDCL) of

500 micrograms per kilogram (µg/kg). IDEM recommended removal of the surface soil with benzo(a)pyrene concentrations greater than the RDCL to achieve NFA or implementation of land use controls (LUCs) to mitigate potential site risks. Removal of the surface soil was selected to achieve NFA.

An Interim Measures Work Plan (IMWP) was submitted April 2012 that discussed the excavation and offsite disposal of soil with benzo(a)pyrene concentrations greater than the RDCL and restoration of the site. During preparation of the IMWP, additional soil samples were collected and analyzed to determine the vertical and horizontal extent of the excavation; these results are presented in the IMWP.

Interim Measures (IM) were performed in October 2012. Activities included removal and offsite disposal of approximately 570 tons of soil. A draft final Interim Measures Report (IMR) was submitted February 2013, which summarizes IM activities and concludes that NFA is appropriate for SWMU 32.

TABLE ES-1

SUMMARY OF RECEPTOR-SPECIFIC HUMAN RISKS AND HAZARDS, ECOLOGICAL RISKS, AND RECOMMENDATIONS

Receptor Population	Environmental Media	Overall Carcinogenic Risk (Human Health)	Overall Hazard Index (Human Health)	Overall Risk (Ecological)	Recommendations
Current/Future Industrial Worker	Surface Soil DU 1, Groundwater	4.E-06	0.00004	N/A	NFA
	Surface Soil DU 2, Groundwater	2.E-06	0.00004	N/A	NFA
Current/Future Adolescent Trespasser	Surface Soil DU 1, Groundwater	6E-07	0	N/A	NFA
	Surface Soil DU 2, Groundwater	2E-08	6E-08	N/A	NFA
Current/Future Construction Worker	Soil DU 1, Groundwater	2E-07	0.02	N/A	NFA
	Soil DU2, Groundwater	5E-05	0.000006	N/A	NFA
Future Child Recreational User	Surface Soil DU 1, Groundwater	4E-06	0.00002	N/A	NFA
	Surface Soil DU 2, Groundwater	2E-06	0.00002	N/A	NFA
Future Adult Recreational User	Surface Soil DU 1, and Groundwater	1E-06	0.00001	N/A	NFA
	Surface Soil DU 2, and Groundwater	5E-07	0.000006	N/A	NFA
Future Child Resident	Surface Soil DU 1, and Groundwater	5E-05	0.0002	N/A	NFA
	Surface Soil DU 2, and Groundwater	2E-05	0.0002	N/A	NFA

Receptor Population	Environmental Media	Overall Carcinogenic Risk (Human Health)	Overall Hazard Index (Human Health)	Overall Risk (Ecological)	Recommendations
Future Adult Resident	Surface Soil DU 1, and Groundwater	1E-05	0.00008	N/A	NFA
	Surface Soil DU 1, and Groundwater	7E-06	0.00008	N/A	NFA
Terrestrial Plants and Invertebrates	Surface Soil	N/A	N/A	Acceptable	N/A
Mammals and Birds	Surface Soil	N/A	N/A	Acceptable	N/A
	Sediment	N/A	N/A	Acceptable	N/A
Aquatic Organisms	Surface Water	N/A	N/A	Acceptable	N/A
Sediment Invertebrates	Sediment	N/A	N/A	Acceptable	N/A

DU – Decision Unit
N/A – Not Applicable
NFA – No Further Action

1.0 INTRODUCTION

This Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for the Former Fuel Oil Tank Farm at Naval Support Activity (NSA) Crane, located in Crane, Indiana was conducted by Tetra Tech NUS, Inc. (Tetra Tech) as a contractor to the United States Department of the Navy (Navy) under Contract Task Order (CTO) F273, Contract No. N62470-08-D-1001, Comprehensive Long-term Environmental Action Navy (CLEAN). The Former Fuel Oil Tank Farm is also known as Solid Waste Management Unit (SWMU) 32.

The Former Fuel Oil Tank Farm (site) operated from 1947 to 1996 as an on-site bulk storage facility for fuel oil to heat buildings located on NSA Crane property. The site primarily consisted of multiple above ground storage tanks (ASTs) that were generally located within concrete walls that formed containment cells. In 1987, approximately 3,700 gallons of virgin Fuel Oil No. 2 was released from the site, and an unknown quantity of the oil discharged to the ditch south of the site and flowed into Culpepper Branch and then into First Creek. The release impacted approximately 300 feet of Culpepper Branch and approximately 4.8 miles of First Creek. The remaining fuel oil presumably soaked into the ground at Cell 6, one of the containment cells over an approximately 5,000-square-foot area (65 feet by 70 feet).

The RFI at SWMU 32 was conducted to determine the nature and extent of potential contaminants as a result of the 1987 fuel oil release and routine AST activities at the site.

1.1 PURPOSE

The purpose of this RFI Report is to describe the site investigation activities conducted at the site and to present the results and interpretation. This report provides information regarding concentrations of organic chemicals measured in surface soils, subsurface soils, sediment, and groundwater at SWMU 32. In addition, human health and ecological risks associated with SWMU 32 were evaluated with a baseline human health risk assessment (HHRA) and a screening-level ecological risk assessment (SERA). The risk assessments were performed using the data collected during investigations conducted at the site in 2010.

1.2 SITE BACKGROUND

1.2.1 Site Location and Description

NSA Crane is located in a rural, sparsely populated region of south-central Indiana, approximately 75 miles southwest of Indianapolis, 60 miles northwest of Louisville, Kentucky, and immediately east of

Burns City and Crane Village, Indiana. A location map of the NSA Crane facility is provided on Figure 1-1. NSA Crane encompasses approximately 62,463 acres or approximately 98 square miles of the northern portion of Martin County and smaller portions of Greene, Davies, and Lawrence Counties.

The Former Fuel Oil Tank Farm (site) is located in the northwest area of NSA Crane (Figure 1-1). It is located just northeast of Highway H-5, as shown on Figure 1-2. The site covers approximately 3 acres and is currently vacant, grass-covered, and open. With the exception of two small areas, a chain-link fence surrounds the site. All previously existing tank farm structures (storage tanks, associated piping, and tank farm containment walls) have been removed and the site has been vacant since 1999.

Most of NSA Crane is forested including the area surrounding the site. The nearest stream, Culpepper Branch, is located approximately 400 feet southwest of the site and south of Highway H-5. As shown on Figure 1-2, Culpepper Branch drains into First Creek approximately 700 feet south of the site. The northern side of the site slopes gently south. An unnamed drainage channel beginning south of the fenced area drains surface water from the site and flows through a pipe under Highway H-5 to Culpepper Branch. The southern side of the site flows southeast to a drainage channel that flows through a pipe under Highway H-5 and into Culpepper Branch.

The nearest residence is approximately one-half mile southeast of the site. The next nearest residences are approximately 1.5 miles northwest of the site in the Village of Crane, which is located just west of NSA Crane.

The NSA Crane facility was a rural, forested, and farmed area when it was commissioned as a Navy facility in 1941; the site has been part of the Navy facility since that time. There are no known historical or cultural concerns, such as Native American burial grounds or historic landmarks on or in the vicinity of the site. There is no land use controls associated with the site.

1.2.2 Project Screening Levels

Project Screening Levels (PSLs) for the site were determined based on United States Environmental Protection Agency (USEPA) Region Screening Levels (RSLs) (USEPA RSL Table, November, 2010) and Indiana Department of Environmental Management (IDEM) Risk Integrated System Closure (RISC) default closure levels. Additionally, for the HHRA, the following USEPA screening levels were used; ecological soil screening levels (Eco-SSLs) for surface soil, migration to groundwater risk-based soil screening levels (RBSSLs) for subsurface soil, Region 5 soil ecological screening levels (R5 Soil ESL) for sediment and tap water regional screening level (T-RSL) for groundwater. These PSLs for the site were

approved by IDEM in the Sampling and Analysis Plan (SAP) for this Resource Conservation and Recovery Act Facility Investigation (RFI) (Tetra Tech 2010) and are outlined in Tables 5-1 through 5-4.

1.2.3 Site History

The Former Fuel Oil Tank Farm was operational from 1947 to 1996 as an on-site bulk storage facility for fuel oil to heat buildings located on NSA Crane property. The locations of the former tanks are shown on Figure 1-3.

The Fuel Oil Tank Farm was constructed in phases from 1947 to 1975. By the 1970s, 19 ASTs were on site. Seventeen of these ASTs were contained within 6 concrete cells (Cell 1 to Cell 6) that were approximately 58 feet wide and 210 feet long. The cells had concrete walls that extended 4 feet underground and were used for secondary containment; there were no concrete or impervious floors in the cells. Fuel oil was delivered by tanker trucks and transferred into the tanks via piping. Fuel oil was loaded from the tanks into tanker trucks for local transport. The fuel loading and unloading area was south and south-southwest of the fuel tank containment area in the region identified on Figure 1-3 as "Tanker Unloading Station." Fuel piping to and from the tanks was located primarily underground and was bare single-walled steel with no corrosion protection.

Several other tanks were present at the tank farm area. A horizontal AST for waste oil was located within the containment walls, and an underground storage tank (UST) used to store No. 6 Fuel Oil and two smaller ASTs were south of and outside the containment walls. One AST was used to store gasoline, and the other was used to store No. 1 Fuel Oil. Trench drains collected runoff from the site and conveyed it to a sump and then to an underground 3,000-gallon oil/water separator located south of the concrete-walled containment area.

In 1987, there was a release of approximately 3,700 gallons of virgin Fuel Oil No. 2 when a valve on AST 2634 was inadvertently left open in Cell No. 6 on the southern side of the site. An unknown quantity of the oil discharged to the existing ditch south of the site and flowed southwest through a pipe under Highway H-5 and the railroad tracks, into Culpepper Branch and then into First Creek. Absorbent booms and pads were used to collect oil from First Creek. Oil was pumped and vacuumed from Cell 6 and First Creek and was flushed from the ditch and culvert leading to Culpepper Branch. Soil was excavated from the ditch between the site and Culpepper Branch. Approximately 500 gallons of fuel oil were collected from Cell 6. The release impacted approximately 300 feet of Culpepper Branch and approximately 4.8 miles of First Creek. The remaining fuel oil presumably soaked into the ground at Cell 6 over an approximately 5,000-square-foot area (65 feet by 70 feet).

1.3 PREVIOUS ENVIRONMENTAL INVESTIGATIONS AND ACTIONS

Multiple environmental investigations, removal and demolition projects, and soil excavation projects were performed at SWMU 32 between 1989 and 1999.

In 1989, a two-phase investigation was performed to characterize possible soil contamination within the six cells of the Former Fuel Oil Tank Farm. The first phase consisted of a soil gas survey, and the second phase consisted of a soil sampling and analysis program. Samples were collected from areas with elevated soil gas readings. Total petroleum hydrocarbons (TPH) were detected in two soil samples from Cell 6 at concentrations greater than 100 milligrams per kilogram (mg/kg), which was then the applicable IDEM action level for TPH in soil. The investigation report recommended that soil be removed for proper disposal from the two locations in Cell 6. The report also recommended removal of soil from six additional locations with a “noticeable presence of petroleum hydrocarbons” but with TPH concentrations less than the action level (ATEC Environmental Consultants, 1989; PEDCo, E and A Services, Inc., 1989).

In 1993, a Site Remediation Study concluded that contamination at the site was more limited than previously thought and confined principally to surficial clay soil. Soil borings and test pits indicated that subsurface contamination was limited to the southern side of the site in Cells 5 and 6. Cell 6 had the greatest concentrations of TPH, with concentrations greater than 100 mg/kg detected at depths of 3.5 to 5 feet and 6 feet bgs. The study recommended removal of all soil with TPH concentrations greater than 100 mg/kg and any contaminated groundwater that may exist (Howard, Needles, Tammen, and Bergendoff, 1993).

Between 1997 and 1999, all remaining tanks, piping, and associated concrete structures were removed from the site. In 1997, the seven remaining ASTs (including the waste oil tank) and the UST were removed along with most of the associated concrete structures. Prior to removal, the remaining sludge in the waste oil tank was sampled and analyzed. Sampling and analysis during UST removal was performed in accordance with IDEM procedures. A gravel layer was encountered at a depth of approximately 7 feet bgs in Cell 6. It was estimated to be approximately 62 feet long by 58 feet wide and extended beyond the limits of the Cell 6 containment wall. The gravel layer was left in place. Approximately 3,000 cubic yards of fuel-contaminated soil and sand were removed from the site and disposed off site. Clean soil from the northwestern area of the site was used to backfill some of the excavations. Additionally, approximately 2,750 cubic yards of soil were removed, temporarily stockpiled, and returned to the southeastern area of the containment area (Sverdrup Environmental, Inc., 1997a and 1997b).

The final phase of previous environmental work was performed in 1998 and 1999. The Crane Public Works Department plowed soil on the site once every two weeks for six weeks (three plowings) in the area to expose the soil to the air. Three soil samples were collected and analyzed for polychlorinated biphenyls (PCBs) and Toxicity Characteristic Leaching Procedure (TCLP) metals after plowing. No PCBs were detected in the samples. Barium was the only one of the nine TCLP metals detected; it was detected in the TCLP leachate from all three samples at less than 1 milligram per liter (mg/L). The Public Works Department also removed the oil/water separator along with the associated pipelines, which were sold for scrap. Finally, all remaining concrete and other debris were removed from the site. Groundwater was never evaluated in the previously identified investigations. A 1999 Navy memorandum concluded that, “The site is now clean…. No other cleanup activities are planned at this time.” (Navy, 1999).

In September 2000, Science Applications International Corporation (SAIC) issued an Environmental Monitoring Report for the Tank Farm at Crane Division Naval Surface Warfare Center, which summarized previous environmental work at the site including the gravel layer that was encountered in 1987 and left in place and the subsequent excavation and remediation work that did not explicitly address this gravel layer. The report concluded that SWMU 32 “…cannot be considered a clean site.” and recommended that additional samples be collected to characterize the site and specifically address the buried gravel layer in Cell 6 (SAIC, 2000). This RFI describes the results from the work proposed to address that recommendation.

1.4 REPORT ORGANIZATION

Section 1.0 of this report is the introduction, including the purpose, site background, site description, site history, previous investigations, and report organization. Section 2.0 describes the study area field sampling activities and procedures associated with the data collection. Section 3.0 discusses data presentation and data quality review. Section 4.0 describes the physical characteristics of SWMU 32. Section 5.0 presents an evaluation of the nature and extent of contamination detected at SWMU 32 in this field investigation. Section 6.0 presents a discussion of the fate and transport of the contaminants and the conceptual site model (CSM). Section 7.0 identifies the chemicals of potential concern (COPCs) and presents the results of the HHRA. Section 8.0 presents the results of the SERA. Supporting documentation for this RFI is attached as Appendices A through I.

2.0 FIELD INVESTIGATION

This section presents sampling activities, procedures, and documentation utilized during field operations performed for NSA Crane SWMU 32.

2.1 OVERVIEW

RFI field activities for SWMU 32 were conducted during two separate field investigation events in April 2010 and September 2010. These investigations included the collection of surface soil, subsurface soil, groundwater, and sediment samples.

The initial investigation was conducted in April 2010 in accordance with the procedures and methodologies described in the Phase I RCRA Facility Investigation Sampling and Analysis Plan (SAP) for SWMU 32 – Former Fuel Oil Tank Farm at Naval Support Activity Crane, Crane, Indiana (Tetra Tech, 2010). Based on preliminary evaluation of the April 2010 investigation, data gaps were identified. A Technical Memorandum dated September 20, 2010 (Tetra Tech 2010) recommended sampling and analysis to further delineate the impacted soil and groundwater. Subsequent sampling was conducted in accordance with standard operating procedures (SOPs) in Appendix A of the SAP (Tetra Tech, 2010). Appendices A through D of this document include photographs of SWMU 32, copies of all field forms, records, field logbooks, and health and safety documentation associated with the field investigation.

As part of the HHRA, the site was divided into two Decision Units:

- Across the southern portion of the site (Decision Unit #1).
- Across the northern portion of the site (Decision Unit #2).

These two Decision Units (Figure 2.1) were established because the 1987 fuel oil release and other Former Fuel Oil Tank Farm activities may have had a greater impact on the southern portion of the site. Surface and subsurface soil samples were collected from within both Decision Units at the site.

2.2 MOBILIZATION/DEMOBILIZATION

Following approval of the respective SAP and Technical Memorandum, Tetra Tech began mobilization activities. All field team members reviewed the approved SAP and Technical Memorandum, associated appendices, and the site-specific Health and Safety Plan (HASP) prior to the start of project activities. In addition, the Field Operations Leader (FOL) held field team orientation meetings prior to each sampling

event to ensure that personnel were familiar with the scope of the field activities. Health and safety documentation is contained in Appendix E.

Prior to the initiation of fieldwork for both sampling events, the FOL began mobilization activities. These activities included coordination with base personnel and Indiana Underground Plant Protection Services (IUPPS) to complete a utility clearance ticket for the areas under investigation. The equipment required for the field activities was either shipped to the site or transported by the sampling team. At the conclusion of each round of field activities, the FOL directed the decontamination and demobilization of all equipment.

2.3 SUBSURFACE INVESTIGATION METHODOLOGIES AND PROCEDURES

2.3.1 Drilling

All borings were advanced using Direct Push Technology (DPT) drilling methods in accordance with SOP-11 and logged in accordance with SOP-08, located in Appendix A of the SAP. Copies of all soil boring logs are provided in Appendix B. Temporary groundwater well installation dates, depths, lithologic descriptions, and drilling methods are documented in Appendix B and Appendix C. Figure 2-1 shows the locations of all soil borings and temporary groundwater wells completed as part of the RFI at SWMU 32.

During the April 2010 sampling event, 57 borings for soil sampling and 3 borings for the placement of temporary groundwater wells were drilled. Additional borings drilled during the September 2010 sampling event included; 6 borings for subsurface soil sampling, 6 borings for surface soil sampling, and 3 borings for the placement of temporary groundwater wells. Soil borings were advanced to total depths ranging from 2 feet bgs to 24 feet bgs.

To collect soil samples, the DPT sampler was advanced continuously in 5-foot intervals or less if a full 5-foot interval was not needed. Once at the desired depth the DPT sampler was retracted from the hole and the 5-foot continuous sample was removed from the outer coring tube. The sample was contained within an inner acetate liner. The acetate liner was cut through its entire length using the double-bladed knife. Half of the acetate liner was removed allowing access to the soil samples for evaluation and collection. Very few soil cuttings were generated because the soil which is not collected in the sampler is displaced within the formation.

Soil samples were collected from DPT borings for chemical analyses and for lithologic logging. All samples obtained from the boreholes were screened with a photoionization detector (PID) immediately

upon opening. All PID readings were recorded on boring logs or soil and sediment sample log sheets (Appendix B). Soil sample collection information is provided in Section 2.5.1.

2.3.2 Borehole and Sample Logging

A Tetra Tech geologist maintained a log for each boring in accordance with SOP 08 (Borehole and Soil Sample Logging). Copies of the boring logs for each round can be found in Appendix B and contain the following information as appropriate:

- Boring identification
- Temporary groundwater well identification.
- Name of geologist logging the boring
- Name of drilling contractor
- Sample number and type
- Sample depth
- Sample recovery and sample interval
- Soil density or cohesiveness
- Soil color
- Unified Soil Classification System (USCS) material descriptions
- Rock type and description, recovery, and rock quality designation (RQD)
- Location of boring
- Drilling and/or well construction problems or deviations from the project-specific approved SAP
- Date(s) of drilling
- Screening instrument readings

In addition, depths of changes in lithology, sample moisture observations, depth to water, drilling methods, and total depth of each borehole were included on each log, as well as any other pertinent observations.

2.3.3 Borehole Abandonment

All soil borings at SWMU 32 were backfilled with DPT drill cuttings and bentonite chips that were hydrated in accordance with the manufacturer's specifications. The ground surface at each boring location was restored to its original condition.

2.4 SOIL AND SEDIMENT SAMPLES

This section discusses the procedures followed for soil, sediment, and groundwater sampling activities at SWMU 32.

2.4.1 Soil Sampling

During the April and September 2010 RFI sampling activities, a total of 63 soil borings were drilled on-site. From these borings, 68 surface soil and 72 subsurface soil samples were collected. The surface soil samples were analyzed for the select semivolatile organic compound (SVOCs) which included naphthalene and seven carcinogenic polycyclic aromatic hydrocarbons (cPAHs) [benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3,-cd)pyrene, and dibenzo(a,h)anthracene]. The subsurface soils were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX), and select SVOCs. See Figure 2-1 for soil boring locations.

2.4.1.1 Surface Soil Sampling

All surface soil samples were collected from the ground surface to a maximum depth of 2 feet bgs using the DPT rig. Upon retrieving and opening the DPT plastic sleeve, a small portion of the soil sample was collected and placed in sealed Ziploc® plastic bags for the screening of volatile compounds. The vapors within the plastic bag were then monitored for the presence of volatile compounds using a PID. The results of this screening were recorded on the soil boring logs (included in Appendix B and Appendix C).

The April 2010 analytical results showed the contaminant levels in the majority of surface soil samples did not exceed the applicable PSLs. Samples with concentrations that exceed PSLs are generally slightly above PSLs; most of the contamination is limited and bounded by samples with contaminant levels that are below PSLs. The April 2010 analytical results identified one area of the site where contaminant levels exceed the PSLs for a specific poly aromatic hydrocarbon (PAH) (benzo(a)pyrene) and where sufficient analytical data was not obtained to establish the extent of that contaminant.

During the September 2010 sampling event, six surface soil samples were collected and analyzed for benzo(a)pyrene. The locations of the six additional surface soil samples were selected to determine the horizontal extent of the surface benzo(a)pyrene contamination detected during the April 2010 sampling event.

All pertinent field data including sampling methods, depths, descriptions, and locations were recorded on soil and sediment sample log sheets (Appendix C). Figure 2-1 identifies all soil sampling locations.

2.4.1.2 Subsurface Soil Sampling

All subsurface soil samples were collected using the DPT rig. Upon retrieving and opening the DPT plastic sleeve, small portions of soil were selected and placed in sealed Ziploc® plastic bags for the collection of volatile compounds. The soil placed in the plastic bags was selected based on visual observation such as soil staining, petroleum odors, or a change in soil lithology. The vapors within the plastic bag were then monitored for the presence of volatile compounds using a PID. The results of this screening were recorded on the soil boring logs (included in Appendix B).

Once the sample interval was selected based on PID reading or other considerations, samples for BTEX analyses were collected first from that interval using 5-gram EnCore™ samplers. The remaining soil core material was then collected to be analyzed for select SVOCs and placed into the required containers.

The subsurface soil samples collected from a soil boring (32SO-ST01) placed near the former location of a former 2,000-gallon gasoline AST in the southwestern portion of the site was also analyzed for methyl tertiary butyl ether (MTBE) in addition to BTEX and SVOCs. Subsurface soil sample intervals for SWMU 32 are listed in Table 2-1.

The April 2010 analytical results showed the contaminant levels in the majority of subsurface soil samples did not exceed the PSLs. Samples with concentrations that exceed PSLs are generally slightly above PSLs; most of the contamination is limited and bounded by samples with contaminant levels that are below PSLs. The April 2010 analytical results identified one area at the south end of the site where contaminant levels exceed the PSLs for naphthalene and where sufficient analytical data was not obtained to establish the horizontal and vertical extent of that contaminant.

During the September 2010 sampling event, 6 soil borings were drilled and 13 subsurface soil samples were collected and analyzed for naphthalene. The locations of the 6 additional soil borings were selected to determine the extent of the subsurface naphthalene contamination detected during the April 2010 sampling event.

All pertinent field data including sampling methods, depths, descriptions, and locations were recorded on soil and sediment sample log sheets (Appendix C). Figure 2-1 identifies all soil sample locations.

2.4.2 Sediment Sampling

During the April and September 2010 RFI sampling activities, a total of five sediment samples were collected from Culpepper Branch which is located southwest of SWMU 32. During the April 2010

sampling event, one sediment sample was collected upgradient of the point where the 1987 release entered Culpepper Branch and two sediment samples were collected downgradient of that point at 100-foot intervals. The first sediment sample was collect at the most upstream location and the successive samples were downstream from each other. All sediment samples were collected at depths of 0 to 6 inches bgs. The sediment samples were analyzed for the BTEX and select SVOCs, as well as total organic carbon (TOC) to support site-specific risk calculations.

The samples were collected in depositional areas that contained predominantly fine (clay and silt) particles. All sediment samples were collected in accordance with SOP-09. Sediment samples for BTEX analyses were collected first using 5-gram EnCore™ samplers followed by the collection of the sediment samples collected to be analyzed for select SVOCs and TOC. Each sample was placed into the required containers. All pertinent field data including sampling methods, depths, descriptions, and locations were recorded on sediment sample log sheets (Appendix C). Figure 2-2 identifies all sediment sampling locations.

The April 2010 RFI sampling analytical results showed the two sediment samples collected downstream from the point where the 1987 release entered Culpepper Branch contained benzo(a)pyrene at concentrations above the human health PSL. However, the concentrations were in the same order of magnitude as the PSLs and there were no visible signs of contamination in these samples during the field work.

During the September 2010 sampling event, two additional sediment samples were collected and analyzed for BTEX, select SVOCs, and total organic carbon (TOC).

2.5 GROUNDWATER SAMPLES

Six temporary groundwater wells were installed during the April and September 2010 SWMU 32 RFI activities (three during each round of field work). After borings were drilled by DPT to the desired depth and groundwater was encountered, a 1-inch diameter, polyvinyl chlorides (PVC), Schedule 40 well screen and riser pipe was placed in the boring. This was done by inserting the 1-inch diameter PVC in the DPT drill pipe and then removing the drill pipe leaving the 1-inch PVC in the borehole. Well screens were 10 feet in length with a slot size of 0.20 inch. Groundwater samples were collected within 72 hours of well placement. After sampling was complete, each temporary groundwater well 1-inch PVC pipe was pulled from the boring and the hole was backfilled with bentonite chips that were subsequently hydrated.

No permanent monitoring wells were installed at SWMU 32 during either round of sampling field activities.

2.5.1 Groundwater Purging and Sampling

During the April 2010 RFI activities, groundwater samples were collected from three temporary groundwater wells (32MW01, 32MW02, and 32MW03). One of the temporary groundwater wells was located northeast (and assumed to be upgradient based on site topography), and two were located south and southwest (and assumed to be downgradient) of the site. During the September 2010 RFI activities, three additional temporary groundwater wells (32MW04, 32MW05, and 32MW06) were placed south and southeast (and assumed downgradient) of the area of the site that showed naphthalene soil contamination. The six groundwater samples were analyzed for BTEX and select SVOCs. The temporary groundwater well locations are shown on Figure 2-3.

Purging and stabilization of wells prior to sampling was accomplished using low-flow techniques with a peristaltic pump in accordance with SOP-15. Sampling was accomplished in accordance with SOP-15. Groundwater quality parameters including pH, specific conductance, temperature, dissolved oxygen (DO), salinity, and oxidation-reduction potential (ORP) were measured during purging at 5 to 10 minute intervals using a multi-parameter water quality meter and flow-through cell. Turbidity readings were measured using a turbidity meter. Water levels and pumping rates were also measured during purging at 5 to 10 minute intervals. The purging continued until a minimum of three well volumes were removed or the above parameters stabilized in accordance with SOP-15. All temporary groundwater wells were purged at least three well volumes at a steady rate, except well 32MW04, which purged dry. Groundwater samples were collected from 32MW04 immediately after the groundwater level recovered. All groundwater parameters stabilized. However, because the temporary groundwater wells were not constructed with a sand filter pack and the shallow water bearing zone is a silty sediment, the turbidity was never below the desired 10.0 Nephelometric Turbidity Units (NTUs). To the extent possible, the pumping rates were adjusted to prevent excessive drawdown during purging. Copies of the monitoring well low-flow purge data sheets and groundwater sample log sheets are provided in Appendix C.

Sample containers were filled by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence. Select SVOC samples were collected directly from the peristaltic pump. Samples for BTEX analysis were collected using the straw method. The straw method is when the tubing is pinched at the surface to create a vacuum, the tubing removed from the well, and the sample gently dispersed into the sample container. These samples were immediately sealed in 40-milliliter (mL) vials and no headspace existed. All pertinent field data including sampling methods, purge information, pump intake depths, and locations were recorded on low-flow purge data sheets and groundwater sample log sheets (Appendix C).

After groundwater sampling was complete, each temporary groundwater well 1-inch PVC pipe was pulled from the boring and the hole was backfilled with bentonite chips that were subsequently hydrated to seal the hole.

2.6 FIELD SAMPLE DOCUMENTATION

Sample documentation consisted of the completion of boring logs, soil and sediment sample log sheets,, chain-of-custody records, equipment calibration log sheets, field logbooks, and health and safety documentation. Field documentation was completed following SOP-03. Any unusual circumstances encountered during sample collection were noted on the form. Copies of sample log sheets are included in Appendix C of this document. Chain-of-custody records (Appendix C) were used to track each sample from collection to receipt and analysis at the laboratory. Equipment calibration log sheets are discussed in Section 2.9.1 and are also included in Appendix C.

2.7 SAMPLE HANDLING, PACKAGING, AND SHIPPING

The sampling containers were sealed in Ziploc® plastic bags, and glass containers were wrapped in plastic bubble wrap. The sample containers were then placed in a cooler lined with a large plastic garbage bag. The cooler was packed with bubble wrap to prevent breakage. Samples were cooled immediately after collection with ice. A temperature blank was placed in each cooler prior to shipment. The plastic garbage bag was sealed with packing tape, and the chain-of-custody form was sealed in a Ziploc® bag and taped to the inside of the cooler lid. A signed and dated custody seal was applied to each end of the cooler and then covered with strapping tape to provide a tamper-evident seal. Tetra Tech maintained custody of the samples until they were relinquished to Federal Express®. All samples were shipped to the laboratory overnight and were received within sample holding time and temperature.

2.8 QUALITY CONTROL SAMPLES

Quality assurance (QA)/quality control (QC) samples were generated and collected during sampling activities to monitor both field and laboratory procedures. These procedures are detailed in the approved SAP. QA/QC samples included field duplicates, equipment rinsate blanks, trip blanks, and temperature blanks. Field duplicate results are tabulated in Appendix F. These types of QA/QC samples are briefly described below. Further discussion of QA/QC samples is in Section 3 (Data Validation) of this RFI report.

- Field Duplicates - Field duplicates consisted of two samples collected at approximately the same time in the case of soil or sediment VOC samples and groundwater samples or as a single sample split into two portions in the case of non-VOC soil and sediment samples. Field duplicates were collected

at a minimum rate of 1 in 20 per medium and were used to assess the overall precision of the sampling and analysis program.

- Equipment Rinsate Blanks - Equipment rinsate blanks were obtained under representative field conditions by collecting the rinse water generated by running analyte-free water through or over sample collection equipment after decontamination and before use. When pre-cleaned, dedicated, or disposable sampling equipment was used (no decontamination was required), one equipment rinsate blank was collected as a batch blank. Equipment rinsate blanks were analyzed for the same chemical constituents as the associated environmental samples.

- Trip blanks - Trip blanks were used to determine whether contamination of VOC samples had occurred during transit or storage. Trip blanks consisted of analyte-free water taken from the laboratory to the site and returned to the laboratory. One trip blank was submitted to the laboratory in each cooler that contained samples for VOC analyses and was analyzed for BTEX only.

- Temperature blanks - Temperature blanks were used to determine if samples were adequately cooled during shipment. Temperature blanks consisted of analyte-free water poured into a clean sample container at the site or supplied by the fixed-base laboratory. One temperature blank was submitted to the laboratory in each cooler, and the temperature was checked upon receipt at the laboratory.

2.9 FIELD INSTRUMENT MEASUREMENTS

Field measurements taken and recorded during field sampling operations included water temperature, pH, specific conductance, ORP, DO, turbidity, and groundwater level measurements. Ambient air measurements included monitoring of organic vapors in the breathing zone during intrusive field investigation activities and monitoring of organic vapors emanating from site sources such as soil samples and well casings. Several instruments were used during field activities to obtain these measurements, including the following:

- PID
- Multi-parameter water-quality meter
- Turbidity meter
- M-scope water level indicator

2.9.1 Equipment Calibration

Instruments used in the field were calibrated daily prior to use according to manufacturers' requirements and in accordance with applicable SOPs. Copies of equipment calibration logs are located in Appendix C.

2.9.2 Field Investigation Preventive Maintenance Procedures/Schedule

Field instruments for this project included a PID, water-quality meters, a turbidity meter, and a water level indicator. The specific preventive maintenance procedures followed for field equipment were those recommended by the equipment manufacturers.

An appropriate maintenance check was performed daily on each piece of equipment. If damaged or defective parts were identified during the maintenance check, and it was determined that the damage could have an impact on the instrument's performance, the instrument was removed from service until the defective parts were repaired or replaced. Critical spare parts were kept on site to reduce downtime. Spare parts included batteries, a DO probe membrane kit (membranes and a bottle of solution), and air particle filters for the PID. Back-up instruments and equipment were available on-site or were shipped within one day via overnight courier to avoid delays in the field schedule.

2.10 SURVEYING

All soil boring, temporary groundwater wells, and sediment sampling locations were located with a Trimble GeoXH global positioning system (GPS) unit. Following the placement of all soil borings and temporary groundwater wells, the locations were verified using the GPS unit. The GPS unit was used in accordance with SOP-01 (Global Positioning System), located in Appendix A of the SAP. The GPS equipment was checked on control monuments before and after the day's events each day the GPS was used, and these checks were documented in the field notebook. The GPS data was collected using the State Plane NAD 1983 Indiana West (feet) coordinate grid.

The vertical elevations of the six temporary groundwater wells were not surveyed.

2.11 DECONTAMINATION

The non-dedicated, non-disposable equipment involved in field sampling activities was decontaminated before beginning work, during drilling and sampling activities, and at the completion of each round of RFI activities in accordance with SOP-06. This equipment included drilling rigs, down-hole tools, and water sampling equipment.

2.11.1 Sampling Equipment

All nondedicated (reusable) equipment used for collecting samples was decontaminated before field sampling, between sample collections, and at the end of each sampling event. This equipment included stainless steel trowels, stainless steel mixing bowls, etc. The following decontamination steps were taken:

- Potable water and phosphate-free detergent wash (scrub if necessary)
- Potable water rinse
- Deionized (DI) water rinse
- Air dry (if possible)
- Wrap in aluminum foil (if not to be used immediately)

An isopropanol rinse was not necessary because no oily residue was evident on the sampling equipment.

Field analytical equipment such as pH, conductivity, and temperature probes were rinsed first with analyte-free water then with the sample prior to making measurements. Water level measurement devices were rinsed with DI water.

2.12 GROUNDWATER LEVEL MEASUREMENTS

Water level measurements were obtained from each groundwater monitoring well prior to sampling. The water level measurements were recorded to the nearest 0.01 foot as identified on the sample log sheets provided in Appendix C. Information regarding groundwater depths and the estimated groundwater flow direction is discussed in Section 4.6 (Hydrogeology) of this RFI report.

2.13 FIELD CORRECTIVE ACTION

Corrective action includes the process of identifying, recommending, approving, and implementing measures to counter unacceptable procedures or "out of QC" performance that can affect data quality, and the process of modifying procedures to address unexpected/unusual field conditions encountered.

Corrective action in the field resulted when substantive changes were made to the sampling network (i.e., more/fewer samples collected, sampling locations other than those specified, etc.) and when sampling procedures or field analytical procedures required modification. Project personnel reported all suspected technical or QA non-conformance or suspected deficiencies of any activity or issued document to the FOL. The Tetra Tech Project Manager (PM) was responsible for assessing the suspected

problems in consultation with the Project Chemist and for making a decision based on the potential for the situation to affect the quality of the resulting data. If it was determined that the situation warranted a reportable non-conformance requiring corrective action, a non-conformance report was initiated by the PM.

2.14 INVESTIGATION-DERIVED WASTE HANDLING

The field investigations generated several types of potentially contaminated wastes including personal protective equipment (PPE), decontamination fluids from the sampling equipment decontamination fluids, DPT plastic sleeves, development and purge water, and drill cuttings. Management of each residue was performed as follows:

PPE, Pump Tubing, and DPT Plastic Sleeves – All PPE, tubing, and DPT plastic sleeves were decontaminated, double bagged, and placed in NSA Crane trash receptacles (i.e., dumpsters).

Purge Water and Drilling and Sampling Equipment Decontamination Fluids – All purge water and drilling and sampling equipment decontamination fluids were collected and discharged to the NSA Crane permitted waste treatment plant.

Waste Cuttings from Drilling Activities – For each DPT boring, the cuttings produced were scanned for volatile organic vapors. Volatile organic vapor readings were at ambient background levels for all borings, and cuttings were therefore used as backfill if the boring terminated above the water table. Any remaining cuttings were spread on the ground in the immediate vicinity of the boring.

2.15 SITE MANAGEMENT AND FACILITY SUPPORT

The FOL was designated as the lead in coordinating all day-to-day activities during the investigation. The FOL was responsible for ensuring that all field team members (including subcontractors) were familiar with the approved SAP and the HASP. Additionally, the FOL was responsible for all sampling operations, QA/QC, field documentation requirements, and field change orders. The FOL reported to the PM on a daily basis regarding the status of fieldwork.

All site preparation, mobilization/demobilization, and sampling activities were coordinated through NSA Crane personnel through pre-visit communication and daily meetings during field work.

2.16 RECORDKEEPING

Various hardcover, bound record books or electronic logs were maintained for each field activity in accordance with SOP-03. The Master Site Logbook served as the overall record of field activities. Information recorded daily in the Master Site Logbook included daily field activities, weather conditions, identity and arrival and departure times of personnel, management issues, etc. Various field notebooks were also maintained. For example, the site geologist supervising monitoring well installation operations maintained a field notebook. Copies of field log books are included in Appendix D.

The FOL was responsible for the maintenance and security of all field records. Eventually, all field records, chain-of-custody forms, sample log sheets, field forms, logbooks, and notebooks were docketed and incorporated in the central project file for CTO F273.

2.17 RESTORATION AND REVEGETATION

At the conclusion of the field activities, Tetra Tech performed a site walkover to determine if any areas of the site were damage during the drilling activities. No areas of the site were damaged requiring any restoration.

3.0 DATA VALIDATION

A description of the data review processes used to determine whether analytical laboratory data were of acceptable technical quality for use in decision making is presented in this data quality review (DQR). The review began with data verification and validation. Verification is a process used to ensure that contractual requirements were satisfied. Validation is a comparison of data quality indicators (DQIs) against prescribed acceptance criteria to assess analytical method performance. The DQIs include measures to assess the bias and precision of the analytical calibrations and sample analyses. Together, verification and validation are the first steps in evaluating the DQIs of precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS). The data review process culminates with a data usability assessment during which the final usability of the data is established relative to the intended data use.

3.1 DATA VALIDATION PROCESS

All of the results from analytical laboratory samples were validated according to several specifications. Assignment of data qualification flags conformed to rules established in the USEPA guidance document "Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review" (USEPA, October 1999), and the Department of Defense (DoD) guidance document "Quality Systems Manual (QSM) for Environmental Laboratories", Version 4.1 (DoD, April 2009), to the greatest extent practicable for non-contract laboratory program (non-CLP) data. Numerical criteria used in conjunction with these rules were specified in the Phase I RCRA Facility Investigation Sampling and Analysis Plan (SAP) for SWMU 32 – Former Fuel Oil Tank Farm at Naval Support Activity Crane, Crane, Indiana (Tetra Tech, January 2010).

If no qualifier is assigned to a result that has been validated, the data user is assured that no analytical performance deficiencies were identified during validation. The qualification flags used are defined below:

U – Indicates that the chemical was not detected at the numerical detection limit noted. Non-detected results are reported with a "U" qualifier when received from the laboratory. Additionally, a "U" qualifier is added to a result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

J – Indicates that the chemical was detected. However, the associated numerical result is not an accurate representation of the amount that is actually present in the sample. The laboratory reported concentration is considered to be an estimate of the true concentration.

UJ – Indicates that the chemical was not detected. However, the detection limit (sample-specific quantitation limit) is considered to be estimated based on problems encountered during laboratory analysis. The associated numerical detection limit is regarded as inaccurate.

R – Indicates that the chemical may or may not be present. The analytical result reported by the laboratory is considered to be unreliable and unusable. The “R” qualifier is applied in cases of gross technical deficiencies (i.e., holding times missed by a factor of two times the specified time limit, severe calibration non-compliances, and extremely low QC recoveries).

UR – Indicates that the chemical may or may not be present. The non-detected analytical result reported by the laboratory is considered to be unreliable and unusable. The “UR” qualifier is applied in cases of gross technical deficiencies (i.e., holding times missed by a factor of two times the specified time limit, severe calibration non-compliances, and extremely low QC recoveries).

The preceding data qualifiers may be categorized as indicative of major or minor problems. Major problems are defined as issues that result in the rejection of data and qualification with “UR” or “R” data validation qualifiers. Rejected data are considered invalid and are not used for decision making purposes unless used in a qualitative way and the use is justified and documented. Less severe deficiencies, associated with “U”, “J”, and “UJ” data validation qualifiers, are defined as issues resulting in the estimation of data. Estimated analytical results are considered to be suitable for decision making purposes unless the data use requirements are very stringent and the qualifier indicates a deficiency that is incompatible with the intended data use. Also, a “U” qualifier does not necessarily indicate that a data deficiency exists because all non-detect values are flagged with the “U” qualifier regardless of whether a quality deficiency has been detected.

Samples were analyzed for this project for BTEX and/or select SVOCs and reported by the laboratory in 11 Sample Delivery Groups (SDGs), including 9 SDGs for the initial sampling event performed in April 2010 and 2 SDGs for the additional sampling event performed in September 2010.

No data points for the SWMU 32 RCRA Facility Investigation were rejected during validation. Any impacts to the project based on the results of the data evaluation are discussed in the remainder of this review. Please note that data users should be aware that any qualified data, even if it is considered usable, may be less accurate or less precise than non-qualified data.

3.2 DATA VALIDATION OUTPUTS

After laboratory data were validated, a list was developed of non-conformities requiring data qualifier flags that were used to alert the data user to inaccurate or imprecise data. For situations in which several QC criteria were out of specification, the Tetra Tech Data Validator made professional judgments and/or comments on the validity of the overall data package. The reviewer then prepared a technical memorandum presenting qualification of the data, if necessary, and the rationale for making such qualifications. Tetra Tech Data Validators incorporated data qualifiers into the electronic database and submitted the information to the Tetra Tech data management group. A complete printout of the data results with validation flags is presented in Appendix F and the database is included as an electronic file on a compact disk (CD) in this appendix. Data validation summary narrative reports are included in Appendix G. Pertinent quality estimates are summarized in a more quantitative format in the following sections.

3.3 GENERAL DATA QUALITY REVIEW

The DQR provided herein is designed to provide an overall quantitative measure of analytical performance that is not provided by data validation. The analytical performance quantitative evaluations are frequently analyte-specific and reflect deficiencies such as biases associated with the quantitation of particular analytes in a particular sample matrix. The data user must be aware that different chemicals in the same analytical group (e.g. benzene and toluene) may exhibit different degrees of quality.

3.3.1 Completeness

Completeness is a measure of the number of valid samples or measurements that are available relative to the number of samples or measurements that were intended to be generated. For this project, completeness was measured on two different bases: samples collected and laboratory measurements.

- Sample collection completeness was a measure of the number of usable samples collected as compared to those intended to be collected.

- Laboratory measurement completeness was a measure of the amount of usable, valid laboratory measurements for each target analyte in each analytical group obtained per matrix as compared to those intended to be measured.

Usable, valid samples (or results) were those judged, after data assessment, to represent the sampling populations and to have not been disqualified for use through data validation or additional data review. Completeness was determined using the following equation:

$$\%C = \frac{V}{T} \times 100$$

where	%C	=	percent completeness
	V	=	number of samples (or results) determined to be valid
	T	=	total number of planned samples (or results)

Completeness evaluations for each subarea and matrix studied at SWMU 32 are tabulated in Table 3-1. The total sample collection completeness evaluations for each subarea are the values used to evaluate sample collection completeness against a completeness goal of 95 percent. A specific completeness goal was not established in the Phase I RCRA Facility Investigation SAP for SWMU 32 (Tetra Tech, January 2010); however, a goal of 95 percent is appropriate for this project. Discussions pertaining to sample collection and laboratory measurement percent completeness deficiencies (i.e., percent completeness values less than 95 percent) follow.

There were no sample collection completeness deficiencies because the sample collection completeness goals were met for all sample matrices and all analytical groups. As identified in Table 3-1, there was an apparent sample collection completeness deficiency in the number of subsurface samples collected for naphthalene (91.67%) during the additional sampling event performed in September 2010. Eleven out of 12 planned samples were collected, but the planned sample 32SB-57-YYYY (the second SB-57 sample from below 32SB-57-0708) was not collected due to DPT refusal at 8 feet bgs. Subsurface soil sample collection completeness for naphthalene is considered to be 100 percent, because the one expected sample location that was not collected was unavailable due to the site geology (i.e., DPT refusal).

There were no laboratory measurement completeness deficiencies, as identified in Table 3-1. Laboratory measurement completeness was greater than the goal of 95 percent for all sample matrices and analytical groups since all samples that were submitted to the laboratory were analyzed and no data points were rejected.

Per the SAP (Tetra Tech, January 2010), deviations from sample collection and laboratory analysis percent completeness were evaluated by the Tetra Tech PM and Project Chemist to determine if those deviations compromise the ability to meet project quality objectives (PQOs). Evaluations of completeness deviations are discussed in Section 3.4.

3.3.2 Sensitivity

The detection limits (DLs) reported by the laboratory were less than the applicable PSLs provided in Table 3-2 for all samples, including all samples that required dilutions due to elevated concentrations of target analytes in the same analytical group (i.e., cPAHs). Table 3-2 lists target analytes per subarea and per matrix for which the DL exceeded the corresponding revised PSL for one or more sample results. Table 3-2 also displays two different percentages, which are: the percentage of non-detected results that exceeded PSLs when comparing the non-detected exceedances to the total number of non-detected results; and the percentage of non-detected results that exceeded PSLs when comparing the non-detected exceedances to the total number of results analyzed (positive and non-detected results). The percentage of non-detected results that exceeded PSLs when comparing the non-detected exceedances to the total number of non-detected results is used to evaluate the overall success of the laboratory achieving DLs equal to, or less than, PSLs and the percentage of non-detected results that exceeded PSLs when comparing the non-detected exceedances to the total number of results analyzed (positive and non-detected results) is used to evaluate the effect of sensitivity exceedances on the complete corresponding data set. Lists of target analytes per subarea and per matrix for which sensitivity issues were identified and corresponding effects on data usability are described below.

One hundred percent (100%) of the data points for surface and subsurface soil, sediment, and groundwater samples that were reported as non-detected were reported at a concentration below the corresponding revised PSL. Some results were reported with elevated DLs due to dilutions that were necessary to properly quantify other detected target analytes; however, none of the non-detected results were reported at, or above, the corresponding revised PSL, as identified in Table 3-2.

3.3.3 Accuracy

Accuracy in the laboratory was measured through the comparison of a spiked sample or a Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) result to a known or calculated value, and is expressed as a percent recovery (%R). Accuracy was also assessed by monitoring the analytical recovery of select surrogate compounds added to samples that are analyzed by organic chromatographic methods and the analytical recovery of calibration standards for all analyses, also expressed as a %R. LCSs/LCSDs were used to assess the accuracy of laboratory operations with minimal sample matrix effects. Matrix spike/matrix spike duplicate (MS/MSD) and surrogate compound analyses measure the combined effects on accuracy of the sample matrix, sample preparation, and sample measurement. LCS and MS analyses were performed at a minimum frequency of one per 20 associated samples of like matrix. Laboratory accuracy was assessed by comparing calculated %R values to accuracy control limits specified by the laboratory using the appropriate SW-846 Method and DoD QSM acceptance limits.

Percent recovery is calculated using the following equation:

$$\%R = \frac{Ss - So}{S} \times 100$$

where	%R	=	percent recovery
	Ss	=	result of spiked sample
	So	=	result of non-spiked sample
	S	=	concentration of spiked amount.

All LCS/LCSD %Rs were compliant except for the VOC LCS %Rs for SDG CTOF273_011, which exceeded the LCS %R limits for all VOCs. However, the corresponding LCSD %Rs were all within limits. No data was qualified due to LCS/LCSD non-compliance.

A total of 13 MS/MSD samples were collected and analyzed, including 6 surface soil samples for select SVOCs; 5 subsurface soil samples for BTEX and select SVOCs; 1 sediment sample for BTEX and select SVOCs; and 1 groundwater sample for BTEX and select SVOCs. All MS and MSD %Rs were within the project acceptance limits except the total xylenes for the MS sample associated with 32SB-35-0507 (74.1, compared to the lower limit of 75) and chrysene for the MSD sample associated with 32SB-39-0507 (135, compared to the upper limit of 134). The MS sample associated with 32SD-01-0006 was spiked incorrectly by the laboratory, but the MSD %Rs were within acceptance limits, so the MS %Rs and the MS/MSD RPDs were not considered for that sample. No data was qualified due to MS/MSD non-compliance.

A number of results were qualified as estimated (J) due to internal standard (IS) or surrogate %R non-compliance, as described in the data validation summary narrative reports located in Appendix G, as identified in the results database in Appendix F, and as summarized in Table 3-3. Other accuracy DQIs such as LCS and continuing calibration verification (CCV) %Rs indicated that the laboratory analyses were sufficiently accurate for project data use.

CCV non-compliances were noted in SDGs CTOF273_006, CTOF273_007, CTOF273_008, and CTOF273_009, affecting the non-detected and positive results reported for a number of samples. Qualified results were not rejected because the non-compliances were not gross exceedances (i.e., < 10 %R) and are therefore considered usable data.

3.3.4 Precision

Precision is a measure of the degree to which two or more measurements are in agreement and describes the reproducibility of measurements of the same parameter for samples analyzed under similar conditions.

Precision between two values for chemical parameters is expressed as a Relative Percent Difference (RPD), which is defined as the ratio of the difference to the mean for the two values being evaluated. RPDs, typically expressed as percentages, are used to evaluate both field duplicate and laboratory duplicate precision and are calculated as follows:

$$RPD = \frac{|V1 - V2|}{(V1 + V2)/2} \times 100$$

where RPD = relative percent difference
V1, V2 = two results obtained by analyzing duplicate samples

The precision estimates obtained from field duplicate samples encompass the combined uncertainty associated with sample collection, homogenization, splitting, handling, laboratory and field storage (as applicable), preparation for analysis, and analysis. In contrast, precision estimates obtained from analyzing laboratory duplicate samples incorporate only homogenization, subsampling, preparation for analysis, laboratory storage (if applicable), and analysis uncertainties.

A total of 18 field duplicate samples were collected and analyzed, including 6 surface soil samples for select SVOCs; 1 surface soil sample for benzo(a)pyrene; 6 subsurface soil samples for BTEX and select SVOCs; 1 subsurface soil sample for naphthalene; 2 sediment samples for BTEX and select SVOCs; and 2 groundwater samples for BTEX and select SVOCs.

According to the data validation summary narrative reports, some results were qualified as estimated (J) for the field duplicate pairs (32SS-21-0002/ 32SS-FD042710-02), (32SB-50-0607/ 32SB-FD042910-05), (32SD-02-0006/ 32SD-FD043010-01), and (32SS-65-0002/ 32SS-FD092010-02) due to field duplicate imprecision greater than 50 RPD. Upon review of these results, it is noted that most of the results for field duplicate samples were non-detect for all target analytes. In the cases identified above, significant differences are: for sample 32SS-21-0002, there were eight detected SVOC results, but the duplicate results were non-detected at levels approximately 5-10 times lower than the reported values (RPD not calculatable); for sample 32SB-50-0607, the total xylene result was 803 micrograms per kilogram (µg/kg) and the duplicate result was 289 µg/kg (94 RPD) and the naphthalene result was 1,360 µg/kg and the

duplicate result was non-detect (RPD not calculatable); for sample 32SD-02-0006, the total xylene result was 220 µg/kg and the duplicate result was non-detect (RPD not calculatable) and the six detected SVOC results were consistently approximately five times lower than the corresponding duplicate SVOC results; and for sample 32SS-65-0002, the benzo(a)pyrene result was 79.1 µg/kg and the duplicate result was 323 µg/kg (121 RPD).

A total of 13 MS/MSD samples were collected and analyzed, including 6 surface soil samples for select SVOCs; 5 subsurface soil samples for BTEX and select SVOCs; 1 sediment sample for BTEX and select SVOCs; and 1 groundwater sample for BTEX and select SVOCs.

MS/MSD RPD results were within 30 RPD for all samples, with the exception of 32SD-01-0006, which was not considered as identified in Section 3.3.3.

3.3.5 Comparability

Comparability is defined as the confidence with which one data set can be compared with another (e.g., among sampling points and among sampling events). Comparability was achieved by using standardized sampling and analysis methods, as well as standardized data reporting formats. Comparability of laboratory measurements was achieved primarily through the use and documentation of standard sampling and analytical methods. Results were reported in units that ensured comparability with current state and federal standards and guidelines. Comparability of laboratory measurements was assessed primarily through the use of QC samples and through adherence to the SAP (Tetra Tech, January 2010).

3.3.6 Representativeness

Representativeness is an expression of the degree to which data accurately and precisely depict the actual characteristics of a population or environmental condition existing at the site. By complying with the SAP (Tetra Tech, January 2010), and through the use of standardized sampling, sample handling, sample analysis, and data reporting procedures, the sampling program was designed so that the final data would be accurate representations of actual site conditions. The DQR found the data collected to be representative of the targeted populations.

However, one significant parameter that ensures representativeness is the analysis of samples within recommended holding times. Many sample results for this project were qualified as estimated (J) because they were analyzed past the recommended holding times for the VOCs and/or the SVOCs. One or more target analytes were qualified as estimated (J) due to exceeded holding times, as identified in

Table 3-3, for at least 4 groundwater, 5 rinsate blank, 12 subsurface soil and 11 surface soil samples for SVOCs; and 32 subsurface soil and 4 sediment samples for VOCs (including field duplicates).

Delays in analyzing samples within the recommended holding times were caused by power outages and associated problems from historic flooding in the Nashville area on May 1-2, 2010, just days after most of the samples collected during the initial sampling event were sent to the laboratory. In all cases, samples were analyzed within two times the holding time, so there were no gross exceedances of holding times and no results were rejected due to the excess holding times.

3.4 DATA USABILITY

The following findings effect project data usability and must be considered by project data users.

The data collected during the SWMU 32 RCRA Facility Investigation were determined to be of sufficient quality to be used for determining the nature and extent of chemical contaminants identified at the site. QC samples collected during the April and September 2010 sampling events included 18 field duplicate samples, 13 MS/MSD samples, 5 rinsate blanks, and 5 trip blanks, which met or exceeded the minimum quantities defined in the SAP. SW-846 methods were used to analyze the samples for BTEX and/or select SVOCs. Data validation was performed on all data in accordance with the final SAP following the USEPA CLP Functional Guidelines for Organic Data Review, and in conjunction with the method specific criteria presented in the SAP.

No sampling issues or field conditions were identified that caused a rejection of any reported data. Field duplicate precision measurements exceeded the acceptance criteria of 30% RPD for aqueous and 50% RPD for soils for one or more analytes in 4 of the 18 field duplicate data sets. A number of accuracy measurements exceeded the acceptance criteria for surrogate, IS, or CCV %Rs. These data were qualified as estimated (J) and are considered usable. No problems were associated with data representativeness with the exception of exceeded holding times. Numerous target analytes were qualified as estimated (J) due to exceeded holding times and the data are considered usable.

Some results were flagged with the qualifiers J, U, and UJ because the data were outside QC acceptance criteria. For all detected target analytes in surface and subsurface soil, sediment, and groundwater, the Limits of Quantitation (LOQs) were sufficiently sensitive (below the corresponding PSLs for human health direct contact and/or ecological exposure) to meet the PQOs. Any positive detections between the LOQ and the DL were qualified as estimated (J) and are considered usable.

Data validation qualifications and discussions can be found in the reports in Appendix G.

4.0 PHYSICAL CHARACTERISTICS OF THE STUDY AREA

4.1 PHYSIOGRAPHY AND TOPOGRAPHY

SWMU 32 – Former Fuel Oil Tank Farm is located in the northwest area of NSA Crane just northeast of Highway H-5 as shown on Figure 1-1. The site is located on the floor of a narrow, 1500 foot wide valley that trends northwest to southeast. The site is mostly grass-covered with the exception of two small areas; a gravel parking area immediately south of the Former Fuel Oil Tank Farm area and a wooded area immediately northeast of the gravel parking area.

North and east of the site is a wooded area. Further east of the wooded area is Highway 449 which intersects Highway 5 immediately south of the gravel parking area. Further west and southwest of Highway 5 is a railroad track, a grassy area, a wooded area, and Culpepper Branch. An unnamed drainage ditch and tributary of Culpepper Branch begins at the south fence line of the Former Fuel Oil Tank Farm. This drainage ditch runs to the south for approximately 150 feet and enters a drainage pipe. The drainage pipe flows southwest under the gravel parking area, Highway 5, and the railroad tracks and empties into another unnamed drainage ditch. This drainage ditch runs about 150 feet further southwest and flows into the Culpepper Branch. Culpepper Branch then flows into First Creek which is located about 700 feet south of site.

The Former Fuel Oil Tank Farm is generally flat and is surrounded by a chain link fence. The western portion of the site is approximately 560 feet above mean sea level (amsl), the same elevation as Highway 5. Within the fenced area, the eastern portion of the site is slightly elevated, approximately 4 feet, above the western portion of the site. North of the fenced area, the surface elevation rises to an elevation of about 575 amsl (Figure 1-2). The elevation slopes downward west of Highway 5 to an elevation of 540 amsl, the same elevation of Culpepper Branch. The total topographic relief around SWMU 32 is about 35 feet.

4.2 METEOROLOGY

NSA Crane is located in a warm, temperate climatic zone. In general, the summers are warm and humid, and winters are mild with occasional short cold periods. The temperature ranges from an average maximum July temperature of 89 degrees Fahrenheit (°F) to an average minimum January temperature of 26°F. Precipitation is fairly evenly distributed throughout the calendar year; the maximum precipitation occurs during the spring and early summer. The average annual precipitation at the facility is 44 inches and consists of 42 inches of rain and 15 inches of snow. The average humidity ranges from 40 to 90 percent in summer and 60 to 90 percent in winter. Long-term climatological records for the area

indicate that the monthly prevailing wind direction is from the southwest from April through December and from the northwest during January through March [National Oceanic and Atmospheric Administration (NOAA, 1988)]. The annual prevailing wind direction for the region is from the southwest, and the annual average wind speed for the area is about 9.6 miles per hour. Figure 4-1 is a wind rose summarizing the mean wind direction and wind speed distribution at the Indianapolis International Airport over a 5-year period (1985 to 1989).

4.3 SURFACE WATER HYDROLOGY

The general topography at SWMU 32 is a relatively flat plane generally sloping to the south and southwest. Surface water runoff from the grassy area drains to south and southwest. A portion of the northwest corner of the fenced area is poorly drained with standing water in the wet times of the year. Surface runoff in the south portion of the site flows into the drainage ditch that flows into the Culpepper Branch, as described in Section 4.1. This drainage ditch also collects surface runoff from the portion of Highway 5 that is adjacent the gravel parking area. It appears that direct rainfall and a small amount of surface runoff entering the drainage ditch are the only surface waters flowing to Culpepper Branch from the SWMU 32 site.

4.4 GEOLOGY

The surficial geology of the site consists of alluvium underlain by the Lower Pennsylvanian-age Mansfield Formation of the Raccoon Creek shown on Figure 4-2. The boring samples collected during the RFI activities show the alluvium materials to be fine grained sand, silt, and clay. The deepest boring drilled during the RFI activities was 24 feet bgs. The depth to bedrock and the type of bedrock below the unconsolidated sediments at SWMU 32 is unknown because there are no borings deeper than 24 feet bgs and there are no deep bedrock monitoring wells on the site.

During the RFI for SWMU 32, a total of 63 soil borings and 6 temporary groundwater wells were installed to depths ranging from 6 feet bgs to 24 feet bgs. The soil samples collected from these borings showed the surface sediments are generally a light brown and gray silty clay, mottled and semi-dry; a light brown silty clay, semi-dry, or a brown clay, stiff and semi dry. These sediments ranged in depths from surface to 12 feet bgs to 21 feet bgs. The 6 deeper borings placed for the temporary groundwater wells encountered very wet interbedded zones of fine sand, silt, and clay at 15 feet to 17 feet bgs. Boring 32MW02 encountered a semi dry silty clay zone 15 feet bgs then a very wet, silty sand zone between 15 feet bgs to 20 feet bgs. Boring 32MW03 encountered the semi dry silty clay zone to 16 feet bgs; a very wet, silt zone between 16 feet bgs to 17 feet bgs; a moist gray clay between 17 feet bgs and 18 feet bgs; and a wet fine sand from 18 feet bgs to 20 feet bgs.

A small area at the south end of the site had a 1 foot to 1.5 foot sand and gravel layer between 6 feet bgs to 7.5 feet bgs in soil boring 32SB50 and between 7 feet bgs and 8 feet bgs in soil boring 32SB51. This sand and gravel zone was oil stained and had a strong fuel odor. Subsequent borings in this area did not encounter the sand and gravel layer, the oil staining, or the strong fuel odor. This sand and gravel layer may have been fill material placed during the construction of the tank farm. As discussed in Section 1.3, a gravel layer was encountered at a depth of approximately 7 feet when the containment cells were removed and the gravel layer was left in place.

The boring number, sample identification, date of installation, total depth, and analytical analysis of the soil borings and temporary groundwater wells are listed in Table 2-1. The boring logs are included in Appendix B. The locations of the soil borings are shown in Figure 2-1 and the temporary groundwater wells are shown on Figure 2-2.

4.5 SOILS

The site soils are brown silty clay with a moderate amount of organic material. The organic soils were thin and between the surface to 1 foot bgs. The surface soil within the fenced area had been re-worked for the construction of the tank farm, and in some areas the soil was replaced with a gravel cover from ground surface to 1 foot bgs. The site soil was further reworked after removal of the ASTs and ancillary equipment.

The soil is identified as a member of the Willston-Gilpin Group in the Soil Survey of Martin County, Indiana published by the US Department of Agriculture (USDA) Natural Resource Conservation Service. The Willston-Gilpin soils are described as deep and moderately deep, gently sloping to very step, well drained soil formed from loess and material weather from sandstone, siltstone, and shales on uplands. This soil description is consistent with the soils found on site.

4.6 HYDROGEOLOGY

The six temporary groundwater wells placed during the RFI activities ranged in depths from 20 feet bgs in 32MW01, 32MW02, and 32MW03 to 24 feet bgs in 32MW04, 32MW05, and 32MW06. The water-bearing zones were encountered in the thin silt and fine sand zones of the unconsolidated alluvial sediments.

The initial depth to groundwater in the temporary groundwater wells placed in April 2010 ranged from 5.55 feet bgs in 32MW02 to 15.85 feet bgs in 32MW01. The initial depth to groundwater in the temporary groundwater wells placed in September 2010 ranged from 16.58 feet bgs in 32MW04 to 16.86 feet bgs in

32MW06. During the placement of all six temporary groundwater wells, the wet sediments indicative of groundwater flow zones was encountered between 15 feet and 17 feet bgs. The depths to groundwater are summarized in Table 4-1.

TABLE 4-1

TEMPORARY GROUNDWATER WELL DATA

Well Number	Well Install Date	Initial Depth to water (ft)
32MW01	April 2010	15.85
32MW02	April 2010	5.55
32MW03	April 2010	9.23
32MW04	September 2010	16.58
32MW05	September 2010	16.70
32MW06	September 2010	16.86

A comparison of the water levels in the temporary groundwater wells placed in April 2010 to the wells placed in September 2010 is difficult because the wells were placed in different times of the year. The best estimate for groundwater flow direction using the groundwater data from the temporary groundwater wells placed in April 2010 is from wells 32MW02 and 32MW03 because these two wells are at a similar ground elevation. The initial groundwater level in 32MW02 was 5.55 feet bgs and in 32MW03 the initial groundwater level was 9.23 feet bgs. Using these two wells, the general groundwater flow direction is likely to the south.

The estimate groundwater flow direction using the groundwater data from the three temporary groundwater wells placed in September 2010 is inconclusive. The wells are aligned linearly from north to south as shown on Figure 2-3, making it impossible to triangulate the groundwater levels. Also, the initial groundwater level in each well is very similar as shown in Table 4-1 above. Therefore, the groundwater flow direction using temporary groundwater wells placed in September 2010 cannot be accurately calculated.

Surface streams are often discharge points for shallow water bearing zones. Therefore it is likely that the discharge points for shallow groundwater at SWMU 32 are First Creek to the southeast and Culpepper Branch to the southwest. The temporary groundwater wells 32MW02 and 32MW03 were placed between the site and Culpepper Branch and the temporary groundwater wells 32MW04, 32MW05, and 32MW06 were placed between the site and First Creek.

The general slope of the site is to the south and southwest and often the shallow groundwater flow direction mimics topography. Based on the site topography, the general groundwater flow direction is likely to the south or southwest (depending on the season) and is consistent with First Creek to the south and Culpepper Branch to the southwest of the site.

No hydraulic conductivity testing was performed in the temporary groundwater wells. The fine sandy/silty water-yielding zones monitored in the temporary wells are expected to have moderately low permeability.

4.7 DEMOGRAPHY AND LAND USE

The economic base of communities surrounding NSA Crane is in transition from agriculture, mining, and quarrying to manufacturing and service industries. The patterns of settlement, population statistics, and median income are similar throughout the region. Because most of the region is covered by vegetation, the area is classified as rural.

There is no State or local planning within the vicinity of NSA Crane. The only zoning and land use regulations are in the municipalities in the region. None of the municipalities are close enough to impact NSA Crane. None of the areas adjacent to NSA Crane are zoned, and zoning is not anticipated in the near future. No known land use or community actions are being considered or proposed at this time.

4.8 ECOLOGY

NSA Crane is a heavily forested facility situated within the Western Mesophytic Forest Region, Hill Section, and Beech-Maple Forest Region (Braun, 1950). Lindsey et al. (1970) further subdivided the area of the installation into the South-Central Oak and Mixed Woods Division, including the Beech-Maple and the Beech-Oak-Maple-Hickory sub-elements. Deam (1940) classified the portion of Martin County in which the facility is located as consisting of the Chestnut Oak Upland based on the dominant floral components at that time. More recently, Kuchler (1964) mapped this portion of Indiana and classified it as belonging to two distinct vegetation classes, the Oak-Hickory and the Beech-Maple forest components of the Broadleaf Forest Classification. This latter classification most closely resembles the current floristic components observed at the facility.

NSA Crane contains old agricultural fields in various stages of biological succession. Openings on dry upland sites contain almost pure stands of grasses, with some clumps of woody plants such as persimmon, sassafras, and sumac. Areas that tend to be wetter have river birch, willow, sycamore, and cottonwood. Hillside communities include hickory, white and black oak, red maple, sugar maple, tulip poplar, ash, and beech (NEESA, 1983). Cleared areas at the facility have various stages of grassland,

old field, and scrub/shrub vegetation forms present. Dominant tree species include black oak, white oak, pignut hickory, and yellow poplar. These stands are relatively young, with the average tree diameter ranging from 6 to 12 inches. Shrubs are present in these areas, and leaf litter, limbs, and saplings cover the understory.

The wildlife habitats and vegetation types present at NSA Crane (including many stages of forest succession, streams, ponds, Greenwood Lake, and grassy open spaces) support a diverse terrestrial and aquatic fauna. The abundance of wildlife is mainly due to the mixture of landforms and vegetation types that occur over the installation. In addition, the lack of agricultural pressures has enhanced wildlife abundance and served to provide an installation-wide "wildlife enclosure" condition. There is an adequate amount of forage materials, concealment opportunities, and shelter locations to support a highly diverse wildlife community at the site.

Terrestrial habitats (i.e., wooded and grassy areas) near the site may provide shelter and food sources for various species of mammals such as white-tailed deer, coyote, red fox, rabbits, raccoons, and mice and for birds such as ducks, geese, wild turkey, bobwhite quail, red-tailed hawks, and American robins.

The white-tailed deer is the most conspicuous large, wild mammal at the installation. Other mammals include opossum, raccoon, rabbits, mice, bats, chipmunks, squirrels, beaver, groundhogs, gray fox, coyotes, and long-tailed weasel. Fox, coyotes, and hawks are carnivores whose presence indicates a healthy ecosystem with smaller mammals present to provide a food source (NEESA, 1983).

The birds at NSA Crane are diverse. Previous studies identified over 100 species present at the facility during breeding seasons (Hengeveld, 1987). Because the facility is largely forested, the species found are predominantly those that frequent wooded habitat types. Species of waterfowl also use the facility, especially in the vicinity of Greenwood Lake (Figure 1-2). A large number of bird species frequent the non-forested grassland, old field, and scrub/shrub vegetation present over portions of NSA Crane. The bird population includes a number of threatened, endangered, or species of special concern that use NSA Crane as their home range. These species include the bald eagle, osprey, sharp-shinned hawk, red-shouldered hawk, broad-winged hawk, black and white warbler, hooded warbler, and worm-eating warbler (Brown & Root Environmental, 1997).

Previous studies conducted at NSA Crane (Nelson et al., 1987) identified 21 amphibian species and 22 reptilian species including skinks, lizards, snakes, and turtles.

A total of 46 distinct fish species were collected from the installation during a 1987 inventory of fish fauna at NSA Crane. Other than Greenwood Lake, the 1987 study observed that the greatest number of

individual fish species was recorded from the largest stream on NSA Crane, Boggs Creek. Boggs Creek contained 29 species, including eight species of fish characteristic of large river-type systems. The Greenwood Lake outfall flows directly into First Creek.

5.0 NATURE AND EXTENT OF CONTAMINATION

This section discusses the locations, spatial patterns, and concentrations of COCs at SWMU 32. Only the analytical data from the April 2010 and September 2010 RFI sampling are included in this discussion of nature and extent. The data from previous investigations at SWMU 32 were not included because, as stated in the January 2010 SAP, data collected during previous investigations were not complete enough to evaluate potential human health or ecological risks. Figures 2-1, 2-2, and 2-3 display the soil borings, temporary groundwater wells, and sediment sampling locations at SWMU 32 from the April 2010 and September 2010 RFI sampling events and the analytical data are presented in Appendix F. Figures 5-1 through 5-3 illustrate only those soil sample locations where the COC concentrations exceeded the PSLs and were retained in the HHRA and/or ERA.

5.1 SURFACE SOIL

Figure 2-1 displays the SWMU 32 soil sample locations and Table 5-1 presents the chemicals detected at least once in surface soil compared with the USEPA R-RSL and Eco-SSLs, the applicable PSLs for the HHRA and the SERA, respectively, for surface soil. In April 2010, 56 surface soil samples were collected at SWMU 32, 32SO-01 through 32SO-53 and 32DW-01 through 32DW-03, and analyzed for select SVOCs. In September 2010, six additional surface soil samples, 32SO-60 through 32SO-65, were collected on the west side of SWMU 32 and analyzed for benzo(a)pyrene only.

Naphthalene and cPAHs were detected in surface soil samples at SWMU 32. Naphthalene was detected in 12 samples at concentrations below the R-RSL and the Eco-SSL. Benzo(a)anthracene was detected in eight samples with two samples exceeding at least one of the screening levels. The sample from location 32SO-17 had benzo(a)anthracene exceeding the R-RSL by more than one order of magnitude and exceeding the Eco-SSL by less than an order of magnitude. The sample from location 32SO-18 had benzo(a)anthracene exceeding the R-RSL by less than one order of magnitude and did not exceed the Eco-SSL.

Benzo(b)fluoranthene was detected in 10 samples with two samples exceeding at least one of the screening levels. Concentrations from 32SO-17 exceed the R-RSL by more than one order of magnitude and are greater than the Eco-SSL; concentrations from 32SO-18 exceeded the R-RSL by less than an order of magnitude and are less than the Eco-SSL. Benzo(k)fluoranthene was detected in five samples at concentrations below the R-RSL and Eco-SSL. Chrysene was detected in eight samples at concentrations below the R-RSL. Dibenzo(a,h)anthracene was detected in four samples, with two samples exceeding at least one of the screening levels. Concentrations in 32SO-17 are greater than one order of magnitude above the R-RSL but less than the Eco-SSL, while the concentration in 32SO-18 is

less than one order of magnitude above the R-RSL and less than the Eco-SSL. Indeno(1,2,3-cd)pyrene was detected in five samples with two samples, 32SO-17 and 32SO-18, exceeding at least one of the PSLs. The concentration from 32SO-17 is an order of magnitude greater than the R-RSL and is greater than the Eco-SSL. The concentration from 32SO-18 is less than an order of magnitude above the R-RSL and below the Eco-SSL.

Benzo(a)pyrene was detected in 13 surface soil samples with 10 samples exceeding at least one of the PSLs. Concentrations from locations 32SO-21, 32SO-23, 32SO-26, 32SO-44, 32SO-45 and 32SO-65 are greater than the R-RSL by less than one order of magnitude and do not exceed the Eco-SSL. Concentrations from locations 32SO-18 and 32SO-63 are greater than the R-RSL by more than one order of magnitude and do not exceed the Eco-SSL. Concentrations from 32SO-17 and 32SO-64 exceed the R-RSL by more than two orders of magnitude and exceed the Eco-SSL.

Two surface soil samples, 32SO-17 and 32SO-18, with benzo(a)pyrene concentrations exceeding the R-RSL were collected during the April 2010 RFI activities, and were unbounded to the west. During the September 2010 RFI activities, five additional surface soil samples were collected from locations west of 32SO-17 and 32SO-18 and one additional surface soil samples was collected from a location east of 32SO-17. These six surface soil samples were analyzed for benzo(a)pyrene. One of the additional surface soil samples, 32SO-64, had a benzo(a)pyrene concentration that exceeded the R-RSL by more than two orders of magnitude. Two soil samples in the area, 32SO-17 and 32SO-64, had benzo(a)pyrene concentrations that exceeded the Eco-SSL; these samples had the only two benzo(a)pyrene concentrations that exceeded both the HHRA and ERA and are shown on Figure 5-1. The analytical results of all samples analyzed for benzo(a)pyrene were used for the HHRA and ERA.

5.2 SUBSURFACE SOIL

Figure 2-1 displays the SWMU 32 soil sample locations and Table 5-2 presents the chemicals detected at least once in subsurface soil compared with the R-RSLs and the USEPA RBSSLs, the applicable PSLs for the HHRA for subsurface soil. In April 2010, 72 subsurface soil samples were collected from 63 locations, 32SO-01 through 32SO-53, 32SO-ST01, and 32DW-01 through 32DW-03 and analyzed for BTEX and select SVOCs. In September 2010, 12 additional subsurface soil samples were taken from 32SO-54 through 32SO-59 and 32SO-ST01. Samples 32SO-54 through 32SO-59 were analyzed for naphthalene only and 32SO-ST01 was analyzed for MTBE only.

BTEX, naphthalene, and cPAHs were detected in subsurface soil at SWMU 32. If a chemical was detected in any sample at a concentration that exceeded the screening criteria, the analyses of all samples for that chemical were included in the HHRA evaluation.

BTEX contaminants were detected in ten subsurface samples. Benzene was the only BTEX contaminant detected at concentrations above the R-RSL. Benzene was detected in four samples with only one sample, 32SO-06, slightly exceeding the R-RSL; the location of this sample is shown on Figure 5-2. As shown on Figure 5-2, this sample is bounded on all sides by samples with benzene levels below the R-RSL. All benzene analytical results were used in the HHRA.

Naphthalene was detected in 11 subsurface samples at concentrations below the R-RSL; however, concentrations in four samples (32SO-6, 32SO-17, 32SO-50, and 32SO-51) are an order of magnitude greater than the rest of the samples and exceed the RBSSL of 0.47 ug/kg. These four samples were all collected from 2-foot intervals ranging between 4 and 8 feet bgs. Two subsurface soil samples that showed naphthalene concentrations that exceed the RBSSL, 32SO-50 and 32SO-51, were collected during the April 2010 RFI activities. These two locations were unbounded to the southeast. Therefore, during the September 2010 RFI activities, six additional subsurface soil samples were collected from locations southeast and east of 32SO-50 and 32SO-51. These samples were analyzed for naphthalene and none of these exceed the RBSSL, delineating the plume to the southeast. The naphthalene concentrations for the four samples that exceed the RBSSL (32SO-6, 32SO-17, 32SO-50, and 32SO-51) are shown on Figure 5-3. All samples analyzed for naphthalene were used in the HHRA.

For the select PAHs, only benzo(a)anthracene and benzo(a)pyrene were detected above the R-RSL. Benzo(a)anthracene was detected in six subsurface samples with two samples, 32SO-17 and 32SO-37, exceeding the R-RSL by less than one order of magnitude. Two subsurface soil samples were taken at 32SO-17, one at 6 to 7 feet bgs and one at 11 to 12 feet bgs, only the sample taken at 6 to 7 feet bgs exceeded the R-RSL and the sample taken at 11 to 12 feet bgs was non-detect. The benzo(a)anthracene concentrations at 32SO-17 decreased with sample depth. Benzo(a)pyrene was detected in eight subsurface samples with four samples (32SO-15, 32SO-17, 32SO-37, and 32SO-45) exceeding the R-RSL by less than one order of magnitude. Two subsurface soil samples were taken at 32SO-17, one at 6 to 7 feet bgs and one at 11 to 12 feet bgs, only the sample taken at 6 to 7 feet bgs exceeded the R-RSL and the sample taken at 11 to 12 feet bgs was non-detect. Benzo(b)fluoranthene and chrysene were detected in seven samples at concentrations below the R-RSL. Benzo(k)fluoranthene was detected in three samples at concentrations below the R-RSL. Dibenzo(a,h)anthracene was detected in one subsurface sample at a concentration below the R-RSL. Indeno(1,2,3-cd)pyrene was detected in two subsurface samples at concentrations below the R-RSL. All samples analyzed for select PAHs were used in the HHRA.

5.3 SEDIMENT

Figure 2-2 displays the SWMU 32 sediment locations. Table 5-3 presents the chemicals detected at least once in sediment compared to the R-RSL and the R5 Soil ESLs, the applicable PSLs for the HHRA and the ERA, respectively, for sediment. In April 2010, sediment samples were collected from 32SD-01, 32SD-02, and 32SD-03. In September 2010, two additional sediment samples, 32SD-04 and 32SD-05 were collected downgradient from 32SD-03. Sample 32SD-01 was collected upgradient of the point where the 1987 release entered Culpepper Branch.

Sediment samples were analyzed for BTEX and select SVOCs. BTEX and cPAHs were detected in the sediment samples. BTEX contaminants were detected in one sample location at 32SD-02 at concentrations below both screening levels. For the cPAHs, only benzo(a)pyrene and benzo(b)fluoranthene were detected in two samples at concentrations exceeding one of the PSLs. Benzo(a)pyrene and benzo(b)fluoranthene were detected in three samples, with two samples (32SD-02 and 32SD-03) exceeding one of the screening levels. Concentrations of benzo(a)pyrene in 32SD-02 and 32SD-03 are slightly greater than the R-RSL and are less than the R5 Sed ESL. Concentrations of benzo(b)fluoranthene in 32SD-02 and 32SD-03 are less than the R-RSL, but are slightly greater than the R5 Sed ESL. Benzo(a)anthracene, chrysene, and indeno(1,2,3-cd)pyrene were detected in three of the sediment samples at concentrations below both screening levels.

5.4 GROUNDWATER

Figure 2-3 shows the locations of the SWMU 32 temporary groundwater wells. Table 5-4 presents the chemicals detected at least once in groundwater compared to the USEPA T-RSL, the applicable PSL for the HHRA for groundwater. In April 2010, three groundwater samples were collected from 32MW-01, 32MW-02, and 32MW-03. In September 2010, three additional groundwater samples were collected from 32MW-04, 32MW-05, and 32MW-06 in the area south and southeast of the site. Temporary groundwater well 32MW-01 was located northeast (and assumed upgradient) of the site.

Groundwater samples were analyzed for BTEX and select SVOCs. Several cPAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene) were detected in only one groundwater sample, at location 32MW-06. In this sample, benzo(k)fluoranthene, and chrysene were detected at concentrations below the T-RSL. Concentrations of benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene were detected at concentrations exceeding the T-RSL. Concentrations of benzo(a)anthracene and benzo(b)fluoranthene in 32MW-06 are less than two times the T-RSL; the concentration of benzo(a)pyrene in 32MW-06 is more than an order of magnitude above the T-RSL. Naphthalene was also detected at concentrations below the T-RSL in 32GW-02.

6.0 CONTAMINANT FATE AND TRANSPORTATION ANALYSIS

This section discusses the evaluation of contaminant fate and transport at SWMU 32 to provide an understanding of potential risks from contaminant migration. To support the evaluation, a discussion of the physical and chemical properties of the contaminants associated with SWMU 32 sources and their potential persistence, migration, dispersion, and degradation pathways and the CSM of contaminant migration are provided.

6.1 PHYSICAL AND CHEMICAL PROPERTIES

Persistence of various classes of contaminants and their chemical and physical properties in soil-water environments are discussed in this section. Several chemical transformation mechanisms affect contaminant persistence, including hydrolysis, biodegradation, photolysis, and oxidation/reduction reactions. The following contaminants were identified as exceeding screening levels in Section 5:

- Polycyclic aromatic hydrocarbons (PAHs)
- Benzene

6.1.1 PAHs

PAHs are generally considered to be fairly immobile chemicals in the environment. PAHs are large molecules that have low solubilities, vapor pressures, and Henry's Law constants, and have high partitioning coefficients. The low molecular weight PAHs (e.g., acenaphthene, anthracene, fluorene, and phenanthrene) may volatilize from surface waters, whereas the higher molecular weight PAHs (e.g., benzo(a)pyrene, benzo(a)anthracene, chrysene, etc.) are less likely to volatilize. PAHs in soil are much more likely to bind to soil and be transported via mass transport mechanisms than through dissolution. These compounds, when found in the surface soil, generally do not migrate vertically to a great extent. Instead, they are more likely to adhere to soil particles and be removed from the site via surface water runoff and erosional processes. Especially, when no pavement is present or if erosion controls are not present or functioning properly.

Bio-concentration of PAHs in aquatic organisms is greater for the higher molecular weight compounds than the lower molecular weight compounds. PAHs can be bioaccumulated from water, sediments, or lower organisms in the food chain. Bioaccumulation from water through biological membranes requires the chemical in the surrounding water to be available in a dissolved form. Environmental factors that reduce the amount of a chemical in true solution will also reduce the rate of uptake of the chemical. Among the most important processes that reduce bioavailability are adsorption to suspended solids,

adsorption to sediments, adsorption to humic acids and other macromolecules, formation of colloidal suspensions, chelation, complexation, and ionization. Some of the bound chemicals may be available to benthic organisms through ingestion or direct uptake from pore water (Rand and Petrocelli, 1985).

PAHs are highly amenable to microbial degradation in soil and sediment. The rate of degradation is influenced by temperature, pH, oxygen concentrations, initial chemical concentrations, and moisture. Photolysis, hydrolysis, and oxidation are not important fate processes for the degradation of PAHs in soil (ATSDR, October 1989).

The most important fate processes for PAHs in water are photo-oxidation, chemical oxidation, and biodegradation. PAHs do not contain functional groups that are susceptible to hydrolytic reactions, and hydrolysis is considered an insignificant degradation mechanism. The rate of photodegradation is influenced by water depth, turbidity, and temperature. Benzo(a)pyrene, chrysene, fluorene, and pyrene are reported to be resistant to photodegradation. PAHs may also be oxidized by chlorination and ozonation, and they may be metabolized by microbes under oxygenated conditions (ATSDR, October 1989).

6.1.2 Benzene

Benzene is a VOC. VOCs are generally more soluble in water than other chemicals and have a low capacity for retention by soil organic carbon. Therefore, VOCs are typically the most frequently detected organic chemicals in groundwater. Benzene may migrate through the soil column after it has been released by a spill event and precipitation solubilizes the benzene infiltrating it downward. Some fraction of benzene may be retained by the soil, but most will continue migrating downward to the water table. At that time, migration occurs primarily laterally with the hydraulic gradient.

However, benzene is often consumed by microorganisms (primarily bacteria) that occur naturally in the soil and groundwater. Benzene is a naturally occurring chemical and because of its solubility serves as a primary energy and nutrient source for many bacteria that are widely distributed in nature. The natural attenuation of benzene to less harmful chemicals is likely to occur in the subsurface of the site.

6.2 CONCEPTUAL SITE MODEL OF CONTAMINANT MIGRATION

The CSM for SWMU 32 was developed based on site history and uses and site contaminant fate and transport pathways and processes.

The primary source of contamination at SWMU 32 is from fuel oil. Contaminants from the fuel oil can migrate via several pathways, as discussed in Section 6.2.1. Potential exposure routes and receptors are discussed in Section 6.2.2.

6.2.1 Potential Contaminant Migration Pathways

The nature and extent of contamination at SWMU 32 is a result of spills and leaks from routine operations and one reported release event in 1987. After release to the soil, fuel oil constituents may migrate through the soil, volatilize to the air, or migrate to groundwater.

The site geology as discussed in Section 4.6 describes the surficial alluvium materials as clay, silt, and fine sand which generally have low permeability. The COC concentrations found at SWMU 32 are contained in the surficial alluvium in either the surface soil or the subsurface soil. The surface soil COC (benzo(a)pryene) is less than 2 feet bgs and the subsurface soil COCs are at depths of 4 feet to 5 feet bgs (benzene) to 7 feet to 8 feet bgs (naphthalene). The COCs detected at SWMU 32 generally have low mobility, except benzene, which is isolated to one location and consumable by soil bacteria.

The shallow groundwater bearing zone is expected to have moderately low permeability. Fuel oil constituents that potentially may reach the shallow groundwater would likely migrate to Culpepper Branch or First Creek.

6.2.2 Potential Exposure Routes and Receptors

SWMU 32 covers approximately 3 acres and is currently vacant, grass-covered, and open. With the exception of two small areas, a chain-link fence surrounds the site. Current site use is industrial and commercial. Therefore current receptors are industrial workers, construction workers, and trespassers. However, future land use is unknown therefore potential future receptors are residential and recreational users.

7.0 HUMAN HEALTH RISK ASSESSMENT

This section presents the Human Health Risk Assessment (HHRA) for the Former Fuel Oil Tank Farm (SWMU 32) at NSA Crane. The objective of the HHRA is to determine whether detected concentrations of chemicals within the study areas pose a significant threat to potential human receptors under current and/or future land use. The potential risks to human receptors were estimated based on the assumption that no actions were taken to control contaminant releases.

As part of the HHRA, the site was divided into two Decision Units:

- Across the southern portion of the site (Decision Unit #1).
- Across the northern portion of the site (Decision Unit #2).

These two Decision Units (see Figure 2-1) were established because the 1987 fuel oil release had greater impact to the southern portion of the site. Surface and subsurface soil samples were collected from within both Decision Units at the site.

7.1 INTRODUCTION

The following current USEPA and IDEM guidance documents were used to develop the framework for the baseline HHRA:

- Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (Part A) (USEPA, 1989).

- Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors (USEPA, 1991).

- Distribution of Preliminary Review Draft: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure (USEPA, 1993a).

- Exposure Factors Handbook. Office of Health and Environmental Assessment (USEPA, 1997a).

- Risk Assessment Guidance for Superfund: Volume 1 - Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments) (USEPA, 2001).

- Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment), Final Guidance (USEPA, 2004).

- Risk Integrated System of Closure. User's Guide and Technical Resource Guidance Document (IDEM, 2009).

A HHRA consists of five components: data evaluation, exposure assessment, toxicity assessment, risk characterization, and uncertainty analysis. Sections 7.2 through 7.6 contain detailed discussions of the five components of the HHRA. A schematic diagram of the general risk assessment process is provided as Figure 7-1.

Three major aspects of chemical contamination and environmental fate and transport must be considered to evaluate potential risks: (1) contaminants with toxic characteristics must be found in environmental media and must be released by either natural processes or by human action; (2) potential exposure points must exist; and (3) human receptors must be present at the point of exposure. Risk is a function of both toxicity and exposure. If any one of these factors is absent for a site, the exposure route is regarded as incomplete, and no potential risks are considered to exist for human receptors.

7.2 DATA EVALUATION

Data evaluation, the first component of a baseline HHRA, is a medium-specific task involving the compilation and evaluation of analytical data. The main objective of the data evaluation is to develop a medium-specific list of COPCs that will be used to quantitatively determine potential human health risks for site media.

Data from samples collected during the RFI, April 2010 and September 2010, were used to assess risks to potential human receptors.

Typically, screening by risk-based concentrations is used to focus the risk assessment on meaningful chemicals (i.e., the COPCs) and exposure routes. As discussed previously, the potential source of contaminants at SWMU 32 was from fuel oil. Therefore, the target analytes in media collected from SWMU 32 were petroleum COCs. Select SVOCs (naphthalene and cPAHs) were the only target analytes for surface soil, BTEX and select SVOCs were the target analytes for subsurface soil (and MTBE was an additional target analyte in one subsurface soil sample). BTEX and select SVOCs were the target analytes for groundwater and sediment. The following sections define the screening criteria used to determine the COPCs for SWMU 32 soil, groundwater, and sediment.

7.2.1 Derivation of Screening Criteria

Several types of screening levels were used to identify COPCs for SWMU 32. Screening concentrations based on current USEPA RSLs (USEPA RSL Table, November, 2010) and IDEM Risk Integrated System Closure (RISC) default closure levels (DCLs) were used, as well as other USEPA criteria. The risk-based USEPA RSL concentrations correspond to a hazard quotient (HQ) of 0.1 (for noncarcinogens) or an incremental lifetime cancer risk (ILCR) of 1×10^{-6} (for carcinogens). It should be noted that the USEPA RSLs for noncarcinogens are based on a Hazard Index (HI) of 1. The USEPA RSL values for noncarcinogens were multiplied by 0.1 to account for potential cumulative effects of several chemicals affecting the same target area or producing the same adverse noncarcinogenic health effect.

The IDEM R-DCLs for soil are based on the lower of the risk-based direct contact criteria, the soil attenuation capacity values, the soil saturation concentrations, and the migration from soil to groundwater criteria (IDEM, 2009). The IDEM risk-based closure levels for residential direct contact correspond to a systemic HQ of 1 (for noncarcinogens) or an ILCR of 1×10^{-5} (for carcinogens). The screening levels used for each medium evaluated in the risk assessments are briefly discussed below.

Soil

Screening concentrations based on the following criteria were used to select COPCs for surface and subsurface soil:

- USEPA RSLs for Residential Soil (USEPA RSL Table, November 2010).
- IDEM residential closure levels for direct contact (IDEM, 2009).
- USEPA generic Soil Screening Levels (SSLs) for the inhalation of volatiles and fugitive dusts published online at http://rais.ornl.gov/epa/ssl1.shtml based on methodology from the USEPA's Soil Screening Guidance (USEPA, July 1996).
- USEPA generic SSLs for migration from soil to groundwater published online at http://rais.ornl.gov/epa/ssl1.shtml based on methodology from the USEPA's Soil Screening Guidance (USEPA, 1996).
- IDEM residential closure levels for migration from soils to groundwater (IDEM, 2009)

Because of the different exposure scenarios for potential human receptors, COPCs were identified for surface and subsurface soil. Surface soil was defined as soil collected from 0 to 2 feet bgs. Subsurface soil was defined as soil collected from depths greater than 2 feet bgs.

The comparison of site soil data to USEPA generic SSLs for transfers from soil to air was used to identify whether a quantitative analysis of the inhalation of particulates or vapors from the soil exposure pathway was warranted. If the maximum soil concentration of a chemical exceeded the SSL, a quantitative evaluation of potential risks from inhalation was performed, as described in Section 7.3.4. Otherwise, the risks associated with the inhalation pathway are considered insignificant, and the exposure pathway was eliminated from further evaluation.

USEPA generic SSLs and IDEM closure levels based on transfers from soil to groundwater were not used for COPC selection, but were presented to allow a qualitative evaluation of the potential for chemical migration from soil to groundwater. Chemicals with concentrations exceeding the SSLs and IDEM closure levels may potentially migrate from the soil to groundwater in sufficient quantities to pose concerns about groundwater quality.

Sediment

No specific screening levels exist for human exposure to sediment. COPCs were selected for sediment by comparing detected site concentrations to screening levels based on the following:

- USEPA RSLs for residential soil (R-RSLs) (USEPA, November 2010)
- IDEM residential default closure levels for direct contact (R-DCLs) (IDEM, 2009)

A chemical detected in sediments was selected as a COPC for sediments if the maximum detected concentration exceeded screening levels based on these values. The use of soil screening criteria for sediment COPC identification is regarded as a conservative approach because exposure to sediment is anticipated to be less intensive than exposure to soil. USEPA generic SSLs for transfers from soil to air and for migration to groundwater are not considered to be appropriate for sediment screening because of the high moisture content associated with sediment matrices.

The risk-based screening levels and health-based standards used in the COPC selection for soil and sediment are presented in Table 7-1.

Groundwater

The following criteria were used as the basis of the screening criteria for groundwater:

- USEPA RSLs for tap water (T-RSLs) (USEPA, November 2010)
- USEPA Maximum Contaminant Levels (MCLs) (USEPA, October, 2009)
- IDEM residential default closure levels for groundwater (G-DCLs) (IDEM, 2009)

Risk-based COPC screening levels for tap water ingestion, which are based on daily, residential exposure assumptions, were used to select COPCs for groundwater. In general, the use of T-RSLs is regarded as a highly conservative approach to COPC selection at SWMU 32 because groundwater at the site is not used as a potable drinking water source.

Federal Ambient Water Quality Criteria (AWQCs) applicable to the protection of human health assuming routine consumption of water were not used because the conservative T-RSLs, MCLs, and IDEM G-DCLs were used to select COPCs for groundwater.

The risk-based screening levels and health-based standards used in the COPC selection for groundwater are presented in Table 7-2.

7.2.2 Decision Rules for Establishing COPCs

The following decision rules were used to select initial lists of COPCs for SWMU 32:

- A chemical detected in soil was selected as a COPC for soil if any detected chemical concentration exceeded the screening levels for soils.

- A chemical detected in groundwater was selected as a COPC for groundwater if the maximum detected concentration exceeded screening levels for groundwater.

- A chemical detected in sediment was selected as a COPC for sediment if the maximum detected concentration exceeded the screening level for sediment.

7.2.3 COPCs Selected for HHRA

COPCs at SWMU 32 were selected for surface soil, subsurface soil, groundwater, and sediment using the risk-based COPC screening levels described in Section 7.2.1. As discussed in Section 1, two areas of soil, one area for groundwater, and one area for sediment were investigated. Each area was evaluated

separately for the purposes of selecting COPCs. A discussion of the chemicals identified as COPCs and the rationale for COPC selection are provided in the following subsections. The following subsections do not discuss the nature and extent of the chemicals detected in site media. A detailed discussion of nature and extent of contamination is presented in Section 5. COPC selection tables for each medium are presented in Tables 7-3 through 7-12. Chemicals retained as COPCs for SWMU 32 are presented in Table 7-13.

7.2.3.1 Decision Unit 1

Surface Soil (0 to 2 feet bgs)

Eight PAHs were detected in the surface soil samples collected at Decision Unit 1. A comparison of the maximum detected surface soil concentrations to the screening levels based on the R-RSLs for residential exposures and IDEM R-DCLs for direct contact is presented in Table 7-3. The following chemicals were detected in surface soil at maximum concentrations exceeding the direct contact risk-based COPC screening levels and were retained as COPCs for surface soil in Decision Unit 1.

- benzo(a)anthracene
- benzo(a)pyrene
- benzo(b)fluoranthene
- dibenzo(a,h)anthracene
- indeno(1,2,3-cd)pyrene

A comparison of the maximum detected surface soil concentrations to USEPA generic SSLs for chemical migration from soil to air is presented in Table 7-4. Concentrations reported for all chemicals were less than the USEPA generic SSLs for soil to air. Consequently, receptor exposure through inhalation of fugitive dusts and VOCs was not evaluated.

A comparison of the maximum detected surface soil concentrations to RBSSLs for chemical migration from soil to groundwater and IDEM residential closure levels for migration to groundwater is also presented in Table 7-4. The following chemicals were detected at maximum concentrations in surface soil that exceeded the COPC screening levels for migration from soil to groundwater and were retained as COPCs for surface soil at Decision Unit 1.

- benzo(a)anthracene
- benzo(a)pyrene
- benzo(b)fluoranthene

- benzo(k)fluoranthene
- chrysene
- dibenzo(a,h)anthracene
- indeno(1,2,3-cd)pyrene
- naphthalene

Subsurface Soil (Greater than 2 feet bgs)

BTEX and PAHs were detected in the subsurface soil at Decision Unit 1. A comparison of the maximum detected subsurface soil concentrations to the screening levels based on the R-RSLs for residential exposures and IDEM residential closure levels for direct contact is presented in Table 7-5. The following chemicals were detected in subsurface soil at maximum concentrations exceeding the direct contact risk-based COPC screening levels and were retained as COPCs for subsurface soil at Decision Unit 1.

- benzene
- benzo(a)anthracene
- benzo(a)pyrene

A comparison of the maximum detected subsurface soil concentrations to USEPA generic SSLs for chemical migration from soil to air is presented in Table 7-6. The maximum concentration of benzene in subsurface soil exceeded the USEPA generic SSL for migration from soil to air and was retained as a COPC for subsurface soil at Decision Unit 1. Consequently, receptor exposure through inhalation of fugitive dusts and VOCs was evaluated.

A comparison of the maximum detected subsurface soil concentrations to RBSSLs for chemical migration from soil to groundwater and IDEM residential closure levels for migration to groundwater is also presented in Table 7-6. The following chemicals were detected at maximum concentrations in subsurface soil that exceeded the COPC screening levels for migration from soil to groundwater and were retained as COPCs for surface soil at Decision Unit 1.

- benzene
- ethylbenzene
- total xylenes
- benzo(a)anthracene
- benzo(a)pyrene
- benzo(b)fluoranthene
- naphthalene

7.2.3.2 Decision Unit 2

Surface Soil

PAHs were detected in surface soil samples collected at Decision Unit 2. A comparison of the maximum detected surface soil concentrations to screening levels based on the R-RSLs for residential exposures and IDEM residential closure levels for direct contact is presented in Table 7-7. Benzo(a)pyrene was the only chemical detected in surface soils at maximum concentrations exceeding the direct contact risk-based COPC screening levels and was retained as COPCs for surface soil at Decision Unit 2.

A comparison of the maximum detected surface soil concentrations to USEPA generic SSLs for chemical migration from soil to air is presented in Table 7-8. Concentrations reported for all chemicals were less than the USEPA generic SSLs for soil to air. Consequently, receptor exposure through inhalation of fugitive dusts and VOCs was not evaluated.

A comparison of the maximum detected surface soil concentrations to RBSSLs for chemical migration from soil to groundwater and IDEM residential closure levels for migration to groundwater is also presented in Table 7-8. The following chemicals were detected at maximum concentrations in surface soil that exceeded the COPC screening levels for migration from soil to groundwater and were retained as COPCs for surface soil at Decision Unit 2.

- benzo(a)pyrene
- benzo(b)fluoranthene
- naphthalene

Subsurface Soil

BTEX and PAHs were detected in the subsurface soil samples collected at Decision Unit 2. A comparison of the maximum detected subsurface soil concentrations to screening levels based on the R-RSLs for residential exposures and IDEM residential closure levels for direct contact is presented in Table 7-9. The following chemicals were detected in subsurface soils at maximum concentrations exceeding the direct contact risk-based COPC screening levels and were retained as COPCs for subsurface soil at Decision Unit 2.

- benzo(a)anthracene
- benzo(a)pyrene

A comparison of the maximum detected surface soil concentrations to USEPA generic SSLs for chemical migration from soil to air is presented in Table 7-10. Concentrations reported for all chemicals were less than the USEPA generic SSLs for soil to air. Consequently, receptor exposure through inhalation of fugitive dusts and VOCs was not evaluated.

A comparison of the maximum detected surface soil concentrations to RBSSLs for chemical migration from soil to groundwater and IDEM residential closure levels for migration to groundwater is also presented in Table 7-10. The following chemicals were detected at maximum concentrations in subsurface soil that exceeded the COPC screening levels for migration from soil to groundwater and were retained as COPCs for surface soil.

- benzo(a)anthracene
- benzo(a)pyrene

7.2.2.3 Groundwater

PAHs were detected in groundwater at SWMU 32. A comparison of the maximum detected groundwater concentrations to screening levels based on the T-RSLs and IDEM G-DCLs is presented in Table 7-11. The following chemicals were detected at maximum concentrations in groundwater that exceeded the COPC screening level for groundwater and were retained as COPCs for groundwater at SWMU 32.

- benzo(a)anthracene
- benzo(a)pyrene
- benzo(b)fluoranthene
- benzo(k)fluoranthene
- naphthalene

PAHs were only detected in the groundwater sample from monitoring well 32MW-06.

7.2.2.4 Sediment

BTEX and PAHs were detected in sediment at SWMU 32. A comparison of the maximum detected sediment concentration to screening levels based on the R-RSL for residential exposure to soil and IDEM residential closure levels for direct contact multiplied by ten for anticipated reduced exposure to sediment is presented in Table 7-12. None of the chemicals detected in the sediment at SWMU 32 exceeded the COPC screening criteria for sediment. Therefore, there are no COPCs for sediment at SWMU 32.

7.2.2.5 Summary

COPC Selection Tables for each media are presented in Tables 7-3 through 7-12. Chemicals retained as COPCs for SWMU 32 are provided in Table 7-13. The Risk Assessment Guidance for Superfund (RAGS) Part D tables for COPC selection are included in Appendix H.

7.3 EXPOSURE ASSESSMENT

This portion of the risk assessment defines and evaluates, quantitatively or qualitatively, the type and magnitude of human exposure to the chemicals present at or migrating from a site. The exposure assessment is designed to depict the physical setting of the site, to identify potentially exposed populations and applicable exposure pathways, to calculate concentrations of COPCs to which receptors might be exposed, and to estimate chemical intakes under the identified exposure scenarios.

Actual or potential exposures at SWMU 32 were determined based on the most likely pathways of contaminant release and transport, as well as human activity patterns. A complete exposure pathway has three components: a source of chemicals that can be released to the environment, a route of contaminant transport through an environmental medium, and an exposure or contact point for a human receptor.

7.3.1 Conceptual Site Model

This section discusses the conceptual site model (CSM) for SWMU 32. A CSM facilitates consistent and comprehensive evaluation of the potential risks to human health by creating a framework for identifying the pathways by which human receptors may come in contact with contaminated media resulting from source area(s). A CSM depicts the relationships among the following elements, which are necessary for defining complete exposure pathways:

- Site sources of contamination
- Contaminant release mechanisms and transport/migration pathways
- Exposure routes
- Potential receptors

The elements of the CSM (contaminant source, release mechanisms, transport/migration pathways, exposure routes, and potential receptors) establish the manner and degree to which a potential receptor may be exposed to chemicals present at the site. The degree of risk incurred by a potential receptor varies according to the means of exposure, the duration of exposure, and the specific chemical to which the receptor is exposed. An exposure, however long in duration, does not necessarily result in an

"unacceptable" health or environmental risk, although risks generally increase with increased frequency and/or duration of exposure.

Details on the site background, physical setting, previous investigations, and hazard identification were presented in Section 1.0. Summarizing the information from Section 1, SWMU 32 is approximately 3 acres and is currently vacant, grass-covered, and open. With the exception of two small areas, a chain link fence surrounds the area. Culpepper Branch, which drains into First Creek, is located approximately 400 southwest of the site and south of Highway H-5. The northern side of the site slopes gently northwest and into a drainage channel that flows through a pipe under Highway H-5 to Culpepper Branch. The southern side of the site flows southeast to a drainage channel that flows through a pip under Highway H-5 and into Culpepper Branch.

Figure 7-2 illustrates the CSM for SWMU 32. The elements of the CSM, including how they pertain to SWMU 32 are discussed below. Sources of contamination, contaminant release mechanisms, transport and migration pathways, exposure routes, and potential receptors are defined. Table 7-14 provides a site-specific summary of the potential receptors to be evaluated for SWMU 32. A summary of the exposure routes that will be addressed quantitatively for each human receptor is provided in Table 7-15.

Site Sources of Environmental Contamination

Navy facilities at SWMU 32 were in use between 1947 and 1996 as an on-site bulk storage facility for fuel oil to heat buildings located on NSA Crane property. The site is currently vacant. The following historical uses could have acted as sources for contamination:

- 1987 drainage way release.
- Storage and transportation of fuel oil.

Potential Contaminant Release Mechanisms and Transport/Migration Pathways

Past operations at SWMU 32 have resulted in the release of fuel oil and associated petroleum contaminants of concern (COCs) to soil. The petroleum COCs may have been transported from the soils to groundwater.

Potential Current and Future Receptors of Concern and Exposure Pathways

NSA Crane is an active naval base and will remain active for the foreseeable future. Current site users include industrial or construction workers, and trespasses. However, for purposes of completeness, the baseline risk assessment will consider receptor exposure under residential, industrial, and recreational

land use scenarios. No COPCs were identified for sediment; therefore exposure pathways for these media are considered to be incomplete and are not evaluated further in this HHRA. Based on current and potential future land use, the following potential receptors may be exposed to contaminated environmental media within the study area:

- **Industrial Worker** – A plausible receptor under current and future land use. This includes adult military or civilian personnel assigned to routine daily work tasks in the SWMU 32 area. This receptor could be exposed to surface soil (incidental ingestion; dermal contact) and air (inhalation). It is anticipated that this receptor would not be routinely exposed to subsurface soils or sediments. This receptor is expected to be exposed to surface soil on a more frequent basis than the maintenance or construction worker.

- **Trespassers** – A plausible receptor under current or future land use. Although access to the base is controlled, once inside the base, access to the study areas is not limited by any physical constraints. In addition, hunting activities are permitted at the base. Because the study areas are relatively remote and surrounded by forested areas, individuals (particularly adolescents and adults [but, not small children]) may trespass within the study areas. This receptor may be exposed to potentially contaminated surface soil (incidental ingestion; dermal contact), air (inhalation), and sediments (incidental ingestion; dermal contact). Direct contact with subsurface soils is not anticipated for this receptor.

- **Construction Workers** – A plausible receptor under future land use. No construction activities are currently planned for the study area. However, this receptor could be exposed to surface and subsurface soils (incidental ingestion; dermal contact), and air (inhalation) if excavation activities were to occur in the future. Routine exposure to sediments is not expected for the construction worker.

- **Recreational Users** – A plausible receptor under future land use. If NSA Crane were to close, the most likely scenario is that the property would be converted to a park. A recreational user may be exposed to potentially contaminated surface soil (incidental ingestion; dermal contact), air (inhalation), and sediments (incidental ingestion; dermal contact). NSA Crane is not expected to close because principal base operations, the demilitarization of munitions, are critical to the support of the United States Naval fleet.

- **On-Base Residents** – An unlikely receptor under future land use. Although this scenario is highly unlikely, a future residential scenario is typically evaluated in a risk assessment for decision-making purposes. For example, the need for deed restrictions at a site may be eliminated prior to site closure if minimal risks are estimated for residential receptors. It is assumed that a hypothetical resident may

be exposed to surface soils (incidental ingestion; dermal contract) and sediment (incidental ingestion; dermal contact) and air (inhalation).

Details regarding the assumed receptor characteristics (e.g., intake rate, frequency, duration of exposure) are defined in Section 7.3.4.

Potential risks associated with the inhalation of particulates or VOCs emanating from surface and subsurface soils were evaluated (in the COPC selection process) by comparing the maximum site soil concentrations to the USEPA Generic SSLs for transfers from soil to air.

Current/future occupational workers and future hypothetical residents are not assumed to be exposed to subsurface soil, although exposures to subsurface soil might occur if subsurface soil is brought to the surface as a result of excavation activities. A quantitative analysis of exposures to subsurface soils by industrial workers and future hypothetical residents will be included in the uncertainty analysis to assist the risk managers tasked with making remedial decisions for SWMU 32. This analysis will use a simple "risk ratio" technique that involves the comparison of a chemical's exposure point concentration (EPC) to its USEPA RSLs to calculate cancer and noncancer risks using the following equation:

$$\frac{\text{EPC}}{\text{RSL}} = \frac{\text{HI}}{\text{HI of } 1} \text{ or } \frac{\text{ILCR}}{\text{ILCR of } 1 \times 10^{-6}}$$

This is a valid technique for estimating risk because all of the intake equations and risk characterization equations used to develop the risk-based concentrations are linear.

7.3.2 Central Tendency Exposure vs. Reasonable Maximum Exposure

Traditionally, exposures evaluated in the HHRA were based on the concept of a reasonable maximum exposure (RME) only, which is defined as "the maximum exposure that is reasonably expected to occur at a site" (USEPA, 1989). However, subsequent risk assessment guidance (USEPA, 1992) indicates the need to address an average case or central tendency exposure (CTE).

To provide a full characterization of potential exposure, both RME and CTE scenarios were evaluated in the HHRA for SWMU 32. The available guidance (USEPA, 1993a) concerning the evaluation of CTE is limited and at times vague. Therefore, professional judgment was exercised when defining CTE conditions for a particular receptor at a site.

7.3.3 Exposure Point Concentrations

The exposure point concentration (EPC), which is calculated for COPCs only, is an estimate of the chemical concentration within an exposure unit (EU) likely to be contacted over time by a receptor and is used to estimate exposure intakes. An exposure unit is defined as the area typically encountered/traversed by a receptor under a particular land use scenario. For example, a residential lot size of ¼ acre to 2 acres is often used for the evaluation of a hypothetical future resident. However, the size of an EU is typically based on the distribution of the chemical concentrations in a medium as well as on presumed receptor activity patterns.

SWMU 32 is an active facility, and operations at this facility are expected to continue in the foreseeable future. As discussed in Section 1, the site has been divided into two areas, Decision Unit 1 and 2. Under current conditions an occupational worker can be exposed to soil anywhere within the SWMU 32 boundaries during their normal work activities.

The following guidelines were used to calculate the EPCs:

- If a data set contained fewer than 10 samples, the EPC for the RME and CTE case was defined as the maximum detected concentration.

- If a data set for an EU contains 10 or more samples and at least three detected samples, the 95 percent upper confidence limit (UCL) on the arithmetic mean, which was based on the distribution of the data set, was selected as the EPC for the RME and CTE case. EPCs were calculated following the USEPA's UCL Calculator (ProUCL, Version 4.00.05) which implements the recommendations in USEPA's Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites (USEPA, 2002a).

- The maximum detected concentration was used as the EPC for groundwater.

Table 7-16 summarizes the EPCs used in this HHRA. RAGS Part D Tables for the EPCs are presented in Appendix H.

7.3.4 Chemical Intake Estimation

The methodologies and techniques used to estimate exposure intakes are presented in this section. Intakes for the identified potential receptor groups were calculated using current USEPA risk assessment

guidance (e.g., USEPA, 1991, 1997a, and 2004) and presented in the risk assessment spreadsheets. All quantitative risk assessment results are presented in RAGS Part D format tables (Appendix H).

Noncarcinogenic intakes were estimated using the concept of an average annual exposure. Carcinogenic intakes were calculated as an incremental lifetime exposure, which assumed a life expectancy of 70 years. Assumptions regarding exposure are presented in Tables 7-17 and 7-18 for the RME and CTE scenarios, respectively.

7.3.4.1 Inhalation of Air and Fugitive Dust/Volatile Emissions from Soils

The amount of a chemical that a receptor takes in as a result of respiration was determined using the concentration of the contaminant in air. Intakes of particulates were calculated using following equation (USEPA, 2009):

$$EC = \frac{(C_{air})(ET)(EF)(ED)}{AT \times 24\ \text{hrs/day}}$$

where:

EC	=	exposure concentration, in milligrams per cubic meter (mg/m^3)
C_{ai}	=	concentration of chemical "i" in air (mg/m^3)
ET	=	exposure time (hours/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (year)
BW	=	body weight, in kilograms (kg)
AT	=	averaging time (days);
		for noncarcinogens, AT = ED x 365 days/year;
		for carcinogens, AT = 70 years x 365 days/year

The concentrations of chemicals in air resulting from emissions from soil were developed following procedures presented in USEPA Soil Screening Guidance (USEPA, 2002b). The chemical concentration in air was calculated as follows:

$$C_{air} = C_{soil} \times \left[\frac{1}{PEF} + \frac{1}{VF}\right]$$

where:

C_a = chemical concentration in air, mg/m^3

C_s = chemical concentration in soil, mg/kg

PEF = particulate emission factor, m^3/kg

VF = volatilization factor, m^3/kg

The particulate emissions factor (PEF) relates the concentration of the chemical in soil with the concentration of dust particles in air. A PEF value of 1.316 x 10^{+9} was used for the HHRA of SWMU 32 soils (IDEM, 2009). This value is based on hypothetical fugitive dust emissions from the site during a typical work day. Because air emissions resulting from fugitive dust emissions generated during a typical work day will be different than dust emissions generated during construction activities, a separate PEF was used for the evaluation of construction activities. The PEF for construction workers (1.49 x 10^{+6} m^3/kg) was calculated using the equations presented in the supplemental SSL guidance document (USEPA, 2002b).

Ambient air concentrations resulting from the volatilization of COPCs from soil are chemical dependent and were calculated using the following equation from USEPA's Soil Screening Guidance:

$$VF = \frac{Q/C \times (3.14 \times D_a \times T)^{0.5} \times 10^{-4} \ (m^2 / cm^2)}{(2 \times \rho_b \times D_a)}$$

and

$$D_a = \frac{[(\theta_a^{10/3} \times D_i \times H' + \theta_w^{10/3} \times D_w)/n^2]}{\rho_b \times K_d + \theta_w + \theta_a \times H'}$$

where:

VF = volatilization factor (m^3-air/kg-soil)

Q/C = inverse of the mean concentration at the center of source (gm/m^2-sec per kg/m^3)

D_a = apparent diffusivity, chemical specific, (cm^2/sec)

T = exposure interval, exposure specific, (sec)

ρ_b = dry bulk soil particle density (g/cm^3)

θ_a = air-filled soil porosity (L_{air}/L_{soil})

D_i = diffusivity in air, chemical specific, (cm^2/sec)

n = total soil porosity (L_{pore}/L_{soil})

θ_w = water-filled soil porosity (L_{air}/L_{soil})

D_w = diffusivity in water, chemical specific, (cm^2/sec)

K_d = soil-water partition coefficient, chemical specific

H' = dimensionless Henry's law constant, chemical specific

Chemical properties were obtained from current USEPA RSL table, dated November 2010, and are presented in Table 7-19. Input assumptions for the calculation of VF are presented in Table 7-20.

7.3.4.2 Dermal Contact with Soil/Sediment

Direct physical contact with soil and sediment may result in the dermal absorption of chemicals. Exposures associated with the dermal route are estimated in the following manner (USEPA, 2004):

$$Intake_{si} = \frac{(C_{si})(SA)(AF)(ABS)(CF)(EF)(ED)}{(BW)(AT)}$$

where:

$Intake_{si}$	=	amount of chemical "i" absorbed during contact with soil/sediment (mg/kg/day)
C_{si}	=	concentration of chemical "i" in soil/sediment (mg/kg)
SA	=	skin surface area available for contact (cm^2/day)
AF	=	skin adherence factor (mg/cm^2)
ABS	=	absorption factor (dimensionless)
CF	=	conversion factor (1×10^{-6} kg/mg)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days);
		for noncarcinogens, AT = ED x 365 days/year;
		for carcinogens, AT = 70 years x 365 days/year

Exposed surface areas of body available for dermal contact are determined on a receptor-specific basis because they correspond with assumed human activities and clothing worn during exposure events. Current guidance documents (USEPA, 1997a and 2004) were used to develop the default assumptions concerning the amount of skin surface area available for contact for a receptor. To maintain consistency from project to project, input parameters previously used for other NSA Crane risk assessments were reviewed when developing the exposed surface areas. The rationales used to select the skin areas available for contact with contaminated soils or sediments were as follows:

- For construction workers, maintenance workers, and occupational workers exposed to surface soil or sediment, the surface area available for soil contact was assumed to be the head, hands, and

forearms. The skin surface area is 3,300 cm^2 for the CTE and RME scenarios. These values represent the 50th-percentile areas for the head, hands, and forearms (USEPA, 2004).

- For adolescent trespassers, 25 percent of the total body surface area for an adolescent (aged 6 to 16) was assumed to be available for surface soil and/or sediment contact. The RME value (3,820 cm^2) was derived from the 95th-percentile surface area data, and the CTE value (3,100 cm^2) was derived from the 50th-percentile data, as provided in Table 4-6 of the Exposure Factors Handbook (USEPA, 1997a).

- For adult recreational users assumed to be exposed to soil/sediment, the exposed surface area available for contact was the sum of the head, arms, hands, lower legs, and feet of an adult male. This skin surface area is 9,070 cm^2 for the RME and CTE scenarios. This value represents the 50th-percentile areas for the arms, hands, lower legs, and feet (USEPA, 1997a). For a small child recreational user (0 to 6 years old), it was assumed that 50 percent of the body surface area was exposed to surface soil and sediment (i.e., 3,300 cm^2). This value represents the 50th-percentile areas presented in Table 4-6 of the Exposure Factors Handbook (USEPA, 1997a).

- For adult residents exposed to surface soil/sediment, the exposed surface area available for contact will be the USEPA recommended value of 5,700 cm^2 for the RME and CTE scenarios (USEPA, 2004). This value assumes that the adult resident is wearing a short-sleeved shirt, shorts, and shoes; therefore, the exposed skin surface is limited to the head, hands, forearms, and lower legs. For a child resident, the recommended value of 2,800 cm^2 was used as the exposed skin surface area for the RME and CTE scenarios (USEPA, 2004). This value assumes that the child resident is wearing a short-sleeved shirt, shorts, and no shoes; therefore, the exposed skin surface area is limited to the head, hands, forearms, lower legs, and feet.

The following values of soil adherence factors provided in RAGS Part E (USEPA, 2004) were used to evaluate risks from exposure to soil and sediment:

- Construction workers - 0.3 mg/cm^2 for the RME and 0.1 mg/cm^2 for the CTE. These values are the 95th-percentile and geometric mean values for construction workers, respectively (USEPA, 2004 and 2002b).

- Occupational workers - 0.2 mg/cm^2 for the RME and 0.02 mg/cm^2 for the CTE (USEPA, 2004).

- Adolescent trespassers, child recreational users, and child residents - 0.2 mg/cm^2 for the RME and 0.04 mg/cm^2 for the CTE. These values are the 95th-percentile and geometric mean values presented for soccer players (teens) playing in moist conditions (USEPA, 2004).

- Adult recreational users and adult residents - 0.07 mg/cm^2 for the RME and 0.01 mg/cm^2 for the CTE (USEPA, 2004).

For the constituents identified as COPCs in soil, the following absorption factors were used:

- PAHs - 0.13 (USEPA, 2004)

7.3.4.3 Incidental Ingestion of Soil and Sediment

Incidental ingestion of soil (and sediment) by potential receptors coincides with dermal exposure. Exposures associated with incidental ingestion were estimated in the following manner (USEPA, 1989):

$$Intake_{si} = \frac{(C_{si})(IR_s)(FI)(EF)(ED)(CF)}{(BW)(AT)}$$

where:

$Intake_{si}$	=	intake of contaminant "i" from soil or sediment (mg/kg/day)
C_{si}	=	concentration of contaminant "i" in soil or sediment (mg/kg)
IR_s	=	ingestion rate (mg/day)
FI	=	fraction ingested from contaminated source (dimensionless)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (year)
CF	=	conversion factor (1×10^{-6} kg/mg)
BW	=	body weight (kg)
AT	=	averaging time (days);
		for noncarcinogens, AT = ED x 365 days/year;
		for carcinogens, AT = 70 years x 365 days/year

The same exposure frequencies and durations used in the estimation of dermal intakes were used to estimate exposure via incidental ingestion. Default values of 1.0 were used for the fraction of soil ingested from the source for both the RME and CTE scenarios.

7.3.4.4 Assessing Cancer Risks from Early Life Exposures

USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005) recommends making adjustments to the toxicity of carcinogenic chemicals that act via the mutagenic mode of action when evaluating early-life exposures. The guidance recommends using age-dependent adjustment factors (ADAFs) combined with age-specific exposure estimates when assessing cancer risks. In the absence of chemical-specific data, the supplement guidance recommends the following default adjustments, which reflect the fact that cancer risks are generally higher from early-life exposures than from similar exposures later in life:

- For exposures before 2 years of age (i.e., spanning a 2-year interval from the first day of birth until a child's second birthday), a 10-fold adjustment.

- For exposures between 2 and 16 years of age (i.e., spanning a 14-year time interval from a child's second birthday until their sixteenth birthday), a three-fold adjustment.

- For exposures after turning 16 years of age, no adjustment.

The adjustments were applied using the same method as that used by USEPA in the development of RSLs. Children were evaluated as two age groups, ages 0 to 2 years and ages 2 to 6 years, and adults were evaluated as two age groups, ages 6 to 17, and ages greater than 16 years old. Using this approach, the intakes for child and adult recreational users and hypothetical residents were calculated as follows:

$$\text{Intake}_{\text{Child}} = \text{Intake}_{(\text{ages } 0 - 2 \text{ years})} \times 10 + \text{Intake}_{(\text{ages } 2 - 6 \text{ years})} \times 3$$
$$\text{Intake}_{\text{Adult}} = \text{Intake}_{(\text{ages } 6 - 16 \text{ years})} \times 3 + \text{Intake}_{(\text{ages} > 16 \text{ years})}$$

And the intakes for adolescent trespassers were calculated as follows:

$$\text{Intake}_{\text{Adolescent}} = \text{Intake}_{(\text{age } 6 - 16 \text{ years})} \times 3$$

The above approach was used only for those chemicals that are identified as mutagenic in the USEPA RSLs screening table (e.g., cPAHs). Sample calculations showing how this approach was applied are included in Appendix H.

7.3.4.5 Summary of Exposure Parameters

A summary of the exposure input parameters for all exposure pathways are presented in Tables 7-17 and 7-18 for the identified potential receptor groups at SWMU 32. In general, standard default parameters (e.g., USEPA, 1991; Exposure Factors Handbook, USEPA, 1997a), which combine mid-range and upper-end exposure factors, were used to assess RME conditions. CTE was assessed primarily by the use of mid-range exposure factors presented in current risk assessment guidance (USEPA, 1989 and 1993).

7.4 TOXICITY ASSESSMENT

The objective of a toxicity assessment is to identify the potential for human health hazards and adverse effects in exposed populations. Quantitative estimates of the relationship between the magnitude and type of exposures and the severity or probability of human health effects are defined for the identified COPCs. Quantitative toxicity values determined during this component of the risk assessment are integrated with outputs of the exposure assessment to characterize the potential for adverse health effects for each receptor group (Section 7.5). The reference dose (RfD) is the toxicity value used to evaluate noncarcinogenic health effects for ingestion and dermal exposures. The reference concentration (RfC) is used to evaluate noncarcinogenic health effects for inhalation exposures. The RfD and RfC estimate a daily exposure level for a human population that is unlikely to pose an appreciable risk during a portion or for all of a human lifetime. It is based on a review of animal and/or human toxicity data, with adjustments for various data uncertainties. Carcinogenic effects are quantified using the cancer slope factor (CSF) for ingestion and dermal exposures, and using inhalation unit risks (IUR) for inhalation exposure that are plausible upper-bound estimates of the probability of the development of cancer per unit intake of the chemical over a lifetime. These are typically based on dose-response data from human and/or animal studies.

7.4.1 <u>Toxicity Criteria</u>

USEPA guidance recommends the following primary literature sources for obtaining toxicity criteria (USEPA, 2003):

- Integrated Risk Information System (IRIS) (online).

- USEPA Provisional Peer Reviewed Toxicity Values (PPRTVs) – The Office of Research and Development/National Center for Environmental Assessment (NCEA) Superfund Health Risk Technical Support Center develops PPRTVs on a chemical-specific basis when requested by USEPA's Superfund program.

- Other Toxicity Values – These sources include but are not limited to California Environmental Protection Agency (Cal EPA) toxicity values, the Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels (MRLs), and the Annual Health Effects Assessment Summary Tables (HEAST) (USEPA, 1997b).

Oral and inhalation RfDs and CSFs for the constituents identified as COPCs for SWMU 32 are presented in Tables 7-21 through 7-24.

7.4.2 Toxicity Criteria for Dermal Exposure

RfDs and CSFs found in the literature are frequently expressed as administered doses; therefore, these values are considered to be inappropriate for estimating the risks associated with dermal routes of exposure. Oral dose-response parameters based on administered doses must be adjusted to absorbed doses before the comparison to estimated dermal exposure intakes is made.

When oral absorption is essentially complete (i.e., 100%), an absorbed dose is equivalent to the administered dose, and therefore no toxicity adjustment is necessary. Conversely, when the gastrointestinal absorption of a chemical is poor (e.g., 1%), the absorbed dose is smaller than the administered dose; thus, toxicity factors based on absorbed dose should be adjusted to account for the difference in the absorbed dose relative to the administered dose. USEPA (USEPA, 2004) recommends a 50% absorption cut-off to reflect the intrinsic variability in analyzing absorption studies. Therefore, the adjustment from administered to absorbed dose was only performed when the chemical specific gastrointestinal absorption efficiency was less than 50%. The adjustment from administered to absorbed dose was made using chemical-specific gastrointestinal absorption efficiencies published in available guidance (i.e., USEPA 2004 [the primary reference]; IRIS; ATSDR toxicological profiles, etc.) and the following equations:

$$RfD_{dermal} = (RfD_{oral})(ABS_{GI})$$

$$CSF_{dermal} = (CSF_{oral}) \ / \ (ABS_{GI})$$

where: ABS_{GI} = absorption efficiency in the gastrointestinal tract.

RfD_{dermal}	=	RfD for the dermal route of exposure
RfDoral	=	RfD for the oral route of exposure
CSF_{dermal}	=	CSF for the dermal route of exposure
CSF_{oral}	=	CSF of the oral route of exposure

As noted above, the preceding adjustment of the oral toxicity criteria (i.e., RfDs, CSFs) was necessary to allow quantitative evaluation of the dermal route of exposure in the baseline risk assessment. An explanation of this procedure and the need for this procedure are presented in Appendix H of USEPA RAGS Part A.

7.4.3 Toxicity Criteria for Carcinogenic Effects of PAHs

Limited toxicity values are available to evaluate the carcinogenic effects from exposure to PAHs. The most extensively studied PAH is benzo(a)pyrene, which is classified by the USEPA as a probable human carcinogen. Although CSFs are available for benzo(a)pyrene, insufficient data are available to calculate CSFs for other potentially carcinogenic PAHs. Toxic effects for these chemicals were evaluated using the concept of estimated orders of potential potency that relate the potency of the other potentially carcinogenic PAHs to the potency of benzo(a)pyrene, as presented in current USEPA guidance (USEPA, 1993b). The equivalent oral CSF for a carcinogenic PAH other than benzo(a)pyrene is derived by multiplying the CSF for benzo(a)pyrene by the order of potential potency recommended for that PAH.

7.4.4 Mutagenic Chemicals

USEPA's Guidelines for Carcinogen Risk Assessment (USEPA, 2005) and Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005) specify the use of ADAFs for carcinogens that act via a mutagenic mode of action. Carcinogenic PAHs are included in the group of chemicals that have been determined to act via the mutagenic mode of action. No chemical-specific ADAFs have been derived for carcinogenic PAHs; therefore, the following default ADAFs were used: 10 for ages 0 to 2, 3 for ages 2 to 16, and 1 (no adjustment) for ages 16 to 70. The ADAFs were used in evaluating exposures to carcinogenic PAHs for adolescent trespassers, recreational users, and hypothetical residents using the approach presented in Section 7.3.4.4.

7.5 RISK CHARACTERIZATION

This section provides a characterization of the potential human health risks associated with the potential exposures to petroleum COCs at SWMU 32. Section 7.5.1 outlines the methods used to quantitatively estimate the type and magnitude of potential risks for human receptors. A summary of the risk characterization for the SWMU 32 is provided in Section 7.5.2.

7.5.1 Quantitative Analysis

Quantitative estimates of risk were calculated according to risk assessment methods outlined in USEPA guidance (USEPA, 1989). Lifetime cancer risks are expressed in the form of dimensionless probabilities,

referred to as incremental lifetime cancer risks (ILCRs), based on CSFs. Noncarcinogenic risk estimates are presented in the form of HQs determined through a comparison of intakes with published RfDs.

ILCR estimates for ingestion and dermal exposures were generated for each COPC using estimated exposure intakes and published CSFs, as follows:

$$ILCR = (\text{Estimated Exposure Intake})(CSF)$$

If the above equation resulted in an ILCR greater than 0.01, the following equation was used:

$$ILCR = 1-[\exp(-\text{Estimated Exposure Intake})(CSF)]$$

ILCR estimates for inhalation exposures were generated for each COPC using estimated exposure concentrations and published IURs, as follows:

$$ILCR = (IUR)(\text{Exposure Concentration})(1000\ \mu g/mg)$$

An ILCR of 1×10^{-6} indicates that the exposed receptor has a one-in-one-million chance of developing cancer under the defined exposure scenario. Alternatively, such a risk may be interpreted as representing one additional case of cancer in an exposed population of one million persons.

As mentioned previously, noncarcinogenic risks were assessed using the concepts of HQs and HIs. The HQ for a COPC is the ratio of the estimated intake to the RfD and is calculated for ingestion and dermal exposures as follows:

$$HQ = (\text{Estimated Exposure Intake}) / (RfD)$$

For inhalation exposures, HQ is calculated as follows:

$$HQ = (\text{Exposure Concentration})/(RfC)$$

An HI was generated by summing the individual HQs for all COPCs. The HI is not a mathematical prediction of the severity of toxic effects and therefore is not a true "risk"; it is simply a numerical indicator of the possibility of the occurrence of noncarcinogenic (threshold) effects.

7.5.1.1 Comparison of Quantitative Risk Estimates to Benchmarks

To interpret the quantitative risks and to aid risk managers in determining the need for remediation at a site, quantitative risk estimates were compared to typical risk benchmarks. Calculated ILCRs were interpreted using the USEPA's "target range" (1×10^{-6} to 1×10^{-4}).

USEPA has defined the range of 1×10^{-6} to 1×10^{-4} as the ILCR "target risk range" for most hazardous waste facilities addressed under CERCLA and RCRA. IDEM has defined this same risk range for the nondefault evaluation under their RISC program. Individual or cumulative ILCRs greater than 1×10^{-4} will typically not be considered as protective of human health and ILCRs less than 1×10^{-6} will typically be regarded as protective. Risk management decisions are necessary when the ILCR is within the 1×10^{-4} to 1×10^{-6} cancer risk range.

An HI exceeding unity (1.0) indicates that there may be potential noncarcinogenic health risks associated with exposure. If an HI exceeds unity, a segregation of target organ effects associated with exposure to COPCs is typically performed. Only those chemicals that affect the same target organ(s) or exhibit similar critical effect(s) are regarded as truly additive. Consequently, it may be possible for a cumulative HI to exceed 1.0, but no adverse health effects are anticipated if the COPCs do not affect the same target organ or exhibit the same critical effect.

7.5.2 Results of the Risk Characterization

This section contains a summary of the results of the risk characterization for SWMU 32. Quantitative risk estimates for potential human receptors are developed for chemicals detected in soils and groundwater. Uncertainties associated with the risk estimates are discussed in Section 7.6. The methodology used to calculate the risks presented in this section is provided in Sections 7.3 and 7.4. Potential cancer risks and hazard indices were calculated for current/future industrial workers, adolescent trespassers and future construction workers, child recreation users, adult recreational users, and hypothetical residents under the RME and CTE scenarios and are summarized in Tables 7-25 and 7-26, respectively. Sample calculations are presented in Appendix H, and the results of the risk assessment in RAGS Part D format are included in Appendix H.

7.5.2.1 Noncarcinogenic Risks – RME and CTE

HIs for all receptors exposed to soils in both Decision Unit 1 and 2 and groundwater at SWMU 32 were less than or equal to unity (1), indicating that adverse non-carcinogenic effects are not anticipated for these receptors under the defined exposure conditions.

7.5.2.2 Carcinogenic Risks – RME and CTE

Cumulative ILCRs for all receptors exposed to soil in Decision Units 1 and 2 and groundwater at SWMU 32 under the RME and CTE scenarios were less than or within USEPA's and IDEM's target risk range of 10^{-4} to 10^{-6}.

7.6 UNCERTAINTY ANALYSIS

There is uncertainty associated with all aspects of the baseline human health risk assessment. A summary of the uncertainties, including a discussion of how they may affect the final risk numbers, is provided in this section.

Uncertainty in the selection of COPCs is related to the current status of the predictive databases, the grouping of samples, the numbers, types, and distributions of samples, and the procedures used to include or exclude constituents as COPCs. Uncertainty associated with the exposure assessment includes the values used as input variables for a given intake route or scenario, the assumptions made to determine exposure point concentrations, and the predictions regarding future land use and population characteristics. Uncertainty in the toxicity assessment includes the quality of the existing toxicity data needed to support dose-response relationships and the weight-of-evidence used to determine the carcinogenicity of COPCs. Uncertainty in risk characterization includes that associated with exposure to multiple chemicals and the cumulative uncertainty from combining conservative assumptions made in earlier steps of the risk assessment process.

Whereas there are various sources of uncertainty, the direction of uncertainty can be influenced by the assumptions made throughout the risk assessment, including selection of COPCs and selection of values for dose-response relationships. Throughout the entire risk assessment, assumptions are biased toward a margin of safety so that the final calculated risks are overestimated.

Generally, risk assessments carry two types of uncertainty: measurement and informational uncertainty. Measurement uncertainty refers to the usual variance that accompanies scientific measurements. For example, this type of uncertainty is associated with analytical data collected for each site. The risk assessment reflects the accumulated variances of the individual values used.

Informational uncertainty stems from inadequate availability of information needed to complete the toxicity and exposure assessments. Often, this gap is significant, such as the absence of information on the effects of human exposure to low doses of a chemical, on the biological mechanism of action of a chemical, or the behavior of a chemical in soil.

Once the risk assessment is complete, the results must be reviewed and evaluated to identify the type and magnitude of uncertainty involved. Reliance on results from a risk assessment without consideration of uncertainties, limitations, and assumptions inherent in the process can be misleading. For example, to account for uncertainties in the development of exposure assumptions, conservative estimates must be made to ensure that the particular assumptions made are protective of sensitive subpopulations or the maximum exposed individuals. If a number of conservative assumptions are combined in an exposure model, the resulting calculations can propagate the uncertainties associated with those assumptions, thereby producing a much larger uncertainty for the final results. This uncertainty is biased toward over predicting both carcinogenic and noncarcinogenic risks. Thus, both the results of the risk assessment and the uncertainties associated with those results must be considered when making risk management decisions.

This interpretation is especially relevant when the risks exceed the point of departure for defining "acceptable" risk. For example, when risks calculated using a high degree of uncertainty are less than an acceptable risk level (i.e., $1x10^{-6}$ to $1x10^{-4}$), the interpretation of no significant risk is typically straightforward. However, when risks calculated using a high degree of uncertainty exceed an acceptable risk level (i.e., $1x10^{-4}$); a conclusion can be difficult unless uncertainty is considered.

7.6.1 Uncertainty In Data Evaluation

The most significant issue related to uncertainty in the data evaluation are the usability of the existing database. A brief discussion of the uncertainty in the data evaluation is provided in the remainder of this section.

Usability of Existing Databases

All of the data used in the HHRA were validated as discussed in Section 3. A review of data quality is also provided in Section 3. The qualification of data during the formal data validation process is not expected to compromise the results of the baseline HHRA. Analytical data qualified as estimated were utilized, even though the reported positive concentrations or sample-specific quantitation limits may be somewhat imprecise. The use of estimated data adds to the uncertainty associated with the risk assessment; however, the associated uncertainty is expected to be negligible compared to the other uncertainties inherent in the risk evaluation process (i.e., uncertainties with land uses, exposure scenarios, toxicological criteria, etc.). Because all data have been validated, the uncertainty in the calculated risks associated with the data is minimal.

7.6.2 Uncertainty in the Exposure Assessment

Uncertainty in the exposure assessment arises because of the methods used to calculate exposure point concentrations, the determination of land use conditions, the selection of receptors and scenarios, the estimation of exposure point concentrations, and the selection of exposure parameters. Each of these is discussed below.

Land Use

The current land use patterns at NSA Crane are well established, thereby limiting the uncertainty associated with land use assumptions. Land use at SWMU 32 is currently limited and is expected to be limited in the future, as long as NSA Crane remains open (occupational workers, construction workers, and potential and infrequent trespassers are the only current and likely future receptors). To be conservative, risks to potential and future recreational users, and hypothetical residents were estimated for the site.

Exposure Point Concentrations

Uncertainty is associated with the use of the 95 percent UCL on the mean concentration as the EPC. As a result of using the 95 percent UCL, the estimations of potential risk for the RME scenario are most likely overstated since this is a representation of the upper limit that potential receptors would be exposed to over the entire exposure period.

Exposure Routes and Receptor Identification

The determination of various receptor groups and exposure routes of potential concern was based on current land use observed at the site and the anticipated future land use. Therefore, the uncertainty associated with the selection of exposure routes and potential receptors is minimal because they are considered to be well defined.

Exposure Parameters

Each exposure factor (for RME and CTE scenarios) selected for use in the risk assessment has some associated uncertainty. Generally, exposure factors are based on surveys of physiological parameters and lifestyle profiles across the United States. The attributes and activities studied in these surveys generally have a broad distribution. To avoid underestimation of exposure, in most cases, the USEPA guidelines (USEPA, 1991 and 1993a) on the RME receptor were used, which generally specify the use of

the 95th percentile for most parameters. Therefore, the selected values for the RME receptor represent the upper bound of the observed or expected habits of the majority of the population.

Generally, the uncertainty can be assessed quantitatively for many assumptions made in determining factors for calculating exposures and intakes. Many of these parameters were determined from statistical analyses on human population characteristics. Often, the database used to summarize a particular exposure parameter (i.e., body weight) is quite large. Consequently, the values chosen for such variables in the RME scenario have low uncertainty.

Many of the exposure parameters used to calculate exposures and risks in this report are selected from a distribution of possible values, including USEPA guidance (USEPA, 1991, 1993a) and dermal guidance (USEPA, 1997a and 2004). For the RME scenario, the value representing the 95th percentile is generally selected for each parameter to ensure that the assessment bounds the actual risks from a postulated exposure. This risk number is used in risk management decisions but does not indicate what a more average or typical exposure might be or what risk range might be expected for individuals in the exposed population.

To address these issues, USEPA (USEPA, 1992) has suggested the use of the CTE receptor, whose intake variables are often set at approximately the 50th percentile of the distribution. The risks for this receptor seek to incorporate the range of uncertainty associated with various intake assumptions. Some of the parameters presented in this risk assessment were estimated using professional judgment, although USEPA does provide limited guidance for the CTE evaluation (USEPA, 1993a).

7.6.3 Uncertainty in the Toxicological Evaluation

Uncertainty associated with the toxicity assessment is associated with hazard assessment and dose-response evaluations for the COPCs. The hazard assessment deals with characterizing the nature and strength of the evidence of causation or the likelihood that a chemical that induces adverse effects in animals will also induce adverse effects in humans. Hazard assessment of carcinogenicity is evaluated as a weight-of-evidence determination, using the USEPA methods. Positive animal cancer test data suggest that humans contain tissue(s) that may manifest a carcinogenic response; however, the animal data cannot necessarily be used to predict the target tissue in humans.

Uncertainty in hazard assessment arises from the nature and quality of the animal and human data. Uncertainty is reduced when similar effects are observed across species, strain, sex, and exposure route; when the magnitude of the response is clearly dose related; when pharmacokinetic data indicate a similar fate in humans and animals; when postulated mechanisms of toxicity are similar for humans and animals;

and when the chemical of concern is structurally similar to other chemicals for which the toxicity is more completely characterized.

Uncertainty in the dose-response evaluation includes the determination of a CSF for the carcinogenic assessment. Uncertainty is introduced from interspecies (animal to human) extrapolation, which, in the absence of quantitative pharmacokinetic or mechanistic data, is usually based on consideration of interspecies differences in basal metabolic rate. Uncertainty also results from intraspecies variation. Most toxicity experiments are performed with animals that are very similar in age and genotype, so intragroup biological variation is minimal, but the human population of concern may reflect a great deal of heterogeneity, including unusual sensitivity or tolerance to the COPC. Even toxicity data from human occupational exposure reflect a bias because only those individuals sufficiently healthy to attend work regularly (the "healthy worker effect") and those not unusually sensitive to the chemical are likely to be occupationally exposed. Finally, uncertainty arises from the quality of the key study from which the quantitative estimate is derived and the database. For cancer effects, the uncertainty associated with dose-response factors is mitigated by assuming the 95 percent upper bound for the slope factor. Another source of uncertainty in carcinogenic assessment is the method by which data from high doses in animal studies are extrapolated to the dose range expected for environmentally exposed humans. The linearized multistage model, which is used in nearly all quantitative estimations of human risk from animal data, is based on a nonthreshold assumption of carcinogenesis. Evidence suggests, however, that epigenetic carcinogens, as well as many genotoxic carcinogens, have a threshold below which they are noncarcinogenic. Therefore, the use of the linearized multistage model is conservative for chemicals that exhibit a threshold for carcinogenicity.

7.6.4 Uncertainty in the Risk Characterization

Uncertainty in risk characterization resulted from assumptions made regarding additivity of effects from exposure to multiple COPCs from various exposure routes. High uncertainty exists when summing noncancer risks for several substances across different exposure pathways. This assumes that each substance has a similar effect and/or mode of action. Even when compounds affect the same target organs, they may have different mechanisms of action or differ in their fate in the body, so additivity may not have been an appropriate assumption. However, the assumption of additivity was considered acceptable because in most cases it represented a conservative estimate of risk.

Risks to any individual may also have been overestimated by summing multiple assumed exposure pathway risks for any single receptor. Although every effort was made to develop reasonable scenarios, not all individual receptors may have been exposed via all pathways considered.

Also, the risk characterization did not consider antagonistic or synergistic effects. Little or no information was available to determine the potential for antagonism or synergism for the COPCs. Because chemical-specific interactions could not be predicted, the likelihood for risks to be over-predicted or under-predicted could not be defined, but the methodology used was based on current USEPA guidance.

7.6.4.1 Uncertainty Associated with Risk Estimates for Industrial Workers and Hypothetical Residents

There is uncertainty in risk estimates developed for both the industrial worker and hypothetical resident because the HHRA presented in the previous sections did not assume that these receptors would be directly exposed to subsurface soil contamination. However, Tables 4-27 through 4-30 do provide a risk evaluation for the subsurface soil contamination assuming an industrial worker or hypothetical resident is exposed to the subsurface soil contamination (i.e., subsurface soils excavated to the surface). Cancer and non-cancer risk estimates were developed using the EPCs and the USEPA RSLs previously discussed. As noted previously, the USEPA RSLs represent the 1×10^{-6} cancer risk level for carcinogenic effects. Thus, risk estimates may be developed using the EPCs and USEPA RSLs, and using a simple ratio technique:

$$\frac{\text{USEPA Regional Screening Levels}}{\text{EPC for COPC}} = \frac{\text{Cancer Risk Estimate of } 1 \times 10^{-6}}{\text{Cancer Risk Estimate}}$$

ILCRs for industrial workers exposed to subsurface soil in Decision Units 1 and 2 are less than USEPA's and IDEM's target risk range of 1×10^{-6} to 1×10^{-4}. ILCRs for hypothetical resident exposed to subsurface soil in Decision Units 1 and 2 are within USEPA's and IDEM's target risk range of 1×10^{-6} to 1×10^{-4}. Total HIs for industrial workers and hypothetical residents exposed to subsurface soil in Decision Units 1 and 2 are less than unity.

7.7 SUMMARY AND CONCLUSIONS

This section summarizes the results of the baseline HHRA for the SWMU 32 which was performed to characterize the potential risks to likely human receptors under current and potential future land use. Potential receptors under current land use are industrial workers, construction works, and adolescent trespassers. Potential receptors under future land use are child and adult recreational users, and hypothetical child and adult residents. Although future land use is likely to be the same as current land use, the potential future receptors were evaluated in the baseline HHRA, primarily for decision-making purposes.

The COPCs for direct contact to soil at Decision Unit 1

- Surface soil – Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene
- Subsurface Soil – Benzo(a)anthracene and benzo(a)pyrene

The COPCs for chemical migration from soil to groundwater at Decision Unit 1

- Surface soil – Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene
- Subsurface Soil – Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and naphthalene

The COPCs for direct contact exposures at Decision Unit 2 are as follows:

- Surface soil – Benzo(a)pyrene
- Subsurface Soil – Benzo(a)anthracene and benzo(a)pyrene

The COPCs for chemical migration from soil to groundwater at Decision Unit 2 are as follows:

- Surface soil – Benzo(a)pyrene, benzo(b)fluoranthene, and naphthalene
- Subsurface Soil – benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and naphthalene

The COPCs for direct contact to groundwater at SWMU 32 are:

- Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and naphthalene

There were no COPCs for sediment at SWMU 32.

Quantitative estimates of noncarcinogenic and carcinogenic risks (HIs and ILCRs, respectively) were developed for potential human receptors. HIs for all receptors exposed to soils in both Decision Unit 1 and 2 and groundwater at SWMU 32 were less than or equal to unity (1), indicating that adverse non-carcinogenic effects are not anticipated for these receptors under the defined exposure conditions. Cumulative ILCRs for all receptors exposed to soil in Decision Units 1 and 2 and groundwater at SWMU 32 under the RME and CTE scenarios were less than or within USEPA's and IDEM's target risk range of $1x10^{-6}$ to $1x10^{-4}$.

8.0 ECOLOGICAL RISK ASSESSMENT

The goal of this Ecological Risk Assessment (ERA) for SWMU 32 was to evaluate the potential for adverse ecological impacts due to site-related contamination. This goal was accomplished by identifying COPCs detected at concentrations that exceed screening levels, identifying the locations of these exceedances, and concluding whether or not further investigation and/or remedial action at SWMU 32 at NSA Crane is warranted from an ecological perspective.

8.1 INTRODUCTION

The SERA methodology used at NSA Crane is in accordance with the following guidance documents:

- Department of Navy Environmental Policy Memorandum 97-04: Use of Ecological Risk Assessments dated May 16, 1997.
- Navy Policy for Conducting Ecological Risk Assessments (ERAs) (Navy, 1999).
- Final Guidelines for Ecological Risk Assessment (USEPA, 1998).
- Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments (USEPA, 1997).

This ERA consists of Steps 1, 2, and 3a of the eight-step ecological risk evaluation process discussed in USEPA guidance (USEPA, 1997 and 1998) and the Navy Policy for Conducting ERAs (Navy, 1999). These eight steps consist of Steps 1 and 2, which constitute a screening-level ERA (SERA), followed by five additional steps, which constitute a Baseline ERA (BERA), and conclude with Step 8, a risk management evaluation. Step 3a is technically the first step of the BERA and consists of a refinement of the conservative exposure assumptions, but it is included in this ERA in accordance with Navy guidance. Steps 3b through 7 are conducted if additional evaluations or investigations are necessary. Aspects of Step 8, risk management, are addressed throughout the ERA process, in cooperation with Region 5 regulators.

A schematic diagram of the general risk assessment process is provided on Figure 8-1. In addition, Figure 8-2 is a flow chart that summarizes the ERA process as used to evaluate risks for ecological receptors exposed to chemicals in surface soil. This flow chart is discussed later in this ERA.

8.2 SCREENING-LEVEL PROBLEM FORMULATION

The screening-level problem formulation is the first step of the ERA and includes identification of potential receptor groups, COPCs, and the mechanisms for contaminant fate, transport, and toxicity. The complete exposure pathways that exist at a site are determined at this point to facilitate receptor selection. The problem formulation process enables the risk assessor to identify the ecological resources to be protected (known as assessment endpoints), the measurements that were used to evaluate risks to those resources (known as measures of effects) and the chemicals, geographic areas, and environmental media relevant to the risk assessment.

As part of receptor identification, site habitats and potential ecological receptors, as they apply to ecological risk, are described in the following subsections.

8.2.1 Environmental Setting

8.2.1.1 Basewide Environmental Setting

A biological characterization of NSA Crane, including a list of plants and animals found at the facility, is presented in the Installation Assessment (IA) (Army, 1978) and the Initial Assessment Study (IAS) (NEESA, 1983) and is summarized in the Environmental Monitoring Reports (EMRs) (Halliburton NUS, 1992a and 1992b). A list of the species that may inhabit NSA Crane and that are protected under the United States Endangered Species Act, Indiana Department of Natural Resources Heritage Data Center, or the United States Fish and Wildlife Service (USFWS) is summarized in the RCRA Facility Permit and below. The following paragraphs briefly summarize the environmental setting at the base.

Eighty percent of NSA Crane's approximately 63,000 acres is classified as Central Hardwoods Forest of the United States (NEESA, 1983). In addition, some former agricultural fields are in various stages of succession. Open spaces on dry upland sites contain almost pure stands of grasses with some clumps of woody plants such as persimmon, sassafras, and sumac. Wetter sites have river birch, willow, sycamore, and cottonwood. Hillside communities have mostly hickory, white and black oak, red maple, sugar maple, tulip poplar, ash, and beech (NEESA, 1983).

The great variety of habitats at NSA Crane (i.e., many stages of forest succession, streams, ponds, Lake Greenwood, grassy open spaces) lead to great diversity of animal species (NEESA, 1983). These species include but are not limited to mammals such as white-tailed deer, beaver, coyote, hawks, red fox, rabbits, raccoons, and mice; birds such as ducks, geese, wild turkey, bobwhite quail, red-tailed hawks, and American robins; and various amphibians, reptiles, fish, and invertebrates.

Six main creeks receive drainage in five separate drainage basins at NSA Crane: First Creek, Sulphur Creek, Little Sulphur Creek, Boggs Creek, Turkey Creek, and Seed Tick Creek. There are also many smaller streams, creeks, and drainage ditches located at the facility, along with several small man-made ponds and one large lake (Lake Greenwood). Lake Greenwood is the source of potable water for NSA Crane. Surface water from the facility eventually discharges to the East Fork of the White River, which is located south of the facility.

Threatened and Endangered Species

The Endangered Species Management Plan for NSA Crane (Comarco Systems, Inc., 2000) identified the federal and state threatened and endangered species and species of special concern potentially present at the facility. Information included in the Endangered Species Management Plan was obtained from studies and surveys conducted by the Navy and other agencies and groups such as universities and research institutions. A small subset of these studies include the inventory of neotropical migratory birds, mist net and radiotelemetry surveys for the Indiana Bat, bobcat trapping, rattlesnake survey, Purdue University wildlife studies, and several fish surveys, and bird counts. These studies and others that were used in compiling the list of endangered species present at NSA Crane are described in more detail in the Endangered Species Management Plan (Comarco Systems, Inc., 2000) and below.

The Indiana bat is the only federally threatened or endangered species documented to occur at NSA Crane. No mist nets were located at SWMU 32 during the mist net and radiotelemetry surveys for the Indiana Bat; however, two mist net sites were located less than one mile northwest and less than 0.5 mile west of SWMU 32. No Indiana bats were captured at these two locations on July 16, 2005 and July 17, 2005, respectively. Therefore, although Indiana bats have been captured at NSA Crane, their presence surrounding SWMU 32 has not been documented. The USFWS issued a notice in the Federal Register (72 FR 37346 et seq.) on July 9, 2007, that effective August 8, 2007, the American Bald Eagle would be removed from the federal List of Endangered and Threatened Wildlife and Plants. The American Bald Eagle will still be protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The bald eagle is known to be present in Lake Greenwood to the east of SWMU 32.

In addition, a number of state endangered and federal and state species of concern have been listed for NSA Crane (Comarco Systems, Inc., 2000). The state endangered species list includes two mammals (bobcat and Indiana bat), one reptile (timber rattlesnake), and several birds (bald eagle, osprey, loggerhead shrike, yellow-crowned night-heron, Virginia rail, king rail, and Henslow's sparrow).

Boggs Creek and Turkey Creek discharge from NSA Crane to the East Fork of the White River. River otters, a state endangered species, are being reintroduced to Indiana. The otters are expanding from

their original release sites into other watersheds including the East Fork of the White River (IDNR, 2004). Also, the East Fork of the White River is the site of an ongoing study of lake sturgeon populations, another state endangered species (IDNR, 2004). Finally, spotted darters, a state species of special concern, has been found in the East Fork of the White River (IDNR, 2000).

8.2.1.2 Site-Specific Environmental Setting

SWMU 32 – Former Fuel Oil Tank Farm is located in the northwest area of NSA Crane. It is located just northeast of Highway H-5. The site covers approximately 3 acres and is currently vacant, grass-covered, and open. The vegetation at SWMU 32 includes intermittently mowed grasslands. With the exception of two small areas, a chain-link fence surrounds the site. All previously existing tank farm structures (storage tanks, associated piping, and tank farm containment walls) have been removed and the site has been vacant since 1999.

Most of NSA Crane is forested including the area surrounding the site. The nearest stream, Culpepper Branch, is located approximately 400 feet southwest of the site and south of Highway H-5. Culpepper Branch drains into First Creek approximately 700 feet south of the site. The northern side of the site slopes gently northwest and into a drainage channel that flows through a pipe under Highway H-5 to Culpepper Branch. The southern side of the site flows southeast to a drainage channel that flows through a pipe under Highway H-5 and into Culpepper Branch.

8.2.2 Contaminants, Ecotoxicity, and Fate and Transport

Based on historical site data, the following parameters are among the site-related chemical contaminants known to be present or potentially present in environmental media at SWMU 32:

- BTEX
- Select SVOCs

8.2.2.1 Physical and Chemical Characteristics

Physical and chemical characteristics of contaminants may affect their mobility, transport, and bioavailability in the environment. These characteristics include bioaccumulation factors (BAFs), K_{OC}s, and K_{OW}s. The physical and chemical characteristics of the chemical classes present or potentially present in SWMU 32 media are presented in Appendix I.

8.2.3 Potential Exposure Pathways

Section 1.2.2 of this RFI describes the operational history, deposition mechanisms, and potential contaminant migration patterns for SWMU. Section 1.3 presents detailed descriptions of previous investigations and the potential sources of contamination for SWMU 32. Briefly, the Former Fuel Oil Tank Farm was operational from 1947 to 1996 as an on-site bulk storage facility for fuel oil to heat buildings located on NSA Crane property. In 1987, approximately 3,700 gallons of virgin Fuel Oil No. 2 was released from the site when a valve on Tank 2634 was inadvertently left open in Cell No. 6 on the southern side of the site. An unknown quantity of the oil discharged to the existing ditch south of the site and flowed southwest through a pipe under Highway H-5 and the railroad tracks, into Culpepper Branch and then into First Creek. The contaminants from these sources may have migrated to soil, sediment, surface water, and/or groundwater via various transport pathways (e.g., particulate emissions, runoff, and infiltration).

8.2.3.1 Surface Soil

Several groups of terrestrial ecological receptors can be exposed to contaminants in surface soil. Invertebrates such as earthworms are exposed to contaminants as they move through the soil and ingest soil particles while searching for food. Plants are exposed to contaminants via direct contact as contaminants are absorbed through the roots, and contaminants are then translocated to different parts of the plants (e.g., leaves, seeds). These pathways are evaluated in the SERA.

Small mammals may be exposed to contaminants in soil via several exposure routes. They may be exposed by direct contact as they search for food or burrow into the soil. Exposure of terrestrial wildlife to contaminants in the soil via dermal contact is unlikely to represent a major exposure pathway because fur, feathers, and chitinous exoskeletons are expected to minimize transfer of contaminants across dermal tissue. Therefore, the dermal pathway was not evaluated in the SERA. Small mammals also may be exposed to contaminants in soil via incidental ingestion of soil and ingestion of plants and/or invertebrates that have accumulated contaminants from the soil. These pathways are evaluated in the SERA.

Larger predatory species such as the red fox and red-tailed hawk can be indirectly exposed to soil contaminants by ingesting small mammals that have accumulated contaminants from soil. SWMU 32 is relatively small compared to home ranges of the above predatory species, and the chemicals detected at the site (PAHs) do not magnify through the food chain, so these pathways were not evaluated in the SERA.

8.2.3.2 Groundwater

Ecological receptors are not directly exposed to contaminants in groundwater at the site. Exposure to groundwater discharging as a seep or directly to a surface water body represents a complete exposure pathway and is evaluated as part of the surface water pathway.

8.2.3.3 Surface Water/Sediment

As mentioned above, contaminated groundwater may discharge as a seep that flows into surface water or may discharge directly into a surface water body. Contaminants in soil may also enter the Culpepper Branch at SWMU 32 via overland flow. Benthic invertebrates and other aquatic organisms can be exposed to chemicals in surface water and sediment. Sediment represents a complete exposure pathway and sediment samples were collected as part of this investigation to evaluate risks.

8.2.3.4 Air

Inhalation of particulates by mammals and birds is not considered a complete pathway at SWMU 32 because there are no activities causing air contamination. Also, inhalation pathways are not typically evaluated in ERAs because of the uncertainty inherent in estimating exposure levels and toxicological effects. Therefore, the air inhalation pathway is not evaluated in the ERA.

8.2.4 Endpoints

8.2.4.1 Assessment Endpoints

Assessment endpoints are an explicit expression of the environmental value that is to be protected (USEPA, 1997). The selection of these endpoints is based on the habitats present, migration pathways of probable contaminants, and relevant exposure routes for the receptors.

As discussed in 8.2.1.2, the habitat at SWMU 32 consists of mostly grass. Based on the habitats at SWMU 32 and the chemicals present at the site, the assessment endpoints include protection of the following groups of receptors from adverse effects of contaminants on their growth, survival, and reproduction:

- Terrestrial vegetation
- Soil invertebrates
- Sediment invertebrates
- Herbivorous birds and mammals

- Soil invertebrate-eating birds and mammals
- Reptiles
- Piscivorous birds and mammals

The following paragraphs discuss the above assessment endpoints.

Terrestrial Vegetation: Terrestrial vegetation at SWMU 32 consists of grasses, shrubs, and trees. They serve as a food source and provide shade and cover for many organisms, and they help to prevent soil erosion, among other important functions. They also can accumulate some contaminants that can then be transferred to the higher trophic-level organisms that consume plants.

Soil Invertebrates: Soil invertebrates are present in soil at SWMU 32. They aid in the formation of soil and the redistribution and decomposition of organic matter in the soil, and they serve as a food source for higher trophic-level organisms. They also can accumulate bioaccumulative contaminants that can then be transferred to the higher trophic-level organisms that consume soil invertebrates.

Herbivorous Birds and Mammals: Herbivorous birds and mammals (i.e., animals that consume only plant tissue) forage in some portions of SWMU 32. Their role in the community is essential because, without them, higher trophic levels could not exist (Smith, 1966). They may be exposed to and accumulate contaminants present in the plants they consume.

Soil Invertebrate-Eating Birds and Mammals: Soil invertebrate-eating birds and mammals are present throughout the base in different terrestrial habitats (e.g., forested, open field) and are present at SWMU 32. These are considered first-level carnivores, and they serve as a food source for higher trophic-level carnivores. They may be exposed to and accumulate contaminants present in the food items they consume.

Reptiles: Reptiles can inhabit both aquatic environments and terrestrial habitats. Reptiles feed primarily on invertebrates, plants, fish, and/or small mammals. They are exposed to and can accumulate contaminants from the food items they consume.

Piscivorous Birds and Mammals: The term “piscivorous” is used here in a broad sense to describe birds and mammals that prey upon not only fish, but on a variety of aquatic and sediment dwelling organisms (e.g., crayfish, frogs). Piscivorous birds and mammals can be exposed to and accumulate site-related contaminants that have accumulated in prey items obtained from the site.

Not all of the potential assessment endpoints listed above were evaluated in this SERA. As indicated in USEPA guidance (USEPA, 1997), "it is not practical or possible to directly evaluate risks to all of the individual components of the ecosystem at a site. Instead, assessment endpoints focus the risk assessment on particular components of the ecosystem that could be adversely affected by contaminants from the site." Therefore, the SERA will focus on the endpoints that will tend to yield the highest risks, which should then account for endpoints that will have lower risks.

Omnivores were not selected as assessment endpoints because exposure to contaminants in plants is greatest for herbivores, and exposure to contaminants in animals is greatest for insectivores. Therefore, omnivores are protected by protecting herbivores and insectivores. Large carnivorous birds and mammals were not selected as assessment endpoints because their home range (hundreds of acres) is much larger than SWMU 32, so they would only consume a small portion of food from the site. Therefore, risks would be greater to small mammals and birds that may obtain all of the food from the site. Piscivorous birds and mammals were also not selected as assessment endpoints because their home range is much larger than the exposure area in Culpepper Creek. Although amphibians and reptiles are likely to be present in the wetland areas, they were not selected as assessment endpoints because of the general lack of toxicity information and the lack of methods to evaluate their exposure to chemicals.

8.2.4.2 Measures of Effects

Measures of effects are estimates of measurable biological impacts (e.g., mortality, growth, and reproduction) that are used to evaluate the assessment endpoints. The following measures of effects were used to evaluate the assessment endpoints in the SERA:

- Soil screening values - Mortality, growth, and reproduction of plants and soil invertebrates were evaluated by comparing the measured concentrations of chemicals in surface soil to screening values designed to be protective of ecological receptors.

- Sediment screening values - Mortality, growth, and reproduction of sediment invertebrates were evaluated by comparing the measured concentrations of chemicals in sediment to screening values designed to be protective of ecological receptors.

- Wildlife toxicity reference values (TRVs) - Mortality, reproductive, and/or developmental effects of birds and mammals were evaluated by comparing the estimated dose incurred (based on conservative and average assumptions) from ingestion of contaminants in surface soil, plants, and invertebrates to wildlife TRVs.

8.2.4.3 Selection of Receptor Species

Many receptors in the soil environments at SWMU 32 are typically grouped into general categories such as invertebrates and vegetation. This is a reflection of the nature of the threshold values, effects values, or criteria typically used to characterize risk for such organisms. However, for vertebrate receptors, selection of a representative species is required so that risks to these upper-level species incurred by intake through eating and drinking can be estimated.

Ingestion is the primary route of exposure for most mammals and birds. The selection of species used to represent the receptor groups identified in Section 8.2.4.1 was based on considerations of their preferred habitat, body size, sensitivity to contaminants, home range, abundance, commercial or sport utilization, legal status, and functional role (e.g., predators). The availability of exposure parameters such as body mass, feeding rate, and drinking rate was also a factor in selecting surrogate species. The following surrogate species were used in the food-chain modeling conducted as part of this SERA:

- Herbivorous mammal - Meadow vole
- Herbivorous bird - Bobwhite quail
- Insectivorous mammal - Short-tailed shrew
- Insectivorous bird - American woodcock

Receptor profiles for each of the species above are presented in Appendix I.

Food chain modeling was not completed for piscivorous wildlife because the exposure area in Culpepper Creek (approximately 300 ft.) would represent only a fraction of the habitat range of piscivorous receptors such as the mink or green heron.

8.2.4.4 Conceptual Site Model

A conceptual model in problem formulation is a written description and visual representation of predicted relationships between ecological entities and the stressors to which they may be exposed. The conceptual model consists of two primary components: predicted relationships among stressor, exposure, and assessment endpoint response and a diagram that illustrates the relationships (USEPA, 1998).

The primary sources of known or potential contamination at SWMU 32 were identified based on past operational practices and the physical characteristics of the site. The primary sources of contamination have been identified as petroleum releases.

The primary stressors to ecological receptors are contaminants in surface soil and sediment. The primary receptors for contaminants in surface soil are plants, invertebrates, sediment invertebrates, amphibians, and reptiles, and secondary receptors are birds and mammals. Figure 8-3 represents the ecological CSM for SWMU 32.

8.3 ECOLOGICAL EFFECTS EVALUATION/SELECTION OF CONTAMINANTS OF POTENTIAL CONCERN

8.3.1 Ecological Effects Evaluation

The preliminary ecological effects evaluation is an investigation of the relationship between the magnitude of exposure to a chemical and the nature and magnitude of adverse effects resulting from exposure. In addition to being a toxicological evaluation, it may also include descriptions of apparent effects seen during the site visit (e.g., stressed vegetation). Toxicity thresholds are usually expressed in units of concentration when the medium of concern is in intimate contact with the receptor, such as soil for soil invertebrates. For other receptors, such as terrestrial vertebrates, toxicity data are typically available as doses, with units equal to mass of contaminant per unit of body mass per unit of time (usually mg/kg-day).

8.3.1.1 Exposure Characterization

As the first step in the ecological effects evaluation, COPCs were selected by comparing contaminant concentrations in surface soil to USEPA Ecological Soil Screening Levels (Eco-SSLs) (USEPA, 2005 and supporting documents). These values were used in place of the R5 Soil ESLs because they are based on more recent data. For sediment, the Region 5 sediment ESLs (R5 Sed ESLs) (USEPA, 2003) were used in COPC selection. These values are the applicable ERA PSLs. The following are the rules used to select COPCs for SWMU 32:

- A contaminant was retained as a COPC for risks to terrestrial plants, soil invertebrates, birds, mammals, or sediment invertebrates if the maximum detected concentration in surface soil or sediment exceeded the associated screening level or a screening level was not available. For surface soil, if a contaminant had a maximum detected concentration that exceeded the PSL, or a PSL was not available for birds or mammals, then the chemical was retained as a COPC for wildlife. Contaminants retained as COPCs were further evaluated as part of Step 3a of the eight-step ERA process.

The doses in mg/kg-day were estimated for terrestrial wildlife (mammals and birds) using exposure dose equations. Note that the food chain models were conducted on a dry-weight basis to be consistent with

the soil concentrations which are reported on a dry-weight basis. Therefore, the concentrations in the food items were estimated on a dry-weight basis. The following generic equation was used to calculate the exposure point concentrations (EPCs) for terrestrial wildlife from exposure to chemicals in soil and associated food items such as plants and invertebrates:

$$CDI = \frac{[(Cf * If) + (Cs * Is) + (Cw * Iw)] * H}{BW}$$

Where:

CDI	=	Chronic daily intake [milligrams per kilogram (mg/kg)-day]
Cf	=	Chemical concentration in food – (see discussion below)
Cs	=	Chemical concentration in surface soil or sediment (mg/kg)
Cw	=	Chemical concentration in surface water (mg/L)
If	=	Food ingestion rate [kilograms per day (kg/day)]
Is	=	Incidental surface soil ingestion rate (kg/day)
Iw	=	Water ingestion rate [liters per day (L/day)]
H	=	Portion of food intake from the contaminated area (unitless)
BW	=	Body weight (kg)

The exposure factors used for the food chain model, their derivation, and the receptor profiles for the surrogate species are presented in Appendix I. The exposure assumptions (i.e., ingestion rate, body weight) were obtained primarily from the Wildlife Exposure Factors Handbook (USEPA, 1993) and USEPA Eco-SSL Guidance Attachment 4-1 (2007a) with other sources used as necessary. Food ingestion rates are on a dry-weight basis as discussed above.

Chemical concentrations in food items for soil invertivorous and herbivorous receptors were calculated using soil-to-invertebrate or soil-to-plant bioaccumulation factors (BAFs) and regression equations from the EPA Eco-SSL Guidance Document Attachment 4-1 (2007a) or BAFs from published sources. The following equation was used to calculate chemical concentrations in plants or invertebrates when BAFs were used:

$$Cf = Cs * BAF$$

Where:

Cf	=	Contaminant concentration in food (mg/kg)
Cs	=	Contaminant concentration in surface soil (mg/kg)
BAF	=	Biota-soil bioaccumulation factor (unitless)

The following sources of plants/earthworm BAFs were used to calculate the chemical concentrations in plants and earthworms:

- Plant and invertebrate BAFs: *Guidance for Developing Ecological Soil Screening Levels, Interim Final, Attachment 4-1, Exposure Factors and Bioaccumulation Models for Derivation of Wildlife Eco-SSLs* (USEPA, 2007a).

The actual BAFs and sources selected are presented in Appendix I.

The food chain model scenarios were calculated using various exposure assumptions to present a range of potential risks. For selecting chemicals as COPCs, the following conservative exposure assumptions were used:

- Maximum soil concentrations
- 90th percentile BAFs (or maximum value if a 90th percentile value is not available) or regression equations
- Conservative receptor body weight and ingestion rates
- Receptors spend 100% of their time at the Site

8.3.1.2 Risk Characterization

An Ecological Effects Quotient (EEQ) approach was used to characterize the risk to ecological receptors. This approach characterizes potential effects by comparing exposure concentrations with effects data. The EEQs for terrestrial receptors were calculated as follows:

$$EEQ = \frac{Css}{SSSL}$$

where:

C_{ss} = contaminant concentration in surface soil (µg/kg or mg/kg)

SSSL = surface soil screening level (µg/kg or mg/kg)

The EEQs for sediment invertebrates were calculated as follows:

$$EEQ = \frac{Csd}{SdSL}$$

where:

EEQ	=	Ecological Effects Quotient (unitless)
Csd	=	Chemical concentration in sediment (µg/kg or mg/kg)
SdSL	=	Sediment screening level (µg/kg or mg/kg)

The EEQs for terrestrial wildlife were calculated as follows:

$$EEQ = \frac{CDI}{TRV}$$

where:

EEQ	=	Ecological effects quotient (unitless)
CDI	=	Chronic daily intake dose (mg/kg-day)
TRV	=	Toxicity reference value (NOAEL or LOAEL) (mg/kg-day)

An EEQ of greater than 1.0 was considered to indicate potential risk. Such values do not necessarily indicate that an effect will occur but only that a low (i.e., conservative) threshold has been exceeded.

8.3.2 Selection of Contaminants of Potential Concern

Tables 8-1 through 8-3 provide the results of the COPC selection for surface soil, sediment, and conservative food chain model.

8.3.2.1 Soil Invertebrates

Table 8-1 presents the COPC selection for soil invertebrates in SWMU 32 surface soil. No chemicals were retained as COPCs for soil invertebrates because all maximum concentrations were less than their respective Eco-SSL.

8.3.2.2 Terrestrial Plants

Table 8-1 presents the COPC selection for terrestrial plants in SWMU 32 surface soil. All eight PAHs detected were selected as COPCs for plants because an Eco-SSL was not available for this receptor class and the R5 Soil ESLs are based on risks to mammals.

8.3.2.3 Sediment Invertebrates

Table 8-2 presents the COPC selection for sediment invertebrates in Culpepper Creek. No chemicals were retained as COPCs for soil invertebrates because all maximum concentrations were less than their respective R5 Sed ESL.

8.3.2.4 Wildlife

All eight PAHs were selected for food chain modeling for terrestrial wildlife because an avian screening level was not available or the maximum concentration exceeded the mammal Eco-SSL. Table 8-3 presents the results of the conservative food chain model for surface soil. Six PAHs were retained for further evaluation.

8.4 STEP 3A - REFINEMENT OF CONSERVATIVE EXPOSURE ASSUMPTIONS

Step 3a consists of refining the conservative exposure assumptions/concentrations used to evaluate potential risks to ecological receptors (i.e., plants and wildlife receptors) and re-evaluating the analytical data using benchmarks that are more appropriate for the assessment endpoints. The objective of the Step 3a refinement was to better define those chemicals that contribute to potentially unacceptable levels of ecological risk, and to identify and eliminate from further consideration those COPCs that were retained because of the use of very conservative exposure scenarios. The Step 3a evaluation is designed to eliminate chemicals from further evaluation for certain groups of receptors. For example, a chemical might not be retained as a COPC in soil based on low risks to plants but might be retained for evaluating risks to wildlife. Chemicals are evaluated during Step 3a first for terrestrial plants (Section 8.4.1) and then for wildlife (Section 8.4.2). No COPCs were selected for soil invertebrates or sediment invertebrates for further evaluation.

Figure 8-2 is a flow chart that presents the SERA process used to evaluate risks to ecological receptors from chemicals in the surface soil. The following section describes the process for further evaluating chemicals initially selected as COPCs in surface soil.

Chemicals initially selected as COPCs in surface soil were carried through three independent flow paths to further evaluate risks to: (1) plants and (2) wildlife (i.e., mammals and birds). This evaluation was conducted to determine whether there are potential risks to these receptor groups (i.e., plants and wildlife) or to only one of the receptor groups. This is important because if the site proceeds further to a BERA, the studies in the BERA should only focus on the receptors that are at potential risk.

For chemicals evaluated further in Step 3a, the following factors were evaluated, as appropriate, to determine if the risks are great enough to warrant additional evaluations (i.e., proceed to a BERA, develop cleanup levels, proceed to a Corrective Measures Study [CMS]). All of these factors may not be discussed for each chemical and/or receptor group.

- Magnitude of criterion exceedance: Although the magnitude of risks may not relate directly to the magnitude of a criterion exceedance, the magnitude of the criterion exceedance may be one item used in a lines-of-evidence approach to determine the need for further site evaluation. The greater the criterion exceedance, the greater the probability and concern that an unacceptable risk exists.

- Frequency of chemical detection and spatial distribution: A chemical detected at a low frequency typically is of less concern than a chemical detected at higher frequency if toxicity and concentrations and spatial areas represented by the data are similar. All else being equal, chemicals detected frequently were given greater consideration than those detected relatively infrequently. In addition, the spatial distribution of a chemical may be evaluated to determine the area that a sample represents.

- Contaminant bioavailability: Many contaminants (especially inorganics) are present in the environment in forms that are typically not bioavailable, and limited bioavailability was considered when evaluating exposures of receptors to site contaminants. Contaminants with generally less bioavailability are considered to be less toxic than more bioavailable contaminants, all other factors being equal.

- Habitat: Although exceedances of criteria may occur, potential risks to ecological receptors may be minimal if there is little habitat for those receptors. Therefore, the extent of habitat was used qualitatively when considering additional evaluation. Areas with little habitat were less of a concern than areas with suitable habitat to support the receptors of interest.

- Alternate benchmarks: These benchmarks are used to further evaluate risks to specific groups of ecological receptors (e.g., plants, invertebrates) because, although ESLs are useful for initial screening, they are the most conservative values available for surface soil evaluation. For example, the screening levels for soil may be based on risks to small mammals. Therefore, an exceedance of that screening level does not necessarily indicate that potential risks to plants or invertebrates exist and so other more appropriate benchmarks were used to evaluate potential risks to those receptors. Use of these alternate benchmarks was case specific.

In addition to the general Step 3a factors above, other factors were evaluated in Step 3a for each receptor group. The following sections discuss the other factors that were used, including specific alternate benchmarks.

8.4.1 Terrestrial Plants

Potential risks to terrestrial plants from exposure to chemicals initially selected as COPCs were further evaluated. The toxicological basis for the alternate benchmarks are presented below.

PAHs

Seven high molecular weight (HMW) PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene and indeno(1,2,3-cd)pyrene were initially selected as COPCs because a screening level for terrestrial plants was not available. An Eco-SSL was not able to be derived for plants, so PAH concentrations were compared to the plant value in Appendix III of the Canadian SQG for benzo(a)pyrene (4,400,000 µg/kg; EC, 1999). In Appendix III of the Canadian SQG document for benzo(a)pyrene (EC, 1999), a no observed effects concentration (NOEC) of 4,400 mg/kg was the lowest reported NOEC value for plants and was based on seedling emergence after 3 days of exposure. By using this NOEC for benzo(a)pyrene as a surrogate for PAHs, it does not appear that PAHs in the SWMU 32 soil are likely to impact plants because all detected concentrations are significantly less than this benchmark. Therefore, risks to plants PAHs initially selected as COPCs are expected to be acceptable, and PAHs are not retained as COPCs for risks to this receptor from detected concentrations in SWMU 32 surface soil.

8.4.2 Terrestrial Wildlife

As presented in Section 8.3.2.4, the EEQs from the terrestrial food chain modeling were greater than 1.0 for six PAHs using maximum chemical concentrations and conservative exposure assumptions. Therefore, as part of the Step 3a refinement, risks were recalculated using average chemical concentrations and the Step 3a exposure parameters as presented in Appendix I. These parameters are summarized on the exposure factors table in Appendix I. The food chain model calculation sheets are also provided in Appendix I.

For refining the list of COPCs in Step 3a, the following less conservative exposure assumptions were used:

- Average surface soil concentrations were used
- Average BAFs or BAF regression equations

- Average receptor body weights and ingestion rates
- Average surface water concentrations
- Receptors spend 100% of their time at the Site

Decisions made based on the results of the food-chain model are as follows:

- If the EEQ is less than 1.0 using average contaminant concentrations and exposure factors and the NOAEL as the TRV, it was concluded that the chemical is not causing an unacceptable risk to wildlife and the chemical was not evaluated further in Step 3a.

- If the EEQ is greater than 1.0 using average contaminant concentrations and exposure factors and the NOAEL as the TRV, the chemical was further evaluated in Step 3a to determine if the risks are great enough to warrant additional evaluations.

Food Chain Model Refinement

Table 8-4 presents the result of the less conservative food chain model for surface soil. This table only presents the results for the shrew and woodcock because none of the conservative food chain model EEQs were greater than 1.0 for the vole or quail.

After the Step 3a refinement, none of the no observed adverse effects level (NOAEL) EEQs were greater than 1.0 for wildlife. Therefore, impacts to terrestrial wildlife are not expected from the chemicals detected in surface soil at SWMU 32.

8.5 ECOLOGICAL RISK UNCERTAINTY ANALYSIS

This section discusses some of the uncertainties associated with the SWMU 32 SERA.

8.5.1 Measurement and Assessment Endpoints

Measurement endpoints were used to evaluate the assessment endpoints selected for the SERA. For the SERA, the measures of effects were not the same as the assessment endpoints. Measures were used to predict effects to the assessment endpoints by selecting surrogate species to be evaluated. For example, a decrease in reproduction of a shrew was used to assess a decrease in reproduction of the small mammal population. However, predicting a decrease in reproduction of a shrew may either underprotect or overprotect the small mammal population based on differences in ingestion rates, toxicity, food preferences, home ranges, etc. between different species.

Risks to reptiles were not quantitatively evaluated because exposure factors are not established for most species and because toxicity data are very limited (see below for a discussion of potential risks to the timber rattlesnake). As discussed in Section 8.2.1.1, several endangered and threatened species or species of special concern are present at NSA Crane and potentially may inhabit SWMU 32. Risks to these species were not specifically calculated, so the uncertainties of not calculating risks to these species are presented here. Unacceptable risks to the bobcat, bald eagle, Northern harrier, and osprey are not expected because habitat is not available. The bobcat has a significantly larger home range. The bald eagle and osprey require open water habitat, which is not available at SWMU 32, but is available in Lake Greenwood. The Northern harrier prefers wetlands habitat, which is not available at SWMU 32. However, there is uncertainty with this conclusion because risks were not quantitatively evaluated.

Loggerhead shrikes and the sedge wren consume mostly aboveground insects such as caterpillars, beetles, spiders, and flies, as opposed to the worms that are consumed by the American woodcock in the food-chain model. Because worms are in direct contact with soil, it is expected that they would have greater levels of contaminants at SWMU 32 than aboveground insects; therefore, risks to the woodcock from consuming worms are expected to be greater than risks to the loggerhead shrike and sedge wren from consuming aboveground insects. By protecting the woodcock, these other insectivorous birds will also be protected. The American bittern is a marshland bird that feeds on fish, frogs, eels, insects, and water snakes. The tributaries at SWMU 32 do not provide preferred habitat (marshes) for the bittern, so it is not likely that it will be present in this area. As mentioned in Section 8.2.1.1, the presence of the Indiana bat has not been documented at or surrounding SWMU 32.

Finally, there are uncertainties in risks to reptiles because there is a lack of exposure factors for reptiles and a lack of reptile toxicity data for the detected chemicals. As discussed in Section 8.2.1.1, one threatened reptilian species is listed as potentially present at NSA Crane. Based on the preferred habitat of the timber rattlesnake and the ecology of SWMU 32, this species likely does not inhabit areas of SWMU 32. Risks to carnivorous reptiles were not specifically calculated; however, risks are accounted for by using insectivorous birds and mammals as surrogates.

8.5.2 Exposure Characterization

The contaminant dose to terrestrial wildlife is calculated using an equation that incorporates ingestion rates, body weights, BAFs, and other exposure factors. The exposure factors were obtained from literature studies or predicted using various equations. Ingestion rates and body weights vary among species, especially among species inhabiting different areas. This was taken into account when selecting exposure parameters from USEPA (USEPA, 1993), and an attempt was made to minimize the

uncertainties associated with the exposure characterization by selecting exposure parameters from studies conducted in Indiana and surrounding states.

Bioaccumulation of contaminants into various biological media (e.g., plants, invertebrates, small mammals) depends on characteristics of the media such as pH, organic carbon, etc. Therefore, actual BAFs at the sites may be different than those used in the SERA and obtained from the literature. Also, the bioavailability of contaminants reported in toxicity studies is typically greater than the contaminants in environmental media. Typically, highly bioavailable forms of the chemicals are used when conducting toxicity tests and/or conducting dosing studies for wildlife.

There is uncertainty in the chemical data collected at the site. Measured levels of chemicals are only estimates of true site chemical concentrations. At SWMU 32, samples were deliberately biased toward known or suspected high concentrations, so predicted doses are probably higher than actual doses. Whereas this is a conservative approach in predicting exposure concentrations, actual exposure of ecological receptors to chemical concentrations at SWMU 32 is likely overestimated. In particular, wildlife that typically roam over multiple sample locations are unlikely to obtain all of their food from within the most contaminated areas at SWMU 32.

8.5.3 Ecological Effects Data

An alternative benchmark value was used for plants to gain a better understanding of the relationship between maximum concentrations of selected COPCs to the overall ecological assessment of the site. There is some uncertainty involved when using this alternative benchmark; however, attempts have been made to lessen the uncertainties by providing the toxicological basis of the alternate benchmark that was used.

8.5.4 Risk Characterization

Risks are possible if an EEQ is greater than or equal to 1.0 regardless of the magnitude of the EEQ. However, the magnitude of effects to ecological receptors cannot be inferred based on the magnitude of the EEQ. Rather, an EEQ greater than 1.0 simply indicates that the dose used to derive the toxicity reference value was exceeded.

Finally, there is uncertainty in how the predicted risks to a species at a site translate into risk to the population in the area as a whole.

8.6 ECOLOGICAL RISK SUMMARY AND CONCLUSIONS

A SERA was performed for SWMU 32. Several PAHs were retained as COPCs as a result of the initial screening of surface soil for plants and wildlife. These chemicals were further evaluated as a part of the Step 3a refinement. No chemicals were retained for further evaluation for sediments.

In summary, the list of PAHs initially selected as soil COPCs for plants were further evaluated in Step 3a, the first step of the Baseline Ecological Risk Assessment (BERA). After a review of alternate toxicity information (based on plants) for the initial COPCs was conducted, COPC concentrations were compared to the alternate toxicity information. No chemicals were retained as COPCs for plants in surface soil.

The chemicals selected as COPCs for risks to wildlife were further evaluated in Step 3a using less conservative exposure assumptions for insectivorous mammals and birds. None of the food chain model EEQs was greater than 1.0.

Therefore, no chemicals were retained as COPCs for risks to plants, soil invertebrates, sediment invertebrates, or terrestrial wildlife, and ecological risks are not expected from the chemicals detected in SWMU 32 surface soil and sediment.

9.0 CONCLUSIONS

Data collected during the RFI were adequate for developing screening level human health and baseline ecological risk assessments for SWMU 32 and for establishing the nature and extent of contamination to support the risk assessments. The results of the human health risk assessment indicate that potential human health risks calculated for soil and sediment were less than or within IDEM / USEPA goals. The results of the ecological risk assessment determined that there were no significant ecological risks.

COCs were found in concentrations exceeding PSLs in two surface soil samples, four subsurface soil samples, two sediment samples and one groundwater sample. The extent of the contamination has been fully delineated.

The HHRA was conducted to yield quantitative estimates of non-carcinogenic and carcinogenic risks for potential human receptors posed by the COCs at the site. HIs for all receptors exposed to soils and groundwater indicate that adverse non-carcinogenic effects are not anticipated for these receptors under the defined exposure conditions. Similarly, cumulative ILCRs for all receptors exposed to soil and groundwater at SWMU 32 were less than or within USEPA's and IDEM's target risk range and carcinogenic effects are not anticipated.

No ERA chemicals were retained as COPCs for risks to plants, soil invertebrates, sediment invertebrates, or terrestrial wildlife. Ecological risks are not expected from the chemicals detected in SWMU 32 surface soil and sediment. Table 9-1 summarizes receptor-specific human health risks and hazards, ecological risks, critical exposure pathways, and COCs for SWMU 32.

No further action is recommended at NSA Crane SWMU 32.

TABLE 9-1

SUMMARY OF RECEPTOR-SPECIFIC HUMAN RISKS AND HAZARDS, ECOLOGICAL RISKS, AND RECOMMENDATIONS

Receptor Population	Environmental Media	Overall Carcinogenic Risk (Human Health)	Overall Hazard Index (Human Health)	Overall Risk (Ecological)	Recommendations
Current/Future Industrial Worker	Surface Soil DU 1, Groundwater	4.E-06	0.00004	N/A	NFA
	Surface Soil DU 2, Groundwater	2.E-06	0.00004	N/A	NFA
Current/Future Adolescent Trespasser	Surface Soil DU 1, Groundwater	6E-07	0	N/A	NFA
	Surface Soil DU 2, Groundwater	2E-08	6E-08	N/A	NFA
Current/Future Construction Worker	Soil DU 1, Groundwater	2E-07	0.02	N/A	NFA
	Soil DU2, Groundwater	5E-05	0.000006	N/A	NFA
Future Child Recreational User	Surface Soil DU 1, Groundwater	4E-06	0.00002	N/A	NFA
	Surface Soil DU 2, Groundwater	2E-06	0.00002	N/A	NFA
Future Adult Recreational User	Surface Soil DU 1, and Groundwater	1E-06	0.00001	N/A	NFA
	Surface Soil DU 2, and Groundwater	5E-07	0.000006	N/A	NFA
Future Child Resident	Surface Soil DU 1, and Groundwater	5E-05	0.0002	N/A	NFA
	Surface Soil DU 2, and Groundwater	2E-05	0.0002	N/A	NFA

Receptor Population	Environmental Media	Overall Carcinogenic Risk (Human Health)	Overall Hazard Index (Human Health)	Overall Risk (Ecological)	Recommendations
Future Adult Resident	Surface Soil DU 1, and Groundwater	1E-05	0.00008	N/A	NFA
	Surface Soil DU 1, and Groundwater	7E-06	0.00008	N/A	NFA
Terrestrial Plants and Invertebrates	Surface Soil	N/A	N/A	Acceptable	N/A
Mammals and Birds	Surface Soil	N/A	N/A	Acceptable	N/A
	Sediment	N/A	N/A	Acceptable	N/A
Aquatic Organisms	Surface Water	N/A	N/A	Acceptable	N/A
Sediment Invertebrates	Sediment	N/A	N/A	Acceptable	N/A

DU – Decision Unit
N/A – Not Applicable
NFA – No Further Action

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TABLE 2-1

INSTALLATION DATES AND DEPTHS OF MONITORING WELLS AND SOIL BORINGS, AND DEPTHS OF SOIL SAMPLES COLLECTED
SWMU 32 – FORMER TANK FARM AREA
NSA CRANE
CRANE, INDIANA

Boring No.	Sample I.D. Number	Total Depth (feet bgs)	Drilling Method	Date Drilled	Analytical Group
SWMU 32 Soil Borings					
32SB01	32SS-01-0002	10	DPT	26-Apr-10	Select SVOCs
	32SB-01-0708				BTEX, Select SVOCs
32SB02	32SS-02-0002	10	DPT	26-Apr-10	Select SVOCs
	32SB-02-0607				BTEX, Select SVOCs
32SB03	32SS-03-0002	7	DPT	26-Apr-10	Select SVOCs
	32SB-03-0607				BTEX, Select SVOCs
32SB04	32SS-04-0002	6	DPT	26-Apr-10	Select SVOCs
	32SB-04-0506				BTEX, Select SVOCs
32SB05	32SS-05-0002	6	DPT	26-Apr-10	Select SVOCs
	32SB-05-0506				BTEX, Select SVOCs
32SB06	32SS-06-0002	10	DPT	26-Apr-10	Select SVOCs
	32SB-06-0405				BTEX, Select SVOCs
32SB07	32SS-07-0002	7	DPT	26-Apr-10	Select SVOCs
	32SB-07-0607				BTEX, Select SVOCs
32SB08	32SS-08-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-08-0607				BTEX, Select SVOCs
32SB09	32SS-09-0002	10	DPT	27-Apr-10	Select SVOCs
	32SB-09-0607				BTEX, Select SVOCs
32SB10	32SS-10-0002	10	DPT	27-Apr-10	Select SVOCs
	32SB-10-0506				BTEX, Select SVOCs
32SB11	32SS-11-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-11-0607				BTEX, Select SVOCs

TABLE 2-1

INSTALLATION DATES AND DEPTHS OF MONITORING WELLS AND SOIL BORINGS, AND DEPTHS OF SOIL SAMPLES COLLECTED
SWMU 32 – FORMER TANK FARM AREA
NSA CRANE
CRANE, INDIANA

Boring No.	Sample I.D. Number	Total Depth (feet bgs)	Drilling Method	Date Drilled	Analytical Group
32SB12	32SS-12-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-12-0607				BTEX, Select SVOCs
32SB13	32SS-13-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-13-0607				BTEX, Select SVOCs
32SB14	32SS-14-0002	10	DPT	27-Apr-10	Select SVOCs
	32SB-14-0910				BTEX, Select SVOCs
32SB15	32SS-15-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-15-0506				BTEX, Select SVOCs
32SB16	32SS-16-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-16-0607				BTEX, Select SVOCs
32SB17	32SS-17-0002	15	DPT	27-Apr-10	Select SVOCs
	32SB-17-0607				BTEX, Select SVOCs
	32SB-17-1112				BTEX, Select SVOCs
32SB18	32SS-18-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-18-0506				BTEX, Select SVOCs
32SB19	32SS-19-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-19-0506				BTEX, Select SVOCs
32SB20	32SS-20-0002	10	DPT	27-Apr-10	Select SVOCs
	32SB-20-0506				BTEX, Select SVOCs
32SB21	32SS-21-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-21-0506				BTEX, Select SVOCs
32SB22	32SS-22-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-22-0506				BTEX, Select SVOCs

TABLE 2-1

INSTALLATION DATES AND DEPTHS OF MONITORING WELLS AND SOIL BORINGS, AND DEPTHS OF SOIL SAMPLES COLLECTED
SWMU 32 – FORMER TANK FARM AREA
NSA CRANE
CRANE, INDIANA

Boring No.	Sample I.D. Number	Total Depth (feet bgs)	Drilling Method	Date Drilled	Analytical Group
32SB23	32SS-23-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-23-0506				BTEX, Select SVOCs
32SB24	32SS-24-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-24-0506				BTEX, Select SVOCs
32SB25	32SS-25-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-25-0607				BTEX, Select SVOCs
32SB26	32SS-26-0002	10	DPT	27-Apr-10	Select SVOCs
	32SB-26-0405				BTEX, Select SVOCs
32SB27	32SS-27-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-27-0506				BTEX, Select SVOCs
32SB28	32SS-28-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-28-0506				BTEX, Select SVOCs
32SB29	32SS-29-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-29-0304				BTEX, Select SVOCs
32SB30	32SS-30-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-30-0506				BTEX, Select SVOCs
32SB31	32SS-31-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-31-0607				BTEX, Select SVOCs
32SB32	32SS-32-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-32-0506				BTEX, Select SVOCs
32SB33	32SS-33-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-33-0506				BTEX, Select SVOCs
32SB34	32SS-34-0002	7	DPT	27-Apr-10	Select SVOCs
	32SB-34-0607				BTEX, Select SVOCs

TABLE 2-1

INSTALLATION DATES AND DEPTHS OF MONITORING WELLS AND SOIL BORINGS, AND DEPTHS OF SOIL SAMPLES COLLECTED
SWMU 32 – FORMER TANK FARM AREA
NSA CRANE
CRANE, INDIANA

Boring No.	Sample I.D. Number	Total Depth (feet bgs)	Drilling Method	Date Drilled	Analytical Group
32SB35	32SS-35-0002	7	DPT	28-Apr-10	Select SVOCs
	32SB-35-0507				BTEX, Select SVOCs
32SB36	32SS-36-0002	6	DPT	27-Apr-10	Select SVOCs
	32SB-36-0506				BTEX, Select SVOCs
32SB37	32SS-37-0002	6	DPT	27-Apr-10	Select SVOCs
	32SB-37-0506				BTEX, Select SVOCs
32SB38	32SS-38-0002	7	DPT	28-Apr-10	Select SVOCs
	32SB-38-0506				BTEX, Select SVOCs
32SB39	32SS-39-0002	7	DPT	28-Apr-10	Select SVOCs
	32SB-39-0507				BTEX, Select SVOCs
32SB40	32SS-40-0002	6	DPT	28-Apr-10	Select SVOCs
	32SB-40-0506				BTEX, Select SVOCs
32SB41	32SS-41-0002	6	DPT	28-Apr-10	Select SVOCs
	32SB-41-0506				BTEX, Select SVOCs
32SB42	32SS-42-0002	6	DPT	28-Apr-10	Select SVOCs
	32SB-42-0506				BTEX, Select SVOCs
32SB43	32SS-43-0002	7	DPT	29-Apr-10	Select SVOCs
	32SB-43-0506				BTEX, Select SVOCs
32SB44	32SS-44-0002	10	DPT	29-Apr-10	Select SVOCs
	32SB-44-0506				BTEX, Select SVOCs
32SB45	32SS-45-0002	7	DPT	29-Apr-10	Select SVOCs
	32SB-45-0607				BTEX, Select SVOCs
32SB46	32SS-46-0002	7	DPT	29-Apr-10	Select SVOCs
	32SB-46-0304				BTEX, Select SVOCs

TABLE 2-1

INSTALLATION DATES AND DEPTHS OF MONITORING WELLS AND SOIL BORINGS, AND DEPTHS OF SOIL SAMPLES COLLECTED
SWMU 32 – FORMER TANK FARM AREA
NSA CRANE
CRANE, INDIANA

Boring No.	Sample I.D. Number	Total Depth (feet bgs)	Drilling Method	Date Drilled	Analytical Group
32SB47	32SS-47-0002	7	DPT	29-Apr-10	Select SVOCs
	32SB-47-0506				BTEX, Select SVOCs
32SB48	32SS-48-0002	7	DPT	29-Apr-10	Select SVOCs
	32SB-48-0607				BTEX, Select SVOCs
32SB49	32SS-49-0002	10	DPT	29-Apr-10	Select SVOCs
	32SB-49-0405				BTEX, Select SVOCs
32SB50	32SS-50-0002	10	DPT	29-Apr-10	Select SVOCs
	32SB-50-0607				BTEX, Select SVOCs
32SB51	32SS-51-0002	15	DPT	29-Apr-10	Select SVOCs
	32SB-51-0607				BTEX, Select SVOCs
	32SB-51-1415				BTEX, Select SVOCs
32SB52	32SS-52-0002	15	DPT	29-Apr-10	Select SVOCs
	32SB-52-0708				BTEX, Select SVOCs
	32SB-52-1415				BTEX, Select SVOCs
32SB53	32SS-53-0002	15	DPT	29-Apr-10	Select SVOCs
	32SB-53-0607				BTEX, Select SVOCs
	32SB-53-1415				BTEX, Select SVOCs
32SBDW01	32SS-DW01-0002	15	DPT	28-Apr-10	Select SVOCs
	32SB-DW01-0809				BTEX, Select SVOCs
32SBDW02	32SS-DW02-0002	7	DPT	28-Apr-10	Select SVOCs
	32SB-DW02-0506				BTEX, Select SVOCs

TABLE 2-1

INSTALLATION DATES AND DEPTHS OF MONITORING WELLS AND SOIL BORINGS, AND DEPTHS OF SOIL SAMPLES COLLECTED
SWMU 32 – FORMER TANK FARM AREA
NSA CRANE
CRANE, INDIANA

Boring No.	Sample I.D. Number	Total Depth (feet bgs)	Drilling Method	Date Drilled	Analytical Group
32SBDW03	32SS-DW03-0002	7	DPT	28-Apr-10	Select SVOCs
	32SB-DW03-0304				BTEX, Select SVOCs
32SBST01	32SS-ST01-0002	15	DPT	28-Apr-10	Select SVOCs
	32SB-ST01-0708				BTEX, MTBE, Select SVOCs
32SB54	32SB-54-0708	16	DPT	17-SEP-10	BTEX, Select SVOCs
	32SB-54-1112				BTEX, Select SVOCs
	32SB-54-1415				BTEX, Select SVOCs
32SB55	32SB-55-0708	16	DPT	20-SEP-10	BTEX, Select SVOCs
	32SB-55-1112				BTEX, Select SVOCs
32SB56	32SB-56-1011	15	DPT	20-SEP-10	BTEX, Select SVOCs
	32SB-56-1415				BTEX, Select SVOCs
32SB57	32SB-57-0708	6	DPT	20-SEP-10	BTEX, Select SVOCs
32SB58	32SB-58-0708	10	DPT	20-SEP-10	BTEX, Select SVOCs
	32SB-58-1112				BTEX, Select SVOCs
32SB59	32SB-59-1112	10	DPT	20-SEP-10	BTEX, Select SVOCs
32SB60	32SS-60-0002	7	DPT	20-SEP-10	Select SVOCs
32SB61	32SS-61-0002	6	DPT	20-SEP-10	Select SVOCs
32SB62	32SS-62-0002	10	DPT	20-SEP-10	Select SVOCs
32SB63	32SS-63-0002	10	DPT	20-SEP-10	Select SVOCs
32SB64	32SS-64-0002	7	DPT	20-SEP-10	Select SVOCs
32SB65	32SS-65-0002	6	DPT	20-SEP-10	Select SVOCs

TABLE 2-1

INSTALLATION DATES AND DEPTHS OF MONITORING WELLS AND SOIL BORINGS, AND DEPTHS OF SOIL SAMPLES COLLECTED
SWMU 32 – FORMER TANK FARM AREA
NSA CRANE
CRANE, INDIANA

Boring No.	Sample I.D. Number	Total Depth (feet bgs)	Drilling Method	Date Drilled	Analytical Group
SWMU 32 Sediment Samples					
32SD01	32SD-01-0006	.5	DPT	30-Apr-10	BTEX, Select SVOCs
32SD02	32SD-02-0006	.5	DPT	30-Apr-10	BTEX, Select SVOCs
32SD03	32SD-03-0006	.5	DPT	30-Apr-10	BTEX, Select SVOCs
32SD04	32SD-04-0006	.5	DPT	21-SEP-10	BTEX, Select SVOCs
32SD05	32SD-05-0006	.5	DPT	21-SEP-10	BTEX, Select SVOCs
SWMU 32 Temporary Monitoring Wells					
32MW01	32GW-01	20	DPT	26-Apr-10	BTEX, Select SVOCs
32MW02	32GW-02	20	DPT	26-Apr-10	BTEX, Select SVOCs
32MW03	32GW-03	20	DPT	26-Apr-10	BTEX, Select SVOCs
32MW04	32GW-04	24	DPT	17-SEP-10	BTEX, Select SVOCs
32MW05	32GW-05	24	DPT	17-SEP-10	BTEX, Select SVOCs
32MW06	32GW-06	24	DPT	20-SEP-10	BTEX, Select SVOCs

bgs - Below ground surface.
DPT - Direct-push technology.
Select SVOCs- Naphthalene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3,-cd)pyrene, Dibenzo(a,h)anthracene
BTEX- Benzene, Toluene, Ethylbenzene, Xylenes (total)
MTBE- Methyl Tertiary Butyl Ether

Table 3-1
Completeness Assessment

Analytical Fraction	Sample Collection Completeness: Planned Environmental Samples	Environmental Samples Collected	Environmental Sample Collection Percent Completeness		Laboratory Measurement Completeness: Environmental Samples Collected	Valid Analytical Results	Laboratory Measurement Collection Percent Completeness	
Initial Sampling Event								
Decision Unit #1 - Surface Soil								
VOCs - 4 BTEX	0	0	NA		0	0	NA	
SVOCs - 8 cPAHs	21	21	100		21	168	100	
Decision Unit #1 - Subsurface Soil								
VOCs - 4 BTEX	21	21	100		21	84	100	
SVOCs - 8 cPAHs	21	21	100		21	168	100	
Decision Unit #2 - Surface Soil								
VOCs - 4 BTEX	0	0	NA		0	0	NA	
SVOCs - 8 cPAHs	21	21	100		21	168	100	
Decision Unit #2 - Subsurface Soil								
VOCs - 4 BTEX	21	21	100		21	84	100	
SVOCs - 8 cPAHs	21	21	100		21	168	100	
Drainage Way - Surface Soil								
VOCs - 4 BTEX	0	0	NA		0	0	NA	
SVOCs - 8 cPAHs	3	3	100		3	24	100	
Drainage Way - Subsurface Soil								
VOCs - 4 BTEX	3	3	100		3	12	100	
SVOCs - 8 cPAHs	3	3	100		3	24	100	
Former Gasoline Underground Storage Tank - Subsurface Soil								
VOCs - 4 BTEX	1	1	100		1	4	100	
SVOCs - 8 cPAHs	1	1	100		1	8	100	
Sediment								
VOCs - 4 BTEX	3	3	100		3	12	100	
SVOCs - 8 cPAHs	3	3	100		3	24	100	
Groundwater								
VOCs - 4 BTEX	3	3	100		3	12	100	
SVOCs - 8 cPAHs	3	3	100		3	24	100	
Additional Decision Unit #1 Locations - Surface Soil								
VOCs - 4 BTEX	0	0	NA		0	0	NA	
SVOCs - 8 cPAHs	11	11	100		11	88	100	
Additional Decision Unit #1 Locations - Subsurface Soil								
VOCs - 4 BTEX	15	15	100		15	60	100	
SVOCs - 8 cPAHs	15	15	100		15	120	100	

Table 3-1
Completeness Assessment

	Sample Collection Completeness				Laboratory Measurement Completeness			
Analytical Fraction	Planned Environmental Samples	Environmental Samples Collected	Environmental Sample Collection Percent Completeness		Environmental Samples Collected	Valid Analytical Results	Laboratory Measurement Collection Percent Completeness	
Additional Sampling Event								
Decision Unit #1 - Surface Soil								
Benzo(a)pyrene	6	6	100		6	6	100	
Decision Unit #1 - Subsurface Soil								
Naphthalene	12	11	91.67		11	11	100	
Former Gasoline Underground Storage Tank - Subsurface Soil								
MTBE	1	1	100		1	1	100	
Sediment								
VOCs - 4 BTEX	2	2	100		2	8	100	
SVOCs - 8 cPAHs	2	2	100		2	16	100	
Groundwater								
VOCs - 4 BTEX	3	3	100		3	12	100	
SVOCs - 8 cPAHs	3	3	100		3	24	100	

Table 3-1
Completeness Assessment

Totals									
Sample Collection									
Analytical Fraction	**Field Duplicates Expected**	**Field Duplicates Collected**	**Field Duplicate Percent Completeness**	**Rinsate Blanks Expected**	**Rinsate Blanks Collected**	**Rinsate Blank Percent Completeness**	**MS/MSDs Expected**	**MS/MSDs Collected**	**MS/MSD Percent Completeness**
QC Samples - Soil									
VOCs - 4 BTEX	4	5	125	4	5	125	5	5	100
SVOCs - 8 cPAHs	8	10	125	4	5	125	10	10	100
Naphthalene	1	1	100	1	1	100	1	1	100
Benzo(a)pyrene	1	1	100	1	1	100	1	1	100
QC Samples - Sediment									
VOCs - 4 BTEX	1	1	100	1	1	100	1	1	100
SVOCs - 8 cPAHs	1	1	100	1	1	100	1	1	100
QC Samples - Groundwater									
VOCs - 4 BTEX	1	1	100	1	1	100	1	1	100
SVOCs - 8 cPAHs	1	1	100	1	1	100	1	1	100
Laboratory Analysis									
Analytical Fraction	**Field Duplicates Collected**	**Valid Analytical Results**	**Laboratory Measurement Percent Completeness**	**Rinsate Blanks Collected**	**Valid Analytical Results**	**Laboratory Measurement Percent Completeness**	**MS/MSDs Collected**	**Valid Analytical Results**	**Laboratory Measurement Percent Completeness**
QC Samples - Soil									
VOCs - 4 BTEX	5	5	100	5	5	100	5	5	100
SVOCs - 8 cPAHs	10	10	100	5	5	100	10	10	100
Naphthalene	1	1	100	1	1	100	1	1	100
Benzo(a)pyrene	1	1	100	1	1	100	1	1	100
QC Samples - Sediment									
VOCs - 4 BTEX	2	2	100	1	1	100	1	1	100
SVOCs - 8 cPAHs	2	2	100	1	1	100	1	1	100
QC Samples - Groundwater									
VOCs - 4 BTEX	2	2	100	1	1	100	1	1	100
SVOCs - 8 cPAHs	2	2	100	1	1	100	1	1	100

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Table 3-2
Sensitivity Assessment

Parameter	Revised PSL	Original PSL	Number of Non-Detected Results	Number of Non-Detected Results Exceeding PSL	Percentage of Non-Detected Results Exceeding PSL	Number of Analyses	Percentage of Non-Detected Results Exceeding PSL for Entire Data Set
Initial Sampling Event							
Surface Soil							
Benzene	34	NA	NA	NA	NA	NA	NA
Toluene	12,000	NA	NA	NA	NA	NA	NA
Ethylbenzene	5,700	NA	NA	NA	NA	NA	NA
Total Xylenes	60,000	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	1,100	150	48	0	0	56	0
Benzo(a)pyrene	500	15	46	0	0	56	0
Benzo(b)fluoranthene	1,100	150	46	0	0	56	0
Benzo(k)fluoranthene	1,100	1,100	52	0	0	56	0
Chrysene	1,100	1,100	48	0	0	56	0
Dibenzo(a,h)anthracene	500	15	52	0	0	56	0
Indeno(1,2,3-cd)pyrene	1,100	150	51	0	0	56	0
Naphthalene	29,000	700	44	0	0	56	0
Subsurface Soil							
Benzene	34	4.6	57	0	0	61	0
Toluene	12,000	12,000	59	0	0	61	0
Ethylbenzene	13,000	38	54	0	0	61	0
Total Xylenes	170,000	32,000	51	0	0	61	0
Methyl-tert-butyl ether	180	54	1	0	0	1	0
Benzo(a)anthracene	5,000	280	55	0	0	61	0
Benzo(a)pyrene	500	92	53	0	0	61	0
Benzo(b)fluoranthene	5,000	940	54	0	0	61	0
Benzo(k)fluoranthene	39,000	9,200	58	0	0	61	0
Chrysene	25,000	25,000	54	0	0	61	0
Dibenzo(a,h)anthracene	500	300	60	0	0	61	0
Indeno(1,2,3-cd)pyrene	3,100	3,100	59	0	0	61	0
Naphthalene	700	11	53	0	0	61	0
Sediment							
Benzene	142	34	2	0	0	3	0
Toluene	1,220	1,220	2	0	0	3	0
Ethylbenzene	175	175	2	0	0	3	0
Total Xylenes	433	433	2	0	0	3	0
Benzo(a)anthracene	108	150	0	0	0	3	0
Benzo(a)pyrene	15	15	0	0	0	3	0
Benzo(b)fluoranthene	150	150	1	0	0	3	0
Benzo(k)fluoranthene	240	1,100	1	0	0	3	0
Chrysene	166	1,100	0	0	0	3	0
Dibenzo(a,h)anthracene	15	15	3	0	0	3	0
Indeno(1,2,3-cd)pyrene	150	150	1	0	0	3	0
Naphthalene	176	700	3	0	0	3	0
Groundwater							
Benzene	5	5	3	0	0	3	0
Toluene	1,000	1,000	3	0	0	3	0
Ethylbenzene	700	700	3	0	0	3	0
Total Xylenes	10,000	10,000	3	0	0	3	0
Benzo(a)anthracene	1.2	1.2	3	0	0	3	0
Benzo(a)pyrene	0.2	0.2	3	0	0	3	0
Benzo(b)fluoranthene	1.2	1.2	3	0	0	3	0
Benzo(k)fluoranthene	12	12	3	0	0	3	0
Chrysene	120	120	3	0	0	3	0
Dibenzo(a,h)anthracene	0.12	0.12	3	0	0	3	0
Indeno(1,2,3-cd)pyrene	1.2	1.2	3	0	0	3	0
Naphthalene	8.3	8.3	2	0	0	3	0

Table 3-2
Sensitivity Assessment

Parameter	Revised PSL	Original PSL	Number of Non-Detected Results	Number of Non-Detected Results Exceeding PSL	Percentage of Non-Detected Results Exceeding PSL	Number of Analyses	Percentage of Non-Detected Results Exceeding PSL for Entire Data Set
Additional Sampling Event							
Surface Soil							
Benzene	34	NA	NA	NA	NA	NA	NA
Toluene	12,000	NA	NA	NA	NA	NA	NA
Ethylbenzene	5,700	NA	NA	NA	NA	NA	NA
Total Xylenes	60,000	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	1,100	150	NA	NA	NA	NA	NA
Benzo(a)pyrene	500	15	2	0	0	6	0
Benzo(b)fluoranthene	1,100	150	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	1,100	1,100	NA	NA	NA	NA	NA
Chrysene	1,100	1,100	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	500	15	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1,100	150	NA	NA	NA	NA	NA
Naphthalene	29,000	700	NA	NA	NA	NA	NA
Subsurface Soil							
Benzene	34	4.6	NA	NA	NA	NA	NA
Toluene	12,000	12,000	NA	NA	NA	NA	NA
Ethylbenzene	13,000	38	NA	NA	NA	NA	NA
Total Xylenes	170,000	32,000	NA	NA	NA	NA	NA
Methyl-tert-butyl ether	180	54	NA	NA	NA	NA	NA
Benzo(a)anthracene	5,000	280	NA	NA	NA	NA	NA
Benzo(a)pyrene	500	92	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	5,000	940	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	39,000	9,200	NA	NA	NA	NA	NA
Chrysene	25,000	25,000	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	500	300	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	3,100	3,100	NA	NA	NA	NA	NA
Naphthalene	700	11	8	0	0	11	0
Sediment							
Benzene	142	34	2	0	0	2	0
Toluene	1,220	1,220	2	0	0	2	0
Ethylbenzene	175	175	2	0	0	2	0
Total Xylenes	433	433	2	0	0	2	0
Benzo(a)anthracene	108	150	2	0	0	2	0
Benzo(a)pyrene	15	15	2	0	0	2	0
Benzo(b)fluoranthene	150	150	1	0	0	2	0
Benzo(k)fluoranthene	240	1,100	2	0	0	2	0
Chrysene	166	1,100	2	0	0	2	0
Dibenzo(a,h)anthracene	15	15	2	0	0	2	0
Indeno(1,2,3-cd)pyrene	150	150	1	0	0	2	0
Naphthalene	176	700	2	0	0	2	0
Groundwater							
Benzene	5	5	3	0	0	3	0
Toluene	1,000	1,000	3	0	0	3	0
Ethylbenzene	700	700	3	0	0	3	0
Total Xylenes	10,000	10,000	3	0	0	3	0
Benzo(a)anthracene	1.2	1.2	2	0	0	3	0
Benzo(a)pyrene	0.2	0.2	2	0	0	3	0
Benzo(b)fluoranthene	1.2	1.2	2	0	0	3	0
Benzo(k)fluoranthene	12	12	2	0	0	3	0
Chrysene	120	120	2	0	0	3	0
Dibenzo(a,h)anthracene	0.12	0.12	2	0	0	3	0
Indeno(1,2,3-cd)pyrene	1.2	1.2	2	0	0	3	0
Naphthalene	8.3	8.3	3	0	0	3	0

PSL = Project Screening Level
NA = Not Analyzed

Table 3-3

Validation Qualifier Codes Identified Per Medium

MEDIA	VAL_QUAL	QUAL_CODE	PARAMETER	NUM_QUALFD
GW	J	HP	NAPHTHALENE	1
GW	J	P	BENZO(A)ANTHRACENE	1
GW	J	P	BENZO(A)PYRENE	1
GW	J	P	BENZO(B)FLUORANTHENE	1
GW	J	P	BENZO(K)FLUORANTHENE	1
GW	J	P	CHRYSENE	1
GW	U		BENZENE	8
GW	U		BENZO(A)ANTHRACENE	3
GW	U		BENZO(A)PYRENE	3
GW	U		BENZO(B)FLUORANTHENE	3
GW	U		BENZO(K)FLUORANTHENE	3
GW	U		CHRYSENE	3
GW	U		DIBENZO(A,H)ANTHRACENE	3
GW	U		ETHYLBENZENE	8
GW	U		INDENO(1,2,3-CD)PYRENE	3
GW	U		NAPHTHALENE	4
GW	U		TOLUENE	8
GW	U		TOTAL XYLENES	8
GW	U	A	DIBENZO(A,H)ANTHRACENE	1
GW	U	A	INDENO(1,2,3-CD)PYRENE	1
GW	UJ	CH	BENZO(K)FLUORANTHENE	2
GW	UJ	CH	NAPHTHALENE	2
GW	UJ	H	BENZO(A)ANTHRACENE	4
GW	UJ	H	BENZO(A)PYRENE	4
GW	UJ	H	BENZO(B)FLUORANTHENE	4
GW	UJ	H	BENZO(K)FLUORANTHENE	2
GW	UJ	H	CHRYSENE	4
GW	UJ	H	DIBENZO(A,H)ANTHRACENE	4
GW	UJ	H	INDENO(1,2,3-CD)PYRENE	4
GW	UJ	H	NAPHTHALENE	1
RB	J	P	TOLUENE	1
RB	U		BENZENE	5
RB	U		ETHYLBENZENE	5
RB	U		TOLUENE	4
RB	U		TOTAL XYLENES	5
RB	UJ	CH	BENZO(A)ANTHRACENE	1
RB	UJ	CH	BENZO(K)FLUORANTHENE	3
RB	UJ	CH	CHRYSENE	1
RB	UJ	CH	NAPHTHALENE	3
RB	UJ	H	BENZO(A)ANTHRACENE	4
RB	UJ	H	BENZO(A)PYRENE	5
RB	UJ	H	BENZO(B)FLUORANTHENE	5
RB	UJ	H	BENZO(K)FLUORANTHENE	2
RB	UJ	H	CHRYSENE	4
RB	UJ	H	DIBENZO(A,H)ANTHRACENE	5

Table 3-3
Validation Qualifier Codes Identified Per Medium

RB	UJ	H	INDENO(1,2,3-CD)PYRENE	5
RB	UJ	H	NAPHTHALENE	2
SB			BENZENE	1
SB			BENZO(A)ANTHRACENE	3
SB			BENZO(A)PYRENE	7
SB			BENZO(B)FLUORANTHENE	5
SB			BENZO(K)FLUORANTHENE	2
SB			CHRYSENE	3
SB			INDENO(1,2,3-CD)PYRENE	1
SB			NAPHTHALENE	8
SB	J	C	BENZO(A)ANTHRACENE	1
SB	J	C	CHRYSENE	1
SB	J	C	DIBENZO(A,H)ANTHRACENE	2
SB	J	CP	BENZO(K)FLUORANTHENE	1
SB	J	GN	NAPHTHALENE	1
SB	J	H	BENZENE	1
SB	J	H	BENZO(A)ANTHRACENE	1
SB	J	H	BENZO(A)PYRENE	1
SB	J	H	CHRYSENE	1
SB	J	H	TOTAL XYLENES	1
SB	J	HNPR	TOTAL XYLENES	1
SB	J	HP	ETHYLBENZENE	1
SB	J	HP	TOLUENE	1
SB	J	HP	TOTAL XYLENES	3
SB	J	HPR	BENZENE	1
SB	J	HPR	ETHYLBENZENE	2
SB	J	HR	TOTAL XYLENES	1
SB	J	NPR	ETHYLBENZENE	2
SB	J	NPR	TOTAL XYLENES	2
SB	J	P	BENZENE	1
SB	J	P	BENZO(A)ANTHRACENE	1
SB	J	P	BENZO(A)PYRENE	1
SB	J	P	BENZO(B)FLUORANTHENE	3
SB	J	P	BENZO(K)FLUORANTHENE	1
SB	J	P	CHRYSENE	2
SB	J	P	ETHYLBENZENE	2
SB	J	P	NAPHTHALENE	3
SB	J	P	TOLUENE	1
SB	J	P	TOTAL XYLENES	2
SB	J	PC	BENZO(A)ANTHRACENE	1
SB	J	PC	CHRYSENE	1
SB	J	PC	INDENO(1,2,3-CD)PYRENE	2
SB	J	PN	TOTAL XYLENES	1
SB	U		BENZENE	38
SB	U		BENZO(A)ANTHRACENE	43
SB	U		BENZO(A)PYRENE	48

Table 3-3
Validation Qualifier Codes Identified Per Medium

SB	U		BENZO(B)FLUORANTHENE	48
SB	U		BENZO(K)FLUORANTHENE	47
SB	U		CHRYSENE	37
SB	U		DIBENZO(A,H)ANTHRACENE	41
SB	U		ETHYLBENZENE	38
SB	U		INDENO(1,2,3-CD)PYRENE	41
SB	U		METHYL TERT-BUTYL ETHER	1
SB	U		NAPHTHALENE	55
SB	U		TOLUENE	39
SB	U		TOTAL XYLENES	38
SB	UJ	C	BENZO(A)ANTHRACENE	5
SB	UJ	C	BENZO(K)FLUORANTHENE	5
SB	UJ	C	CHRYSENE	10
SB	UJ	C	DIBENZO(A,H)ANTHRACENE	13
SB	UJ	C	INDENO(1,2,3-CD)PYRENE	12
SB	UJ	CH	BENZENE	1
SB	UJ	CH	CHRYSENE	10
SB	UJ	CH	DIBENZO(A,H)ANTHRACENE	1
SB	UJ	GH	NAPHTHALENE	1
SB	UJ	H	BENZENE	13
SB	UJ	H	BENZO(A)ANTHRACENE	10
SB	UJ	H	BENZO(A)PYRENE	10
SB	UJ	H	BENZO(B)FLUORANTHENE	11
SB	UJ	H	BENZO(K)FLUORANTHENE	11
SB	UJ	H	DIBENZO(A,H)ANTHRACENE	10
SB	UJ	H	ETHYLBENZENE	13
SB	UJ	H	INDENO(1,2,3-CD)PYRENE	11
SB	UJ	H	NAPHTHALENE	10
SB	UJ	H	TOLUENE	15
SB	UJ	H	TOTAL XYLENES	11
SB	UJ	HN	BENZENE	4
SB	UJ	HN	ETHYLBENZENE	4
SB	UJ	HN	TOLUENE	4
SB	UJ	HN	TOTAL XYLENES	3
SB	UJ	N	BENZENE	7
SB	UJ	N	BENZO(A)ANTHRACENE	2
SB	UJ	N	CHRYSENE	2
SB	UJ	N	ETHYLBENZENE	5
SB	UJ	N	NAPHTHALENE	1
SB	UJ	N	TOLUENE	7
SB	UJ	N	TOTAL XYLENES	4
SD			BENZO(A)ANTHRACENE	1
SD			BENZO(A)PYRENE	2
SD			BENZO(B)FLUORANTHENE	1
SD			CHRYSENE	1
SD			INDENO(1,2,3-CD)PYRENE	1

Table 3-3
Validation Qualifier Codes Identified Per Medium

SD	J	CG	BENZO(K)FLUORANTHENE	1
SD	J	CGP	BENZO(K)FLUORANTHENE	1
SD	J	CGP	NAPHTHALENE	1
SD	J	CP	BENZO(K)FLUORANTHENE	1
SD	J	G	BENZO(A)ANTHRACENE	1
SD	J	G	BENZO(A)PYRENE	2
SD	J	G	BENZO(B)FLUORANTHENE	2
SD	J	G	CHRYSENE	1
SD	J	G	DIBENZO(A,H)ANTHRACENE	1
SD	J	G	INDENO(1,2,3-CD)PYRENE	2
SD	J	GP	BENZO(A)ANTHRACENE	1
SD	J	GP	CHRYSENE	1
SD	J	HP	BENZENE	1
SD	J	HP	ETHYLBENZENE	1
SD	J	HP	TOLUENE	1
SD	J	HP	TOTAL XYLENES	1
SD	J	P	BENZO(A)ANTHRACENE	1
SD	J	P	BENZO(B)FLUORANTHENE	2
SD	J	P	BENZO(K)FLUORANTHENE	1
SD	J	P	CHRYSENE	1
SD	J	P	DIBENZO(A,H)ANTHRACENE	1
SD	J	P	INDENO(1,2,3-CD)PYRENE	2
SD	U		BENZENE	3
SD	U		BENZO(A)ANTHRACENE	3
SD	U		BENZO(A)PYRENE	3
SD	U		BENZO(B)FLUORANTHENE	2
SD	U		BENZO(K)FLUORANTHENE	2
SD	U		CHRYSENE	3
SD	U		DIBENZO(A,H)ANTHRACENE	4
SD	U		ETHYLBENZENE	3
SD	U		INDENO(1,2,3-CD)PYRENE	2
SD	U		NAPHTHALENE	5
SD	U		TOLUENE	3
SD	U		TOTAL XYLENES	3
SD	UJ	C	BENZO(K)FLUORANTHENE	1
SD	UJ	G	DIBENZO(A,H)ANTHRACENE	1
SD	UJ	G	NAPHTHALENE	1
SD	UJ	H	BENZENE	2
SD	UJ	H	ETHYLBENZENE	2
SD	UJ	H	TOLUENE	2
SD	UJ	H	TOTAL XYLENES	2
SD	UJ	HN	BENZENE	1
SD	UJ	HN	ETHYLBENZENE	1
SD	UJ	HN	TOLUENE	1
SD	UJ	HN	TOTAL XYLENES	1
SS			BENZO(A)ANTHRACENE	5

Table 3-3
Validation Qualifier Codes Identified Per Medium

SS			BENZO(A)PYRENE	12
SS			BENZO(B)FLUORANTHENE	8
SS			BENZO(K)FLUORANTHENE	4
SS			CHRYSENE	3
SS			DIBENZO(A,H)ANTHRACENE	2
SS			INDENO(1,2,3-CD)PYRENE	2
SS			NAPHTHALENE	7
SS	J	C	CHRYSENE	3
SS	J	C	DIBENZO(A,H)ANTHRACENE	1
SS	J	C	INDENO(1,2,3-CD)PYRENE	2
SS	J	G	BENZO(A)ANTHRACENE	1
SS	J	G	BENZO(A)PYRENE	3
SS	J	G	BENZO(B)FLUORANTHENE	1
SS	J	G	BENZO(K)FLUORANTHENE	1
SS	J	G	CHRYSENE	1
SS	J	G	INDENO(1,2,3-CD)PYRENE	1
SS	J	P	BENZO(A)ANTHRACENE	2
SS	J	P	BENZO(B)FLUORANTHENE	1
SS	J	P	CHRYSENE	1
SS	J	P	NAPHTHALENE	5
SS	J	PC	DIBENZO(A,H)ANTHRACENE	1
SS	U		BENZO(A)ANTHRACENE	37
SS	U		BENZO(A)PYRENE	42
SS	U		BENZO(B)FLUORANTHENE	40
SS	U		BENZO(K)FLUORANTHENE	42
SS	U		CHRYSENE	33
SS	U		DIBENZO(A,H)ANTHRACENE	33
SS	U		INDENO(1,2,3-CD)PYRENE	33
SS	U		NAPHTHALENE	38
SS	UJ	C	BENZO(A)ANTHRACENE	5
SS	UJ	C	BENZO(K)FLUORANTHENE	3
SS	UJ	C	CHRYSENE	9
SS	UJ	C	DIBENZO(A,H)ANTHRACENE	13
SS	UJ	C	INDENO(1,2,3-CD)PYRENE	12
SS	UJ	CH	CHRYSENE	8
SS	UJ	CH	DIBENZO(A,H)ANTHRACENE	2
SS	UJ	H	BENZO(A)ANTHRACENE	11
SS	UJ	H	BENZO(A)PYRENE	10
SS	UJ	H	BENZO(B)FLUORANTHENE	10
SS	UJ	H	BENZO(K)FLUORANTHENE	10
SS	UJ	H	CHRYSENE	3
SS	UJ	H	DIBENZO(A,H)ANTHRACENE	9
SS	UJ	H	INDENO(1,2,3-CD)PYRENE	10
SS	UJ	H	NAPHTHALENE	11
SS	UJ	HG	BENZO(A)PYRENE	1
SS	UJ	HG	BENZO(B)FLUORANTHENE	1

Table 3-3
Validation Qualifier Codes Identified Per Medium

SS	UJ	HG	BENZO(K)FLUORANTHENE	1
SS	UJ	HG	INDENO(1,2,3-CD)PYRENE	1
SS	UJ	N	BENZO(A)ANTHRACENE	1
SS	UJ	N	BENZO(A)PYRENE	1
SS	UJ	N	BENZO(B)FLUORANTHENE	1
SS	UJ	N	BENZO(K)FLUORANTHENE	1
SS	UJ	N	CHRYSENE	1
SS	UJ	N	DIBENZO(A,H)ANTHRACENE	1
SS	UJ	N	INDENO(1,2,3-CD)PYRENE	1
SS	UJ	N	NAPHTHALENE	1
TB	U		BENZENE	5
TB	U		ETHYLBENZENE	5
TB	U		TOLUENE	5
TB	U		TOTAL XYLENES	5

TABLE 5-1

SUMMARY OF CHEMICALS DETECTED IN SURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA Criteria[1]	ERA Criteria[2]	32SO-01 32SS-01-0002 4/26/2010	32SO-02 32SS-02-0002 4/26/2010	32SO-03 32SS-03-0002 4/26/2010	32SO-04 32SS-04-0002 4/26/2010	32SO-05 32SS-05-0002 4/26/2010	32SO-06 32SS-06-0002 4/26/2010
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
BENZO(A)ANTHRACENE	150	1100	1.56 U	1.61 U	1.56 U	1.64 U	1.53 U	1.54 U
BENZO(A)PYRENE	15	1100	1.56 U	1.61 U	1.56 U	1.64 U	1.53 U	1.54 U
BENZO(B)FLUORANTHENE	150	1100	1.56 U	1.61 U	1.56 U	1.64 U	1.53 U	13.5
BENZO(K)FLUORANTHENE	1500	1100	1.56 U	1.61 U	1.56 U	1.64 U	1.53 U	1.54 U
CHRYSENE	15000	1100	1.56 U	1.61 U	1.56 U	1.64 U	1.53 U	1.54 U
DIBENZO(A,H)ANTHRACENE	15	1100	1.56 U	1.61 U	1.56 U	1.64 U	1.53 U	1.54 U
INDENO(1,2,3-CD)PYRENE	150	1100	1.56 U	1.61 U	1.56 U	1.64 U	1.53 U	1.54 U
NAPHTHALENE	3600	29000	1.56 U	1.61 U	1.56 U	1.64 U	51.4	1.54 U

HHRA - Human health risk assessment
ERA - Ecological risk assessment
µg/L - micrograms per liter
U - Not Detected
J - Estimated concentration.

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(2) ERA Criteria is the USEPA's Ecological Soil Screening Levels (2005).

Chemicals detected at concentrations greater than the minimum of the screening criteria are bolded and shaded.

TABLE 5-1

SUMMARY OF CHEMICALS DETECTED IN SURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA Criteria(1)	ERA Criteria(2)	32SO-07 32SS-07-0002 4/26/2010	32SO-08 32SS-08-0002 4/27/2010	32SO-09 32SS-09-0002 4/26/2010	32SO-10 32SS-10-0002 4/26/2010	32SO-11 32SS-11-0002 4/27/2010	32SO-12 32SS-12-0002 4/27/2010
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
BENZO(A)ANTHRACENE	150	1100	1.57 U	1.65 U	1.51 U	1.53 U	15.2 U	1.57 U
BENZO(A)PYRENE	15	1100	1.57 UJ	1.65 U	1.51 U	1.53 U	15.2 U	10.9
BENZO(B)FLUORANTHENE	150	1100	1.57 UJ	1.65 U	1.51 U	1.53 U	15.2 U	1.57 U
BENZO(K)FLUORANTHENE	1500	1100	1.57 UJ	1.65 U	1.51 U	1.53 U	15.2 U	1.57 U
CHRYSENE	15000	1100	1.57 U	1.65 U	1.51 U	1.53 U	15.2 U	1.57 U
DIBENZO(A,H)ANTHRACENE	15	1100	1.57 UJ	1.65 U	1.51 U	1.53 U	15.2 UJ	1.57 U
INDENO(1,2,3-CD)PYRENE	150	1100	1.57 UJ	1.65 U	1.51 U	1.53 U	15.2 UJ	1.57 U
NAPHTHALENE	3600	29000	1.57 U	1.65 U	1.51 U	1.53 U	19 J	1.57 U

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µg/L - micrograms per liter
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J - Estimated concentration.

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(2) ERA Criteria is the USEPA's Ecological Soil Screening Levels (2005).

Chemicals detected at concentrations greater than the minimum of the screening criteria are bolded and shaded.

TABLE 5-1

SUMMARY OF CHEMICALS DETECTED IN SURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA Criteria[1]	ERA Criteria[2]	32SO-13 32SS-13-0002 4/27/2010	32SO-14 32SS-14-0002 4/26/2010	32SO-15 32SS-15-0002 4/27/2010	32SO-16 32SS-16-0002 4/27/2010	32SO-17 32SS-17-0002 4/27/2010	32SO-18 32SS-18-0002 4/27/2010
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
BENZO(A)ANTHRACENE	150	1100	1.62 U	1.5 U	15.9 U	15.4 U	**3670**	**689**
BENZO(A)PYRENE	15	1100	1.62 U	1.5 U	15.9 U	15.4 U	**2900**	**521**
BENZO(B)FLUORANTHENE	150	1100	1.62 U	1.5 U	15.9 U	15.4 U	**4140**	**688**
BENZO(K)FLUORANTHENE	1500	1100	1.62 U	1.5 U	15.9 U	15.4 U	1440	239
CHRYSENE	15000	1100	1.62 U	1.5 U	15.9 U	15.4 U	**3980**	637
DIBENZO(A,H)ANTHRACENE	15	1100	1.62 U	1.5 U	15.9 UJ	15.4 UJ	**595 J**	**87.2 J**
INDENO(1,2,3-CD)PYRENE	150	1100	1.62 U	1.5 U	15.9 UJ	15.4 UJ	**2530 J**	**435 J**
NAPHTHALENE	3600	29000	1.62 U	1.5 U	15.9 U	94.5	238	9.93

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(2) ERA Criteria is the USEPA's Ecological Soil Screening Levels (2005).

Chemicals detected at concentrations greater than the minimum of the screening criteria are bolded and shaded.

TABLE 5-1

SUMMARY OF CHEMICALS DETECTED IN SURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA Criteria(1)	ERA Criteria(2)	32SO-19 32SS-19-0002 4/27/2010	32SO-20 32SS-20-0002 4/27/2010	32SO-21 32SS-21-0002 4/27/2010	32SO-22 32SS-22-0002 4/27/2010	32SO-23 32SS-23-0002 4/27/2010	32SO-24 32SS-24-0002 4/27/2010
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
BENZO(A)ANTHRACENE	150	1100	15.7 U	1.7 U	16.8 J	1.59 UJ	4.57 J	1.56 U
BENZO(A)PYRENE	15	1100	15.7 U	1.7 U	**57.4 J**	1.59 U	**31.8**	1.56 U
BENZO(B)FLUORANTHENE	150	1100	15.7 U	1.7 U	97.1 J	1.59 U	44.1	1.56 U
BENZO(K)FLUORANTHENE	1500	1100	15.7 U	1.7 U	33.6 J	1.59 U	16.2	1.56 U
CHRYSENE	15000	1100	15.7 U	1.7 U	21.9 J	1.59 U	8.07	1.56 U
DIBENZO(A,H)ANTHRACENE	15	1100	15.7 UJ	1.7 UJ	10.7	1.59 U	6.41	1.56 U
INDENO(1,2,3-CD)PYRENE	150	1100	15.7 UJ	1.7 UJ	50.6 J	1.59 U	32.1	1.56 U
NAPHTHALENE	3600	29000	15.7 U	1.7 U	5.83 J	5.76 J	5.46 J	1.56 U

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µg/L - micrograms per liter
U - Not Detected
J - Estimated concentration.

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(2) ERA Criteria is the USEPA's Ecological Soil Screening Levels (2005).

Chemicals detected at concentrations greater than the minimum of the screening criteria are bolded and shaded.

TABLE 5-1

SUMMARY OF CHEMICALS DETECTED IN SURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA Criteria(1)	ERA Criteria(2)	32SO-25 32SS-25-0002 4/27/2010	32SO-26 32SS-26-0002 4/27/2010	32SO-27 32SS-27-0002 4/27/2010	32SO-28 32SS-28-0002 4/27/2010	32SO-29 32SS-29-0002 4/27/2010	32SO-30 32SS-30-0002 4/27/2010
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
BENZO(A)ANTHRACENE	150	1100	15.6 U	5.24 J	1.65 U	1.53 UJ	1.51 U	1.59 U
BENZO(A)PYRENE	15	1100	15.6 U	**23.1**	1.65 U	9.39	1.51 U	1.59 U
BENZO(B)FLUORANTHENE	150	1100	15.6 U	34.8	1.65 U	1.53 U	6.56 J	1.59 U
BENZO(K)FLUORANTHENE	1500	1100	15.6 U	11.4	1.65 U	1.53 U	1.51 U	1.59 U
CHRYSENE	15000	1100	15.6 U	6.13 J	1.65 U	1.53 UJ	1.51 U	1.59 U
DIBENZO(A,H)ANTHRACENE	15	1100	15.6 U	1.52 U	1.65 U	1.53 U	1.51 U	1.59 U
INDENO(1,2,3-CD)PYRENE	150	1100	15.6 U	17.7	1.65 U	1.53 U	1.51 U	1.59 U
NAPHTHALENE	3600	29000	15.6 U	3.02 J	1.65 U	1.53 UJ	1.51 U	1.59 U

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(2) ERA Criteria is the USEPA's Ecological Soil Screening Levels (2005).

Chemicals detected at concentrations greater than the minimum of the screening criteria are bolded and shaded.

TABLE 5-1

SUMMARY OF CHEMICALS DETECTED IN SURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA Criteria(1)	ERA Criteria(2)	32SO-31 32SS-31-0002 4/28/2010	32SO-32 32SS-32-0002 4/27/2010	32SO-33 32SS-33-0002 4/27/2010	32SO-34 32SS-34-0002 4/27/2010	32SO-35 32SS-35-0002 4/28/2010	32SO-36 32SS-36-0002 4/27/2010
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
BENZO(A)ANTHRACENE	150	1100	1.55 UJ	1.58 U	7.59 UJ	1.53 UJ	1.55 U	1.53 UJ
BENZO(A)PYRENE	15	1100	1.55 UJ	1.58 U	7.59 UJ	1.53 UJ	1.55 U	1.53 UJ
BENZO(B)FLUORANTHENE	150	1100	1.55 UJ	1.58 U	7.59 UJ	1.53 UJ	1.55 U	1.53 UJ
BENZO(K)FLUORANTHENE	1500	1100	1.55 UJ	1.58 U	7.59 UJ	1.53 UJ	1.55 U	1.53 UJ
CHRYSENE	15000	1100	1.55 UJ	1.58 U	7.59 UJ	1.53 UJ	1.55 U	1.53 UJ
DIBENZO(A,H)ANTHRACENE	15	1100	1.55 UJ	1.58 U	7.59 UJ	1.53 UJ	1.55 UJ	1.53 UJ
INDENO(1,2,3-CD)PYRENE	150	1100	1.55 UJ	1.58 U	7.59 UJ	1.53 UJ	1.55 UJ	1.53 UJ
NAPHTHALENE	3600	29000	1.55 UJ	1.58 U	7.59 UJ	1.53 UJ	1.55 U	1.53 UJ

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J - Estimated concentration.

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(2) ERA Criteria is the USEPA's Ecological Soil Screening Levels (2005).

Chemicals detected at concentrations greater than the minimum of the screening criteria are bolded and shaded.

TABLE 5-1

SUMMARY OF CHEMICALS DETECTED IN SURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA Criteria(1)	ERA Criteria(2)	32SO-37 32SS-37-0002 4/27/2010	32SO-38 32SS-38-0002 4/27/2010	32SO-39 32SS-39-0002 4/28/2010	32SO-40 32SS-40-0002 4/27/2010	32SO-41 32SS-41-0002 4/28/2010	32SO-42 32SS-42-0002 4/27/2010
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
BENZO(A)ANTHRACENE	150	1100	7.5 UJ	1.51 UJ	1.55 U	1.53 UJ	1.55 U	1.55 UJ
BENZO(A)PYRENE	15	1100	7.5 UJ	1.51 UJ	1.55 U	1.53 UJ	1.55 U	1.55 UJ
BENZO(B)FLUORANTHENE	150	1100	7.5 UJ	1.51 UJ	1.55 U	1.53 UJ	1.55 U	1.55 UJ
BENZO(K)FLUORANTHENE	1500	1100	7.5 UJ	1.51 UJ	1.55 U	1.53 UJ	1.55 U	1.55 UJ
CHRYSENE	15000	1100	7.5 UJ	1.51 UJ	1.55 U	1.53 UJ	1.55 U	1.55 UJ
DIBENZO(A,H)ANTHRACENE	15	1100	7.5 UJ	1.51 UJ	1.55 UJ	1.53 UJ	1.55 UJ	1.55 UJ
INDENO(1,2,3-CD)PYRENE	150	1100	7.5 UJ	1.51 UJ	1.55 UJ	1.53 UJ	1.55 UJ	1.55 UJ
NAPHTHALENE	3600	29000	7.5 UJ	1.51 UJ	1.55 U	1.53 UJ	1.55 U	1.55 UJ

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ERA - Ecological risk assessment
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(2) ERA Criteria is the USEPA's Ecological Soil Screening Levels (2005).

Chemicals detected at concentrations greater than the minimum of the screening criteria are bolded and shaded.

TABLE 5-1

SUMMARY OF CHEMICALS DETECTED IN SURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA Criteria(1)	ERA Criteria(2)	32SO-43 32SS-43-0002 4/29/2010	32SO-44 32SS-44-0002 4/29/2010	32SO-45 32SS-45-0002 4/29/2010	32SO-46 32SS-46-0002 4/29/2010	32SO-47 32SS-47-0002 4/29/2010	32SO-48 32SS-48-0002 4/29/2010
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
BENZO(A)ANTHRACENE	150	1100	1.62 U	63.5	78.2	7.62 U	1.54 U	1.44 U
BENZO(A)PYRENE	15	1100	13.6	**15.3**	**25.9**	7.62 U	1.54 U	1.44 U
BENZO(B)FLUORANTHENE	150	1100	13.8	16.8	24.8	7.62 U	1.54 U	1.44 U
BENZO(K)FLUORANTHENE	1500	1100	1.62 U	1.58 U	1.65 U	7.62 U	1.54 U	1.44 U
CHRYSENE	15000	1100	1.62 UJ	16.6 J	57.4 J	7.62 U	1.54 UJ	1.44 UJ
DIBENZO(A,H)ANTHRACENE	15	1100	1.62 U	1.58 U	1.65 U	7.62 UJ	1.54 U	1.44 U
INDENO(1,2,3-CD)PYRENE	150	1100	1.62 U	1.58 U	1.65 U	7.62 U	1.54 U	1.44 U
NAPHTHALENE	3600	29000	1.62 U	1.58 U	1.65 U	31.4	6	1.44 U

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Chemicals detected at concentrations greater than the minimum of the screening criteria are bolded and shaded.

TABLE 5-1

SUMMARY OF CHEMICALS DETECTED IN SURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA Criteria(1)	ERA Criteria(2)	32SO-49 32SS-49-0002 4/29/2010	32SO-50 32SS-50-0002 4/29/2010	32SO-51 32SS-51-0002 4/29/2010	32SO-52 32SS-52-0002 4/29/2010	32SO-53 32SS-53-0002 4/29/2010	32SO-60 32SS-60-0002 9/20/2010
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
BENZO(A)ANTHRACENE	150	1100	61.5	1.57 U	1.56 U	1.47 U	1.49 U	--
BENZO(A)PYRENE	15	1100	1.48 U	1.57 U	1.56 U	1.47 U	1.49 U	11.5
BENZO(B)FLUORANTHENE	150	1100	1.48 U	1.57 U	1.56 U	1.47 U	1.49 U	--
BENZO(K)FLUORANTHENE	1500	1100	1.48 U	1.57 U	1.56 U	1.47 UJ	1.49 UJ	--
CHRYSENE	15000	1100	18.9 J	1.57 UJ	1.56 UJ	1.47 U	1.49 U	--
DIBENZO(A,H)ANTHRACENE	15	1100	1.48 U	1.57 U	1.56 U	1.47 U	1.49 U	--
INDENO(1,2,3-CD)PYRENE	150	1100	1.48 U	1.57 U	1.56 U	1.47 U	1.49 U	--
NAPHTHALENE	3600	29000	273	1.57 U	1.56 U	1.47 U	1.49 U	--

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ERA - Ecological risk assessment
µg/L - micrograms per liter
U - Not Detected
J - Estimated concentration.

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(2) ERA Criteria is the USEPA's Ecological Soil Screening Levels (2005).

Chemicals detected at concentrations greater than the minimum of the screening criteria are bolded and shaded.

TABLE 5-1

SUMMARY OF CHEMICALS DETECTED IN SURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA Criteria(1)	ERA Criteria(2)	32SO-61 32SS-61-0002 9/20/2010	32SO-62 32SS-62-0002 9/20/2010	32SO-63 32SS-63-0002 9/20/2010	32SO-64 32SS-64-0002 9/20/2010	32SO-65 32SS-65-0002 9/20/2010	32SBDW01 32SS-DW01-0002 4/28/2010
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)								
BENZO(A)ANTHRACENE	150	1100	--	--	--	--	--	16.3 U
BENZO(A)PYRENE	15	1100	1.72 U	1.74 U	**157**	**3450**	**79.1 J**	16.3 U
BENZO(B)FLUORANTHENE	150	1100	--	--	--	--	--	16.3 U
BENZO(K)FLUORANTHENE	1500	1100	--	--	--	--	--	16.3 UJ
CHRYSENE	15000	1100	--	--	--	--	--	16.3 U
DIBENZO(A,H)ANTHRACENE	15	1100	--	--	--	--	--	16.3 U
INDENO(1,2,3-CD)PYRENE	150	1100	--	--	--	--	--	16.3 U
NAPHTHALENE	3600	29000	--	--	--	--	--	16.3 U

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ERA - Ecological risk assessment
µg/L - micrograms per liter
U - Not Detected
J - Estimated concentration.

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(2) ERA Criteria is the USEPA's Ecological Soil Screening Levels (2005).

Chemicals detected at concentrations greater than the minimum of the screening criteria are bolded and shaded.

TABLE 5-1

SUMMARY OF CHEMICALS DETECTED IN SURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA Criteria(1)	ERA Criteria(2)	32SBDW02 32SS-DW02-0002 4/28/2010	32SBDW03 32SS-DW03-0002 4/28/2010
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)				
BENZO(A)ANTHRACENE	150	1100	1.65 UJ	1.69 UJ
BENZO(A)PYRENE	15	1100	1.65 U	1.69 U
BENZO(B)FLUORANTHENE	150	1100	1.65 U	1.69 U
BENZO(K)FLUORANTHENE	1500	1100	1.65 U	1.69 U
CHRYSENE	15000	1100	1.65 UJ	1.69 UJ
DIBENZO(A,H)ANTHRACENE	15	1100	1.65 UJ	1.69 UJ
INDENO(1,2,3-CD)PYRENE	150	1100	1.65 UJ	1.69 UJ
NAPHTHALENE	3600	29000	1.65 U	1.69 U

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ERA - Ecological risk assessment
µg/L - micrograms per liter
U - Not Detected
J - Estimated concentration.

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(2) ERA Criteria is the USEPA's Ecological Soil Screening Levels (2005).

Chemicals detected at concentrations greater than the minimum of the screening criteria are bolded and shaded.

TABLE 5-2

SUMMARY OF CHEMICALS DETECTED IN SUBSURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA SCREENING LEVEL	32SO-01 32SB-01-0708 4/26/2010	32SO-02 32SB-02-0607 4/26/2010	32SO-03 32SB-03-0607 4/26/2010	32SO-04 32SB-04-0506 4/26/2010	32SO-05 32SB-05-0506 4/26/2010	32SO-06 32SB-06-0405 4/26/2010
VOLATILES (UG/KG)							
BENZENE	1100	0.535 U	32.4 U	0.486 UJ	0.461 U	0.472 UJ	**1810**
ETHYLBENZENE	5400	0.853 U	51.6 U	0.775 UJ	0.735 U	0.972 J	82 J
TOLUENE	5000000	0.978 U	59.2 U	0.889 UJ	0.843 U	0.863 UJ	112 J
TOTAL XYLENES	630000	0.796 U	48.2 U	0.724 UJ	0.686 U	1.27 J	527 J
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)							
BENZO(A)ANTHRACENE	150	1.56 U	16.4 U	1.62 U	1.55 U	1.59 U	15.3 U
BENZO(A)PYRENE	15	1.56 U	16.4 U	1.62 U	1.55 U	1.59 U	15.3 U
BENZO(B)FLUORANTHENE	150	1.56 U	16.4 U	1.62 U	1.55 U	1.59 U	15.3 U
BENZO(K)FLUORANTHENE	1500	1.56 U	16.4 U	1.62 U	1.55 U	1.59 U	15.3 U
CHRYSENE	15000	1.56 U	16.4 U	1.62 U	1.55 U	1.59 U	15.3 U
DIBENZO(A,H)ANTHRACENE	15	1.56 U	16.4 U	1.62 U	1.55 U	1.59 U	15.3 U
INDENO(1,2,3-CD)PYRENE	150	1.56 U	16.4 U	1.62 U	1.55 U	1.59 U	15.3 U
NAPHTHALENE	3600	1.56 U	16.4 U	1.62 U	1.55 U	1.59 U	1390

HHRA - Human health risk assessment
µg/kg - micrograms per kilograms
U - Not Detected
J - Estimated concentration.

(1) HHRA Criteria is the USEPA Residential Screening Level (2010).
Chemicals detected at concentrations greater than the HHRA criteria are bolded and shaded.

TABLE 5-2

SUMMARY OF CHEMICALS DETECTED IN SUBSURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA SCREENING LEVEL	32SO-07 32SB-07-0607 4/26/2010	32SO-08 32SB-08-0607 4/27/2010	32SO-09 32SB-09-0607 4/26/2010	32SO-10 32SB-10-0506 4/26/2010	32SO-11 32SB-11-0607 4/27/2010	32SO-12 32SB-12-0607 4/27/2010
VOLATILES (UG/KG)							
BENZENE	1100	1.77 J	0.467 U	0.573 U	0.497 U	0.463 UJ	0.483 UJ
ETHYLBENZENE	5400	4.32 J	0.745 U	0.914 U	0.794 U	0.738 UJ	0.77 UJ
TOLUENE	5000000	0.935 U	0.854 U	1.05 U	0.91 U	0.847 UJ	0.883 UJ
TOTAL XYLENES	630000	8.93 J	0.695 U	0.853 U	0.741 U	0.689 UJ	0.719 UJ
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)							
BENZO(A)ANTHRACENE	150	1.59 U	1.55 U	69.8	1.62 U	1.57 U	1.61 U
BENZO(A)PYRENE	15	1.59 U	1.55 U	1.56 U	1.62 U	1.57 U	1.61 U
BENZO(B)FLUORANTHENE	150	1.59 U	1.55 U	1.56 U	1.62 U	1.57 U	1.61 U
BENZO(K)FLUORANTHENE	1500	1.59 U	1.55 U	1.56 U	1.62 U	1.57 U	1.61 U
CHRYSENE	15000	1.59 U	1.55 U	75.5	1.62 U	1.57 U	1.61 U
DIBENZO(A,H)ANTHRACENE	15	1.59 U	1.55 U	1.56 U	1.62 U	1.57 U	1.61 U
INDENO(1,2,3-CD)PYRENE	150	1.59 U	1.55 U	1.56 U	1.62 U	1.57 U	1.61 U
NAPHTHALENE	3600	1.59 U	1.55 U	11.6	1.62 U	1.57 U	1.61 U

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Chemicals detected at concentrations greater than the HHRA criteria are bolded and shaded.

TABLE 5-2

SUMMARY OF CHEMICALS DETECTED IN SUBSURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA SCREENING LEVEL	32SO-13 32SB-13-0607 4/27/2010	32SO-14 32SB-14-0910 4/26/2010	32SO-15 32SB-15-0506 4/27/2010	32SO-16 32SB-16-0607 4/27/2010	32SO-17 32SB-17-0607 4/27/2010	32SO-17 32SB-17-1112 4/27/2010
VOLATILES (UG/KG)							
BENZENE	1100	0.471 U	0.542 U	0.556 U	0.487 U	27.4 U	0.535 U
ETHYLBENZENE	5400	0.751 U	0.865 U	0.887 U	0.777 U	43.7 U	0.853 U
TOLUENE	5000000	0.861 U	0.992 U	1.02 U	0.89 U	50.1 U	0.978 U
TOTAL XYLENES	630000	0.701 U	0.808 U	0.828 U	0.725 U	40.7 U	0.796 U
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)							
BENZO(A)ANTHRACENE	150	1.56 U	1.55 U	46.3	1.56 U	**213**	1.55 U
BENZO(A)PYRENE	15	1.56 U	1.55 U	**56.6**	1.56 U	**112**	1.55 U
BENZO(B)FLUORANTHENE	150	1.56 U	1.55 U	74.4	1.56 U	104	1.55 U
BENZO(K)FLUORANTHENE	1500	1.56 U	1.55 U	34.5	1.56 U	16.1 U	1.55 U
CHRYSENE	15000	1.56 U	1.55 U	48.4	1.56 U	289	1.55 U
DIBENZO(A,H)ANTHRACENE	15	1.56 U	1.55 U	1.58 U	1.56 UJ	16.1 UJ	1.55 UJ
INDENO(1,2,3-CD)PYRENE	150	1.56 U	1.55 U	35.3	1.56 UJ	16.1 UJ	1.55 UJ
NAPHTHALENE	3600	1.56 U	1.55 U	35.5	1.56 U	2470	1.55 U

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TABLE 5-2

SUMMARY OF CHEMICALS DETECTED IN SUBSURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA SCREENING LEVEL	32SO-18 32SB-18-0506 4/27/2010	32SO-19 32SB-19-0506 4/27/2010	32SO-20 32SB-20-0506 4/27/2010	32SO-21 32SB-21-0506 4/27/2010	32SO-22 32SB-22-0506 4/27/2010	32SO-23 32SB-23-0506 4/27/2010
VOLATILES (UG/KG)							
BENZENE	1100	0.471 UJ	0.488 U	0.457 UJ	0.466 U	0.548 U	0.582 UJ
ETHYLBENZENE	5400	0.752 UJ	0.778 U	1.02 J	0.743 U	0.874 U	0.929 UJ
TOLUENE	5000000	0.862 UJ	0.892 U	0.836 UJ	0.852 U	1 U	1.06 UJ
TOTAL XYLENES	630000	0.702 UJ	0.726 U	1.41 J	0.694 U	0.816 U	0.867 UJ
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)							
BENZO(A)ANTHRACENE	150	1.57 U	1.62 U	1.56 UJ	1.57 U	1.57 UJ	1.75 U
BENZO(A)PYRENE	15	1.57 U	1.62 U	1.56 U	1.57 U	10.4	1.75 U
BENZO(B)FLUORANTHENE	150	1.57 U	1.62 U	1.56 U	1.57 U	6.9 J	1.75 U
BENZO(K)FLUORANTHENE	1500	1.57 U	1.62 U	1.56 U	1.57 U	1.57 U	1.75 U
CHRYSENE	15000	1.57 U	1.62 U	1.56 UJ	1.57 U	1.57 U	1.75 U
DIBENZO(A,H)ANTHRACENE	15	1.57 UJ	1.62 UJ	1.56 U	1.57 U	1.57 U	1.75 U
INDENO(1,2,3-CD)PYRENE	150	1.57 UJ	1.62 UJ	1.56 U	1.57 U	1.57 U	1.75 U
NAPHTHALENE	3600	1.57 U	1.62 U	1.56 UJ	1.57 U	1.57 U	1.75 U

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TABLE 5-2

SUMMARY OF CHEMICALS DETECTED IN SUBSURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA SCREENING LEVEL	32SO-24 32SB-24-0506 4/27/2010	32SO-25 32SB-25-0607 4/27/2010	32SO-26 32SB-26-0405 4/27/2010	32SO-27 32SB-27-0506 4/27/2010	32SO-28 32SB-28-0506 4/27/2010	32SO-29 32SB-29-0304 4/27/2010
VOLATILES (UG/KG)							
BENZENE	1100	0.511 U	0.442 U	0.412 U	0.426 U	0.449 UJ	0.525 U
ETHYLBENZENE	5400	0.815 U	0.706 U	0.657 U	0.68 U	0.717 UJ	0.837 U
TOLUENE	5000000	0.934 U	0.81 U	0.754 U	0.78 U	0.822 UJ	0.96 U
TOTAL XYLENES	630000	0.76 U	0.659 U	0.614 U	0.635 U	0.669 UJ	0.781 U
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)							
BENZO(A)ANTHRACENE	150	1.61 U	1.56 U	1.58 U	1.54 U	1.58 U	1.57 U
BENZO(A)PYRENE	15	1.61 U	1.56 U	1.58 U	1.54 U	1.58 U	1.57 U
BENZO(B)FLUORANTHENE	150	1.61 U	1.56 U	1.58 U	1.54 U	1.58 U	1.57 U
BENZO(K)FLUORANTHENE	1500	1.61 U	1.56 U	1.58 U	1.54 U	1.58 U	1.57 U
CHRYSENE	15000	1.61 U	1.56 U	3.2 J	1.54 U	1.58 U	1.57 U
DIBENZO(A,H)ANTHRACENE	15	1.61 U	1.56 U	1.58 U	1.54 U	1.58 U	1.57 U
INDENO(1,2,3-CD)PYRENE	150	1.61 U	1.56 U	1.58 U	1.54 U	1.58 U	1.57 U
NAPHTHALENE	3600	1.61 U	1.56 U	1.58 U	1.54 U	1.58 U	1.57 U

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TABLE 5-2

SUMMARY OF CHEMICALS DETECTED IN SUBSURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA SCREENING LEVEL	32SO-30 32SB-30-0506 4/27/2010	32SO-31 32SB-31-0607 4/28/2010	32SO-32 32SB-32-0506 4/27/2010	32SO-33 32SB-33-0506 4/27/2010	32SO-34 32SB-34-0607 4/27/2010	32SO-35 32SB-35-0507 4/28/2010
VOLATILES (UG/KG)							
BENZENE	1100	0.519 U	0.467 U	0.463 U	0.484 U	0.459 U	0.481 U
ETHYLBENZENE	5400	0.827 U	0.746 U	0.739 U	0.772 U	0.732 U	0.767 U
TOLUENE	5000000	0.949 U	0.855 U	0.848 U	0.885 U	0.839 U	0.879 U
TOTAL XYLENES	630000	0.772 U	0.696 U	0.69 U	0.72 U	0.683 U	0.716 U
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)							
BENZO(A)ANTHRACENE	150	1.56 U	1.53 U	1.58 UJ	1.54 UJ	1.57 UJ	1.55 U
BENZO(A)PYRENE	15	1.56 U	1.53 U	1.58 UJ	1.54 UJ	1.57 UJ	1.55 U
BENZO(B)FLUORANTHENE	150	1.56 U	1.53 U	1.58 UJ	1.54 UJ	1.57 UJ	1.55 U
BENZO(K)FLUORANTHENE	1500	1.56 U	1.53 U	1.58 UJ	1.54 UJ	1.57 UJ	1.55 U
CHRYSENE	15000	1.56 U	1.53 U	1.58 UJ	1.54 UJ	1.57 UJ	1.55 U
DIBENZO(A,H)ANTHRACENE	15	1.56 U	1.53 UJ	1.58 UJ	1.54 UJ	1.57 UJ	1.55 UJ
INDENO(1,2,3-CD)PYRENE	150	1.56 U	1.53 UJ	1.58 UJ	1.54 UJ	1.57 UJ	1.55 UJ
NAPHTHALENE	3600	1.56 U	1.53 U	1.58 UJ	1.54 UJ	1.57 UJ	1.55 U

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TABLE 5-2

SUMMARY OF CHEMICALS DETECTED IN SUBSURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA SCREENING LEVEL	32SO-36 32SB-36-0506 4/27/2010	32SO-37 32SB-37-0506 4/27/2010	32SO-38 32SB-38-0506 4/27/2010	32SO-39 32SB-39-0507 4/28/2010	32SO-40 32SB-40-0506 4/27/2010	32SO-41 32SB-41-0506 4/28/2010
VOLATILES (UG/KG)							
BENZENE	1100	0.462 UJ	0.575 U	0.471 U	0.479 U	0.474 UJ	0.487 U
ETHYLBENZENE	5400	0.737 UJ	0.918 U	0.752 U	0.764 U	0.757 UJ	0.778 U
TOLUENE	5000000	0.846 UJ	1.05 U	0.862 U	0.876 U	0.868 UJ	0.892 U
TOTAL XYLENES	630000	0.688 UJ	0.857 U	0.702 U	0.713 U	1.72 J	0.726 U
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)							
BENZO(A)ANTHRACENE	150	1.54 UJ	**394 J**	1.61 UJ	1.62 U	1.56 UJ	1.55 UJ
BENZO(A)PYRENE	15	1.54 UJ	**121 J**	1.61 UJ	1.62 U	1.56 UJ	1.55 U
BENZO(B)FLUORANTHENE	150	1.54 UJ	8.35 UJ	1.61 UJ	1.62 U	1.56 UJ	1.55 U
BENZO(K)FLUORANTHENE	1500	1.54 UJ	8.35 UJ	1.61 UJ	1.62 U	1.56 UJ	1.55 U
CHRYSENE	15000	1.54 UJ	341 J	1.61 UJ	1.62 U	1.56 UJ	1.55 UJ
DIBENZO(A,H)ANTHRACENE	15	1.54 UJ	8.35 UJ	1.61 UJ	1.62 UJ	1.56 UJ	1.55 UJ
INDENO(1,2,3-CD)PYRENE	150	1.54 UJ	8.35 UJ	1.61 UJ	1.62 UJ	1.56 UJ	1.55 UJ
NAPHTHALENE	3600	1.54 UJ	8.35 UJ	1.61 UJ	1.62 U	1.56 UJ	1.55 U

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TABLE 5-2

SUMMARY OF CHEMICALS DETECTED IN SUBSURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA SCREENING LEVEL	32SO-42 32SB-42-0506 4/27/2010	32SO-43 32SB-43-0506 4/29/2010	32SO-44 32SB-44-0506 4/29/2010	32SO-45 32SB-45-0607 4/29/2010	32SO-46 32SB-46-0304 4/29/2010	32SO-47 32SB-47-0506 4/29/2010
VOLATILES (UG/KG)							
BENZENE	1100	0.486 UJ	23.2 UJ	25.3 UJ	46.9 J	23.7 UJ	22.5 UJ
ETHYLBENZENE	5400	0.776 UJ	37 UJ	40.3 UJ	304 J	37.8 UJ	35.9 UJ
TOLUENE	5000000	0.889 UJ	42.4 UJ	46.2 UJ	46.8 UJ	43.3 UJ	41.2 UJ
TOTAL XYLENES	630000	0.724 UJ	34.5 UJ	91.2 J	1200 J	35.3 UJ	77 J
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)							
BENZO(A)ANTHRACENE	150	1.51 UJ	1.6 U	1.63 U	1.61 U	7.61 U	1.57 U
BENZO(A)PYRENE	15	1.51 UJ	1.6 U	1.63 U	**21.3**	7.61 U	1.57 U
BENZO(B)FLUORANTHENE	150	1.51 UJ	1.6 U	1.63 U	22.2	7.61 U	1.57 U
BENZO(K)FLUORANTHENE	1500	1.51 UJ	1.6 U	1.63 U	1.61 U	7.61 U	1.57 U
CHRYSENE	15000	1.51 UJ	1.6 UJ	1.63 UJ	1.61 UJ	7.61 U	1.57 UJ
DIBENZO(A,H)ANTHRACENE	15	1.51 UJ	1.6 U	1.63 U	1.61 U	7.61 UJ	1.57 U
INDENO(1,2,3-CD)PYRENE	150	1.51 UJ	1.6 U	1.63 U	1.61 U	7.61 U	1.57 U
NAPHTHALENE	3600	1.51 UJ	1.6 U	1.63 U	1.61 U	7.61 U	103

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TABLE 5-2

SUMMARY OF CHEMICALS DETECTED IN SUBSURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA SCREENING LEVEL	32SO-48 32SB-48-0405 4/29/2010	32SO-49 32SB-49-0405 4/29/2010	32SO-50 32SB-50-0607 4/29/2010	32SO-51 32SB-51-0708 4/29/2010	32SO-51 32SB-51-1415 4/29/2010	32SO-52 32SB-52-1415 4/29/2010
VOLATILES (UG/KG)							
BENZENE	1100	21.4 UJ	327 J	27.4 UJ	0.488 UJ	23.2 UJ	0.482 UJ
ETHYLBENZENE	5400	34.2 UJ	114 J	87.5 J	0.778 UJ	37 UJ	0.769 UJ
TOLUENE	5000000	39.2 UJ	64.4 J	50.1 UJ	0.893 UJ	42.4 UJ	0.882 UJ
TOTAL XYLENES	630000	31.9 UJ	608 J	803 J	0.726 UJ	34.5 UJ	0.718 UJ
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)							
BENZO(A)ANTHRACENE	150	1.54 U	1.6 U	14.5 UJ	14.5 U	3.77 J	1.55 U
BENZO(A)PYRENE	15	1.54 U	1.6 U	14.5 U	14.5 U	9.57	1.55 U
BENZO(B)FLUORANTHENE	150	1.54 U	1.6 U	14.5 U	14.5 U	9.47	1.55 U
BENZO(K)FLUORANTHENE	1500	1.54 U	1.6 U	14.5 U	14.5 U	4.37 J	1.55 UJ
CHRYSENE	15000	1.54 UJ	1.6 UJ	14.5 UJ	14.5 U	5 J	1.55 U
DIBENZO(A,H)ANTHRACENE	15	1.54 U	1.6 U	14.5 U	14.5 U	1.5 U	1.55 U
INDENO(1,2,3-CD)PYRENE	150	1.54 U	1.6 U	14.5 U	14.5 U	1.5 U	1.55 U
NAPHTHALENE	3600	1.54 U	1.6 U	1360 J	1560	1.5 U	1.55 U

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TABLE 5-2

SUMMARY OF CHEMICALS DETECTED IN SUBSURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA SCREENING LEVEL	32SO-52 32SB-52-0809 4/29/2010	32SO-53 32SB-53-0910 4/29/2010	32SO-53 32SB-53-1415 4/29/2010	32SO-54 32SB-54-1112 9/20/2010	32SO-54 32SB-54-0708 9/20/2010	32SO-55 32SB-55-1112 9/20/2010
VOLATILES (UG/KG)							
BENZENE	1100	0.556 UJ	0.553 UJ	0.447 UJ	--	--	--
ETHYLBENZENE	5400	0.887 UJ	0.882 UJ	0.713 UJ	--	--	--
TOLUENE	5000000	1.02 UJ	1.01 UJ	0.818 UJ	--	--	--
TOTAL XYLENES	630000	0.828 UJ	0.824 UJ	0.666 UJ	--	--	--
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)							
BENZO(A)ANTHRACENE	150	15.7 U	15.6 U	1.55 U	--	--	--
BENZO(A)PYRENE	15	15.7 U	15.6 U	6.23	--	--	--
BENZO(B)FLUORANTHENE	150	15.7 U	15.6 U	4.39 J	--	--	--
BENZO(K)FLUORANTHENE	1500	15.7 UJ	15.6 UJ	1.55 UJ	--	--	--
CHRYSENE	15000	15.7 U	15.6 U	1.55 U	--	--	--
DIBENZO(A,H)ANTHRACENE	15	15.7 U	15.6 U	1.55 U	--	--	--
INDENO(1,2,3-CD)PYRENE	150	15.7 U	15.6 U	1.55 U	--	--	--
NAPHTHALENE	3600	305	15.6 U	1.55 U	1.51 U	3.95 J	1.89 U

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TABLE 5-2

SUMMARY OF CHEMICALS DETECTED IN SUBSURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA SCREENING LEVEL	32SO-55 32SB-55-0708 9/20/2010	32SO-56 32SB-56-1415 9/20/2010	32SO-56 32SB-56-1011 9/20/2010	32SO-57 32SB-57-0708 9/20/2010	32SO-58 32SB-58-0708 9/20/2010	32SO-58 32SB-58-1112 9/20/2010
VOLATILES (UG/KG)							
BENZENE	1100	--	--	--	--	--	--
ETHYLBENZENE	5400	--	--	--	--	--	--
TOLUENE	5000000	--	--	--	--	--	--
TOTAL XYLENES	630000	--	--	--	--	--	--
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)							
BENZO(A)ANTHRACENE	150	--	--	--	--	--	--
BENZO(A)PYRENE	15	--	--	--	--	--	--
BENZO(B)FLUORANTHENE	150	--	--	--	--	--	--
BENZO(K)FLUORANTHENE	1500	--	--	--	--	--	--
CHRYSENE	15000	--	--	--	--	--	--
DIBENZO(A,H)ANTHRACENE	15	--	--	--	--	--	--
INDENO(1,2,3-CD)PYRENE	150	--	--	--	--	--	--
NAPHTHALENE	3600	1.56 U	1.62 U	13.5	1.4 U	5.11 J	1.53 U

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Chemicals detected at concentrations greater than the HHRA criteria are bolded and shaded.

TABLE 5-2

SUMMARY OF CHEMICALS DETECTED IN SUBSURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA SCREENING LEVEL	32SO-59 32SB-59-1112 9/20/2010	32SO-59 32SB-59-0708 9/20/2010	32SO-ST01 32SB-ST01-0203 4/28/2010	32SBDW01 32SB-DW01-0809 4/28/2010	32SBDW02 32SB-DW02-0506 4/28/2010
VOLATILES (UG/KG)						
BENZENE	1100	--	--	0.482 U	0.522 UJ	0.593 U
ETHYLBENZENE	5400	--	--	0.77 U	0.833 UJ	0.946 U
TOLUENE	5000000	--	--	0.883 U	0.955 UJ	1.09 U
TOTAL XYLENES	630000	--	--	0.718 U	0.777 UJ	0.883 U
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)						
BENZO(A)ANTHRACENE	150	--	--	1.6 UJ	9.44 J	1.7 UJ
BENZO(A)PYRENE	15	--	--	1.6 U	7.43	1.7 U
BENZO(B)FLUORANTHENE	150	--	--	1.6 U	7.78	1.7 U
BENZO(K)FLUORANTHENE	1500	--	--	1.6 U	9.45	1.7 U
CHRYSENE	15000	--	--	1.6 UJ	15.3 J	1.7 UJ
DIBENZO(A,H)ANTHRACENE	15	--	--	1.6 UJ	9.23 J	1.7 UJ
INDENO(1,2,3-CD)PYRENE	150	--	--	1.6 UJ	7.05 J	1.7 UJ
NAPHTHALENE	3600	1.56 U	1.48 U	1.6 U	1.54 U	1.7 U

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U - Not Detected
J - Estimated concentration.

(1) HHRA Criteria is the USEPA Residential Screening Level (2010).
Chemicals detected at concentrations greater than the HHRA criteria are bolded and shaded.

TABLE 5-2

SUMMARY OF CHEMICALS DETECTED IN SUBSURFACE SOIL
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA SCREENING LEVEL	32SBDW03 32SB-DW03-0304 4/28/2010
VOLATILES (UG/KG)		
BENZENE	1100	0.503 U
ETHYLBENZENE	5400	0.803 U
TOLUENE	5000000	0.92 U
TOTAL XYLENES	630000	0.749 U
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)		
BENZO(A)ANTHRACENE	150	1.61 UJ
BENZO(A)PYRENE	15	1.61 U
BENZO(B)FLUORANTHENE	150	1.61 U
BENZO(K)FLUORANTHENE	1500	1.61 U
CHRYSENE	15000	1.61 UJ
DIBENZO(A,H)ANTHRACENE	15	1.61 UJ
INDENO(1,2,3-CD)PYRENE	150	1.61 UJ
NAPHTHALENE	3600	1.61 U

HHRA - Human health risk assessment
µg/kg - micrograms per kilograms
U - Not Detected
J - Estimated concentration.

(1) HHRA Criteria is the USEPA Residential Screening Level (2010).
Chemicals detected at concentrations greater than the HHRA criteria are bolded and shaded.

TABLE 5-3

SUMMARY OF CHEMICALS DETECTED IN SEDIMENT
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION SAMPLE ID SAMPLE DATE	HHRA Criteria[1]	ERA Criteria	32SD-01 32SD-01-0006 4/30/2010	32SD-02 32SD-02-0006 4/30/2010	32SD-03 32SD-03-0006 4/30/2010	32SD-04 32SD-04-0006 9/21/2010	32SD-05 32SD-05-0006 9/21/2010
VOLATILES (UG/KG)							
BENZENE	1000	142 [2]	0.537 UJ	56.1 J	0.54 UJ	0.526 U	0.582 U
ETHYLBENZENE	5400	175 [2]	0.857 UJ	65.7 J	0.862 UJ	0.84 U	0.928 U
TOLUENE	5000000	1220 [2]	0.983 UJ	62.6 J	0.989 UJ	0.963 U	1.06 U
TOTAL XYLENES	630000	--	0.8 UJ	220 J	0.805 UJ	0.784 U	0.867 U
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)							
BENZO(A)ANTHRACENE	150	108 [3]	2.81 J	6.59 J	11	1.56 U	1.62 U
BENZO(A)PYRENE	15	150 [3]	7.59	**16.7 J**	**20.1**	1.56 U	1.62 U
BENZO(B)FLUORANTHENE	150	10.4 [2]	1.63 U	**21.8 J**	**25.2**	6.36 J	1.62 U
BENZO(K)FLUORANTHENE	1500	240 [2]	1.63 UJ	8.07 J	7.67 J	1.56 U	1.62 U
CHRYSENE	15000	166 [3]	2.97 J	6.69 J	21.5	1.56 U	1.62 U
INDENO(1,2,3-CD)PYRENE	150	200 [2]	1.63 U	8.51 J	9.62	3.88 J	1.62 U

HHRA - Human health risk assessment
ERA - Ecological risk assessment
µg/L - micrograms per liter.
U - Not Detected
J - Estimated concentration.

(1) HHRA Criteria is the USEPA Residential Screening Level (2010).
(2) ERA Criteria is the USEPA's Ecological Soil Screening Levels (2005).
(3) ERA criteria is from Developmentand Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems (MacDonald 2000).

Chemicals detected at concentrations greater than the HHRA criteria are bolded and shaded.

TABLE 5-4

SUMMARY OF CHECMICALS DETECTED IN GROUNDWATER
SWMU 32 RFI
NSA CRANE, CRANE, INDIANA

LOCATION	HHRA[1] Criteria	32MW-01	32MW-02	32MW-03	32MW-04	32MW-05	32MW-06
SAMPLE ID		32GW-01	32GW-02	32GW-03	32GW-04	32GW-05	32GW-06
SAMPLE DATE		4/28/2010	4/28/2010	4/27/2010	9/22/2010	9/22/2010	9/21/2010
POLYCYCLIC AROMATIC HYDROCARBONS (µg/L)							
BENZO(A)ANTHRACENE	0.029	0.0189 UJ	0.0189 UJ	0.0187 UJ	0.0187 U	0.0189 U	**0.0469 J**
BENZO(A)PYRENE	0.0029	0.0189 UJ	0.0189 UJ	0.0187 UJ	0.0187 U	0.0189 U	**0.0374 J**
BENZO(B)FLUORANTHENE	0.029	0.0189 UJ	0.0189 UJ	0.0187 UJ	0.0187 U	0.0189 U	**0.0558 J**
BENZO(K)FLUORANTHENE	0.29	0.0189 UJ	0.0189 UJ	0.0187 UJ	0.0187 U	0.0189 U	0.0562 J
CHRYSENE	2.9	0.0189 UJ	0.0189 UJ	0.0187 UJ	0.0187 U	0.0189 U	0.0514 J
NAPHTHALENE	0.14	0.0189 UJ	0.0402 J	0.0187 UJ	0.0187 U	0.0189 U	0.0187 U

HHRA - Human health risk assessment
µg/L - micrograms per liter.
U - Not Detected
J - Estimated concentration.

(1) HHRA Criteria is the USEPA tap water RSL.
Chemicals detected at concentrations greater than the HHRA criteria are bolded and shaded.

TABLE 7-1

SCREENING CRITERIA USED IN SELECTION OF COPCS - SOIL/SEDIMENT
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

CAS Number	Chemical	U.S. EPA Regional Screening Levels (1)	U.S. EPA Soil Screening Levels		IDEM(3)	
			Soil to Groundwater(1)	Soil to Air(2)	Residential	Soil to Groundwater
Volatile Organic Compounds (µg/kg)						
71-43-2	Benzene	1100 C	0.21	830 C	8400 C	34
100-41-4	Ethylbenzene	5400 C	1.7	400000 sat	460000 N	13000
108-88-3	Toluene	500000 N	1600	650000 sat	8800000 N	12000
1330-20-7	Total Xylenes	63000 N	200	700000 N	690000 N	210000
1634-04-4	Methyl tert-butyl ether	43000 C	2.8	8700000 sat	350000 C	180
Semivolatile Organic Compounds (µg/kg)						
56-55-3	Benzo(a)anthracene	150 C	10	NA	5000 C	19000 C
50-32-8	Benzo(a)pyrene	15 C	3.5	NA	500 C	8200
205-99-2	Benzo(b)fluoranthene	150 C	35	NA	5000 C	57000 C
207-08-9	Benzo(k)fluoranthene	1500 C	350	NA	50000 C	570000 C
218-01-9	Chrysene	15000 C	1100	NA	500000 C	1900000 C
53-70-3	Dibenzo(a,h)anthracene	15 C	11	NA	500 C	18000 C
193-39-5	Indeno(1,2,3-cd)pyrene	150 C	120	NA	5000 C	160000 C
91-20-3	Naphthalene	3600 C	0.47	170000 N	3200000 N	700 N

Notes:

1 - U.S. EPA Region Screening Level Table (November 2010). The noncarcinogenic values (denoted with a "N" flag) are the RSL divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag)

2 - U.S. EPA Soil Screening Levels. EPA Internet Site at http://rais.ornl.gov/epa/ssl1.shtml (Soil to air SSLs for noncarcinogens are divided by 10). The migration to groundwater value represents a dilution and attenuation factor (DAF) of 1.

3 - Indiana Department of Environmental Management, Risk Integrated System of Closure (RISC) residential closure levels for soil (IDEM, May 2009).

sat - Saturation concentration.

N - Noncarcinogenic.

C - Carcinogenic.

NA - No criteria available.

TABLE 7-2

SCREENING CRITERIA USED IN SELECTION OF COPCS - GROUNDWATER
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

CAS Number	Chemical	U.S. EPA Regional Screening Level[1] Tap Water	U.S. EPA MCL[2]	IDEM Groundwater Residential[3]
Volatile Organic Compounds (µg/l)				
71-43-2	Benzene	0.41 C	5	5.5
100-41-4	Ethylbenzene	1.5 C	700	1600
108-88-3	Toluene	230 N	1000	2400
1330-20-7	Total Xylenes	20 N	10000	270
Semivolatile Organic Compounds (µg/l)				
56-55-3	Benzo(a)anthracene	0.29 **C**	--	1.2
50-32-8	Benzo(a)pyrene	0.0029 **C**	0.2	0.12
205-99-2	Benzo(b)fluoranthene	0.029 **C**	--	1.2
207-08-9	Benzo(k)fluoranthene	0.29 **C**	--	12
218-01-9	Chrysene	2.9 **C**	--	120
53-70-3	Dibenzo(a,h)anthracene	0.0029 **C**	--	0.12
193-39-5	Indeno(1,2,3-cd)pyrene	0.029 **C**	--	1.2
91-20-3	Naphthalene	0.14 **C**	--	8.3

Notes:
1 - U.S. EPA Region Screening Level Table Tap Water (November 2010).
The noncarcinogenic values (denoted with a "N" flag) are the RSL divided by 10 to correspond
target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag)
2 - U.S. EPA Primary Drinking Water Standard (U.S. EPA, Fall 2009).
3 - Indiana Department of Environmental Management, Risk Integrated System of Closure (RISC) residential closure levels for groundwater (IDEM, May 2009).
N - Noncarcinogenic.
C - Carcinogenic.
NA - Not criteria available.

TABLE 7-3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA Residential RSL(2)	IDEM RISC(3)	COPC Flag	Rationale for Contaminant Deletion or Selection(4)
DECISION UNIT 1	**PAHs (ug/kg)**											
	56-55-3	**BENZO(A)ANTHRACENE**	16.8 J	3670	32SS-17-0002	6 / 35	1.44 - 16.3	3670	**150 C**	5000	YES	ASL
	50-32-8	**BENZO(A)PYRENE**	10.9 J	3450	32SS-64-0002	11 / 41	1.44 - 16.3	3450	**15 C**	**500**	YES	ASL
	205-99-2	**BENZO(B)FLUORANTHENE**	13.5	4140	32SS-17-0002	7 / 35	1.44 - 16.3	4140	**150 C**	5000	YES	ASL
	207-08-9	BENZO(K)FLUORANTHENE	33.6 J	1440	32SS-17-0002	3 / 35	1.44 - 16.3	1440	1500 C	50000	NO	BSL
	218-01-9	CHRYSENE	16.6 J	3980	32SS-17-0002	6 / 35	1.44 - 16.3	3980	15000 C	500000	NO	BSL
	53-70-3	**DIBENZO(A,H)ANTHRACENE**	10.7	595	32SS-17-0002	3 / 35	1.44 - 16.3	595	**15 C**	**500**	YES	ASL
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	50.6 J	2530 J	32SS-17-0002	3 / 35	1.44 - 16.3	2530	**150 C**	5000	YES	ASL
	91-20-3	NAPHTHALENE	5.83 J	273	32SS-49-0002	9 / 35	1.44 - 16.3	273	3600 C	3200	NO	BSL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2 - USEPA RSL - Table, November, 2010. (Noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
3 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) residential direct contact for soil (IDEM, May 2009).
4 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Associated Samples:

32SS-01-0002	32SS-13-0002	32SS-46-0002	32SS-64-0002
32SS-02-0002	32SS-14-0002	32SS-47-0002	32SS-65-0002
32SS-03-0002	32SS-15-0002	32SS-48-0002	32SS-DW01-0002
32SS-04-0002	32SS-16-0002	32SS-49-0002	32SS-DW02-0002
32SS-05-0002	32SS-17-0002	32SS-50-0002	32SS-DW03-0002
32SS-06-0002	32SS-18-0002	32SS-51-0002	
32SS-07-0002	32SS-19-0002	32SS-52-0002	
32SS-08-0002	32SS-20-0002	32SS-53-0002	
32SS-09-0002	32SS-21-0002	32SS-60-0002	
32SS-10-0002	32SS-43-0002	32SS-61-0002	
32SS-11-0002	32SS-44-0002	32SS-62-0002	
32SS-12-0002	32SS-45-0002	32SS-63-0002	

Definitions
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

TABLE 7-4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - MIGRATION FROM SURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSWC CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA SSL Migration to Air(2)	USEPA SSL Migration to Groundwater(3)	IDEM RISC(4)	COPC Flag	Rationale for Contaminant Deletion or Selection(5)
DECISION UNIT 1	**PAHs (ug/kg)**												
	56-55-3	**BENZO(A)ANTHRACENE**	16.8 J	3670	32SS-17-0002	6 / 35	1.44 - 16.3	3670	NA	**10**	19000	YES	ASL
	50-32-8	**BENZO(A)PYRENE**	10.9 J	3450	32SS-64-0002	11 / 41	1.44 - 16.3	3450	NA	**3.5**	8200	YES	ASL
	205-99-2	**BENZO(B)FLUORANTHENE**	13.5	4140	32SS-17-0002	7 / 35	1.44 - 16.3	4140	NA	**35**	57000	YES	ASL
	207-08-9	**BENZO(K)FLUORANTHENE**	33.6 J	1440	32SS-17-0002	3 / 35	1.44 - 16.3	1440	NA	**350**	570000	YES	ASL
	218-01-9	**CHRYSENE**	16.6 J	3980	32SS-17-0002	6 / 35	1.44 - 16.3	3980	NA	**1100**	1900000	YES	ASL
	53-70-3	**DIBENZO(A,H)ANTHRACENE**	10.7	595	32SS-17-0002	3 / 35	1.44 - 16.3	595	NA	**11**	18000	YES	ASL
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	50.6 J	2530 J	32SS-17-0002	3 / 35	1.44 - 16.3	2530	NA	**120**	160000	YES	ASL
	91-20-3	**NAPHTHALENE**	5.83 J	273	32SS-49-0002	9 / 35	1.44 - 16.3	273	17000	**0.47**	700	YES	ASL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2- EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm.
3 - USEPA RSL - Table, November, 2010.
4- Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) migration to groundwater for soil (IDEM, May 2009).
5- The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Definitions
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

Associated Samples:

32SS-01-0002	32SS-19-0002	32SS-37-0002	32SS-61-0002
32SS-02-0002	32SS-20-0002	32SS-38-0002	32SS-62-0002
32SS-03-0002	32SS-21-0002	32SS-39-0002	32SS-63-0002
32SS-04-0002	32SS-22-0002	32SS-40-0002	32SS-64-0002
32SS-05-0002	32SS-23-0002	32SS-41-0002	32SS-65-0002
32SS-06-0002	32SS-24-0002	32SS-42-0002	32SS-DW01-0002
32SS-07-0002	32SS-25-0002	32SS-43-0002	32SS-DW02-0002
32SS-08-0002	32SS-26-0002	32SS-44-0002	32SS-DW03-0002
32SS-09-0002	32SS-27-0002	32SS-45-0002	
32SS-10-0002	32SS-28-0002	32SS-46-0002	
32SS-11-0002	32SS-29-0002	32SS-47-0002	
32SS-12-0002	32SS-30-0002	32SS-48-0002	
32SS-13-0002	32SS-31-0002	32SS-49-0002	
32SS-14-0002	32SS-32-0002	32SS-50-0002	
32SS-15-0002	32SS-33-0002	32SS-51-0002	
32SS-16-0002	32SS-34-0002	32SS-52-0002	
32SS-17-0002	32SS-35-0002	32SS-53-0002	
32SS-18-0002	32SS-36-0002	32SS-60-0002	

TABLE 7-5
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SUBSURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Location of Max Detect	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening[1]	USEPA Residential RSL[2]	IDEM RISC[3]	COPC Flag	Rationale for Contaminant Deletion or Selection[4]
DECISION UNIT 1	**Volatile Organics (ug/kg)**												
	71-43-2	**BENZENE**	1.77 J	1810	32SO-06	32SB-06-0405	4 / 40	0.447 - 32.4	1810	**1100 C**	**34**	YES	ASL
	100-41-4	ETHYLBENZENE	0.972 J	304 J	32SO-45	32SB-45-0607	7 / 40	0.713 - 51.6	304	5400 C	13000	NO	BSL
	108-88-3	TOLUENE	64.4 J	112 J	32SO-06	32SB-06-0405	2 / 40	0.818 - 59.2	112	500000 N	12000	NO	BSL
	1330-20-7	TOTAL XYLENES	1.27 J	1200 J	32SO-45	32SB-45-0607	9 / 40	0.666 - 48.2	1200	63000 N	210000	NO	BSL
	PAHs (ug/kg)												
	56-55-3	**BENZO(A)ANTHRACENE**	3.77 J	213	32SO-37	32SB-17-0607	5 / 40	1.54 - 16.4	213	**150 C**	5000	YES	ASL
	50-32-8	**BENZO(A)PYRENE**	6.23	112	32SO-37	32SB-17-0607	6 / 40	1.54 - 16.4	112	**15 C**	500	YES	ASL
	205-99-2	BENZO(B)FLUORANTHENE	4.39 J	104	32SO-17	32SB-17-0607	6 / 40	1.54 - 16.4	104	150 C	5000	NO	BSL
	207-08-9	BENZO(K)FLUORANTHENE	4.37 J	34.5	32SO-15	32SB-15-0506	3 / 40	1.54 - 16.4	34.5	1500 C	50000	NO	BSL
	218-01-9	CHRYSENE	5 J	289	32SO-37	32SB-17-0607	5 / 40	1.54 - 16.4	289	15000 C	500000	NO	BSL
	53-70-3	DIBENZO(A,H)ANTHRACENE	9.23 J	9.23 J	32SOW01	32SB-DW01-0809	1 / 40	1.5 - 16.4	9.23	15 C	500	NO	BSL
	193-39-5	INDENO(1,2,3-CD)PYRENE	7.05 J	35.3	32SO-15	32SB-15-0506	2 / 40	1.5 - 16.4	35.3	150 C	5000	NO	BSL
	91-20-3	NAPHTHALENE	3.95 J	2470	32SO-17	32SB-17-0607	11 / 51	1.4 - 16.4	2470	3600 C	3200	NO	BSL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2 - USEPA RSL - Table, November, 2010. (Noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
3 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) residential direct contact for soil (IDEM, May 2009).
4 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Associated Samples:

32SB-01-0708	32SB-09-0607	32SB-17-0607	32SB-45-0607	32SB-52-0809	32SB-56-1011	32SB-ST01-0708
32SB-02-0607	32SB-10-0506	32SB-17-1112	32SB-46-0304	32SB-52-1415	32SB-56-1415	32SB-DW01-0809
32SB-03-0607	32SB-11-0607	32SB-18-0506	32SB-47-0506	32SB-53-0910	32SB-57-0708	32SB-DW02-0506
32SB-04-0506	32SB-12-0607	32SB-19-0506	32SB-48-0405	32SB-53-1415	32SB-58-0708	32SB-DW03-0304
32SB-05-0506	32SB-13-0607	32SB-20-0506	32SB-49-0405	32SB-54-0708	32SB-58-1112	
32SB-06-0405	32SB-14-0910	32SB-21-0506	32SB-50-0607	32SB-54-1112	32SB-59-0708	
32SB-07-0607	32SB-15-0506	32SB-43-0506	32SB-51-0708	32SB-55-0708	32SB-59-1112	
32SB-08-0607	32SB-16-0607	32SB-44-0506	32SB-51-1415	32SB-55-1112	32SB-ST01-0203	

Definitions
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

TABLE 7-6
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - MIGRATION FROM SUBSURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA SSL Migration to Air(2)	USEPA SSL Migration to Groundwater(3)	IDEM RISC(4)	COPC Flag	Rationale for Contaminant Deletion or Selection(5)
DECISION UNIT 1	**Volatile Organics (ug/kg)**												
	71-43-2	**BENZENE**	1.77 J	1810	32SB-06-0405	4 / 40	0.447 - 32.4	1810	**830**	**0.21**	**34**	YES	ASL
	100-41-4	**ETHYLBENZENE**	0.972 J	304 J	32SB-45-0607	7 / 40	0.713 - 51.6	304	400000	**1.7**	13000	YES	ASL
	108-88-3	TOLUENE	64.4 J	112 J	32SB-06-0405	2 / 40	0.818 - 59.2	112	650000	1600	12000	NO	BSL
	1330-20-7	**TOTAL XYLENES**	1.27 J	1200 J	32SB-45-0607	9 / 40	0.666 - 48.2	1200	70000	**200**	210000	YES	ASL
	PAHs (ug/kg)												
	56-55-3	**BENZO(A)ANTHRACENE**	3.77 J	213	32SB-17-0607	5 / 40	1.54 - 16.4	213	NA	**10**	19000	YES	ASL
	50-32-8	**BENZO(A)PYRENE**	6.23	112	32SB-17-0607	6 / 40	1.54 - 16.4	112	NA	**3.5**	8200	YES	ASL
	205-99-2	**BENZO(B)FLUORANTHENE**	4.39 J	104	32SB-17-0607	6 / 40	1.54 - 16.4	104	NA	**35**	57000	YES	ASL
	207-08-9	BENZO(K)FLUORANTHENE	4.37 J	34.5	32SB-15-0506	3 / 40	1.54 - 16.4	34.5	NA	350	570000	NO	BSL
	218-01-9	CHRYSENE	5 J	289	32SB-17-0607	5 / 40	1.54 - 16.4	289	NA	1100	1900000	NO	BSL
	53-70-3	DIBENZO(A,H)ANTHRACENE	9.23 J	9.23 J	32SB-DW01-0809	1 / 40	1.5 - 16.4	9.23	NA	11	18000	NO	BSL
	193-39-5	INDENO(1,2,3-CD)PYRENE	7.05 J	35.3	32SB-15-0506	2 / 40	1.5 - 16.4	35.3	NA	120	160000	NO	BSL
	91-20-3	**NAPHTHALENE**	3.95 J	2470	32SB-17-0607	11 / 51	1.4 - 16.4	2470	17000	**0.47**	**700**	YES	ASL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2- EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm.
3 - USEPA RSL - Table, November, 2010.
4- Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) migration to groundwater for soil (IDEM, May 2009).
5- The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Definitions
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

Associated Samples:

32SB-01-0708	32SB-11-0607	32SB-20-0506	32SB-30-0506	32SB-40-0506	32SB-50-0607	32SB-55-1112	32SB-DW03-0304
32SB-02-0607	32SB-12-0607	32SB-21-0506	32SB-31-0607	32SB-41-0506	32SB-51-0708	32SB-56-1011	32SB-ST01-0203
32SB-03-0607	32SB-13-0607	32SB-22-0506	32SB-32-0506	32SB-42-0506	32SB-51-1415	32SB-56-1415	
32SB-04-0506	32SB-14-0910	32SB-23-0506	32SB-33-0506	32SB-43-0506	32SB-52-0809	32SB-57-0708	
32SB-05-0506	32SB-15-0506	32SB-24-0506	32SB-34-0607	32SB-44-0506	32SB-52-1415	32SB-58-0708	
32SB-06-0405	32SB-16-0607	32SB-25-0607	32SB-35-0507	32SB-45-0607	32SB-53-0910	32SB-58-1112	
32SB-07-0607	32SB-17-0607	32SB-26-0405	32SB-36-0506	32SB-46-0304	32SB-53-1415	32SB-59-0708	
32SB-08-0607	32SB-17-1112	32SB-27-0506	32SB-37-0506	32SB-47-0506	32SB-54-0708	32SB-59-1112	
32SB-09-0607	32SB-18-0506	32SB-28-0506	32SB-38-0506	32SB-48-0405	32SB-54-1112	32SB-DW01-0809	
32SB-10-0506	32SB-19-0506	32SB-29-0304	32SB-39-0507	32SB-49-0405	32SB-55-0708	32SB-DW02-0506	

TABLE 7-7
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening[1]	USEPA Residential RSL[2]	IDEM RISC[3]	COPC Flag	Rationale for Contaminant Deletion or Selection[4]
DECISION UNIT 2	**PAHs (ug/kg)**											
	56-55-3	BENZO(A)ANTHRACENE	4.57 J	5.24 J	32SS-26-0002	2 / 21	1.51 - 15.6	5.24	150 C	5000	NO	BSL
	50-32-8	**BENZO(A)PYRENE**	9.39	31.8	32SS-23-0002	3 / 21	1.51 - 15.6	31.8	**15 C**	500	YES	ASL
	205-99-2	BENZO(B)FLUORANTHENE	6.56 J	44.1	32SS-23-0002	3 / 21	1.51 - 15.6	44.1	150 C	5000	NO	BSL
	207-08-9	BENZO(K)FLUORANTHENE	11.4	16.2	32SS-23-0002	2 / 21	1.51 - 15.6	16.2	1500 C	50000	NO	BSL
	218-01-9	CHRYSENE	6.13 J	8.07	32SS-23-0002	2 / 21	1.51 - 15.6	8.07	15000 C	500000	NO	BSL
	53-70-3	DIBENZO(A,H)ANTHRACENE	6.41	6.41	32SS-23-0002	1 / 21	1.51 - 15.6	6.41	15 C	500	NO	BSL
	193-39-5	INDENO(1,2,3-CD)PYRENE	17.7	32.1	32SS-23-0002	2 / 21	1.51 - 15.6	32.1	150 C	5000	NO	BSL
	91-20-3	NAPHTHALENE	3.02 J	5.76 J	32SS-22-0002	3 / 21	1.51 - 15.6	5.76	3600 C	3200	NO	BSL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2 - USEPA RSL - Table, November, 2010. (Noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
3 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) residential direct contact for soil (IDEM, May 2009).
4 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Associated Samples:

32SS-22-0002	32SS-27-0002	32SS-32-0002	32SS-37-0002	32SS-42-0002
32SS-23-0002	32SS-28-0002	32SS-33-0002	32SS-38-0002	
32SS-24-0002	32SS-29-0002	32SS-34-0002	32SS-39-0002	
32SS-25-0002	32SS-30-0002	32SS-35-0002	32SS-40-0002	
32SS-26-0002	32SS-31-0002	32SS-36-0002	32SS-41-0002	

Definitions
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

TABLE 7-8
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - MIGRATION FROM SURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSWC CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA SSL Migration to Air(2)	USEPA SSL Migration to Groundwater(3)	IDEM RISC(4)	COPC Flag	Rationale for Contaminant Deletion or Selection(5)
DECISION UNIT 2	**PAHs (ug/kg)**												
	56-55-3	BENZO(A)ANTHRACENE	4.57 J	5.24 J	32SS-26-0002	2 / 21	1.51 - 15.6	5.24	NA	10	19000	NO	BSL
	50-32-8	**BENZO(A)PYRENE**	9.39	31.8	32SS-23-0002	3 / 21	1.51 - 15.6	31.8	NA	**3.5**	8200	YES	ASL
	205-99-2	**BENZO(B)FLUORANTHENE**	6.56 J	44.1	32SS-23-0002	3 / 21	1.51 - 15.6	44.1	NA	**35**	57000	YES	ASL
	207-08-9	BENZO(K)FLUORANTHENE	11.4	16.2	32SS-23-0002	2 / 21	1.51 - 15.6	16.2	NA	350	570000	NO	BSL
	218-01-9	CHRYSENE	6.13 J	8.07	32SS-23-0002	2 / 21	1.51 - 15.6	8.07	NA	1100	1900000	NO	BSL
	53-70-3	DIBENZO(A,H)ANTHRACENE	6.41	6.41	32SS-23-0002	1 / 21	1.51 - 15.6	6.41	NA	11	18000	NO	BSL
	193-39-5	INDENO(1,2,3-CD)PYRENE	17.7	32.1	32SS-23-0002	2 / 21	1.51 - 15.6	32.1	NA	120	160000	NO	BSL
	91-20-3	**NAPHTHALENE**	3.02 J	5.76 J	32SS-22-0002	3 / 21	1.51 - 15.6	5.76	17000	**0.47**	700	YES	ASL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2 - EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm.
3 - USEPA RSL - Table, November, 2010.
4- Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) migration to groundwater for soil (IDEM, May 2009).
5- The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Associated Samples:

32SS-22-0002	32SS-27-0002	32SS-32-0002	32SS-37-0002	32SS-42-0002
32SS-23-0002	32SS-28-0002	32SS-33-0002	32SS-38-0002	
32SS-24-0002	32SS-29-0002	32SS-34-0002	32SS-39-0002	
32SS-25-0002	32SS-30-0002	32SS-35-0002	32SS-40-0002	
32SS-26-0002	32SS-31-0002	32SS-36-0002	32SS-41-0002	

Definitions
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

TABLE 7-9
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SUBSURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA Residential RSL(2)	IDEM RISC(3)	COPC Flag	Rationale for Contaminant Deletion or Selection(4)
Decision Unit 2	**Volatile Organics (ug/kg)**											
	1330-20-7	TOTAL XYLENES	1.72 J	1.72 J	32SB-40-0506	1 / 21	0.614 - 0.867	1.72	63000 N	210000	NO	BSL
	PAHs (ug/kg)											
	56-55-3	**BENZO(A)ANTHRACENE**	394 J	394 J	32SB-37-0506	1 / 21	1.51 - 1.75	394	**150 C**	5000	YES	ASL
	50-32-8	**BENZO(A)PYRENE**	10.4	121 J	32SB-37-0506	2 / 21	1.51 - 1.75	121	**15 C**	500	YES	ASL
	205-99-2	BENZO(B)FLUORANTHENE	6.9 J	6.9 J	32SB-22-0506	1 / 21	1.51 - 8.35	6.9	150 C	5000	NO	BSL
	218-01-9	CHRYSENE	3.2 J	341 J	32SB-37-0506	2 / 21	1.51 - 1.75	341	15000 C	500000	NO	BSL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2 - USEPA RSL - Table, November, 2010. (Noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
3 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) residential direct contact for soil (IDEM, May 2009).
4 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Associated Samples

32SB-22-0506	32SB-29-0304	32SB-36-0506
32SB-23-0506	32SB-30-0506	32SB-37-0506
32SB-24-0506	32SB-31-0607	32SB-38-0506
32SB-25-0607	32SB-33-0506	32SB-39-0507
32SB-26-0405	32SB-32-0506	32SB-40-0506
32SB-27-0506	32SB-34-0607	32SB-41-0506
32SB-28-0506	32SB-35-0507	32SB-42-0506

Definitions
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

TABLE 7-10
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - MIGRATION FROM SUBSURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA SSL Migration to Air(2)	USEPA SSL Migration to Groundwater(3)	IDEM RISC(4)	COPC Flag	Rationale for Contaminant Deletion or Selection(5)
Decision Unit 2	**Volatile Organics (ug/kg)**												
	1330-20-7	TOTAL XYLENES	1.72 J	1.72 J	32SB-40-0506	1 / 21	0.614 - 0.867	1.72	70000	200	210000	NO	BSL
	PAHs (ug/kg)												
	56-55-3	**BENZO(A)ANTHRACENE**	394 J	394 J	32SB-37-0506	1 / 21	1.51 - 1.75	394	NA	**10**	19000	YES	ASL
	50-32-8	**BENZO(A)PYRENE**	10.4	121 J	32SB-37-0506	2 / 21	1.51 - 1.75	121	NA	**3.5**	8200	YES	ASL
	205-99-2	BENZO(B)FLUORANTHENE	6.9 J	6.9 J	32SB-22-0506	1 / 21	1.51 - 8.35	6.9	NA	35	57000	NO	BSL
	218-01-9	CHRYSENE	3.2 J	341 J	32SB-37-0506	2 / 21	1.51 - 1.75	341	NA	1100	1900000	NO	BSL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2 - EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm.
3 - USEPA RSL - Table, November, 2010.
4- Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) migration to groundwater for soil (IDEM, May 2009).
5- The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Associated Samples

32SB-22-0506	32SB-29-0304	32SB-36-0506
32SB-23-0506	32SB-30-0506	32SB-37-0506
32SB-24-0506	32SB-31-0607	32SB-38-0506
32SB-25-0607	32SB-33-0506	32SB-39-0507
32SB-26-0405	32SB-32-0506	32SB-40-0506
32SB-27-0506	32SB-34-0607	32SB-41-0506
32SB-28-0506	32SB-35-0507	32SB-42-0506

Definitions
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

TABLE 7-11
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA Tapwater RSL(2)	IDEM RISC(3)	Upgradient Concentration(4)	COPC Flag	Rationale for Contaminant Deletion or Selection(5)
		PAHs (ug/l)											
SWMU 32	56-55-3	**BENZO(A)ANTHRACENE**	0.0469 J	0.0469 J	32GW-06	1/5	0.0187 - 0.0189	0.0469	**0.029 C**	**0.0012**	NA	YES	ASL
	50-32-8	**BENZO(A)PYRENE**	0.0374 J	0.0374 J	32GW-06	1/5	0.0187 - 0.0189	0.0374	**0.0029 C**	**0.00012**	NA	YES	ASL
	205-99-2	**BENZO(B)FLUORANTHENE**	0.0558 J	0.0558 J	32GW-06	1/5	0.0187 - 0.0189	0.0558	**0.029 C**	**0.0012**	NA	YES	ASL
	207-08-9	**BENZO(K)FLUORANTHENE**	0.0562 J	0.0562 J	32GW-06	1/5	0.0187 - 0.0189	0.0562	0.29 C	**0.012**	NA	YES	ASL
	218-01-9	CHRYSENE	0.0514 J	0.0514 J	32GW-06	1/5	0.0187 - 0.0189	0.0514	2.9 C	0.12	NA	NO	BSL
	91-20-3	**NAPHTHALENE**	0.0402 J	0.0402 J	32GW-02	1/5	0.0187 - 0.0189	0.0402	0.14 C	**0.0083**	ND	YES	ASL

Footnotes
1 - The maximum detected concentraiton is used for screening purposes.
2 - USEPA RSL - Tapwater- Table, November, 2010. (Noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
3 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) residential groundwater (IDEM, May 2009).
4 - MW 1 is upgradient of SWMU 32
5 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Associated Samples:
32GW-02
32GW-03
32GW-04
32GW-05
32GW-06

Definitions
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value
NA = Not Available
ND = Non-detect

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

TABLE 7-12
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SEDIMENT
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Max Detect	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA Residential RSL(2)	IDEM RISC(3)	Upgradient Concentration(4)	COPC Flag	Rationale for Contaminant Deletion or Selection(5)
SWMU 32	**Volatile Organics (ug/kg)**												
	71-43-2	BENZENE	56.1 J	56.1 J	32SD-02-0006	1/4	0.526 - 0.58	56.1	11000 C	340	ND	NO	BSL
	100-41-4	ETHYLBENZENE	65.7 J	65.7 J	32SD-02-0006	1/4	0.84 - 0.93	65.7	54000 C	130000	ND	NO	BSL
	108-88-3	TOLUENE	62.6 J	62.6 J	32SD-02-0006	1/4	0.963 - 1.06	62.6	5000000 N	120000	ND	NO	BSL
	1330-20-7	TOTAL XYLENES	220 J	220 J	32SD-02-0006	1/4	0.784 - 0.87	220	630000 N	2100000	ND	NO	BSL
	PAHs (ug/kg)												
	56-55-3	BENZO(A)ANTHRACENE	6.59 J	11	32SD-03-0006	2/4	1.56 - 1.62	11	1500 C	50000	**2.81**	NO	BSL
	50-32-8	BENZO(A)PYRENE	16.7 J	20.1	32SD-03-0006	2/4	1.56 - 1.62	20.1	150 C	5000	**7.59**	NO	BSL
	205-99-2	BENZO(B)FLUORANTHENE	6.36 J	25.2	32SD-03-0006	3/4	1.62 - 1.62	25.2	1500 C	50000	ND	NO	BSL
	207-08-9	BENZO(K)FLUORANTHENE	7.67 J	8.07 J	32SD-02-0006	2/4	1.56 - 1.62	8.07	15000 C	500000	ND	NO	BSL
	218-01-9	CHRYSENE	6.69 J	21.5	32SD-03-0006	2/4	1.56 - 1.62	21.5	150000 C	5000000	**2.97**	NO	BSL
	193-39-5	INDENO(1,2,3-CD)PYRENE	3.88 J	9.62	32SD-03-0006	3/4	1.62 - 1.62	9.62	1500 C	50000	ND	NO	BSL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2 - USEPA RSL - Residential Soil multiplied by 10 for anticipated reduced exposure to sediment - Table, November, 2010. (Noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
3 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) residential direct contact for soil (IDEM, May 2009).
4 - 32SD-01 is upgradient of SWMU 32
5 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Associated Samples:
32SD-02-0006
32SD-03-0006
32SD-04-0006
32SD-05-0006

Definitions
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value
N = Non-Carcinogen

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level and Upgradient Concentration
BSL = Below Screening Level or Upgradient Concentration

TABLE 7-13

CHEMICALS RETAINED AS COPCs
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Chemical	Decision Unit 1			Decision Unit 2			Decision Unit 1			Decision Unit 2			Groundwater	Sediment
	Surface Soil			Surface Soil			Subsurface Soil			Subsurface Soil				
	Direct Contact	Soil to Groundwater	Soil to Air	Direct Contact	Soil to Groundwater	Soil to Air	Direct Contact	Soil to Groundwater	Soil to Air	Direct Contact	Soil to Groundwater	Soil to Air		
Volatiles														
BENZENE							X	X	X					
ETHYLBENZENE								X						
TOTAL XYLENES								X						
PAHs														
BENZO(A)ANTHRACENE	X	X					X	X		X	X		X	
BENZO(A)PYRENE	X	X		X	X		X	X		X	X		X	
BENZO(B)FLUORANTHENE	X	X			X			X					X	
BENZO(K)FLUORANTHENE		X											X	
CHRYSENE		X												
DIBENZO(A,H)ANTHRACENE	X	X												
INDENO(1,2,3-CD)PYRENE	X	X												
NAPHTHALENE		X			X			X					X	

X - Indicates chemical was retained as a COPC.

TABLE 7-14

RECEPTORS AND EXPOSURE ROUTES FOR QUANTITATIVE EVALUATION
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Receptors	Exposure Routes
Industrial Worker (current/future land use)[1]	• Soil dermal contact (surface) • Soil ingestion (surface) • Inhalation of air/dust/emissions (surface) • Direct ingestion of ground water • Groundwater dermal contact • Inhalation of vapors intruding into a building from the groundwater
Adolescent Trespassers (6 to 17 years) (current/future land use)	• Soil dermal contact (surface) • Soil ingestion (surface) • Inhalation of air/dust/emissions(surface) • Sediment dermal contact • Sediment Ingestion
Construction Workers (current/future land use)	• Soil dermal contact (surface and subsurface) • Soil ingestion (surface and subsurface) • Inhalation of air/dust/emissions (surface and subsurface) • Groundwater dermal contact (during excavation) • Groundwater inhalation of volatile organics (during excavation)
Small Child (0 to 6 years) and Adult Recreational Users (future land use)	• Soil dermal contact (surface) • Soil ingestion (surface) • Inhalation of air/dust/emissions (surface) • Sediment dermal contact • Sediment ingestion • Groundwater dermal contact • Direct ingestion of groundwater
On-Base Residents (Adult/Children) (future land use)[1]	• Soil dermal contact (surface) • Soil ingestion (surface) • Inhalation of air/dust/emissions (surface) • Sediment dermal contact • Sediment ingestion • Groundwater dermal contact (showering/bathing) • Inhalation of volatiles in groundwater (showering/bathing) • Inhalation of vapors intruding into a building from the groundwater • Direct ingestion of groundwater

1 – Industrial workers and residents will also be evaluated for exposures to chemicals of concern in subsurface soil in the uncertainty section of the risk assessments. This scenario is included to account for the possibility that subsurface soil could be brought to the surface in future excavation projects.

TABLE 7-15
SELECTION OF EXPOSURE PATHWAYS
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Surface Soil	Surface Soil	Decision Unit 1 & 2	Industrial Worker	Adult	Ingestion Dermal	Quant Quant	Industrial workers may contact surface soil during normal work activities.
				Construction Worker	Adult	Ingestion Dermal	Quant Quant	Construction workers may contact surface soil during normal work activities.
				Trespassers	Adolescents	Ingestion Dermal	Quant Quant	Adolescent trespassers may be exposed to surface soil while at the site.
		Air	Decision Unit 1 & 2	Industrial Worker	Adult	Inhalation	None	No COPCs were identified in surface soil for the inhalation exposure pathway.
				Construction Worker	Adult	Inhalation	None	No COPCs were identified in surface soil for the inhalation exposure pathway.
				Trespassers	Adolescents	Inhalation	None	No COPCs were identified in surface soil for the inhalation exposure pathway.
	Subsurface Soil	Subsurface Soil	Decision Unit 1 & 2	Industrial Worker	Adult	Ingestion Dermal	None None	Industrial workers are not expected to be exposed to subsurface soil.
				Construction Worker	Adult	Ingestion Dermal	Quant Quant	Construction workers may contact subsurface soil during normal work activities.
				Trespassers	Adolescents	Ingestion Dermal	None None	Trespassers are not exposed to subsurface soil.
		Air	Decision Unit 1 & 2	Industrial Worker	Adult	Inhalation	None	Industrial workers are not expected to be exposed to subsurface soil.
				Construction Worker	Adult	Inhalation	Quant	Construction workers may be exposed to fugitive dust and volatile emissions during construction activities.
				Trespassers	Adolescents	Inhalation	None	Adolescent trespassers are not expected to be exposed to subsurface soil.
	Groundwater	Groundwater	SWMU 32	Industrial Worker	Adult	Ingestion Dermal	Quant Quant	An industrial worker may come into direct contact with groundwater.
				Construction Worker	Adult	Ingestion Dermal	None Quant	A construction worker may come into contact with groundwater during excavation.
				Trespassers	Adolescents	Ingestion Dermal	None None	A trespasser is not expected to come into contact with groundwater.
		Air	SWMU 32	Industrial Worker	Adult	Ingestion Dermal	Quant Quant	Inhalation of vapors intruding into a building from the groundwater.
				Construction Worker	Adult	Ingestion Dermal	None Quant	Inhalation of volatilce organics during excavation.
				Trespassers	Adolescents	Ingestion Dermal	None None	Trespassers are not expected to be exposed to the inhalation of vapors from groundwater.
	Sediment	Sediment	SWMU 32	Industrial Worker	Adult	Ingestion Dermal	None None	Industrial workers are not expected to come into contact with sediment.
				Construction Worker	Adult	Ingestion Dermal	None None	Construction workers are not expected to be exposed to sediment.
				Trespassers	Adolescents	Ingestion Dermal	Quant Quant	Trespassers may be exposed to sediment.

TABLE 7-15
SELECTION OF EXPOSURE PATHWAYS
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface Soil	Surface Soil	Decision Unit 1 & 2	Residents	Child	Ingestion Dermal	Quant Quant	A future child resident may be exposed to surface soil.
					Adult	Ingestion Dermal	Quant Quant	A future adult resident may be exposed to surface soil.
				Recreational Users	Child	Inhalation	Quant Quant	A future child recreational user may be exposed to surface soil.
					Adult	Inhalation	Quant Quant	A future adult recreational user may be exposed to surface soil.
		Air	Decision Unit 1 & 2	Residents	Child	Inhalation	None	No COPCs were identified in surface soil for the inhalation exposure pathway.
					Adult	Inhalation	None	No COPCs were identified in surface soil for the inhalation exposure pathway.
				Recreational Users	Child	Inhalation	None	No COPCs were identified in surface soil for the inhalation exposure pathway.
					Adult	Inhalation	None	No COPCs were identified in surface soil for the inhalation exposure pathway.
	Subsurface Soil	Subsurface Soil	Decision Unit 1 & 2	Residents	Child	Inhalation	None	A future child resident is not expected to be exposed to subsurface soil.
					Adult	Inhalation	None	A future adult resident is not expected to be exposed to subsurface soil.
				Recreational Users	Child	Inhalation	None	A future child recreational user is not expected to be exposed to subsurface soil.
					Adult	Inhalation	None	A future adult recreational user is not expected to be exposed to subsurface soil.
		Air	Decision Unit 1 & 2	Residents	Child	Inhalation	None	A future child resident is not expected to be exposed to subsurface soil.
					Adult	Inhalation	None	A future adult resident is not expected to be exposed to subsurface soil.
				Recreational Users	Child	Inhalation	None	A future child recreational user is not expected to be exposed to subsurface soil.
					Adult	Inhalation	None	A future adult recreational user is not expected to be exposed to subsurface soil.

TABLE 7-15
SELECTION OF EXPOSURE PATHWAYS
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Groundwater	Groundwater	SWMU 32	Residents	Child	Ingestion	Quant	Although a future residential scenario is considered unlikely at the site, this scenario is included to aid in future risk management decisions.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	
				Recreational Users	Child	Inhalation	Quant	A child recreational user may be exposed to groundwater
					Adult	Inhalation	Quant	An adult recreational user may be exposed to groundwater
		Air	SWMU 32	Residents	Child	Ingestion	None	No VOCs were retained indentified in groundwater.
						Dermal	None	
					Adult	Ingestion	None	
						Dermal	None	
				Recreational Users	Child	Inhalation	None	No VOCs were retained indentified in groundwater.
					Adult	Inhalation	None	No VOCs were retained indentified in groundwater.
	Sediment	Sediment	SWMU 32	Residents	Child	Ingestion	Quant	No COPCs were identified.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	
				Recreational Users	Child	Ingestion	Quant	No COPCs were identified.
						Dermal	Quant	
					Adult	Ingestion	Quant	No COPCs were identified.
						Dermal	Quant	

Notes:
Quant - Quantitative.
Qual - Qualitative.

TABLE 7-16

EXPOSURE POINT CONCENTRATIONS
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Chemical	Decision Unit 1		Decision Unit 2		Groundwater (µg/L) [3]
	Surface Soil (mg/kg)	Subsurface Soil (mg/kg)	Surface Soil (mg/kg)	Subsurface Soil (mg/kg)	
Volatiles					
BENZENE	NA	0.144[1]	NA	NA	NA
ETHYLBENZENE	NA	0.031[1]	NA	NA	NA
TOTAL XYLENES	NA	0.154[1]	NA	NA	NA
PAHs					
BENZO(A)ANTHRACENE	0.337[1]	0.022[1]	NA	0.394[2]	0.0469
BENZO(A)PYRENE	0.374[1]	0.016[1]	0.014[1]	0.121[2]	0.0374
BENZO(B)FLUORANTHENE	0.367[1]	0.015[1]	0.014[1]	NA	0.0558
BENZO(K)FLUORANTHENE	0.162[1]	NA	NA	NA	0.0562
CHRYSENE	0.357[1]	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	0.064[1]	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	0.278[1]	NA	NA	NA	NA
NAPHTHALENE	0.0431[1]	0.262[1]	0.004[1]	NA	0.0402

Notes:
(1) 95% KM(T) UCL
(2) Less than three detected concentration, the maximum detected concentrations is used as the EPC.
(3) Maximum Concentration is used as the EPC for groundwater.

NA - Not applicable, chemical is not a COPC for this media.
RAGS Part D tables for the exposure point concentrations are included in Appendix H.

TABLE 7-17

SUMMARY OF EXPOSURE INPUT PARAMETERS
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE INDIANA

Exposure Parameter	Construction Worker	Industrial Worker	Adolescent Trespasser	Child Recreational User	Adult Recreational User	On-Site Child Resident	On-Site Adult Resident
All Exposures							
C_{soil}/C_{sed} (mg/kg)	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]
C_{gw} (µg/L)	Average	Average	NA	Average	Average	Average	Average
C_{sw} (µg/L)	NA	NA	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]
ED (years)	1[2]	25[3]	11[4]	6[5]	24[5]	6[5]	24[5]
BW (kg)	70[5]	70[5]	43[6]	15[5]	70[5]	15[5]	70[5]
AT_n (days)	365[6]	9,125[6]	4,015[6]	2,190[6]	8,760[6]	2,190[6]	8,760[6]
AT_c (days)	25,550[6]	25,550[6]	25,550[6]	25,550[6]	25,550[6]	25,550[6]	25,550[6]
Incidental Ingestion/Dermal Contact with Soil							
IR (mg/day)	330[7]	100[5]	100[5]	200[5]	100[5]	200[5]	100[5]
EF-Soil (days/year)	150[8]	250[5]	26[9]	52[10]	52[10]	350[5]	350[5]
FI (unitless)	1[5]	1[5]	1[5]	0.5[2]	0.5[2]	1[5]	1[5]
SA (cm^2/day)	3,300[11]	3,300[11]	3,820[12]	3,300[13]	9,070[14]	2,800[11]	5,700[11]
AF (mg/cm^2)	0.3[11]	0.2[11]	0.2[11]	0.2[11]	0.07[11]	0.2[11]	0.07[11]
ABS (unitless)	chemical-specific[11]	chemical-specific[11]	chemical-specific[11]	chemical-specific[11]	chemical-specific[11]	chemical-specific[11]	chemical-specific[11]
CF (kg/mg)	1E-06	1E-06	1E-06	1E-06	1E-06	1E-06	1E-06
Inhalation Fugitive Dust/Volatile Emissions from Surface Soil							
C_{air} (mg/m^3)	calculated[15]	calculated[15]	calculated[15]	calculated[15]	calculated[15]	calculated[15]	calculated[15]
InhR (m^3/hour)	2.5[16]	20 m^3/day[3]	1.2[16]	1.2[16]	1.6[16]	15 m^3/day[16]	20 m^3/day[16]
ET (hours/day)	8[17]	8[17]	4[2]	4[2]	4[2]	24[16]	24[16]
EF-Soil (days/year)	150[8]	250[5]	26[9]	52[10]	52[10]	350[5]	350[5]
PEF (m^3/kg)	1.49E+06[7]	1.316E+09[18]	1.316E+09[18]	1.316E+09[18]	1.316E+09[18]	1.316E+09[18]	1.316E+09[18]
Ingestion/Dermal Contact with Ground Water							
IR_{gw} (L/day)	NA	1[2]	NA	1[2]	1[2]	1.5[16]	2[5]
EF (days/year)	150[8]	250[5]	NA	52[9]	52[9]	350[5]	350[5]
ET (hours/day) and t_{event}	2[2]	0.25[2]	NA	0.25[2]	0.25[2]	0.25[16]	0.25[16]
EV (events/day)	1[2]	1[2]	NA	1[2]	1[2]	1[2]	1[2]
A (cm^2/day)	3,300[11]	3,300[11]	NA	3,300[13]	9,070[14]	6,600[11]	18,000[11]
K_p (cm/hour)	chemical-	chemical-	NA	chemical-	chemical-	chemical-	chemical-
t* (hour/event), τ (hour),	chemical-	chemical-	NA	chemical-	chemical-	chemical-	chemical-
Incidental Ingestion/Dermal Contact with Sediment							
IR (mg/day)	NA	NA	100[5]	200[5]	100[5]	100[2]	50[2]
EF-Sediment (days/year)	NA	NA	26[9]	52[10]	52[10]	52[10]	52[10]
FI (unitless)	NA	NA	1[5]	0.5[2]	0.5[2]	1[5]	1[5]
SA (cm^2/day)	NA	NA	3,280[12]	3,300[13]	9,070[14]	2,800[11]	5,700[11]
AF (mg/cm^2)	NA	NA	0.2[11]	0.2[11]	0.07[11]	0.2[11]	0.07[11]
ABS (unitless)	NA	NA	chemical-specific[11]	chemical-specific[11]	chemical-specific[11]	chemical-specific[11]	chemical-specific[11]
CF (kg/mg)	NA	NA	1E-06	1E-06	1E-06	1E-06	1E-06

TABLE 7-17

SUMMARY OF EXPOSURE INPUT PARAMETERS
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE INDIANA

Notes:

A	Skin surface area available for contact	EF	Exposure frequency
ABS	Absorption factor	ET	Exposure time
AF	Soil-to-skin adherence factor	EV	Event frequency
AT_c	Averaging time for carcinogenic effects	FI	Fraction ingested from contaminated source
AT_n	Averaging time for noncarcinogenic effects	InhR	Inhalation rate
BW	Body weight	IR	Ingestion rate
CF	Conversion factor	NA	Not applicable
$C_{soil/sed}$	Exposure concentration for soil/sediment	SA	Skin surface area available for contact
C_{air}	Exposure concentration for air	PEF	Particulate emission factor
ED	Exposure duration	UCL	Upper confidence limit on arithmetic mean

1 - U.S. EPA, 2002. Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.
2 - Professional judgment.
3 - U.S. EPA, 1991: Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.
4 - Adolescents ages 7 to 16 years old.
5 - U.S. EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
6 - U.S. EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
7 - U.S. EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9365.4-24.
8 - Ground is assumed to be frozen or snow covered 22 weeks/year.
9 - Assume one day a week in warm weather months for reasonable maximum exposure and every other week for central tendency exposure.
10 - Assume two days a week in warm weather months for reasonable maximum exposure and one day a week for central tendency exposure.
11 - U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. PA/540/R/99/005.
12 - Assume 25 percent of total body surface area is exposed, U.S. EPA, 1997: Exposure Factors Handbook. EPA/600/8-95/002FA.
13 - Assume 50 percent of total body surface area is exposed, U.S. EPA, 2004.
14 - Assume that head, arms, hands, lower legs, and feet are exposed, U.S. EPA, 1997a.
15 - U.S. EPA, 1996: Soil Screening Guidance: Technical Background Document (PEF values site specific).
16 - U.S. EPA, 1997: Exposure Factors Handbook. EPA/600/8-95/002FA.
17 - Assume an 8-hour work shift.
18 - IDEM, 2004: RISC Technical Guide, January Update.
19 - VDEQ September 2004. Virginia Department of Environmental Quality (VDEQ, online -http://www.deq.state.va.us/brownfieldweb/vrp.html).
20 - Foster, S.A. and P.C. Chrostowski, 1987. Inhalation Exposure to Volatile Organic Contaminants in the Shower.

TABLE 7-18

SUMMARY OF EXPOSURE INPUT PARAMETERS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE INDIANA

Exposure Parameter	Construction Worker	Industrial Worker	Adolescent Trespasser	Child Recreational User	Adult Recreational User	On-Site Child Resident	On-Site Adult Resident
All Exposures							
C_{soil}/C_{sed} (mg/kg)	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]
C_{gw} (µg/L)	Average	Average	NA	Average	Average	Average	Average
C_{sw} (µg/L)	NA	NA	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]
ED (years)	1[2]	9[3]	11[4]	2[3]	7[3]	2[3]	7[3]
BW (kg)	70[3]	70[3]	43[5]	15[3]	70[3]	15[3]	70[3]
AT_n (days)	365[5]	3,285[5]	4,015[5]	730[5]	2,555[5]	730[5]	2,555[5]
AT_c (days)	25,550[5]	25,550[5]	25,550[5]	25,550[5]	25,550[5]	25,550[5]	25,550[5]
Incidental Ingestion/Dermal Contact with Soil							
IR (mg/day)	165[6]	50[3]	50[3]	100[3]	50[3]	100[3]	50[3]
EF-Soil (days/year)	150[7]	219[3]	13[8]	26[9]	26[9]	234[3]	234[3]
FI (unitless)	1[3]	1[3]	1[3]	0.5[2]	0.5[2]	1[3]	1[3]
SA (cm^2/day)	3,300[10]	3,300[10]	3,100[11]	3,300[12]	9,070[13]	2,800[10]	5,700[10]
AF (mg/cm^2)	0.1[10]	0.02[10]	0.04[10]	0.04[10]	0.01[10]	0.04[10]	0.01[10]
ABS (unitless)	chemical-specific[10]	chemical-specific[10]	chemical-specific[10]	chemical-specific[10]	chemical-specific[10]	chemical-specific[10]	chemical-specific[10]
CF (kg/mg)	1E-06	1E-06	1E-06	1E-06	1E-06	1E-06	1E-06
Inhalation Fugitive Dust/Volatile Emissions from Surface Soil							
C_{air} (mg/m^3)	calculated[14]	calculated[14]	calculated[14]	calculated[14]	calculated[14]	calculated[14]	calculated[14]
InhR (m^3/hour)	2.5[15]	20 m^3/day[16]	1.2[15]	1.2[15]	1.6[15]	15 m^3/day[15]	20 m^3/day[15]
ET (hours/day)	8[17]	8[17]	2[2]	2[2]	2[2]	24[15]	24[15]
EF-Soil (days/year)	150[7]	219[3]	13[8]	26[9]	26[9]	234[3]	234[3]
PEF (m^3/kg)	1.49E+06[19]	1.316E+09[19]	1.316E+09[19]	1.316E+09[19]	1.316E+09[19]	1.316E+09[19]	1.316E+09[19]
Ingestion/Dermal Contact with Groundwater							
IR_{gw} (L/day)	NA	1[2]	NA	1[2]	1[2]	0.66[15]	1.4[3]
EF (days/year)	150[7]	219[3]	NA	26[9]	26[9]	234[3]	234[3]
ET (hours/day) and t_{event}	1.5[2]	0.167[2]	NA	0.167[2]	0.167[2]	0.167[15]	0.167[15]
EV (events/day)	1[2]	1[2]	NA	1[2]	1[2]	1[2]	1[2]
A (cm^2/day)	3,300[10]	3,300[10]	NA	3,300[12]	9,070[13]	6,600[10]	18,000[10]
K_p (cm/hour)	chemical-	chemical-	NA	chemical-	chemical-	chemical-	chemical-
t* (hour/event), τ (hour),	chemical-	chemical-	NA	chemical-	chemical-	chemical-	chemical-
Incidental Ingestion/Dermal Contact with Sediment							
IR (mg/day)	NA	NA	50[3]	100[3]	50[3]	50[2]	25[2]
EF-Sediment (days/year)	NA	NA	13[8]	26[9]	26[9]	26[9]	26[9]
FI (unitless)	NA	NA	1[3]	0.5[2]	0.5[2]	1[3]	1[3]
SA (cm^2/day)	NA	NA	3,100[11]	3,300[12]	9,070[13]	2,800[10]	5,700[10]
AF (mg/cm^2)	NA	NA	0.04[10]	0.04[10]	0.01[10]	0.04[10]	0.01[10]
ABS (unitless)	NA	NA	chemical-specific[10]	chemical-specific[10]	chemical-specific[10]	chemical-specific[10]	chemical-specific[10]
CF (kg/mg)	NA	NA	1E-06	1E-06	1E-06	1E-06	1E-06

TABLE 7-18

SUMMARY OF EXPOSURE INPUT PARAMETERS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE INDIANA

Notes:

A	Skin surface area available for contact	EF	Exposure frequency
ABS	Absorption factor	ET	Exposure time
AF	Soil-to-skin adherence factor	EV	Event frequency
AT_c	Averaging time for carcinogenic effects	FI	Fraction ingested from contaminated source
AT_n	Averaging time for noncarcinogenic effects	InhR	Inhalation rate
BW	Body weight	IR	Ingestion rate
CF	Conversion factor	NA	Not applicable
$C_{soil/sed}$	Exposure concentration for soil/sediment	SA	Skin surface area available for contact
C_{air}	Exposure concentration for air	PEF	Particulate emission factor
ED	Exposure duration	UCL	Upper confidence limit on arithmetic mean

1 - U.S. EPA, 2002. Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.
2 - Professional judgment.
3 - U.S. EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
4 - Adolescents ages 7 to 16 years old.
5 - U.S. EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
6 - Central tendency exposure is assumed to be one-half the reasonable maximum exposure value.
7 - Ground is assumed to be frozen or snow covered 22 weeks per year.
8 - Assume 1 day a week in warm weather months for RME and every other week for CTE.
9 - Assume 2 days a week in warm weather months for RME and one day a week for CTE.
10 - U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. PA/540/R/99/005.
11 - Assume 25 percent of total body surface area is exposed, U.S. EPA, 1997: Exposure Factors Handbook. EPA/600/8-95/002FA.
12 - Assume 50 percent of total body surface area is exposed, U.S. EPA, 2004.
13 - Assume that head, arms, hands, lower legs, and feet are exposed (U.S. EPA, 1997a).
14 - U.S. EPA, 1996: Soil Screening Guidance: Technical Background Document (PEF values site specific).
15 - U.S. EPA, 1997: Exposure Factors Handbook. EPA/600/8-95/002FA.
16 - U.S. EPA, 1991: Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.
17 - Assume an 8-hour work shift.
18 - U.S. EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9365.4-24.
19 - IDEM, 2004: RISC Technical Guide, January Update.
20 - VDEQ September 2004. Virginia Department of Environmental Quality (VDEQ, online -http://www.deq.state.va.us/brownfieldweb/vrp.html).
21 - Foster, S.A. and P.C. Chrostowski, 1987. Inhalation Exposure to Volatile Organic Contaminants in the Shower.

TABLE 7-19
CHEMICAL PROPERTIES FOR
VOLATILIZATION FROM SOIL/GROUNDWATER TO OUTDOOR AIR MODELS
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Chemical	Molecular Weight (g/mole)	Organic Carbon Partition Coefficient (cm^3/g)	Air Diffusivity (cm^2/sec)	Water Diffusivity (cm^2/sec)	Solubility Limit (mg/L)	Henry's Law Constant	
						(Dimensionless)	(atm-m^3/mol)
Benzene	7.81E+01	1.46E+02	9.00E-02	1.00E-05	1.79E+03	2.30E-01	5.55E-03
Ethylbenzene	1.06E+02	4.46E+02	6.80E-02	8.50E-06	1.69E+02	3.20E-01	7.88E-03
Total Xylenes	1.06E+02	3.83E+02	8.50E-02	9.90E-06	1.06E+02	2.10E-01	5.18E-03
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA

Source: U.S. EPA RSL Table, November 2010.
NA - Not applicable, chemical is not considered to be a VOC.

TABLE 7-20
INPUT PARAMETERS FOR CALCULATION OF
THE VOLATILIZATION FROM SOIL TO OUTDOOR AIR MODELS
SWMU 32 FORMER FULE OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Parameter	Definition	Value	Reference
Q/C	Inverse of mean concentration at center of source (g/m^2-s per kg/m^3).	68.81	U.S. EPA, 2002; IDEM, 2009
T	Exposure interval (seconds).	9.5E+08	U.S. EPA, 2002; IDEM, 2009
pb	Dry soil bulk density (g/cm^3).	1.5	U.S. EPA, 2002; IDEM, 2009
ps	Soil particle density (g/cm^3).	2.65	U.S. EPA, 2002; IDEM, 2009
θw	Water-filled soil porosity (L_{pore}/L_{soil}).	0.15	U.S. EPA, 2002; IDEM, 2009
n	Total soil porosity (L_{pore}/L_{soil}).	0.434	U.S. EPA, 2002; IDEM, 2009
Di	Diffusivity in air (cm^2/sec).	Chemical specific	U.S. EPA, 2010
H'	Dimensionless Henry's Law Constant.	Chemical specific	U.S. EPA, 2010
S	Solubility limit (mg/L)	Chemical specific	U.S. EPA, 2010
Dw	Diffusivity in water (cm^2/sec).	Chemical specific	U.S. EPA, 2010
Koc	Soil organic carbon partition coefficient (cm^3/g).	Chemical specific	U.S. EPA, 2010
foc	Fraction organic carbon in soil (g/g).	0.006	U.S. EPA, 2002; IDEM, 2009

Notes:
Chemical specific values are presented in Table 7-19.
IDEM, 2009: RISC Technical Guide, May Update.
U.S. EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.
U.S. EPA 2010, U.S. EPA RSL Table, November 2010.

TABLE 7-21
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal[1]	Absorbed RfD for Dermal[2]		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds										
Benzene	Chronic	4.00E-03	mg/kg/day	1	4.00E-03	mg/kg/day	Blood	1000/1	IRIS	12/14/2010
Ethylbenzene	Chronic	1.00E-01	mg/kg/day	1	1.00E-01	mg/kg/day	Liver, Kidney	1000/1	IRIS	12/14/2010
Total Xylenes	Chronic	2.0E-01	mg/kg/day	1	2.0E-01	mg/kg/day	Body Weight	1000/1	IRIS	12/14/2010
Semivolatile Organic Compounds										
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	Chronic	2.0E-02	mg/kg/day	1	2.0E-02	mg/kg/day	Body Weight	3000/1	IRIS	12/14/2010

Notes:
1 - U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.
2 - Adjusted dermal RfD = Oral RfD x Oral Absorption Efficiency for Dermal.

TABLE 7-22
NON-CANCER TOXICITY DATA -- INHALATION
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Extrapolated RfD[1]		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds									
Benzene	Chronic	3.00E-02	mg/m^3	8.57E-03	mg/kg/day	Blood	NA	IRIS	12/14/2010
Ethylbenzene	Chronic	1.00E+00	mg/m^3	2.86E-01	mg/kg/day	Liver, Kidney	NA	IRIS	12/14/2010
Total Xylenes	Chronic	1.0E-01	mg/m^3	2.86E-02	mg/kg/day	Body Weight	NA	IRIS	12/14/2010
Semivolatile Organic Compounds									
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	Chronic	3.0E-03	mg/m^3	8.57E-04	mg/kg/day	Body Weight	NA	IRIS	12/14/2010

Notes:
1 - Extrapolated RfD = RfC *$20m^3$/day / 70 kg
NA = Not Applicable

TABLE 7-23
CANCER TOXICITY DATA -- ORAL/DERMAL
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal[1]	Absorbed Cancer Slope Factor for Dermal[2]		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds								
Benzene	5.50E-02	$(mg/kg/day)^{-1}$	1	5.5E-02	$(mg/kg/day)^{-1}$	A	IRIS	12/14/2010
Ethylbenzene	1.10E-02	(mg/kg/day)-1	1	1.1E-02	$(mg/kg/day)^{-1}$	D	California EPA	12/18/2008
Total Xylenes	NA	NA	1	NA	NA	D	NA	NA
Semivolatile Organic Compounds								
Benzo(a)anthracene	7.3E-01	$(mg/kg/day)^{-1}$	1	7.3E-01	$(mg/kg/day)^{-1}$	B2	E	7/1993
Benzo(a)pyrene	7.3E+00	$(mg/kg/day)^{-1}$	1	7.3E+00	$(mg/kg/day)^{-1}$	B2	IRIS	12/14/2010
Benzo(b)fluoranthene	7.3E-01	$(mg/kg/day)^{-1}$	1	7.3E-01	$(mg/kg/day)^{-1}$	B2	E	7/1993
Benzo(k)fluoranthene	7.3E-02	$(mg/kg/day)^{-1}$	1	7.3E-02	$(mg/kg/day)^{-1}$	B2	E	7/1993
Chrysene	7.3E-03	$(mg/kg/day)^{-1}$	1	7.3E-03	$(mg/kg/day)^{-1}$	B2	E	7/1993
Dibenzo(a,h)anthracene	7.3E+00	$(mg/kg/day)^{-1}$	1	7.3E+00	$(mg/kg/day)^{-1}$	B2	E	7/1993
Indeno(1,2,3-cd)pyrene	7.3E-01	$(mg/kg/day)^{-1}$	1	7.3E-01	$(mg/kg/day)^{-1}$	B2	E	7/1993
Naphthalene	NA	NA	1	NA	NA	C	NA	NA

Notes:
1 - U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.
2 - Adjusted cancer slope factor for dermal = Oral cancer slope factor / Oral Absorption Efficiency for Dermal.

EPA Group:
A - Human carcinogen.
B1 - Probable human carcinogen - indicates that limited human data are available.
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans .
C - Possible human carcinogen.
D - Not classifiable as a human carcinogen.
E - Evidence of noncarcinogenicity.

Source:
E = U.S. EPA, Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons, July 1993, EPA/600/R-93/089.

TABLE 7-24
CANCER TOXICITY DATA -- INHALATION
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor[1]		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds							
Benzene	7.80E-09	$(mg/m^3)^{-1}$	2.73E-08	$(mg/kg/day)^{-1}$	A	IRIS	12/14/2010
Ethylbenzene	2.50E-09	(mg/m3)-1	8.75E-09		D	California EPA	12/18/2008
Total Xylenes	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds							
Benzo(a)anthracene	1.1E-07	$(mg/m^3)^{-1}$	3.85E-07	$(mg/kg/day)^{-1}$	B2	California EPA	12/18/2008
Benzo(a)pyrene	1.10E-06	(mg/m3)-1	3.85E-06	(mg/kg/day)-1	B2	California EPA	12/18/2008
Benzo(b)fluoranthene	1.1E-07	(mg/m3)-1	3.85E-07	(mg/kg/day)-1	B2	California EPA	12/18/2008
Benzo(k)fluoranthene	1.1E-07	$(mg/m^3)^{-1}$	3.85E-07	$(mg/kg/day)^{-1}$	B2	California EPA	12/18/2008
Chrysene	1.1E-08	(mg/m3)-1	3.85E-08	(mg/kg/day)-1	B2	California EPA	12/18/2008
Dibenzo(a,h)anthracene	1.2E-06	(mg/m3)-1	4.20E-06	(mg/kg/day)-1	B2	California EPA	12/18/2008
Indeno(1,2,3-cd)pyrene	1.1E-07	(mg/m3)-1	3.85E-07	(mg/kg/day)-1	B2	California EPA	12/18/2008
Naphthalene	3.4E-08	(mg/m3)-1	1.19E-07	(mg/kg/day)-1	C	California EPA	12/18/2008

Notes:

1 - Inhalation CSF = Unit Risk * 70 kg / $20m^3$/day.

EPA Group:

A - Human carcinogen.

B1 - Probable human carcinogen - indicates that limited human data are available.

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans .

C - Possible human carcinogen.

D - Not classifiable as a human carcinogen.

E - Evidence of noncarcinogenicity.

TABLE 7-25

SUMMARY OF CANCER RISKS AND HAZARD INDICES
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals Contributing to an HI > 1
Industrial Worker	Decision Unit 1 Surface Soil	Ingestion	1E-06	--	--	--	--	--
		Dermal	1E-06	--	--	--	---	--
		Total	3E-06	--	--	BENZO(A)PYRENE	--	--
	Decision Unit 2 Surface Soil	Ingestion	4E-08	--	--	--	0.0000002	--
		Dermal	3E-08	--	--	--	0.0000002	--
		Total	7E-08	--	--	--	0.0000003	--
	Groundwater	Ingestion	1E-06	--	--	--	0.00002	--
		Dermal	4E-07	--	--	--	0.00002	--
		Total	2E-06	--	--	--	0.00004	--
Adolescent Trespasser	Decision Unit 1 Surface Soil	Ingestion	3E-07	--	--	--	--	--
		Dermal	3E-07	--	--	--	---	--
		Total	6E-07	--	--	--	--	--
	Decision Unit 2 Surface Soil	Ingestion	9E-09	--	--	--	0.00000003	--
		Dermal	9E-09	--	--	--	0.00000003	--
		Total	2E-08	--	--	--	0.00000006	--
Construction Worker	Decision Unit 1 Surface Soil	Ingestion	1E-07	--	--	--	--	--
		Dermal	4E-08	--	--	--	--	--
		Total	2E-07	--	--	--	--	--
	Decision Unit 1 Subsurface Soil	Incidental Ingestion	4E-09	--	--	--	0.00007	--
		Dermal Contact	1E-09	--	--	--	--	--
		Inhalation	5E-08	--	--	--	0.02	--
		Total	6E-08	--	--	--	0.01618	--
	Decision Unit 2 Surface Soil	Incidental Ingestion	3E-09	--	--	--	0.0000004	--
		Dermal Contact	1E-09	--	--	--	0.0000001	--
		Total	4E-09	--	--	--	0.0000005	--
	Decision Unit 2 Subsurface Soil	Ingestion	3E-08	--	--	--	--	--
		Dermal	1E-08	--	--	--	--	--
		Total	5E-08	--	--	--	--	--
	Groundwater	Dermal	5E-09	--	--	--	0.000005	--
		Total	5.E-09	--	--	--	0.000005	--

TABLE 7-25

SUMMARY OF CANCER RISKS AND HAZARD INDICES
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals Contributing to an HI > 1
Child Recreational User	Decision Unit 1 Surface Soil	Ingestion	1E-06	--	--	--	--	--
		Dermal	1E-06	--	--	--	--	--
		Total	3E-06	--	--	BENZO(A)PYRENE	--	--
	Decision Unit 2 Surface Soil	Ingestion	5E-08	--	--	--	0.0000002	--
		Dermal	4E-08	--	--	--	0.0000002	--
		Total	9E-08	--	--	--	0.0000003	--
	Groundwater	Ingestion	2E-06	--	--	--	0.00002	--
		Dermal	9E-08	--	--	--	0.000003	--
		Total	2E-06	--	--	--	0.00002	--
Adult Recreational User	Decision Unit 1 Surface Soil	Ingestion	2E-07	--	--	--	--	--
		Dermal	3E-07	--	--	--	--	--
		Total	6E-07	--	--	--	--	--
	Decision Unit 2 Surface Soil	Ingestion	7E-09	--	--	--	2E-08	--
		Dermal	1E-08	--	--	--	3E-08	--
		Total	2E-08	--	--	--	5E-08	--
	Groundwater	Ingestion	5E-07	--	--	--	0.000004	--
		Dermal	7E-08	--	--	--	0.000002	--
		Total	5E-07	--	--	--	0.00001	--
Lifelong Recreational User (Child and Adult)	Decision Unit 1 Surface Soil	Ingestion	2E-06	--	--	--	--	--
		Dermal	2E-06	--	--	--	--	--
		Total	3E-06	--	--	BENZO(A)PYRENE	--	--
	Decision Unit 2 Surface Soil	Ingestion	5E-08	--	--	--	0.0000002	--
		Dermal	5E-08	--	--	--	0.0000002	--
		Total	1E-07	--	--	--	0.0000004	--
	Groundwater	Ingestion	2E-06	--	--	BENZO(A)PYRENE	0.00002	--
		Dermal	2E-07	--	--	--	0.000005	--
		Total	2E-06	--	--	BENZO(A)PYRENE	0.00003	--

TABLE 7-25

SUMMARY OF CANCER RISKS AND HAZARD INDICES
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals Contributing to an HI > 1
Child Residents	Decision Unit 1 Surface Soil	Ingestion	2E-05	--	BENZO(A)PYRENE	BENZO(B)FLUORANTHENE, DIBENZO(A,H)ANTHRACENE	--	--
		Dermal	8E-06		--	BENZO(A)PYRENE	--	--
		Total	3E-05	--	BENZO(A)PYRENE	BENZO(A)ANTHRACENE, BENZO(B)FLUORANTHENE, DIBENZO(A,H)ANTHRACENE, INDENO(1,2,3-CD)PYRENE	--	--
	Decision Unit 2 Surface Soil	Ingestion	6E-07	--	--	--	0.000002	
		Dermal	2E-07	--	--	--	0.0000009	--
		Total	9E-07	--	--	--	0.000003	--
	Groundwater	Ingestion	2E-05	--	--	BENZO(A)ANTHRACENE, BENZO(A)PYRENE, BENZO(B)FLUORANTHENE	0.0002	--
		Dermal	1E-06	--	--	--	0.00004	--
		Total	2E-05	--	--	BENZO(A)ANTHRACENE, BENZO(A)PYRENE, BENZO(B)FLUORANTHENE	0.0002	--
Adult Residents	Decision Unit 1 Surface Soil	Ingestion	3E-06	--	--	BENZO(A)PYRENE	--	--
		Dermal	2E-06	--	--	--	--	--
		Total	5E-06	--	--	BENZO(A)PYRENE	--	--
	Decision Unit 2 Surface Soil	Ingestion	9E-08	--	--	--	0.0000003	--
		Dermal	5E-08	--	--	--	0.0000001	--
		Total	1E-07	--	--	--	0.0000004	--
	Groundwater	Ingestion	6E-06	--	--	BENZO(A)PYRENE	0.00006	--
		Dermal	1E-06	--	--	--	0.00002	--
		Total	7E-06	--	--	BENZO(A)PYRENE	0.00008	--
Lifelong Residents (Child and Adult)	Decision Unit 1 Surface Soil	Ingestion	3E-05	--	BENZO(A)PYRENE	BENZO(A)ANTHRACENE, BENZO(B)FLUORANTHENE, DIBENZO(A,H)ANTHRACENE	--	
		Dermal	1E-05	--	--	BENZO(A)PYRENE	--	
		Total	4E-05	--	BENZO(A)PYRENE	BENZO(A)ANTHRACENE, BENZO(B)FLUORANTHENE, DIBENZO(A,H)ANTHRACENE, INDENO(1,2,3-CD)PYRENE	--	
	Decision Unit 2 Surface Soil	Ingestion	7E-07	--	--	--	0.000002	
		Dermal	3E-07	--	--	--	0.000001	
		Total	1E-06	--	--	--	0.000003	
	Groundwater	Ingestion	2E-05	--	BENZO(A)PYRENE	BENZO(A)ANTHRACENE, BENZO(B)FLUORANTHENE	0.0003	
		Dermal	2E-06	--	--	BENZO(K)FLUORANTHENE	0.00006	
		Total	2E-05	--	BENZO(A)PYRENE	BENZO(A)ANTHRACENE, BENZO(B)FLUORANTHENE, BENZO(K)FLUORANTHENE	0.0003	

TABLE 7-26

SUMMARY OF CANCER RISKS AND HAZARD INDICES
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks > 10^{-4}	Chemicals with Cancer Risks > 10^{-5} and ≤ 10^{-4}	Chemicals with Cancer Risks > 10^{-6} and ≤ 10^{-5}	Hazard Index	Chemicals Contributing to an HI > 1
Industrial Worker	Decision Unit 1 Surface Soil	Ingestion	2E-07	--	--	--	--	--
		Dermal	4E-08	--	--	--	--	--
		Total	3E-07	--	--	--	--	--
	Decision Unit 2 Surface Soil	Ingestion	6E-09	--	--	--	0.00000008	--
		Dermal	1E-09	--	--	--	0.00000001	--
		Total	7E-09	--	--	--	0.00000009	--
	Groundwater	Ingestion	4E-07	--	--	--	0.00002	--
		Dermal	2E-08	--	--	--	0.00001	--
		Total	4E-07	--	--	--	0.00003	--
Adolescent Trespasser	Decision Unit 1 Surface Soil	Ingestion	8E-08	--	--	--	--	--
		Dermal	2E-08	--	--	--	--	--
		Total	1E-07	--	--	--	--	--
	Decision Unit 2 Surface Soil	Ingestion	2E-09	--	--	--	--	--
		Dermal	6E-10	--	--	--	--	--
		Total	3E-09	--	--	--	0.00000001	--
Construction Worker	Decision Unit 1 Surface Soil	Ingestion	5E-08	--	--	--	--	--
		Dermal	1E-08	--	--	--	--	--
		Total	7E-08	--	--	--	--	--
	Decision Unit 1 Subsurface Soil	Incidental Ingestion	2E-09	--	--	--	0.00003	--
		Dermal Contact	5E-10	--	--	--	--	--
		Inhalation	5E-08	--	--	--	0.02	--
		Total	6E-08	--	--	--	0.02	--
	Decision Unit 2 Surface Soil	Incidental Ingestion	2.E-09	--	--	--	0.0000002	--
		Dermal Contact	4.E-10	--	--	--	0.00000005	--
		Total	2E-09	--	--	--	0.0000002	--
	Decision Unit 2 Subsurface Soil	Ingestion	2E-08	--	--	--	--	--
		Dermal	4E-09	--	--	--	--	--
		Total	2E-08	--	--	--	--	--
	Groundwater	Dermal	4E-09	--	--	--	0.000005	--
		Total	4E-09	--	--	--	0.000005	--
Child Recreational User	Decision Unit 1 Surface Soil	Ingestion	2E-07	--	--	--	--	--
		Dermal	8E-08	--	--	--	--	--
		Total	3E-07	--	--	--	--	--
	Decision Unit 2 Surface Soil	Ingestion	7E-09	--	--	--	0.00000004	--
		Dermal	3E-09	--	--	--	0.00000002	--
		Total	1E-08	--	--	--	0.00000006	--
	Groundwater	Ingestion	3E-07	--	--	BENZO(A)PYRENE	0.00001	--
		Dermal	1E-08	--	--	--	0.000001	--
		Total	3E-07	--	--	BENZO(A)PYRENE	0.00001	--
Adult Recreational User	Decision Unit 1 Surface Soil	Ingestion	2E-08	--	--	--	--	--
		Dermal	1E-08	--	--	--	--	--
		Total	4E-08	--	--	--	--	--
	Decision Unit 2 Surface Soil	Ingestion	8E-10	--	--	--	0.000000005	--
		Dermal	4E-10	--	--	--	0.000000002	--
		Total	1E-09	--	--	--	0.000000007	--
	Groundwater	Ingestion	6E-08	--	--	--	0.000002	--
		Dermal	7E-09	--	--	--	0.000001	--
		Total	6E-08	--	--	--	0.000003	--

TABLE 7-26

SUMMARY OF CANCER RISKS AND HAZARD INDICES
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks > 10^{-4}	Chemicals with Cancer Risks > 10^{-5} and ≤ 10^{-4}	Chemicals with Cancer Risks > 10^{-6} and ≤ 10^{-5}	Hazard Index	Chemicals Contributing to an HI > 1
Lifelong Recreational User (Child and Adult)	Decision Unit 1 Surface Soil	Ingestion	2E-07	--	--	--	--	--
		Dermal	9E-08	--	--	--	--	--
		Total	3E-07	--	--	--	--	--
	Decision Unit 2 Surface Soil	Ingestion	8E-09	--	--	--	0.00000005	--
		Dermal	3E-09	--	--	--	0.00000002	--
		Total	1E-08	--	--	--	0.00000007	--
	Groundwater	Ingestion	4E-07	--	--	BENZO(A)PYRENE	0.00001	--
		Dermal	2E-08	--	--	--	0.000002	--
		Total	4E-07	--	--	--	0.00001	--
Child Residents	Decision Unit 1 Surface Soil	Ingestion	3E-06	--	--	BENZO(A)PYRENE	--	--
		Dermal	5E-07	--	--	--	--	--
		Total	4E-06	--	--	BENZO(A)PYRENE	--	--
	Decision Unit 2 Surface Soil	Ingestion	9E-08	--	--	--	0.0000008	--
		Dermal	1E-08	--	--	--	0.0000001	--
		Total	1E-07	--	--	--	0.0000009	--
	Groundwater	Ingestion	2E-06	--	--	--	0.0001	--
		Dermal	3E-07	--	--	--	0.00002	--
		Total	2E-06	--	--	--	0.0001	--
Adult Residents	Decision Unit 1 Surface Soil	Ingestion	3E-07	--	--	--	--	--
		Dermal	4E-08	--	--	--	--	--
		Total	3E-07	--	--	--	--	--
	Decision Unit 2 Surface Soil	Ingestion	8E-09	--	--	--	0.00000008	--
		Dermal	1E-09	--	--	--	0.00000001	--
		Total	9E-09	--	--	--	0.0000001	--
	Groundwater	Ingestion	7E-07	--	--	BENZO(A)PYRENE	0.00003	--
		Dermal	1E-07	--	--	--	0.00001	--
		Total	8E-07	--	--	BENZO(A)PYRENE	0.00004	--
Lifelong Residents (Child and Adult)	Decision Unit 1 Surface Soil	Ingestion	3E-06	--	--	BENZO(A)PYRENE	--	--
		Dermal	5E-07	--	--	--	--	--
		Total	4E-06	--		BENZO(A)PYRENE	--	--
	Decision Unit 2 Surface Soil	Ingestion	9E-08	--	--	--	0.0000009	--
		Dermal	1E-08	--	--	--	0.0000001	--
		Total	1E-07	--	--	--	0.000001	--
	Groundwater	Ingestion	3E-06	--	--	BENZO(A)PYRENE	0.00008	--
		Dermal	4E-07	--	--	--	0.00004	--
		Total	3E-06	--	--	BENZO(A)PYRENE	0.0001	--

TABLE 7-27
SUMMARY OF INDUSTRIAL WORKERS CANCER RISKS AND HAZARDS INDICES FOR EXPOSURES TO SUBSURFACE SOIL - DECISION UNIT 1
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	EPC[1] (mg/kg)	U.S. EPA Industrial Screening Level[2] (mg/kg)	Estimated ILCR	U.S. EPA Industrial Screening Level[2] (mg/kg)	PRG - Industrial[2] (mg/kg)	Estimated HQ
Volatiles						
BENZENE	0.144	5.4	3.E-08	Blood	450	0.0003
ETHYLBENZENE	0.031	27	1.E-09	Developmental, Liver, Kidney	21000	0.000001
TOTAL XYLENES	0.154	--	--	Neurological	17000	0.000009
PAHS						
BENZO(A)ANTHRACENE	0.022	2.1	1.E-08	Carcinogen	--	--
BENZO(A)PYRENE	0.016	0.21	8.E-08	Carcinogen	--	--
BENZO(B)FLUORANTHENE	0.015	2.1	7.E-09	Carcinogen	--	--
NAPHTHALENE	0.262	18	1.E-08	Nasal	620	0.0004
		Total Carcinogenic Risk	**1.E-07**		**Total HI**	**0.0008**

Target Organ HIs

Total Blood HI = 0.0003
Total Developmental HI = 0.000001
Total Liver HI = 0.000001
Total Kidney HI = 0.000001
Total Neurological HI = 0.000009
Total Nasal HI = 0.0004

Footnotes:
1 - Exposure Point Concentration (EPC) is the 95 percent UCL calculated using U.S. EPA's ProUCL version 4.00.05.
2 - Source: USEPA, November, 2010. Industrial soil screening values.

TABLE 7-28
SUMMARY OF INDUSTRIAL WORKERS CANCER RISKS AND HAZARDS INDICES FOR EXPOSURES TO SUBSURFACE SOIL - DECISION UNIT 2
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	EPC[1] (mg/kg)	U.S. EPA Industrial Screening Level[2] (mg/kg)	Estimated ILCR	U.S. EPA Industrial Screening Level[2] (mg/kg)	PRG - Industrial[2] (mg/kg)	Estimated HQ
PAHS						
BENZO(A)ANTHRACENE	0.394	2.1	2.E-07	Carcinogen	--	--
BENZO(A)PYRENE	0.121	0.21	6.E-07	Carcinogen	--	--
		Total Carcinogenic Risk	**8.E-07**		**Total HI**	**--**

Footnotes:
1 - There were less than three detected concentrations, maximum detected concentration is used as the EPC.
2 - Source: USEPA, November, 2010. Industrial soil screening values.

TABLE 7-29
SUMMARY OF RESIDENTIAL CANCER RISKS AND HAZARDS INDICES FOR EXPOSURES TO SUBSURFACE SOIL - DECISION UNIT 1
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	EPC[1] (mg/kg)	U.S. EPA Residential Screening Level[2] (mg/kg)	Estimated ILCR	Primary Target Organs	U.S. EPA Residential Screening Level[2] (mg/kg)	Estimated HQ
Volatiles						
BENZENE	0.144	1.1	1.E-07	Blood	86	0.002
ETHYLBENZENE	0.031	5.4	6.E-09	Developmental, Liver, Kidney	3500	0.000009
TOTAL XYLENES	0.154	--	--	Neurological	630	0.0002
PAHS						
BENZO(A)ANTHRACENE	0.022	0.15	1.E-07	Carcinogen	--	--
BENZO(A)PYRENE	0.016	0.015	1.E-06	Carcinogen	--	--
BENZO(B)FLUORANTHENE	0.015	0.15	1.E-07	Carcinogen	--	--
NAPHTHALENE	0.262	3.6	7.E-08	Nasal	150	0.002
		Total Carcinogenic Risk	**2.E-06**		**Total HI**	**0.004**

Target Organ HIs

Total Blood HI = 0.002
Total Developmental HI = 0.000009
Total Liver HI = 0.000009
Total Kidney HI = 0.000009
Total Neurological HI = 0.0002
Total Nasal HI = 0.002

Footnotes:
1 - Exposure Point Concentration (EPC) is the 95 percent UCL calculated using U.S. EPA's ProUCL version 4.00.05.
2 - Source: USEPA, November, 2010. Residential soil screening values.

TABLE 7-30
SUMMARY OF RESIDENTIAL CANCER RISKS AND HAZARDS INDICES FOR EXPOSURES TO SUBSURFACE SOIL - DECISION UNIT 2
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	EPC[1] (mg/kg)	U.S. EPA Screening Level[2] (mg/kg)	Estimated ILCR	Primary Target Organs	U.S. EPA Screening Level[2] (mg/kg)	Estimated HQ
PAHS						
BENZO(A)ANTHRACENE	0.394	0.15	3.E-06	Carcinogen	--	--
BENZO(A)PYRENE	0.121	0.015	8.E-06	Carcinogen	--	--
		Total Carcinogenic Risk	**1.E-05**		**Total HI**	**--**

Footnotes:
1 - There were less than three detected concentrations, maximum detected concentration is used as the EPC.
2 - Source: USEPA, November, 2010. Residential soil screening values.

TABLE 8-1

SURFACE SOIL COPC SELECTION
SWMU 32
NSA CRANE, CRANE, INDIANA

Parameter	Frequency of Detection	Minimum Detection	Maximum Detection	Sample ID of Maximum Detection	Average of Detections	Average of All Results[1]	Ecological Screening Level[2]		Ecological Effects Quotient[3]				Rationale for Invertebrate/ Plant Deletion or Selection	Retain for Food Chain Modeling?
							Invertebrates	Mammals	Invertebrates[4]	Plants[4]	Avian[5]	Mammals[5]		
Polycyclic Aromatic Hydrocarbons (µg/kg)														
BENZO(A)ANTHRACENE	8/56	4.57 J	3670	32SS-17-0002	574	83.5	18000	1100	0.20	NA	NA	3.3	BSL/NSL	YES
BENZO(A)PYRENE	14/62	9.39	3450	32SS-64-0002	522	119	18000	1100	0.19	NA	NA	3.1	BSL/NSL	YES
BENZO(B)FLUORANTHENE	10/56	6.56 J	4140	32SS-17-0002	508	92.3	18000	1100	0.23	NA	NA	3.8	BSL/NSL	YES
BENZO(K)FLUORANTHENE	5/56	11.4	1440	32SS-17-0002	348	32.7	18000	1100	0.08	NA	NA	1.3	BSL/NSL	YES
CHRYSENE	8/56	6.13 J	3980	32SS-17-0002	593	86.3	18000	1100	0.22	NA	NA	3.6	BSL/NSL	YES
DIBENZO(A,H)ANTHRACENE	4/56	6.41	595 J	32SS-17-0002	175	14.1	18000	1100	0.03	NA	NA	0.5	BSL/NSL	YES
INDENO(1,2,3-CD)PYRENE	5/56	17.7	2530 J	32SS-17-0002	613	56.4	18000	1100	0.14	NA	NA	2.3	BSL/NSL	YES
NAPHTHALENE	12/56	3.02 J	273	32SS-49-0002	61.9	14.5	29000	29000	0.01	NA	NA	0.01	BSL/NSL	YES

Shading indicates an exceedance of the criterion or criterion is not available.

NA - Not applicable/not available
J - estimated concentration

COPC Selection Rationale:
NSL = No Screening Level
BSL = Below Screening Level

1 - Average value determined by including non-detected concentrations as the detection limit divided by 2.
2 - Source of Ecological Screening Levels is the U.S. EPA Eco SSL for PAHs (U.S. EPA, 2007). Screening levels are not available for plants or avian wildlife.
3 - Ecological effects quotients were calculated by dividing the maximum detected concentration by the COPC screening level. Values are unitless.
4 - Cells are shaded if the chemical was retained as a COPC for that receptor. Chemicals retained as COPCs are further evaluated in the Step 3a evaluation.
5 - Shading for wildlife receptors indicates that the chemical was retained for food chain modeling. If a screening level was not available for a wildlife receptor or the chemical was retained for the other wildlife receptor, the chemical was retained for food chain modeling.

Associated samples:

32SS-01-0002	32SS-11-0002	32SS-21-0002	32SS-31-0002	32SS-41-0002	32SS-51-0002	32SS-DW02-0002
32SS-02-0002	32SS-12-0002	32SS-22-0002	32SS-32-0002	32SS-42-0002	32SS-52-0002	32SS-DW03-0002
32SS-03-0002	32SS-13-0002	32SS-23-0002	32SS-33-0002	32SS-43-0002	32SS-53-0002	
32SS-04-0002	32SS-14-0002	32SS-24-0002	32SS-34-0002	32SS-44-0002	32SS-60-0002	
32SS-05-0002	32SS-15-0002	32SS-25-0002	32SS-35-0002	32SS-45-0002	32SS-61-0002	
32SS-06-0002	32SS-16-0002	32SS-26-0002	32SS-36-0002	32SS-46-0002	32SS-62-0002	
32SS-07-0002	32SS-17-0002	32SS-27-0002	32SS-37-0002	32SS-47-0002	32SS-63-0002	
32SS-08-0002	32SS-18-0002	32SS-28-0002	32SS-38-0002	32SS-48-0002	32SS-64-0002	
32SS-09-0002	32SS-19-0002	32SS-29-0002	32SS-39-0002	32SS-49-0002	32SS-65-0002	
32SS-10-0002	32SS-20-0002	32SS-30-0002	32SS-40-0002	32SS-50-0002	32SS-DW01-0002	

TABLE 8-2

SEDIMENT COPC SELECTION
SWMU 32
NSA CRANE, CRANE, INDIANA

Parameter	Frequency of Detection	Minimum Detection	Maximum Detection	Sample ID of Maximum Detection	Average of Detections	Average of All Results[1]	Ecological Screening Level[2]	Ecological Effects Quotient[3]	Rationale for COPC Selection /Deletion
Volatile Organics (µg/kg)									
BENZENE	1/5	56.1 J	56.1 J	32SD-02-0006	56.1	11.4	142	0.40	BSL
ETHYLBENZENE	1/5	65.7 J	65.7 J	32SD-02-0006	65.7	13.5	175	0.38	BSL
TOLUENE	1/5	62.6 J	62.6 J	32SD-02-0006	62.6	12.9	1220	0.05	BSL
TOTAL XYLENES	1/5	220 J	220 J	32SD-02-0006	220	44.3	433	0.51	BSL
Polycyclic Aromatic Hydrocarbons (µg/kg)									
BENZO(A)ANTHRACENE	3/5	2.81 J	11	32SD-03-0006	6.8	4.4	108	0.10	BSL
BENZO(A)PYRENE	3/5	7.59	20.1	32SD-03-0006	14.8	9.2	150	0.13	BSL
BENZO(B)FLUORANTHENE	3/5	6.36 J	25.2	32SD-03-0006	17.8	11.0	10400	0.002	BSL
BENZO(K)FLUORANTHENE	2/5	7.67 J	8.07 J	32SD-02-0006	7.9	3.6	240	0.03	BSL
CHRYSENE	3/5	2.97 J	21.5	32SD-03-0006	10.4	6.6	166	0.13	BSL
INDENO(1,2,3-CD)PYRENE	3/5	3.88 J	9.62	32SD-03-0006	7.3	4.7	200	0.05	BSL

Shading indicates an exceedance of the criterion.

NA - Not applicable/not available
J - estimated concentration

COPC Selection Rationale:
BSL = Below Screening Level

1 - Average value determined by including non-detected concentrations as the detection limit divided by 2.
2 - Source of Ecological Screening Levels is the U.S. EPA Region 5 Screening Levels (U.S. EPA, 2003).
3 - Ecological effects quotients were calculated by dividing the maximum detected concentration by the COPC screening level. Values are unitless.

Associated Samples:

32SD-01-0006	32SD-03-0006	32SD-05-0006
32SD-02-0006	32SD-04-0006	

TABLE 8-3

TERRESTRIAL WILDLIFE MODEL NOAEL AND LOAEL EEQS-CONSERVATIVE EXPOSURE ASSUMPTIONS
SWMU 32
NSA CRANE, CRANE, INDIANA

Chemical	Meadow Vole		Bobwhite Quail		Short-Tailed Shrew		American Woodcock	
	NOAEL EEQ	LOAEL EEQ	NOAEL EEQ	LOAEL EEQ	NOAEL EEQ	LOAEL EEQ	NOAEL EEQ	LOAEL EEQ
Semivolatile Organics								
BENZO(A)ANTHRACENE	4.97E-02	7.96E-04	9.94E-03	9.94E-04	1.64E+00	2.63E-02	5.88E-01	5.88E-02
BENZO(A)PYRENE	1.02E-01	1.63E-03	1.37E-02	1.37E-03	1.30E+00	2.08E-02	4.71E-01	4.71E-02
BENZO(B)FLUORANTHENE	2.69E-01	4.30E-03	2.82E-02	2.82E-03	3.01E+00	4.82E-02	1.05E+00	1.05E-01
BENZO(K)FLUORANTHENE	3.88E-02	6.21E-04	5.44E-03	5.44E-04	1.05E+00	1.68E-02	3.63E-01	3.63E-02
CHRYSENE	5.29E-02	8.48E-04	1.07E-02	1.07E-03	2.55E+00	4.09E-02	8.92E-01	8.92E-02
DIBENZO(A,H)ANTHRACENE	1.83E-02	2.93E-04	2.43E-03	2.43E-04	3.85E-01	6.16E-03	1.34E-01	1.34E-02
INDENO(1,2,3-CD)PYRENE	6.82E-02	1.09E-03	9.57E-03	9.57E-04	2.02E+00	3.24E-02	6.99E-01	6.99E-02
NAPHTHALENE	5.94E-03	1.09E-03	5.12E-02	5.12E-03	3.13E-03	5.77E-04	1.14E-01	1.14E-02

Cells are shaded if the EEQ > 1.0

EEQ = Ecological Effects Quotient

TABLE 8-4

TERRESTRIAL WILDLIFE MODEL NOAEL AND LOAEL EEQS-LESS CONSERVATIVE EXPOSURE ASSUMPTIONS
SWMU 32
NSA CRANE, CRANE, INDIANA

Chemical	Short-Tailed Shrew		American Woodcock	
	NOAEL EEQ	LOAEL EEQ	NOAEL EEQ	LOAEL EEQ
Semivolatile Organics				
BENZO(A)ANTHRACENE	2.12E-02	3.40E-04	9.21E-03	9.21E-04
BENZO(A)PYRENE	2.54E-02	4.06E-04	1.11E-02	1.11E-03
BENZO(B)FLUORANTHENE	3.82E-02	6.12E-04	1.64E-02	1.64E-03
BENZO(K)FLUORANTHENE	1.36E-02	2.17E-04	5.81E-03	5.81E-04
CHRYSENE	3.15E-02	5.05E-04	1.35E-02	1.35E-03
INDENO(1,2,3-CD)PYRENE	2.57E-02	4.11E-04	1.10E-02	1.10E-03

EEQ = Ecological Effects Quotient
Less conservative exposure assumptions were not used to determine EEQs for the vole and quail because no conservative vole or quail food chain model EEQs were greatert than 1.0.

FIGURES

1-1 BASE AND SITE LOCATION MAP
1-2 SWMU 32 GENERAL LOCATION MAP
1-3 SWMU 32 SITE PLAN
2-1 SOIL SAMPLE LOCATION MAP AND DECISION UNITS 1 AND 2
2-2 SEDIMENT AND DRAINAGE WAY SAMPLE LOCATION MAP
2-3 GROUNDWATER MONITORING WELL LOCATION MAP
4-1 FIVE YEAR WIND ROSE SUMMARY FOR INDIANAPOLIS, INDIANA
4-2 SURFICAL GEOLOGY MAP
5-1 BENZO (A) PYRENE DETECTIONS IN SURFACE SOIL
5-2 BENZENE DETECTIONS IN SUBSURFACE SOIL
5-3 NAPTHALENE DETECTIONS IN SUBSURFACE SOIL
7-1 SUMMARY OF HUMAN HEALTH RISK ASSESSMENT
7-2 HUMAN HEALTH CONCEPTUAL SITE MODEL
8-1 NAVY ECOLOGICAL RISK ASSESSMENT TIERED APPROACH
8-2 GENERAL ERA PROCESS FOR EVALUATION OF RISKS TO CHEMICALS IN SURFACE SOIL
8-3 ECOLOGICAL CONCEPTUAL SITE MODEL

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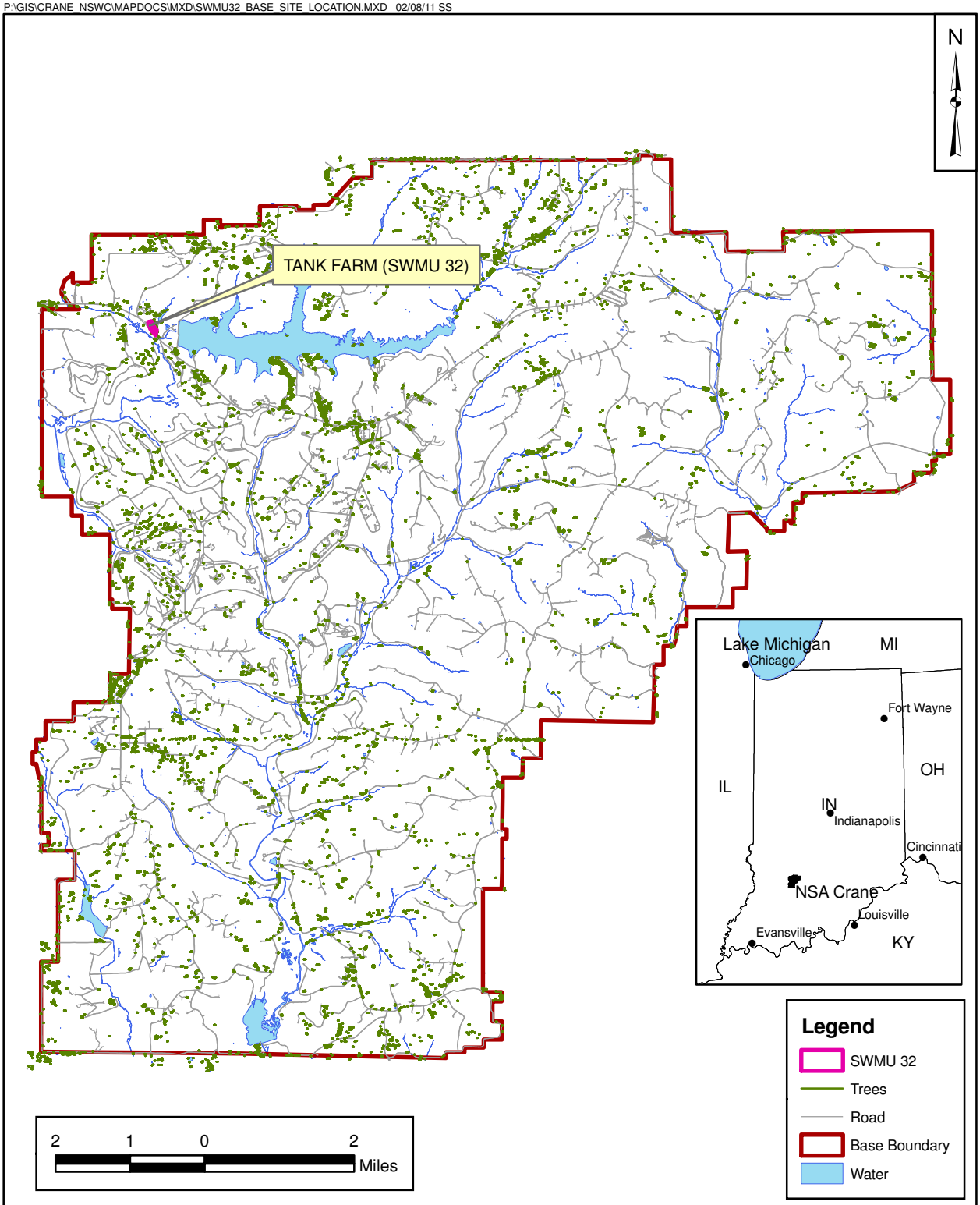
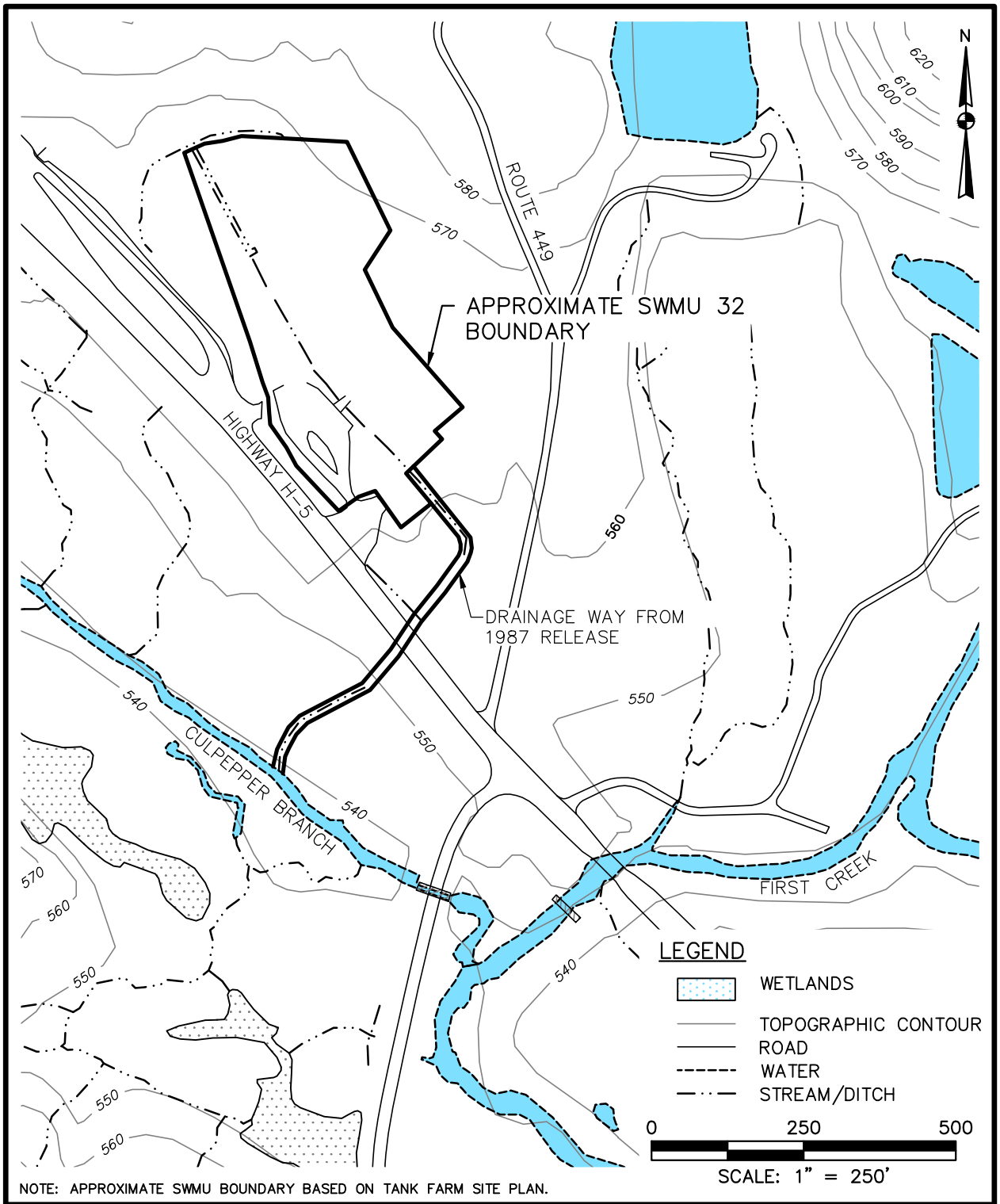


DRAWN BY K. MOORE	DATE 04/15/09	Tetra Tech NUS, Inc.	CONTRACT NUMBER F273
CHECKED BY K. LOSEKAMP	DATE 02/08/11	BASE AND SITE LOCATION MAP SWMU 32 - FORMER TANK FARM AREA NSWC CRANE CRANE, INDIANA	APPROVED BY ___ DATE ___
REVISED BY ___	DATE ___		APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 1-1 / REV 0



NOTE: APPROXIMATE SWMU BOUNDARY BASED ON TANK FARM SITE PLAN.

DRAWN BY BH	DATE 2/10/11	SWMU 32 GENERAL LOCATION MAP SWMU 32 RFI NSA CRANE CRANE, INDIANA	CONTRACT NO. F-273
CHECKED BY KEL	DATE 2/10/11		OWNER NO.
REVISED BY	DATE		APPROVED BY / DATE
SCALE 1" = 250'			DRAWING NO. FIGURE 1-2 / REV. 0

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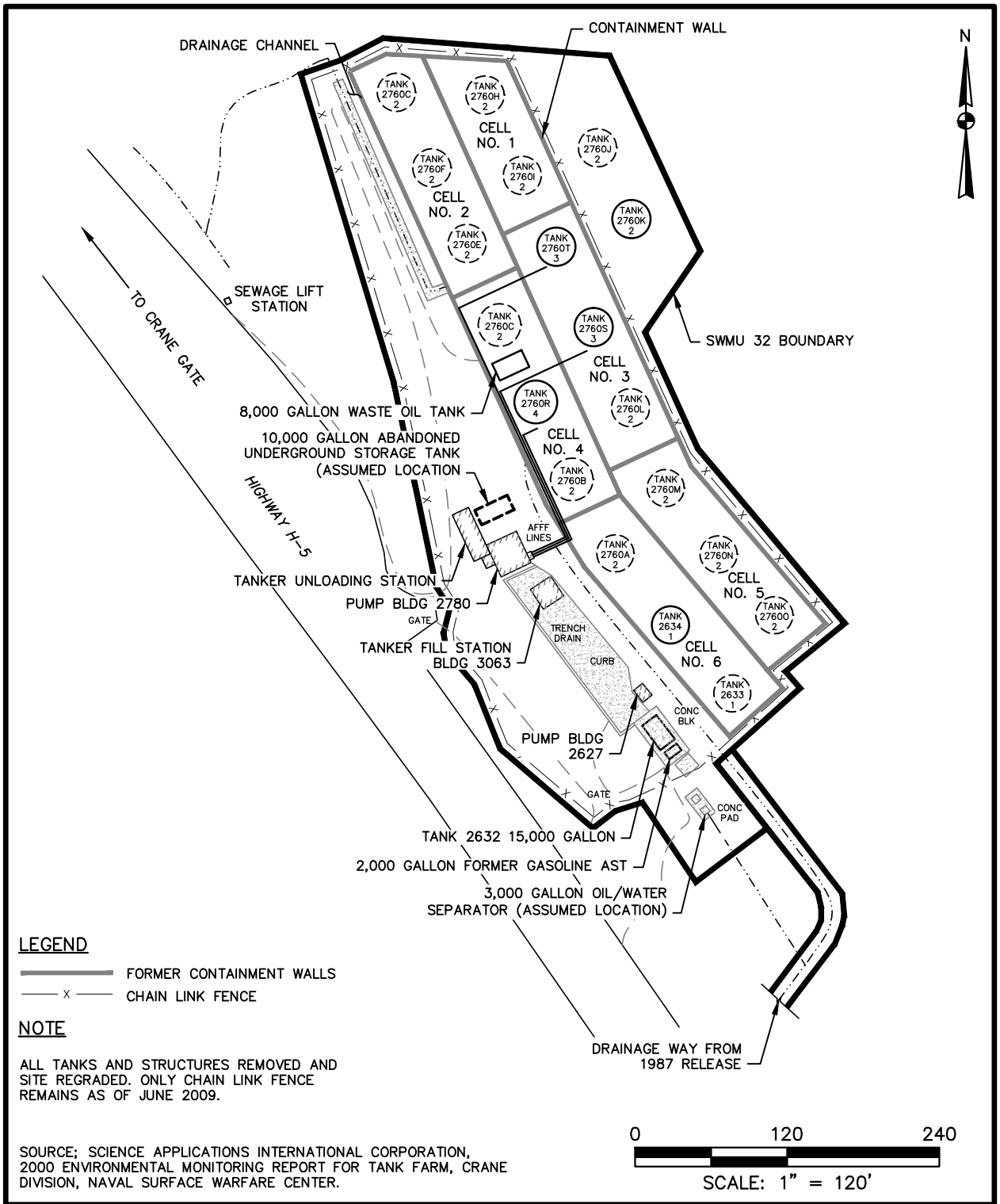

LEGEND

FORMER CONTAINMENT WALLS

CHAIN LINK FENCE

NOTE

ALL TANKS AND STRUCTURES REMOVED AND SITE REGRADED. ONLY CHAIN LINK FENCE REMAINS AS OF JUNE 2009.

SOURCE; SCIENCE APPLICATIONS INTERNATIONAL CORPORATION, 2000 ENVIRONMENTAL MONITORING REPORT FOR TANK FARM, CRANE DIVISION, NAVAL SURFACE WARFARE CENTER.

DRAWN BY BH	DATE 2/10/11	SWMU 32 SITE PLAN SWMU 32 RFI NSA CRANE CRANE, INDIANA	CONTRACT NO. F-273
CHECKED BY KEL	DATE 2/10/11		OWNER NO.
REVISED BY	DATE		APPROVED BY / DATE
SCALE 1" = 120'			DRAWING NO. FIGURE 1-3 / REV. 0

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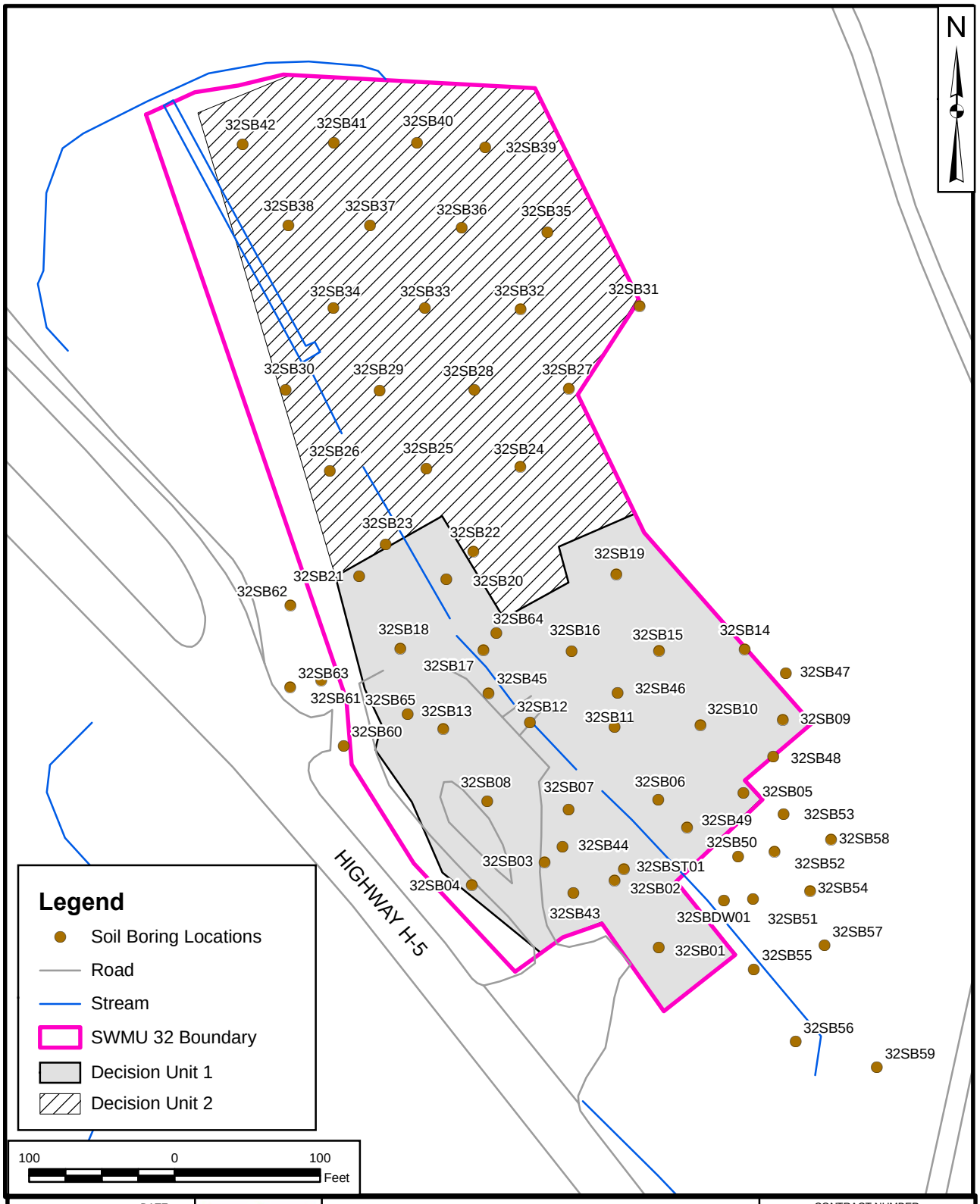

DRAWN BY S. STROZ	DATE 02/15/11	SOIL SAMPLE LOCATION MAP AND DECISION UNITS 1 AND 2 SWMU 32 NSA CRANE CRANE, INDIANA	CONTRACT NUMBER F273
CHECKED BY G. TEN EYCK	DATE 02/15/11		APPROVED BY ___ DATE ___
REVISED BY ___	DATE ___		APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 2-1 REV 0

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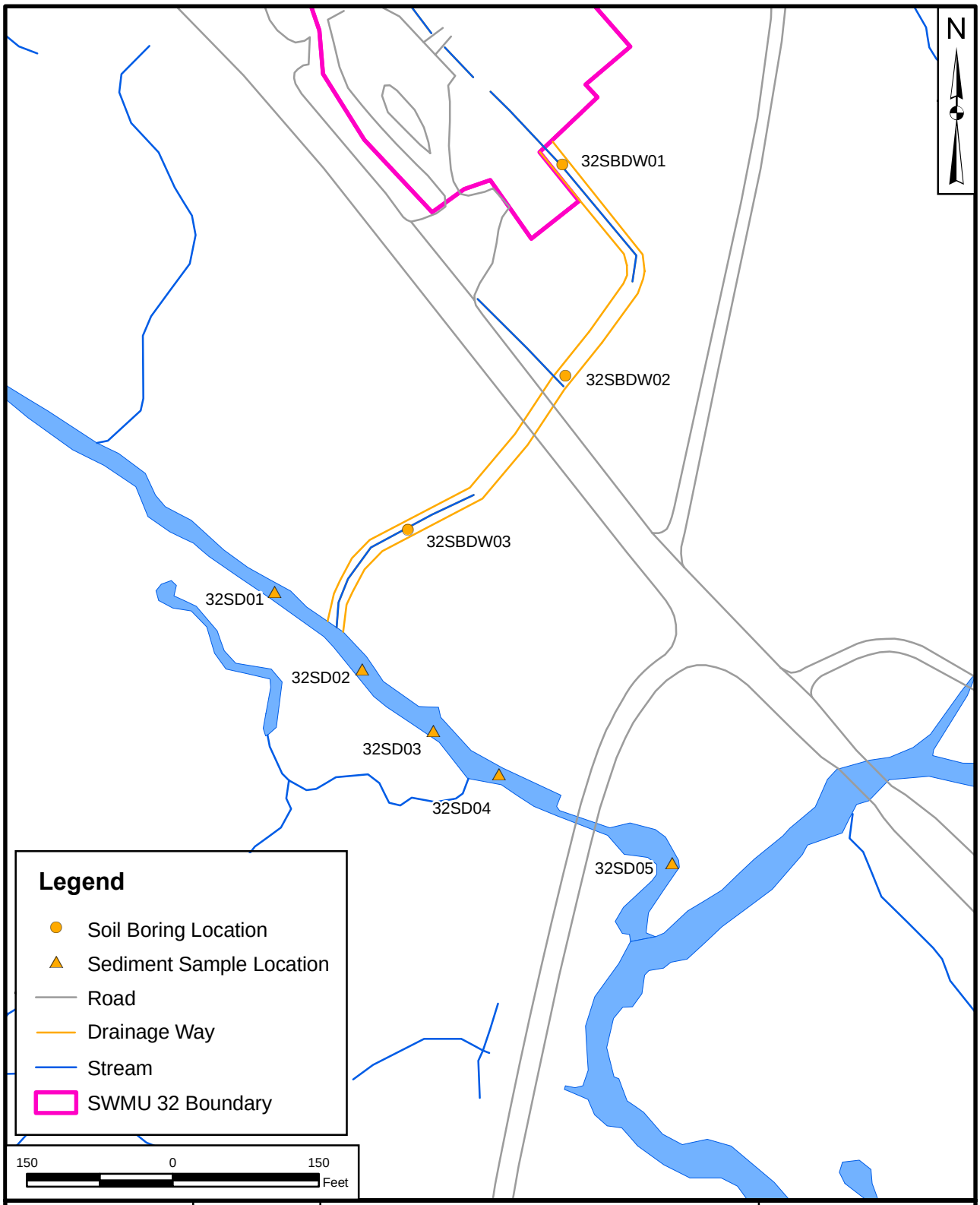

DRAWN BY S. STROZ	DATE 10/19/10	SEDIMENT AND DRAINAGE WAY SAMPLE LOCATION MAP SWMU 32 NSA CRANE CRANE, INDIANA	CONTRACT NUMBER F273
CHECKED BY G. TEN EYCK	DATE 02/10/11		APPROVED BY ___ DATE ___
REVISED BY ___	DATE ___		APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 2-2 REV 0

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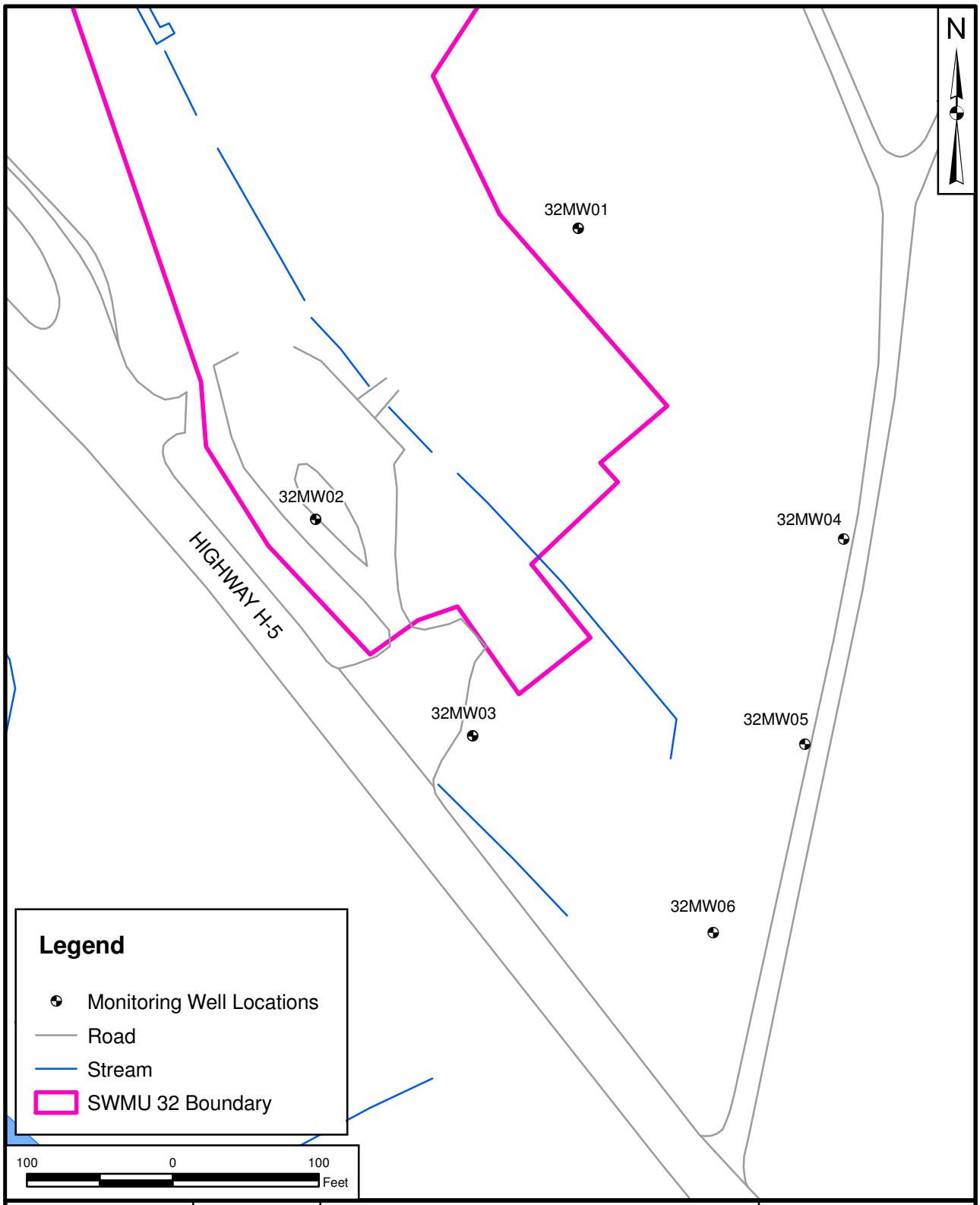
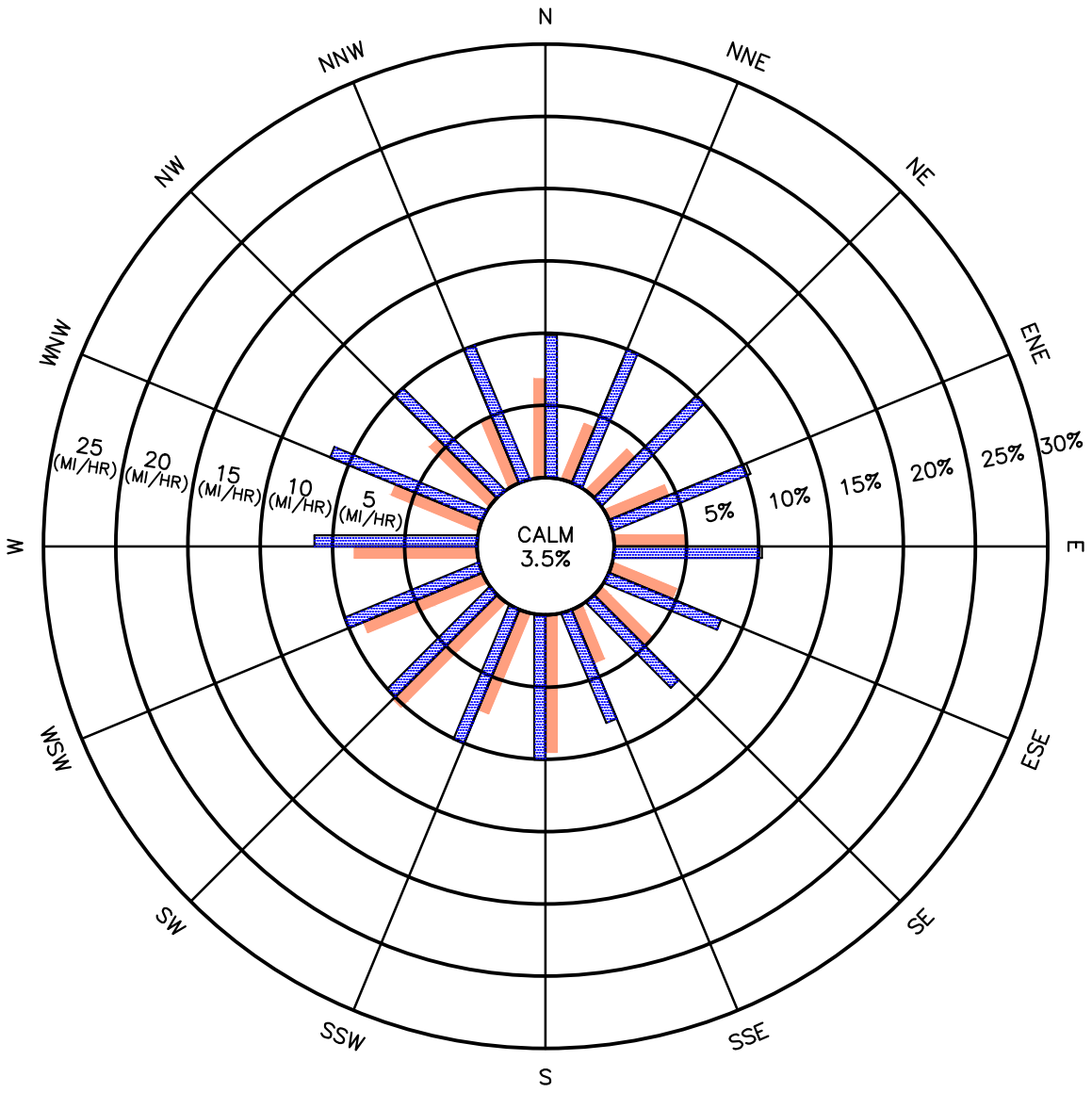


DRAWN BY S. STROZ	DATE 10/19/10	GROUNDWATER MONITORING WELL LOCATION MAP SWMU 32 NSA CRANE CRANE, INDIANA	CONTRACT NUMBER F273
CHECKED BY K. LOSEKAMP	DATE 02/08/11		APPROVED BY ___ DATE ___
REVISED BY ___	DATE ___		APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 2-3 REV 0



LEGEND:

WIND DIRECTION FREQUENCY (PERCENT)
(DIRECTION FROM WHICH THE WIND IS BLOWING)

MEAN WIND SPEED (MI/HR)

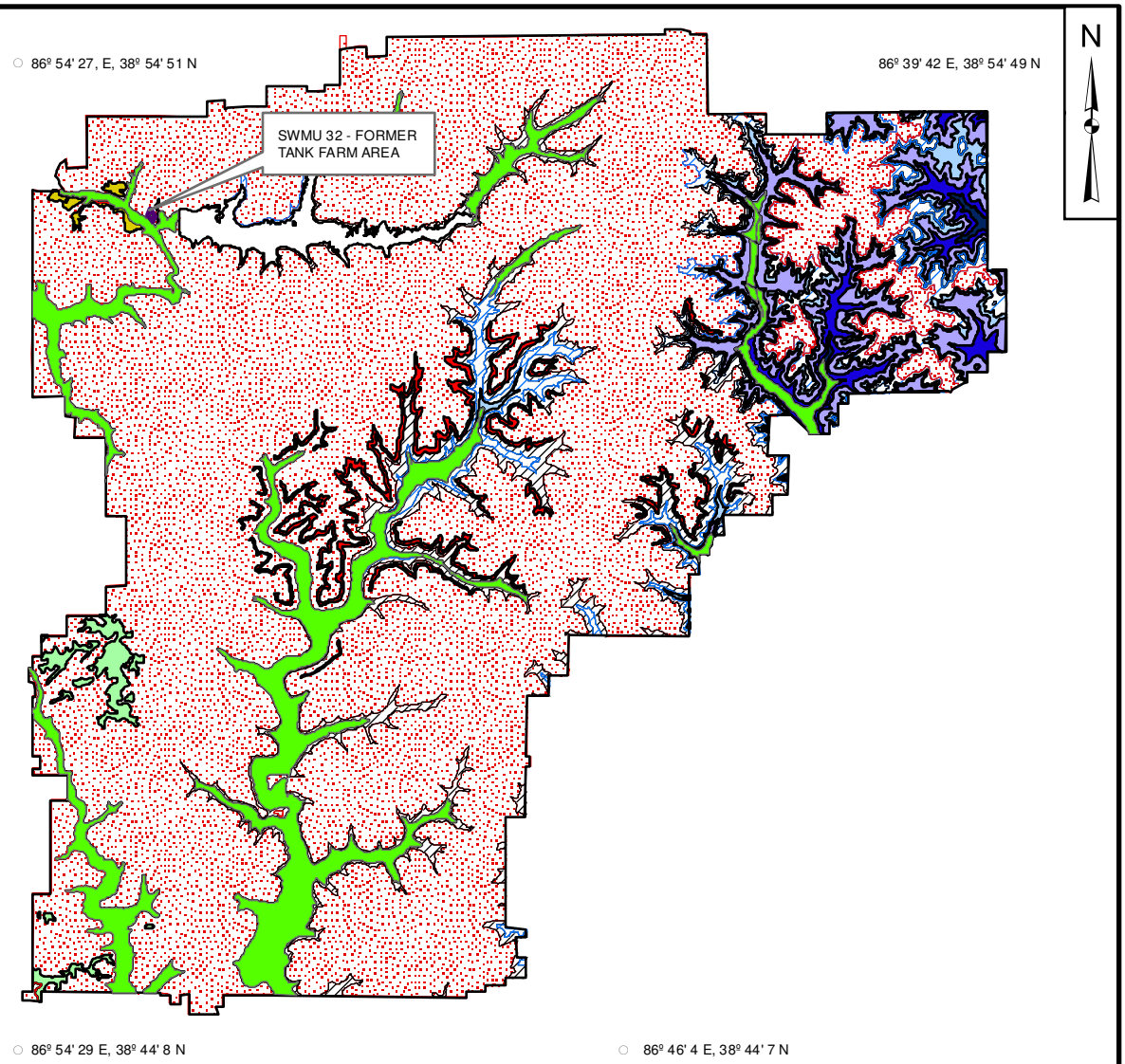
DATA SOURCE: INDIANAPOLIS, INDIANA AIRPORT
PERIOD OF RECORD: 1985–1989
43,824 OBSERVATIONS

DRAWN BY BH	DATE 2/10/11	FIVE YEAR WIND ROSE SUMMARY FOR INDIANAPOLIS, INDIANA SWMU 32–FORMER TANK FARM AREA NSA CRANE CRANE, INDIANA	CONTRACT NO. F–273
CHECKED BY KEL	DATE 2/10/11		OWNER NO.
REVISED BY	DATE		APPROVED BY / DATE
SCALE NOT TO SCALE			DRAWING NO. FIGURE 4–1 / REV. 0

NAVFAC

H:\2111 – SWMU 32\Figures\2111FG003.dwg PIT BEN.HOPPE 2/9/2011 12:15:50 PM

P:\GIS\CRANW_NSWC\MAPDOCS\MXD\SWMU18_SURFICIAL_GEOLOGY.MXD 02/10/11 SS



Explanation of Geology

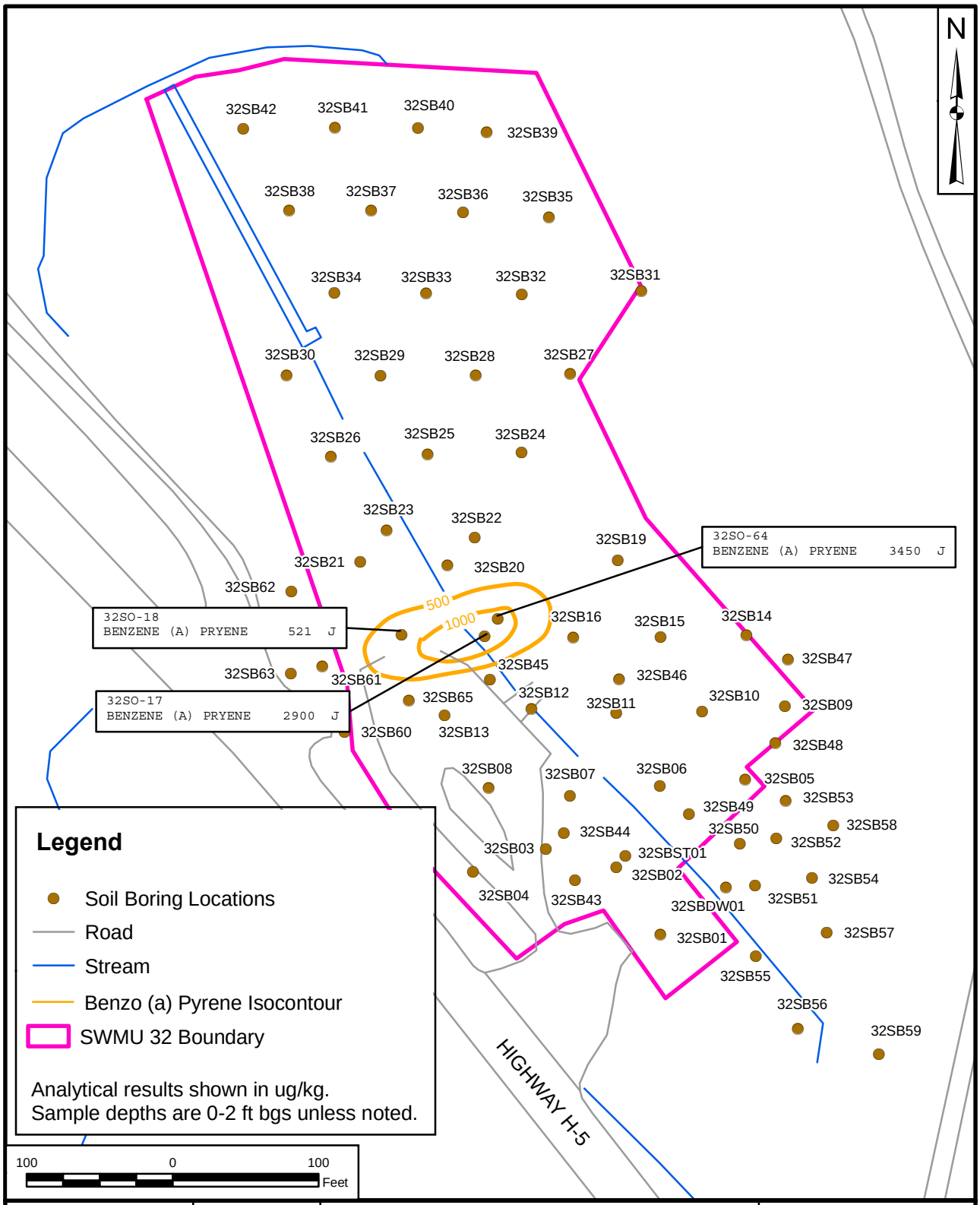
- Qal — *Alluvium*
- Ql — *Loess*
- Qo — *Glacial Outwash*
- P — *Raccoon Creek Group and undifferentiated*
- Ps — *Sandstone-dominated horizon of Lower Pennsylvanian*
- M6 — *Glenn Dean Ls, Hardinsburg Fm, Haney Ls, Indian Springs Shale Mbr, and undifferentiated*
- M5 — *Sandstone member of the Big Clifty Fm*
- M4 — *Beech Creek Ls*
- M3 — *Elwren Fm, Reelsville Ls, upper Sample Fm, and undifferentiated*
- M2 — *Lower part of Sample Fm, Beaver Bend Ls, Bethel Fm, and undifferentiated*
- M1 — *Paoli Ls, Ste Genevieve Ls, and undifferentiated*
- Select Solid Waste Management Units (SWMUs)

0 6,000 12,000 24,000 Feet

(Modified from Blunck, 1995)

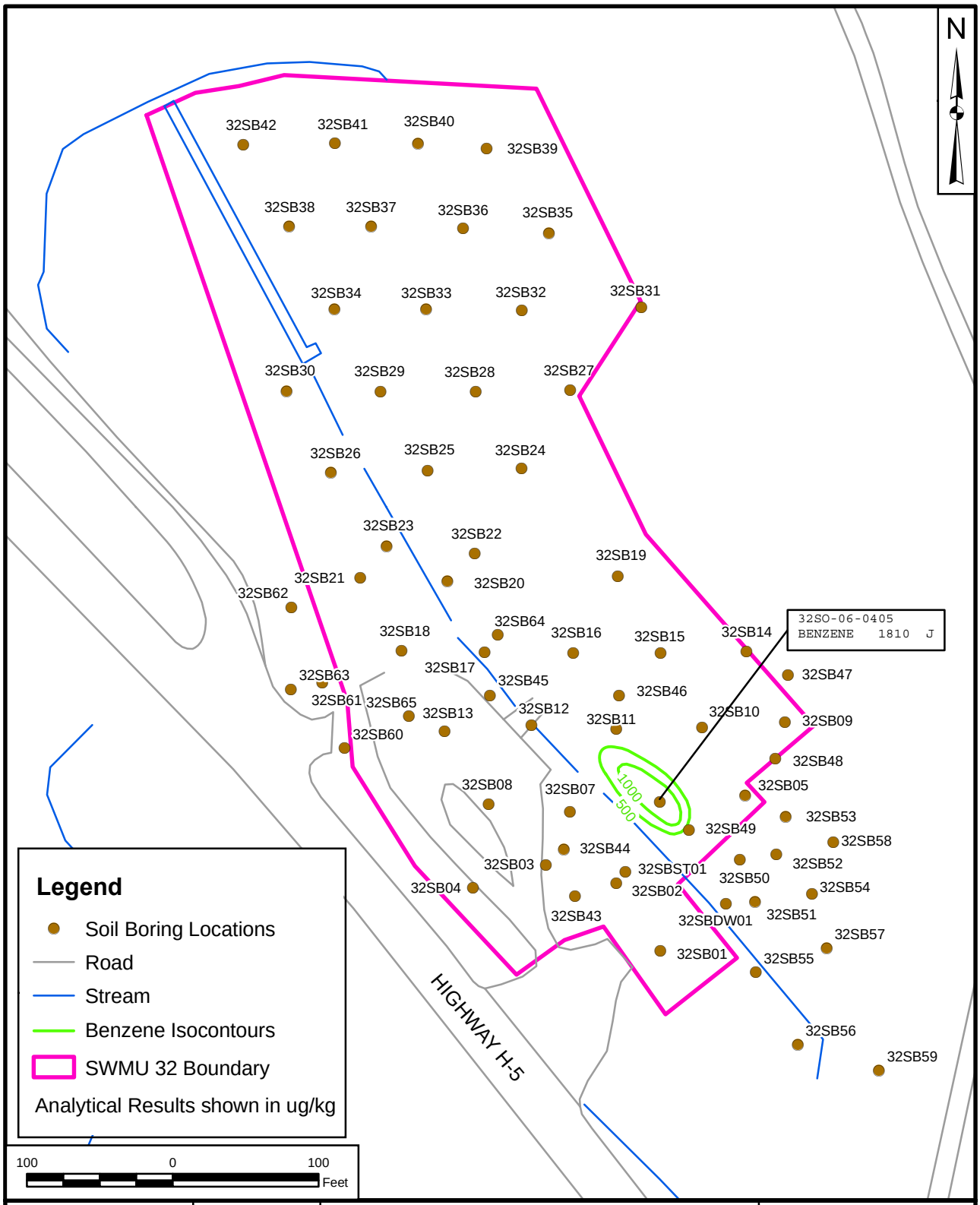
DRAWN BY S. STROZ	DATE 12/01/10	SURFICIAL GEOLOGY MAP SWMU 32 - FORMER TANK FARM AREA NSA CRANE CRANE, INDIANA	CONTRACT NUMBER F273
CHECKED BY K. LOSEKAMP	DATE 02/10/11		APPROVED BY — DATE —
COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED	NAVFAC		DRAWING NO. FIGURE 4-2 REV 0

P:\GIS\CRANE_NSWC\MAPDOCS\MXD\SWMU32_BEZO_DETECTS_SS.MXD 02/15/11 SS



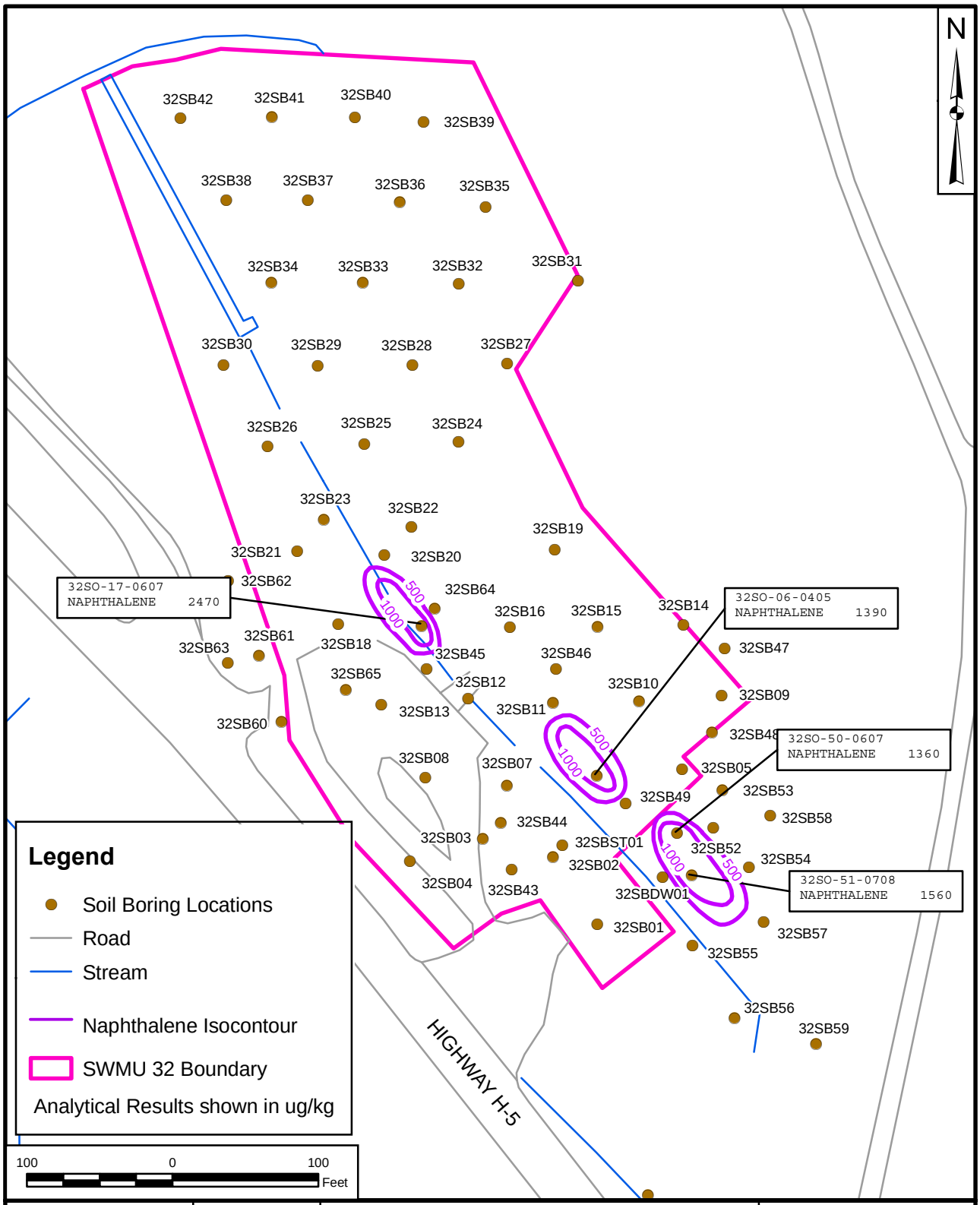
DRAWN BY S. STROZ	DATE 02/15/11	BENZO (A) PYRENE DETECTIONS IN SURFACE SOIL SWMU 32 NSA CRANE CRANE, INDIANA	CONTRACT NUMBER F273
CHECKED BY G. TEN EYCK	DATE 02/15/11		APPROVED BY ___ DATE ___
REVISED BY ___	DATE ___		APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 5-1 / REV 0

P:\GIS\CRANE_NSWC\MAPDOCS\MXD\SWMU32_BENZENE-DETECT_SS.MXD 02/15/11 SS



DRAWN BY S. STROZ	DATE 02/15/11	BENZENE DETECTIONS IN SUBSURFACE SOIL SWMU 32 NSA CRANE CRANE, INDIANA	CONTRACT NUMBER F273
CHECKED BY G. TEN EYCK	DATE 02/15/11		APPROVED BY ___ DATE ___
REVISED BY ___	DATE ___		APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 5-2 REV 0

P:\GIS\CRANE_NSWC\MAPDOCS\MXD\SWMU32_NAPHTHALENE_DETECTS_SBS.MXD 05/11/11 SS



DRAWN BY S. STROZ	DATE 02/15/11	NAPHTHALENE DETECTIONS IN SUBSURFACE SOIL NSA CRANE CRANE, INDIANA	CONTRACT NUMBER F273
CHECKED BY G. TEN EYCK	DATE 05/11/11		APPROVED BY ___ DATE ___
REVISED BY ___	DATE ___		APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 5-3 / REV 0

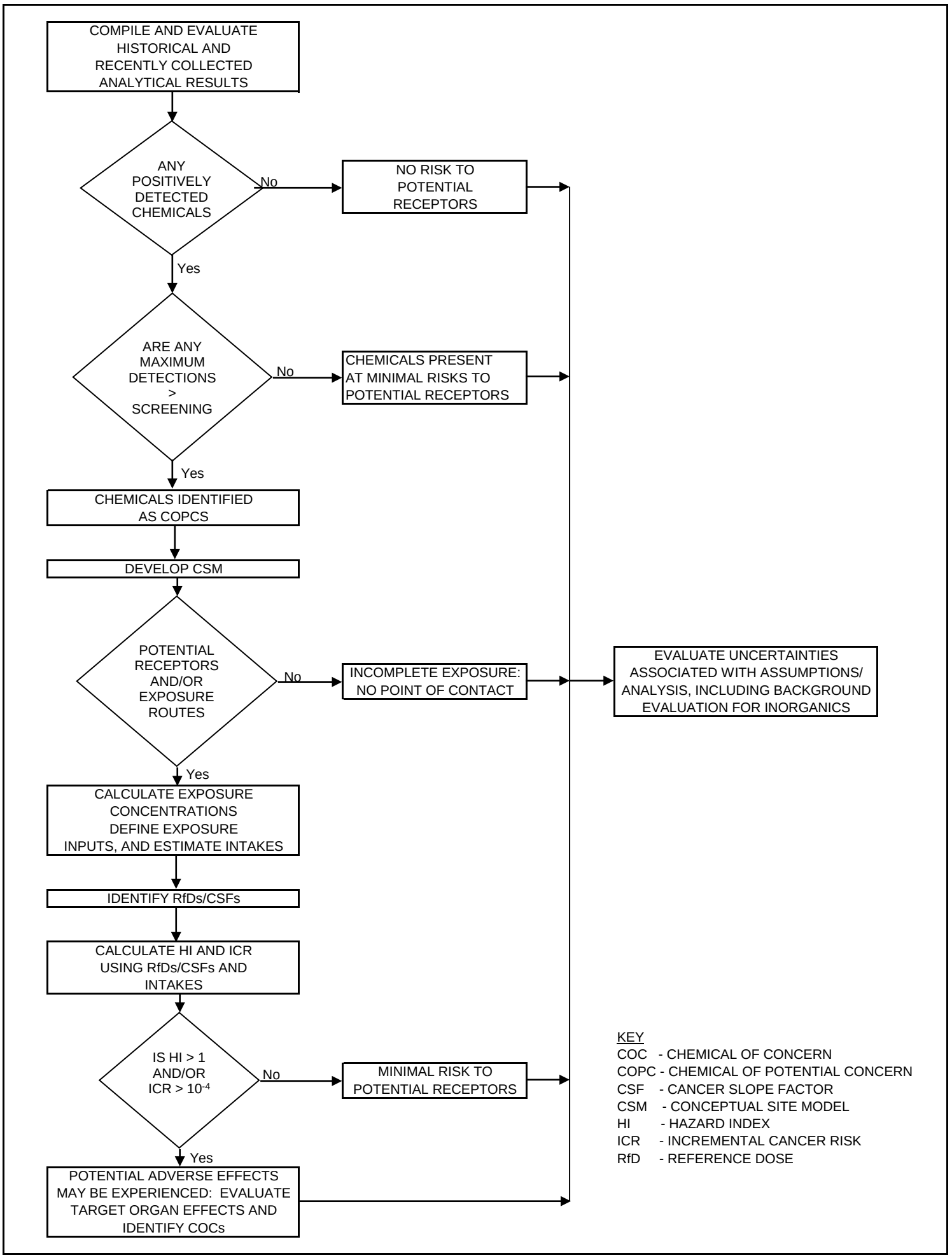
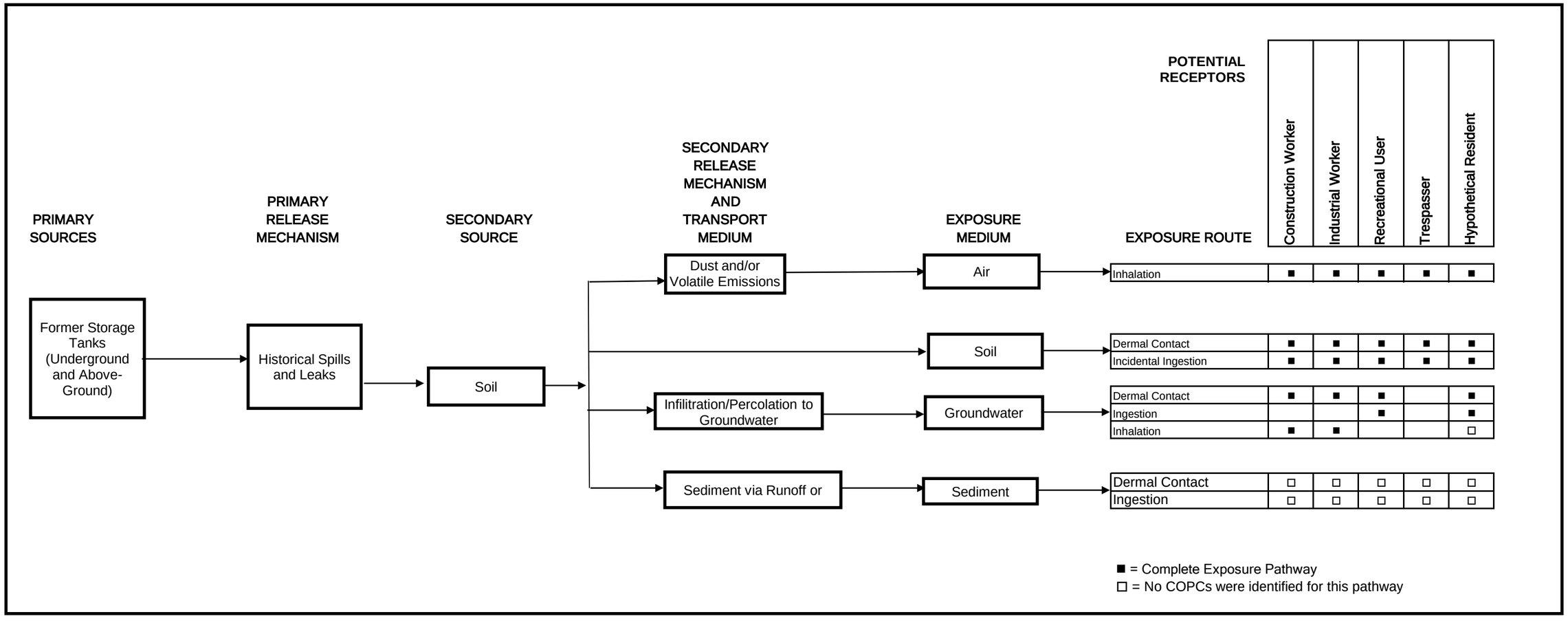


FIGURE 7-1

SUMMARY OF HUMAN HEALTH RISK ASSESSMENT PROCESS
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

FIGURE 7-2

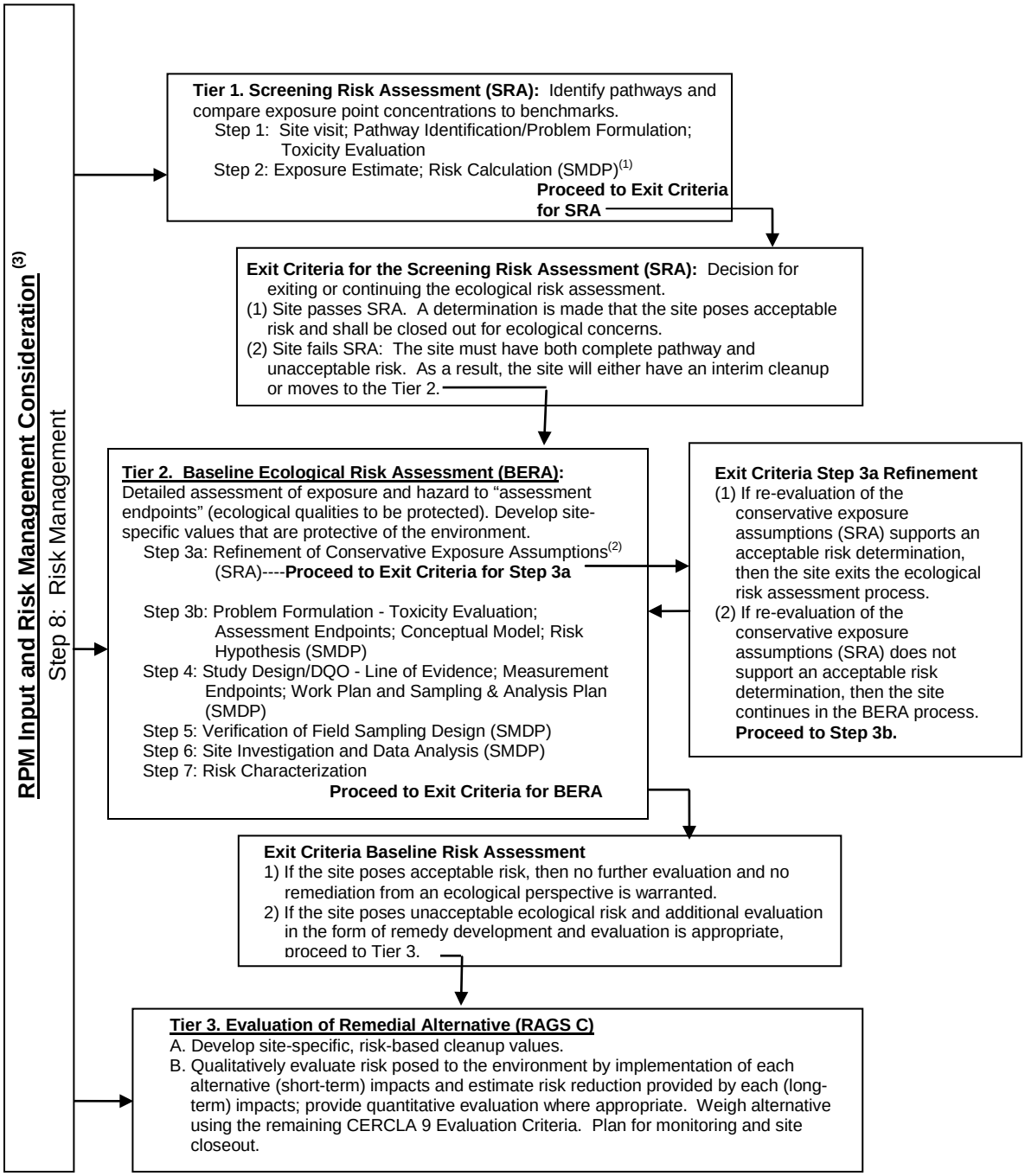
HUMAN HEALTH CONCEPTUAL SITE MODEL
SWMU 32 FORMER FUEL TANK FARM
NSA CRANE
CRANE, INDIANA



Notes:
1 - Blank space indicates incomplete exposure pathway or relatively insignificant, or not applicable potential exposure.

FIGURE 8-1

NAVY ECOLOGICAL RISK ASSESSMENT TIERED APPROACH
SWMU 32
NSA CRANE
CRANE, INDIANA



Notes: 1 See U.S. EPA's 8 Steps ERA Process for requirements for each Scientific Management Decision Point (SMDP).
2 Refinement includes but is not limited to background, bioavailability, detection frequency, etc.
3 Risk management is incorporated throughout the tiered approach.

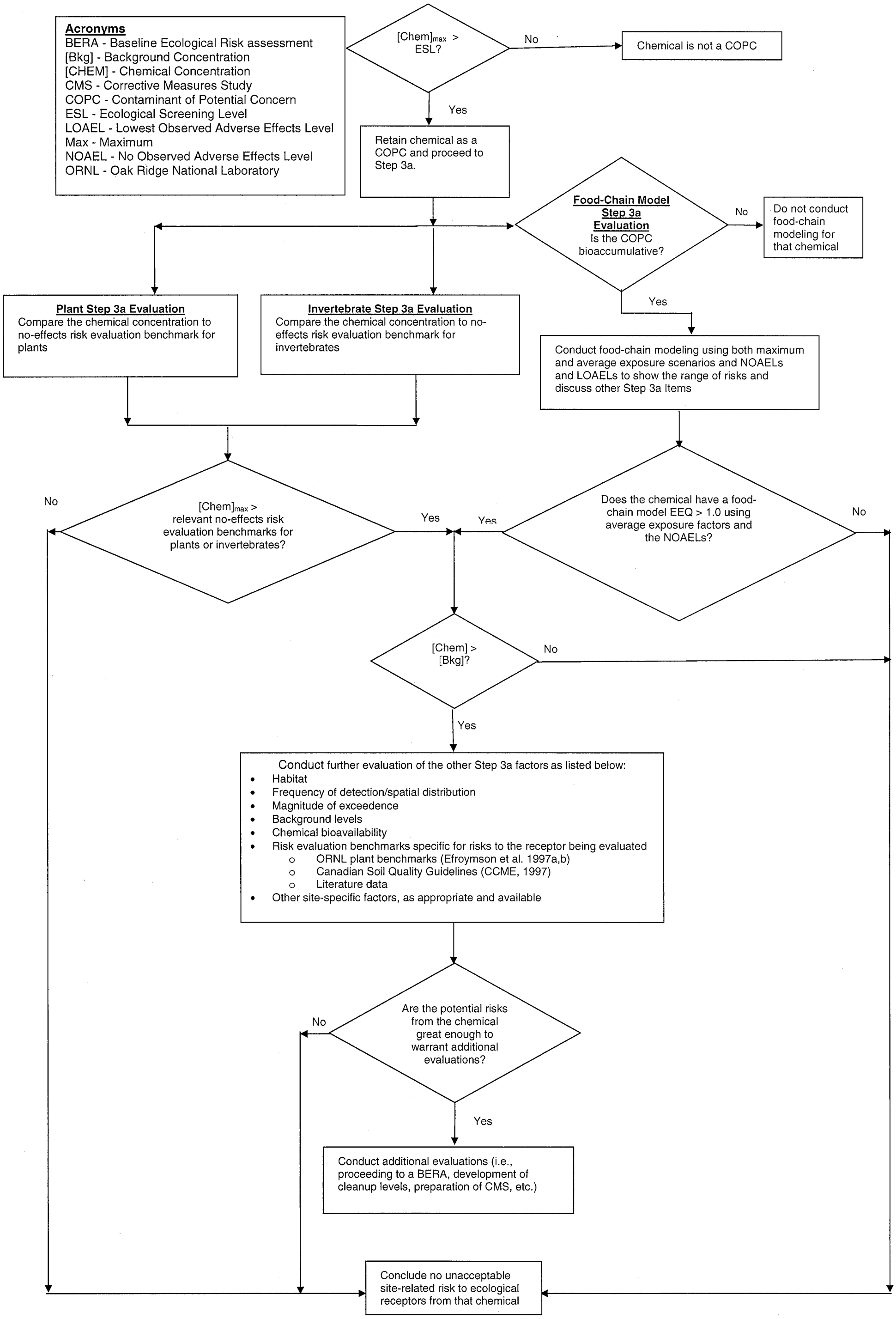
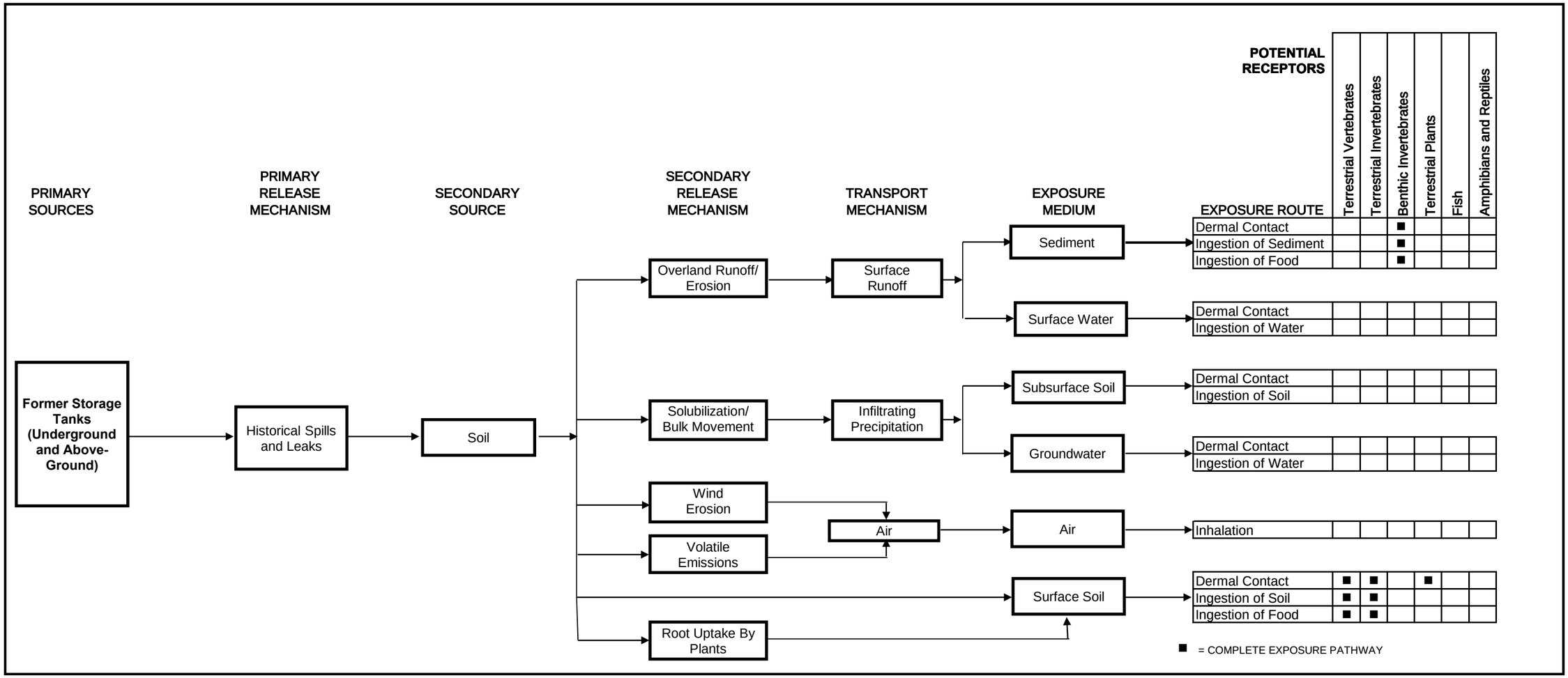


FIGURE 8-2

GENERAL ERA PROCESS FOR EVALUATION OF RISKS TO CHEMICALS IN SURFACE SOIL AT NSWC CRANE, INDIANA
SWMU 32
NSA CRANE, CRANE, INDIANA



Blank space indicates incomplete exposure pathway or relatively insignificant or not applicable potential exposure.

FIGURE 8-3

ECOLOGICAL CONCEPTUAL SITE MODEL
SWMU 32
NSA CRANE, CRANE, INDIANA

SWMU 32 APPENDICES

A PHOTOGRAPHS
B BORING LOGS AND RELATED MATERIALS
C SAMPLE LOG SHEETS AND OTHER FIELD FORMS
D DAILY ACTIVITY LOGS, LOG BOOK, GROUNDWATER DATA SHEETS
E HEALTH AND SAFETY DOCUMENTATION
F ANALYTICAL DATA
G DATA VALIDATION REPORTS
H SUPPORTING DOCUMENTATION FOR THE HUMAN HEALTH RISK ASSESSMENT
I SUPPORTING DOCUMENTATION FOR THE ECOLOGICAL RISK ASSESSMENT

APPENDIX A - PHOTOGRAPHS

SITE PHOTOGRAPHS
1987 SPILL PHOTOGRAPHS

SITE PHOTOGRAPHS

SITE PHOTOGRAPHS

Date:	View:	Photographer:
5/14/09	N	T. Evans

View of former Tank Farm from across Highway H-5.

Date:	View:	Photographer:
5/14/09	NE	T. Evans

View of area east of fenced area of former Tank Farm.

Date:	View:	Photographer:
5/14/09	E-SE	T. Evans

View of area east of former Tank Farm. Bridge over First Creek visible in right center of photo.

Date:	View:	Photographer:
5/14/09	E-SE	T. Evans

View of former Tank Farm from southern gate. Concrete manhole visible in center of photo.

SITE PHOTOGRAPHS

Date:	View:	Photographer:
5/14/09	SW	T. Evans

View of west-central portion of former Tank Farm. Highway H-5 is visible in background.

Date:	View:	Photographer:
5/14/09	NW	T. Evans

View of northeastern portion of former Tank Farm.

Date:	View:	Photographer:
5/14/09	SE	T. Evans

View of southeastern portion of former Tank Farm.

Date:	View:	Photographer:
5/14/09	S	T. Evans

View of southwestern portion of former Tank Farm.

SITE PHOTOGRAPHS

Date:	View:	Photographer:
5/14/09	E	T. Evans

Close-up view of former drainage channel exiting fenced area at northwestern end of former Tank Farm.

Date:	View:	Photographer:
5/14/09	NW	T. Evans

Area northwest of former Tank Farm. Weigh station visible in background.

Date:	View:	Photographer:
5/14/09	SE	T. Evans

View of drainage way (ditch) where the 1987 release left the area of the Tank Farm and flowed to Culpepper Branch.

Date:	View:	Photographer:
5/14/09	S	T. Evans

View inside manhole located in west-central area of former Tank Farm.

1987 SPILL PHOTOGRAPHS

APPENDIX B – BORING LOGS

BORING LOGS

BORING LOGS

Tetra Tech NUS, Inc.

BORING LOG

15:30
3:45

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32 SB 01
DATE: 4-26-10
GEOLOGIST: B. Ten Eyck
DRILLER: A. Radcliff

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1							Gravel						
1-2							Lt Brown & gray						
							silty clay - Semi-Dry						
							no odor						
				32	SS-01-0002 = 32 SS FD 04 26 10								
~~2-3~~ 2-3							Lt Brown gray silty						
							clay - Semi Dry -						
							no odor 6-7 sample follow ground						
7-8							sample collected 7-8 - 32 SB FD 04 26 10						
							Lt Brown & gray mottled						
							clay - Semi-Dry -						
8-10							Lt Brown - silty - clay -						
							Semi - Dry						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

10:45

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32SB02
DATE: 4/26/10
GEOLOGIST: G. Ten Eyck 10:16
DRILLER: Andrew Radloff

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1							Concrete rubble						
1-2							gray-Brown mottled clay						
							soft - strong fuel		odor				
							sampled	1-2					
2-6							Lt gray clay - w/ strong fuel odor						
6-7							no shine sample 6-7						
6-8							Lt Brown - gray mottled clay						
							stiff - no odor						
8-9							Lt gray moist clay - no odor						
							sampled 6-9						
9-10							Brown Hard stiff clay w/ Dk Brown						
							mottling						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

16.15

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-03
DATE: 9-26-10
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
							Moved Because of utility						
0-1							gravel / fill						
1-2							Lt Br. to greenish gray						
							clay - Semi Dry - no odor						
2-5							gray very moist clay -						
6-7							gray silty clay no odor						
							some Brown mottled						
							very moist						
							sampled 6-7						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

16.00

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32 SB 04
DATE:
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
							moved location 10' east off						
01							top soil						
1-2							Brown silty clay -						
							no ~~odor~~ odor						
2-6							Lt Brown - Lt gray silty						
							clay - no staining -						
5-6							no odor -						
							collected sample		5-6				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

11-25

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB 05
DATE:
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1						Brown	silty clay w/ organic						
1-2						Brown	silty clay	no color					
							no renaling						
2-4							same						
4-5						DR	gray - soft silty clay w/ gravel						
							FID 4ppm						
5-6							Dry silty clay -						
							sampled 5-6						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

10:55

Page ___ of ___

PROJECT NAME: CTO. F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32 SB 06 06
DATE: 4/26
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1							BR. top soil						
1-1.5							concrete		sampled				
1.5-2							gray clay - moist		odor 1-2				
2-4							gray clay moist		odor				
4-5							same - sampled 4-5						
5-10							gray - brown mottled clay						
							no odor						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

16:25
4:30

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: ~~33~~ 32-SB-07
DATE: 4-26-10
GEOLOGIST: B. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
							NO FID						
0-1							Very wet top soil						
1-2.5						greenish gray	mottle clay - Lt Br						
1.5-2							Bluish gray silty -						
							sli odor - moist -						
2-5						Lt Brown - gray	mottle						
							silty clay - sli ~~and~~ dry odor.						
5-7						Lt gray - w/ some Lt Brown							
							mottle - very sli odor -						
							semi dry						
							sampled 6-7						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-08
DATE: 4-27-10
GEOLOGIST: G. Ten Eyck
DRILLER: A. Rachell

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1							gravel w/ some fill						
							gray clay fill						
1-2						Lt. Brown	silty clay						
							soft - semi moist		no odor				
2-7						Lt Br-gray	silty clay						
							some oxide stains						
							no odor - stiff						
							Sample 6-7 at		8:15				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

1110

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32 SB 09
DATE: 4-16
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0	1					Brown	silty clay - no odor						
1	2					Lt gray - Lt Brown	mottled						
							silty clay - no odor						
2 -	4					Lt	gray silty clay						
~~4 -~~	4.0	4.5					gravel layer						
4.5	- 6					Lt	gray silty clay	sh	odor				
6 - 8							gray clay no odor						
9 - 10							Brown clay no odor						
						Sampled 6 - 7							

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

11:35

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: SB 32 SB 10
DATE: 4-26 11:45
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1							Lt Brown wet silty clay						
1-2							Lt Brown silty clay		no FID Read				
							sample						
2-4													
4-5							~~gravel layer~~ Lt Brown dry						
							silty clay some mottle						
4-5							gravel layer						
5-6							Greenish gray clay - FID 30 ppm						
							Sampled 5-6						
6-10							Brown & gray mottle - no FID reading						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-11
DATE: 4/27/10
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-.5							top soil - silty clay						
							Dk Brown moist						
.5-2							gray silty clay w/						
							red-Brown oxide spots						
							sampled - no odor		0002				
2-7							Lt. Br w/ some gray mottling						
							silty clay - oxide spots						
							no odor stiff - semi moist						
							sampled 6-7 8:25						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-12
DATE: 4/27/10
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1					Lt Bro - Dk Gray mottled								
					silty clay w/ oxide spots -		no odor						
1-2					greenish gray silty clay								
					odor - fuel - sampled 2 yr								
					1-2								
2-4					Lt Brown silty clay w/								
					some gray mottle - oxide stain								
					no odor								
5-7					~~Lt~~ Lt gray - w/ sli brown								
					mottle - ~~wo~~ silty clay								
					no odor								
					sampled 6-7								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-13
DATE: 4/2/10
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0	0.5						Gravel						
0.5 - 1					Dk	gray	silty clay w						
					Wide	band	varves - looks contaminated						
					However,	no	odor - sampled stiff						
							8:50						
3 - 5					Lt	Brown	silty clay w/ gray mottle						
					oxidic	staining	- no odor						
5 - 7					Lt	Brown & gray	mottled						
					silty	clay	- some oxidic						
					staining	-	some moist - no odor						
							9:00						
					Sampled		6 - 7						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #:

Tetra Tech NUS, Inc.

BORING LOG

12:00

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32 SB 14
DATE:
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-2						Lt Br	silty clay						
2-4						Lt Gy	silty clay						
4-6							no FID reading						
4-6					thin gravel	DK Gray	visible staining						
					sli ~~odor~~ odor		2 ppm FID						
5-8					gray silty clay, moist		4 ppm FID						
9-10					Moist gray silty clay		FID 10 ppm.						
					Sample At this point								
							9-10						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-15
DATE: 4/27/10
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1					silty clay - Brown								
1-2					Dk gray Black sand -								
					no odor - sampled								
2-5					greenish gray silty clay								
					no odor -								
5-6					gravel layer - silty clay w/								
					gravel - sli odor -								
					sampled 9:15 5-6								
6-7					Lt Brown to tan w/ gray mottled								
					silty clay - no odor								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

10"

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-16
DATE: 4-27-10
GEOLOGIST: G. Ten Eyck
DRILLER: A. Radcliff

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0	-5					Br	silty clay topsoil						
5-	2					DK	Brown silty clay some sand						
							Very moist - No odor						
							Sample						
3	-5					Lt	gray w/ some Brown						
							~~staining~~ mottle silty clay						
							no odor stiff						
5-	7					Lt	Brown w/ some						
							gray silty clay -						
							oxide stains -						
							no odor.						
							sample 6-7						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32 SB 17-
DATE:
GEOLOGIST: E. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1							gravel/~~silty~~ gh silty clay						
1-2							Dk gray - silty clay -						
							moist no odor						
	2-4			Brown silty clay - no odor - semi dry									
3-5							tan Blush gray silty		pID =	1.8			
							clay with staining						
							fuel odor - moist						
5-6			sampled										
4-5			10:30				very wet soft Dk gray		pID =	2.2	ppm		
							silty clay - gravel						
6-8							Dk gray sandy clay		pID	2.5	ppm		
							wet odor - ~~fuel~~						
							sampled 6-7						
9-10							Blush gray - mottled Brown		pID =	0.0			
							silty clay - moist sli odor						
11-12			sampled				Blush gray - silty clay -		pID =	3.5			
			10:35				fl odor moist						
							sampled 11-12						
12-14							Brown fine gray sand - no odor						
							moist						
14-15							very stiff - lt Brown clay -						
							no odor						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-18
DATE:
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1						Dk	gray-granular						
							silty clay						
1-2			sample		Dk	gray	silty clay						
						w/	gravel - very fast odor		0.0	ppm			
2-3					wet -	Brown	silty clay -						
							no odor - soft						
3-4					Gray	Brown	mottled						
							silty clay -	semi	moist				
						no	odor - soft						
5-6					as	above -	no odor						
						sample	5-6	11:00					
6-7						as	above no odor						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-15
DATE:
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1					top soil - clay -								
					gravel at 1'								
1-2					stiff	Brown	silty clay						
					semi-dry	no odor	sampled 11:18						
2-4					Dk	gray	silty clay -						
					moist - no odor -								
					then sandy seam at 3'		wet no odor						
~~4-7~~					~~gra~~								
4-5					gravel layer - Dk gray								
					silty clay w/ gravel -								
					stiff - semi dry no odor								
5-7					lt	gray	silty clay -						
					dry - no odor								
							sampled 5-6 11:20						
7-10					~~lt Brown~~	~~gray~~	~~silty clay~~						
					~~mottled~~	~~no odor~~							
					~~semi dry~~	~~semi stiff~~							

4/27/00

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-DB-20
DATE:
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-.5					top soil - clay								
.5-1					gravel - Dry								
1-2					lt gray & Brown								
					silty clay - Semi Dry			~~st~~ stf					
					no odor - sampled								
2-5					Brown - gray mottled								
					Oxide stains - semi Dry								
~~5-6~~					no odor								
					gleish								
~~6-7~~ ~~5-6~~					gray - Brown silty clay -								
					moist - semi stiff - fuel odor								
					Sampled - 5-6								
~~9-10~~	6-7				As above sli odor -				pid				
7-10					As above no odor								
9-10					As above no odor -				pid -				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-21
DATE:
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1					gravel -								
1-2					gray silty clay								
					some brown mottle -								
					sampled 40 ppm				PID				
					no odor				Field Dry				
2-4					gray silty clay - no								
					odor								
4-~~7~~													
4-5					gray silty clay - as above								
					semi dry - no odor								
					sampled 5-6				Field Dry				
					12:45								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32 53 22 1.00
DATE: 4-
GEOLOGIST: B. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-2					Brown		silty clay -						
					Semi - moist		no odor						
						Sampled 0-2							
2-5					Brown		silty clay						
					moist		no odor						
5-7					Gray & Brown		no odor						
							silty clay -						
							Soft - semi moist -						
							no odor PID		1 ppm				
					Sample 5-6								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: ~~SB~~-32-SB-23
DATE:
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks 1.5	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1					top soil - gravel to 1.5								
~~1-2~~	1.5-2				Lt Br. gray mottled				PID 4ppm				
					silty clay - sampled								
					no odor								
2-4					as above								
4-5					Dk Brown & Brown mottled								
					silty clay								
					oxidel stains - no odor								
5-7					gray-? Brown mottled								
					silty clay -								
					moist - sem. soft								
							no odor -		0.0ppm PID				
							sampled 5-6						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-24
DATE:
GEOLOGIST: B. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks 1:20	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0 - 2					Brown - silty clay								
						no odor -							
1 - 2					gray - silty clay no odor								
							PID 0.7 ppm						
2 - 7					Brown & gray mottled Iron oxide stain								
						silty clay -							
					sampled 5-6 0.0 ppm								
						no odor							

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32 SB 25
DATE:
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1					top soil								
1-1.25					grass								
1.25-2					gray - Brown mottled								
					silty clay - semi soft								
					semi moist no odor				0.0 pid				
					sampled 1:20								
2-7					Brown - gray silty clay								
					moist - no odor								
					0.0 pid								
					sampled 6-7								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-26
DATE: 4-27-10
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1							~~Sample~~						
							Grayish wnd silty clay-						
1-2							Dk gray silty clay w/						
							oxide inclusions -						
2-3		Same					no odor - 0.0 pid						
4-5					Dk	gray	moist - soft		pid 6 ppm				
							silty clay - sli fuel odor						
							Sample - 4-5						
6-7						gray - brown -			4 pid				
							silty clay - no odor						
							pid reading						
7-8							as above						
8.0 -		9.5					oxic zone - Dk Brown -						
7-10							no odor		0.0 pid				
9.5 -		10					gray - dark brown mottled						
							silty clay - no odor						
									0.0 pid				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

1:50

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO 273 Tank Farm
PROJECT NUMBER: 112G02116
DRILLING COMPANY:
DRILLING RIG:

BORING No.: 32 - SB - 27
DATE: 4-27-04
GEOLOGIST: Craig Teig
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0	-2					Brown	silty clay						
							~~Sample~~ Some fine sand		PID		2	ppm	
							wo odor - very soft						
							Semi moist						
2	-7					Brown - gray mottled							
							silty clay - moist		PID		2	ppm	
							wo odor -						
							Sampled 5-6						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #:

Tetra Tech NUS, Inc.

BORING LOG

2:24

Page ___ of ___

PROJECT NAME: CTO 223 Task Form
PROJECT NUMBER: 112 G 02111
DRILLING COMPANY: Mirak
DRILLING RIG:

BORING No.: 32-SB-28
DATE: 4-27-10
GEOLOGIST: Tom Eyd
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-	1.5				Brown silty clay -								
1.5-2					semi moist - stiff -				~~pid = 0.5 ppm~~				
					no odor								
			thin		gravel at 1.5 -								
1.5-2					Dk gray silty clay -								
					reduced area - no odor				pid = 0.0 ppm				
					sampled								
2-7					Lt Brown silty clay								
					w/ oxid stain -				no odor				
									pid = 0.0 ppm				
					sampled ~~2~~ 5-6								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: 273 Tank Farm
PROJECT NUMBER: 112 G 02111
DRILLING COMPANY: Micah
DRILLING RIG:

BORING No.: 32-SB-29
DATE: 4-27-09
GEOLOGIST: Tuegel
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0	- 2				Brown silty clay								
					very little gray mottled								
					no odor sampled				0.0 PID				
2	- 4				as above								
~~4~~	~~- 5~~												
4	- 5				gray silty clay -								
					no odor ~~no pid~~				pid = 0.0				
					Reduced zone								
					sampled - 3-4'								
5	- 7				Brown silty clay -								
					no odor								
									PID 0.0				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME:
PROJECT NUMBER: 112 G02111
DRILLING COMPANY:
DRILLING RIG:

BORING No.: 32 SB 30
DATE: 4-27-90
GEOLOGIST:
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-2						Brown- silty clay							
1-2						~~gow~~ gray oxic gow							
						as other wells no odor-							
2-5						gray ~~oxic~~ ~~water~~ mottled moist - silty clay							
						as other wells							
						no odor-							
5-7						Brown-silty clay w/							
						some gray mottling							
						& ~~no~~ tan oxid stain							
						no odor							
						sample 5-6							

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #:

Tetra Tech NUS, Inc.

BORING LOG

10:14

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-31
DATE: 4-28-10
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-.5						top soil							
.5-2						gray & Brown							
						mottled silty clay			pid 0.0				
						no odor - semi moist							
3-4					lt gray silty clay - no odor								
					& Brown mottled								
4-7					lt Brown w/ some gray mottled								
					silty clay - stiff - semi dry								
					no odor pid 0.0								
					sampled 6-7								
							rinsate collected						
							32 SS RB 04 28 10-01						
							11:16						
					MS/MSD collect this Boring								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: ______

Drilling Area Background (ppm): ______

Converted to Well: Yes ______ No ______ Well I.D. #: ______

Tetra Tech NUS, Inc.

BORING LOG

2-09 Seguoyah Dam & outside power

Page ___ of ___

PROJECT NAME: CTO 273 Tank Farm
PROJECT NUMBER: 112 00 2111
DRILLING COMPANY: mc ah
DRILLING RIG:

BORING No.: 32-SB-32
DATE: 4-27-10
GEOLOGIST: Tod Eyk
DRILLER: H. Rudolff

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-2					Brown-		silty clay						
					wet at top 0-1.5 feet								
					Semi	moist	1.5-2		Field Dup				
					no	odor	sample		0.0 pid				
2-7					consistant		Brown silty clay						
					no	mottling	- no oxide						
					stains	- no	odor						
					sampled		5-6		0.0 pid				
									Field Dup				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME:
PROJECT NUMBER: 112 G 02111
DRILLING COMPANY:
DRILLING RIG:

BORING No.: 32-SB-33
DATE: 4-27-10
GEOLOGIST: Tw
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification 3.30	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
~~0-2~~													
0-.5							top soil - organic						
.5-2					Brown silty clay								
					no odor		0 pid						
						sampled							
2-7					Brown silty clay w/								
					some sand fine sand								
						no odor - no staining							
							Sample 5-6		0 pid				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #:

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME:
PROJECT NUMBER: 112G02111
DRILLING COMPANY:
DRILLING RIG:

BORING No.: 32 - SB - 34
DATE: 4-27-10
GEOLOGIST:
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-	0.5					top soil							
0.5-	2				Brown silty clay w/ some								
					fine sand semi moist								
					no odor				0.0 pid				
					sample 3-4.0								
2-	4				gray silty clay								
					semi soft - moist								
4-	7				Brown silty clay								
						no odor							
						no staining							
						sampled 6-7							

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #:

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:
BORING No.: 32-SB-35
DATE: 4/28/10
GEOLOGIST: G. TEN Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0.5					top		soil						
0.5-2					Lt	Brown	Silty clay -						
							no odor		0.0 pid				
					some	gray	mottled						
5-6					gray	fine	sand w/ clay						
					moist		no odor						
6-7					Brown &	gray	mottled						
							silty clay -						
							no odor -						
							Sample 10:40						
							5-7						
					MS/MSD		collected						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: Area 32
PROJECT NUMBER: 112 G 02111
DRILLING COMPANY:
DRILLING RIG:

BORING No.: 32 - SB - 36
DATE: 4-27-10
GEOLOGIST: Tim Eyd
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0 - 2					Brown - silty clay								
					wet - no odor -								
					no stain								
2 - 5					As above - more stiff than								
					other location								
5-6					lt gray clayey silt								
					moist - soft				pid 4.5				
					sampled -								
					5-6 sample								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #:

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: Swmu 32
PROJECT NUMBER: 112 G02111
DRILLING COMPANY:
DRILLING RIG:

BORING No.: 32-SB-37
DATE: 4-27-10
GEOLOGIST: Tom Eyeh
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-2					Brown silty clay w/								
					fine sand - no odor								
					wet - crumbly -								
					more silty								
2-5					As above -								
5-6					tan fine sand to silt								
					wet - no odor		PID 0.2ppm						
							sample 4:07						
							5-6						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes _____ No _____ Well I.D. #:

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: / Site 32
PROJECT NUMBER: 112 G 02111
DRILLING COMPANY: Micah
DRILLING RIG:

BORING No.: 32 SB 38
DATE: 4/29/10
GEOLOGIST: G. Ten Eyck
DRILLER: A. Radcliff

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0 -	1				Br.	Silty clay w/ gravel							
					Dry								
1 -	2				Br.	silty clay - trace							
					fine	Sand -							
						sampled							
2 -	7				As	above							
						sampled 5-6							

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-39
DATE: 7-23-10
GEOLOGIST: G. Ten Eyck
DRILLER: H. Ratcliff

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-.5						top soil							
.5-3					Brown silty clay								
					some sand moist								
					pid 0.0 - sampled								
2-5					Brown silty ~~sand~~ clay w/								
					sand as above								
					no odor								
5-7					Brn silty clay w/ sand								
					wet - pid = 0.0								
					sampled 5-7								
							MS/MSD sample collected						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-40
DATE:
GEOLOGIST: E. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-0.5							Top soil		ppm 0.0				
							Brown silty clay						
							w/ some fine sand						
							sampled 9:00		no odor				
0.5-5							Brown silty clay						
							as above						
5-6							Brown fine sand. moist						
							no odor PID = 0.0						
							sampled 5-6						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): ____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-41
DATE: 4-28-10
GEOLOGIST: B. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-.5							Top soil						
					Be		silty clay - w/ fine sand						
					Some		mottle w/ gray silty clay						
5-5					as above		PID = 0.0						
5-6					Be		fine ~~sandy~~ sand w/ some						
							silt & clay -						
					sampled		5-6 8:35						
					sampled		MS/MSD						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): [ ]

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB-42
DATE: 4-28-10
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0	0.5						top soil						
0.5	-6				Br		silty clay w/		pid 0.0				
							trace sand						
							w/ cedar sm. no	51					
5-6					Sampled 10:05								
							5-6 as above		pid 0.0				
					Note								
					LAB ID # 32SB420507								
					Field		Dup						
							4/28/10 01						
					32SBFD042810		04		Analyzed				
						SS	+ SB Field		Dups				
					PAH		PAH-BTEX						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): ____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: Sumo 32
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah
DRILLING RIG:

BORING No.: 32SB43
DATE: 4/29
GEOLOGIST: GLT
DRILLER: Randolph

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1						gravel							
1-2					Br silty clay some								
					oxide stains - moist								
					no odor - no stains -								
					Sampled 1-2				pid 0.0				
3-5					same as above								
5-6					gr - silty clay soft				no odor				
					sample 5-6 moist				pid 7ppm				
6-7					Br silty clay -								
					stiff				no odor				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm):

Converted to Well: Yes ____ No ____ Well I.D. #:

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: SWMU 32
PROJECT NUMBER: 112 G 02111
DRILLING COMPANY: Micah
DRILLING RIG:

9:26

BORING No.: 32-SB-44
DATE: 4-29
GEOLOGIST: GET
DRILLER: Rudolf

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1					gray & tan silty clay								
1-2					Moist Gray silty clay								
					Sl. odor, PID 1.2								
					Sampled-								
4-6					gray moist silty								
					clay - odor PID				4.9				
					Sample 5-6								
6.5-7					Brown silty clay								
					stiff - no odor								
7-10					Brown - tan silty								
					clay - stiff semi-dry								
					no odor								
							PID 7-8	0.0	ppm				
			9-35				9-10	0.5	ppm				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: Somu 32
PROJECT NUMBER: R 112 60211
DRILLING COMPANY: Michl 9-46
DRILLING RIG:

BORING No.: 32 SB 45
DATE: 4/29/10
GEOLOGIST: GIT
DRILLER: Radcliff

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1					top soil some gravel								
1-2					gray silty clay								
					soft - moist odor								
					pid - 1ppm								
					Sample 1-2								
2-3					same								
3-4					gray Brown mottled								
					silty clay - no odor - 0 pid								
4-7					Brown - Gray silty								
					clay no odor -								
					stiff semi moist								
					pid 1ppm								
					Sample 6-7								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): ____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: SWMU 32
PROJECT NUMBER: 112 G 02111
DRILLING COMPANY: Micah
DRILLING RIG:

BORING No.: 32 SB 46
DATE: 4/29/10
GEOLOGIST: Eit
DRILLER: Randolph

10:16

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-0.25						top soil							
0.25-2					Dk Brown silty clay								
					semi moist - crumbly				pid 0.0				
					no odor or stain								
					sampled 1-2								
2-2.25					gravel -								
2.25		5			moist Dk gray - moist								
					silty clay stiff very								
					sl odor		pid		0.0				
					sampled								
							ob 3-4						
~~5.5-5~~		5-5.5				no odor							
5.5-7					Brown - gray								
					silty clay								
						no odor			pid 0.1				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: Sumu 32
PROJECT NUMBER: 112 G 02111
DRILLING COMPANY: Micah
DRILLING RIG:

BORING No.: 32 SB 47
DATE: 4/29/10
GEOLOGIST: Gut
DRILLER:

10:40

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-2					~~gr~~		Brown silty clay						
							w/ gravel-						
							no odor ~~stiff~~ firm						
							semi dry-						
							sampled 1-2						
2-4						SAME							
4-5					Dk gray- firm								
						silty clay-							
						no odor-			pid 0.0				
5-6					SAME				pid 0.0				
					SAMPLE 5-6								
6-7					BR silty clay - very firm				10:40				
					+ stiff - no odor - semi moist								
							pid 0.0						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: SWMU 32
PROJECT NUMBER: 112 G0 21M
DRILLING COMPANY: MICAH
DRILLING RIG:

BORING No.: 32 SB 48
DATE: 4/29/10
GEOLOGIST: GCT
DRILLER:

10:40

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-2					BR	silty clay							
					Semi	Dry - no odor							
					0.0 pid -								
					Sampled 1-2								
2-4					SAME	AS abv							
4-6					Lt	Brown silty clay							
					faint ~~[illegible]~~ odor - pid 4ppm								
						Semi-Dry							
6-7					gray	silty clay							
						DRY - crumbly							
						no odor							
						Sampled 6-7							

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME:
PROJECT NUMBER:
DRILLING COMPANY:
DRILLING RIG:

BORING No.: 32 SD 49
DATE: 4/29/10
GEOLOGIST: BLT
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
3" inch							top soil						
0.25-1						gravel							
1-2					Br		silty clay						
						w/	~~asphalt~~ asphalt		11:13				
					oxid stains - no								
					odor				pid 0.0 sampled 1-2				
2-4					gray - Brown mottled								
					silty clay - no odor								
4-6					gray fine sand w/ clay								
					moist		stiff faint odor		pid 0.7				
						sampled	4-5		11:19				
~~6-10~~													
6-10					Br & gray silty clay -								
					no stains no odor								
							pid 7'		0.0				
							10'		0.0				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: SWMU 32
PROJECT NUMBER: 112 G 02111
DRILLING COMPANY: McCabb Drilling
DRILLING RIG:

BORING No.: 32 SB 50
DATE: 4/29/10
GEOLOGIST: GRT
DRILLER: A. Radcliff

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-.5							top soil						
~~2-6~~		1-2				Br	silty clay w some		pid 0.0				
							gravel - Dry no odor		sample				
							Field Dup 042910-05		1-2 feet				
2-6							~~Br silty clay~~						
						Br	silty clay w/						
							some gray mottle -						
							semi Dry - no odor -						
							gravel						
6-7.5							sand - strong odor		pid 65				
							& stain		sampled 6-7 Field Dup				
									32 SB FD 042910-05				
7.5-10							firm Brown silty clay						
							w/ gray mottle						
							no odor & stain		pid 0.0				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): 0.0

Converted to Well: Yes _____ No ___/___ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: Swmu 32
PROJECT NUMBER: 112 G 02111
DRILLING COMPANY: Micah
DRILLING RIG:

BORING No.: 32 SB 51 Aquifer
DATE: 4/29/10
GEOLOGIST: GET
DRILLER: A. Radcliff

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks PID	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0	-.5						top soil						
.5	-7					Br	silty clay						
						of Lt	Br mottling -						
							no odor - soft to						
							semi firm -						
					Sample		00-02		2' 4				
7	8				Gray		Sand - fool odor		8' 16				
					Stained								
					Sample		7-8						
8	-10				gray		silty clay		10' 2.8				
					odor		- moist -						
							~~Sam~~		11 2.0				
10	10.5				As above								
									13 0.0				
10.5	-15				Reddish		Brown - gray						
							silty clay no odor						
					Stiff		Dry - no stn		15 0.1				
					Sample		14-15						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): 0

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: SWMU 32
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32SB52
DATE: 4/29/10
GEOLOGIST: G.
DRILLER: A. Radcliff

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-	1/4'					top soil							
1-	3					Reddish Brown			1.1				
						silty clay Dry							
						no odor -							
						Sampled 1-2	2'		1.1				
3-	6.5'				Brown silty clay								
					moist - no odor		6		0.7				
							8'						
6.5-	10				gray clay w/ gravel								
					At 6-7 feet - no sand								
					like ~~clay~~ SI-								
					strong odor								
					Sampled 8-9				9.0				
						2:42							
10-	14				gray & Brown silty clay -				0.5				
14-	15				gray silt -			PID	7.7				
					Sample 14-15			2:45					

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: SWMU 32
PROJECT NUMBER: 112 G 0211
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32 SB 53
DATE: 4-29-10
GEOLOGIST: BCT
DRILLER: A. Rodolff

3 2/ pm

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
D	- 7					Brown silty			pid 0.7				
						clay semi moist							
						no odor - sampled			ϕ.2				
7	-10					gray silty clay - semi moist firm							
						~~Distinct~~ sli odor							
						Dk gray 9-10			7.7				
						sample 9-10							
10	-11					As above			2.7				
11	- 15					Br - gray mottled clay -							
						very moist - soft -							
						sandy at 14-15							
						sampled 14-15			pid 3.5				
						15-15 firm							

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32 SB PW 01
DATE: 4/28/10
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification 12:54	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0 -	0.5				Organic silty clay -								
0.5 -	2				gray + some brown mottled								
					silty clay - strong fuel odor								
					PID = 3.0								
					Sampled 1-2				Fuel Dip - ~~0.4~~ 0.5				
2 -	4				very stiff - silty clay								
					Dry - no odor								
2													
4 -	8				Brown silty clay w/								
					some clay mottle - sli odor								
					pid - 3 ppm								
8 -	10				silty clay - wet + soft								
					more silt - PID 2 ppm								
					Brown				08-09 sample				
10 -	11				silty clay wet pid - 0.5				Fuel Dip 0.5				
11 -	13				Dk gray clay - most stiff 0.0								
13 -	15				Brown silty clay dry most 0.0								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB DW 02
DATE: 4-28-10
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-	1				Dk Brown silty								
					clay - no odor -								
1-					2" gravel		sampled 1-2						
1-	5				Dk gray silty clay				pid 0.0				
					Very moist								
						no odor							
5-7					Dk gray silty clay -								
					very moist								
						no odor			pid 0.0				
					sampled 5-6								
					soft silty clay -								
						no odor							
					2:00								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32-SB DW-03
DATE: 9-28-10
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0	-	2				Organic loading							
						silty clay		0.0 pid					
						sampled -							
						no odor -							
2	-	3			Brown silty clay								
3	-	4			Dk gray - very soft								
					& wet silty clay -								
					organic appearance								
					no odor			0.5 pid					
					sample 3-4								
4	-	7			Brn silty clay -			0 pid					
							3rd						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: 32SB ST01-
DATE: 4/28
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification (12:05)	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1							top soil						
1-5							Lt Brown & gray						
							mottled silty clay						
							Dry - stiff no odor						
					sample		61-62 = 7.5 pid						
5-6							Lt Brown silty clay						
							as above pid - .7						
6-10							Lt Brown - gray mottled						
							silty clay - very stiff						
							Sm. Dry pid 0.5						
							sample 7.8						
10-15													
10-14							As above Dry Brown silty clay						
							no odor -						
13-14							gray silt moist						
							pid = 0.9 ppm						
14-15							Very stiff - Brown clay						
							no odor -						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: MW-1
DATE: 4/26
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0	5						gravel - no odor						
5	10						gray clay - dry -						
							gray - brown mottled silty clay						
							stiff - slow - dry						
10	14		DS				as above						
14	15						lt brown silty sand						
							moist - fine grained sand						
15	17						Brown silty ~~sand~~ sand -						
							fine grained - wet		no odor				
17	20				Brown		silty clay - wet -						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

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Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: MW-2
DATE: 4/26
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-8						fill	- gravel 0-1						
						1-2	sand fill						
5-10						Orang-Br	mottled						
						stiff	clay						
~~10-15~~													
10-13							as above						
13-15						gray	clayey silt	very moist					
15-20					wet	silty	fine grain sand -						
					Brown -	no	odor -						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area

Remarks:

Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #:

Tetra Tech NUS, Inc.

BORING LOG

3:23

Page ___ of ___

PROJECT NAME: CTO F273 Tank Farm
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Micah Drilling
DRILLING RIG:

BORING No.: MW-3
DATE: 4-26-10
GEOLOGIST: G. Ten Eyck
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1							gravel						
2-4							gray brown mottled						
							clay -						
4-10													
						gray	silty clay - mottled						
							lt Brown - semi Dry						
10-12					Lt	Brown	clay - semi Dry						
12-15					~~silty~~		clayey silt -						
15-16							as above						
16-17							wet silt -						
17-18						Dk	gray clay - moist						
18-20							wet fine grain sand						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

NSA Crane

BORING LOG

Page ___ of ___

PROJECT NAME: SWMU 32
PROJECT NUMBER: 112 G 02111
DRILLING COMPANY: Arck Engineering
DRILLING RIG: Rig #1

BORING No.: 32 SB 54
DATE: 9-17-10 16:00
GEOLOGIST: G. Tom Egck
DRILLER: C Chambers

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-4			100				Sand - Brown		~~0~~ PID				
							Dry		no odor				
4-7			100				Silty clay - Brown						
							moist - no odor		0 PID				
7-8			100				gray silt w/ clay						
							Dk gray - very moist						
							faint odor - no stain		1.1 PID				
					Sampled 0708								
8-10			100				Silty clay - Brown						
11-12							Silty clay - Dk gray		No odor				
							Sampled 1112		No stain				
									PID =		1.0		
12-13							As above		No odor 0 PID				
13-16							gray silty clay		no odor 0 PID				
									no stain				
					Sampled 14-15								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: NSA Crane SWMU 32
PROJECT NUMBER: 112 G 02111
DRILLING COMPANY: Ant Engineering
DRILLING RIG: Rig 61

BORING No.: 32 SB 55
DATE: 5-20-10 10:40
GEOLOGIST: G. Tonkovich
DRILLER: C. Chambers

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-4			50%				Gravel Backfill						
4-8			75				Gravel 4-5						
					5-8		silty clay - Brown w/						
							DK Oxide mottle						
							No stain - no odor & pid						
					Sample 7-8								
8-12							Silty clay, Br & gray mottle						
							& pid no odor						
12-16							Silty clay Br very moist						
							No stain no odor pid = 0						
					Sample 11-12 - most moist								
							Section						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): ____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSA Crane Sump 32
PROJECT NUMBER: 112 G 02111
DRILLING COMPANY: Aztec Engineering
DRILLING RIG: Rig #1

BORING No.: 32 SB 56
DATE: 9-20-10 10:10
GEOLOGIST: G. Tonzych
DRILLER: C. Chambers.

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-2			75%				gravel backfill						
2-4			75%				silty clay - Brown						
							Semi moist		No odor & pid				
4-8			75%				silty clay - gray w/ oxide						
							mottle no odor & pid no stains						
8-12			100				silty clay gray						
							no fuel odor - no stain						
					10.41'		pid 5.5						
					Sampled 1016			32 SB 56 1016					
12-15			100				silty clay - gray moist						
							as above no odor & pid no stain						
12-15			100				silty clay Brown						
							Semi wet No odor no stain PID = 0.7						
					Sampled 14-15			32 SB 56 1415					
					Field Dup of 32 SB 56 1415								
					FD 052010-01								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSA Mawe - SWMU 32
PROJECT NUMBER: 112G02117
DRILLING COMPANY: Atlantic Engineering
DRILLING RIG: Rig 1

BORING No.: 32 SB 57
DATE: 9/20/10 13:42
GEOLOGIST: C Tewksbury
DRILLER: C Chambers

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-4			75			0-1	silty clay w/ gravel						
					1-3		silty clay - Brown		0 PID				
							very Dry No odor no stain						
4-8			100				silty clay - very		Affect pass				
							Dry						
					Sampled 7-8								
					refusal at 8'								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSA Crane Sum 32
PROJECT NUMBER: 112 G02111
DRILLING COMPANY: Ark Engineering
DRILLING RIG: Rig #1
BORING No.: 32 SB 59
DATE: 9/20/10 14:32
GEOLOGIST: G. Von Engel
DRILLER: C. Chasibene

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-4			100				Silty clay - Brown no stain						
							very dry - no odor Ø pid						
4-7							As above						
~~7-8~~													
7-8							Sand & clay - fine sand						
							w/ silty zone						
							Dk gr moist - very						
							faint septic odor pid = 0.1						
					Sampled 0709								
9-10							Silty clay - Dk gray						
							mottled						
							no odor no stain Ø pid						
10-12							Silty clay gray -						
							no odor - no stain Ø pid						
							Semi moist						
					Sampled 11-12								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: MSA Chase Summit 32
PROJECT NUMBER: 112G02111
DRILLING COMPANY: Ark Engineering
DRILLING RIG: Rig 1
BORING No.: 32 SB - 59
DATE: 9/20/10
GEOLOGIST: G. Van Eych
DRILLER: C. Chamberlin

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-4			50%				silty clay DRY						
						NO	odor no ~~stain~~ stain						
4-8							silty clay gray with						
							iron oxide mottled						
							Dry - no odor Ø pid						
8-9							As above						
9-10							~~silty silt~~ - gray DRY						
10-12					silty clay DK BR w/ oxide								
					mottle								
					NO odor no stain Ø pid								
					Sampled 11-12								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSA Crane SWMU 32
PROJECT NUMBER: 112-G-02111
DRILLING COMPANY: ARK Engineering
DRILLING RIG: Rig #1

BORING No.: MW-4
DATE: 9-17-10 14:30
GEOLOGIST: George Tom Eyck
DRILLER: C. Chambers

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-6"							Top Soil						
6"-4'			25		MC 25%		Lt tan silty clay						
							Very Dry - w/ many						
							mottling						
4-7			100				As above						
7-8			100				Silty clay - gray &						
							tan mottled						
							Semi-moist		No stains or				
									odor				
8-10			100				gray silty clay w/						
							orange mottling		moist				
							silt						
10-12			100				gray ~~silty clay~~ - very		moist				
12-13							gray silt						
13-15							Sand - Brown -		Very moist				
15-16							Silty clay very		wet				
16-19							clay & silt Brown		wet				
19-20							gray clay		wet				
20-24							gray clay		wet				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: Set well w/ 10' Screen (14-24) temporary well

Converted to Well: Yes ✓ No _____ Well I.D. #: MW-4

Tetra Tech NUS, Inc.

NSA Crane **BORING LOG**

PROJECT NAME: SWMU 32
PROJECT NUMBER: N2G02111
DRILLING COMPANY: ARK Engineering
DRILLING RIG: Rig #1

BORING No.: MW-5
DATE: 9-17-10 15:15
GEOLOGIST: G. Van Eyck
DRILLER: C. Chambers

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-1							Clayey sand top soil		Dry				
1-4			100				Silty clay - soft						
							gray & lt BR mottled		No odor				
									No stain				
4-8			100				Silty clay - gray & BR						
							mottled some - Dry		No stain				
8-12			75				gray silty w/ clay						
							Very moist -		0 PID				
12-13			100				fine sand - gray		0 PID				
							Very moist						
13-16							Clay - Brown - Very moist						
							some silt		0 PID				
16-17			100				As above						
17-18							fine sand wet		0 PID				
18-20			100				Clayey silt - gray						
20-24			100				Silt - gray - Very wet		0 PID				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Temp. Monitoring well MW-5
10' Screen 14-24

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSA Crane Swmu 32
PROJECT NUMBER: 112 G 02111
DRILLING COMPANY: Arle Engineering
DRILLING RIG: Mg #1

BORING No.: MW-6
DATE: 9-20-00 8:15
GEOLOGIST: B. Jon Eyck
DRILLER: C Chambers

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-4			25%				gravel Backfill						
4-8			50				gravel & silty clay Brown						
							Moist - no odor Ø PID						
8-12			50				Silty clay Brown						
							moist - no odor Ø PID						
12-16			100										
12-13					D/C		gray clay - very moist						
							no odor Ø PID						
13-16					B/C		silty clay wet at 15'						
							no odor Ø PID						
16-17			100				Silty clay - Brown as above						
17-20			100				silty clay - gray soft wet						
							no odor Ø PID						
20-21			100			As	above						
21-24			100				silty - gray very wet						
							no odor Ø PID						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: Temp well in Parking area
set well w/ 10' screen 14-24'

Converted to Well: Yes ✓ No _____ Well I.D. #: Temp. mw 6

APPENDIX C – SAMPLE LOG SHEETS AND OTHER FORMS

SAMPLE LOG SHEETS
CHAIN OF CUSTODY FORMS
CALIBRATION LOGS

SAMPLE LOG SHEETS

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

Sample ID No.: 325BDW010002
Sample Location: 325DDW01
Sampled By: George Tentkich
C.O.C. No.: 4-28-10 5 of 5

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-28-10 Time: 12:54 Method: DPT Monitor Reading (ppm): 30	0-2	Gray	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
	325FD042810 05

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SBDW010509
Sample Location: 32SBDW01
Sampled By: George Ten Eyck
C.O.C. No.: 4-28-10 4 of 5

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-28-10 Time: 12:54 Method: DPT Monitor Reading (ppm): 7.0	08-09	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.: ~~32SS~~ 32SSFD 042810-05

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 3255DW02D002
Sample Location: 3255DW02
Sampled By: City of Tentek
C.O.C. No.: 4-28-10 SOFS

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04-28-10	0-2	Brown	Silty clay
Time: 14:08			
Method: DPI			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G 02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SBDW02050G
Sample Location: 32SBDW02
Sampled By: George Ten Eyck
C.O.C. No.: 04-28-10 SOFS

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04-28-10 Time: @ 14:08 Method: DPT Monitor Reading (ppm): 0	05-06	Grey	Silty Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 3258DW03 0002
Sample Location: 3258DW03
Sampled By: Gregory Tex Fuller
C.O.C. No.: 04-28-10 SES

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04-28-10			
Time: 14:08			
Method: DPT	0-2	Brown	Silty Clay
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G 02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SBDW03030304
Sample Location: 32SBDW03
Sampled By: Gregory Lyck
C.O.C. No.: 04-28-10 SOFS

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04-28-10
Time: 1500
Method: DPI
Monitor Reading (ppm): Q

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
03-04 Bgs	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G 02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB ST01 0203
Sample Location: 32SB ST01
Sampled By: George Tim Clark
C.O.C. No.: 04-28-10 SXS

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04-28-10 Time: 12:05 Method: DPT Monitor Reading (ppm): 7.5	02-03	Light Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 3255B010002
Sample Location: 3255B01
Sampled By: George Ten Eyck
C.O.C. No.: 4-26-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-26-10	0-2	Brown	Silty Clay
Time: 15:30			
Method: DPT			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH's			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.: 3255-FD042610-01

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G 02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB01 0708
Sample Location: 32SB01
Sampled By: George Tuntright
C.O.C. No.: 4-26-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-26-10 Time: 15:30 Method: DPT Monitor Reading (ppm): 0	07-08	Brown	Silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
	32SB FD 042610-01

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 32SS020002
Sample Location: 32SB02
Sampled By: George Tom Eight
C.O.C. No.: 04-26-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04-26-10 Time: 10:45 Method: DPT Monitor Reading (ppm): NA	0-2	Brown	Silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 325B020607
Sample Location: 325B02
Sampled By: George Van Eyck
C.O.C. No.: 4-26-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-26-10 Time: 1045 Method: DPT Monitor Reading (ppm): 0	06-07	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 325S03002
Sample Location: 325B03
Sampled By: George Den Ewa
C.O.C. No.: 4-26-10

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-26-10 Time: 11:15 Method: DPT Monitor Reading (ppm): 0	0-2	Brown	Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 Tank FARM
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 325B030607
Sample Location: 325B03
Sampled By: George Dan Buck
C.O.C. No.: 4-26-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-26-10	06-07	Brown	Silty Clay
Time: 10:10			
Method: DPT			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 32SS04000Z
Sample Location: 32SB04
Sampled By: George Jim Eyck
C.O.C. No.: 4-26-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04-26-10 Time: 1600 Method: DPH Monitor Reading (ppm): 0	0-2	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 3SB040506
Sample Location: 3SB04
Sampled By: George Ten Eyck
C.O.C. No.: 04-26-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04-26-10 Time: 16:00 Method: DPT Monitor Reading (ppm): 0	05-06	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G 02111

Sample ID No.: 325S05 0002
Sample Location: 325S05
Sampled By: Gregory Tankersley
C.O.C. No.: 4-26-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-26-10 Time: 11:25 Method: DPT Monitor Reading (ppm): Ø	0-2	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G 02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 323B05 0506
Sample Location: 323B05
Sampled By: George Ten Eyck
C.O.C. No.: 4-26-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-26-10	05-06	Grey	Silty Clay
Time: 11:25			
Method: DPT			
Monitor Reading (ppm): 4.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 325506 0002
Sample Location: 325306
Sampled By: Owen R Rodgers
C.O.C. No.: 4-26-10

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04-26-10 Time: 10:55 Method: DPT Monitor Reading (ppm): 0	0-2	Grey	Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: S2SB060405
Sample Location: S2SB06
Sampled By: George Ten Eyck
C.O.C. No.: 04-26-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04-26-10
Time: 11:00
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
04-05	Grey Brown	Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 325S070002
Sample Location: 325B07
Sampled By: Grace Ten Eyck
C.O.C. No.: 04-26-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04-26-10
Time: 16:25
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Grey	Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH's			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 325B070607
Sample Location: 325B07
Sampled By: George Ten Eyck
C.O.C. No.: 4-26-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04-26-10
Time: 1625
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
06-07	Grey	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 32SS080002
Sample Location: 32SB08
Sampled By: Gregory Ten Eyck
C.O.C. No.: 4-27-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4-27-10
Time: 8:10
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 325B06-0607
Sample Location: 325B08
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 4-27-10
Time: 8:10
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
06-07	Grey	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 325S090002
Sample Location: 325B09
Sampled By: Grace Tan Eyk
C.O.C. No.: 4-26-10

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4-26-10
Time: 11:10
Method: DPT
Monitor Reading (ppm): X

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 325B090607
Sample Location: 325B09
Sampled By: Grace Ten Eyck
C.O.C. No.: 4-26-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04-26-10
Time: 11:10
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
06-07	Grey	Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 32SS10 0002
Sample Location: 32SB10
Sampled By: George Ten Eyck
C.O.C. No.: 4-26-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-26-10	0-2	Brown	Silty Clay
Time: 11:35			
Method: DPT			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB100506
Sample Location: 32SB10
Sampled By: George Ten Eyck
C.O.C. No.: 04-26-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04-26-10
Time: 11:25
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
05-06	Grey	Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 32SS11 0002
Sample Location: 32SB11
Sampled By: Gregory Ten Eyck
C.O.C. No.: 4-26-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04-26-10
Time: 0820
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB110607
Sample Location: 32SB11
Sampled By: George Ten Eyck
C.O.C. No.: 4-26-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04-26-10 Time: 08:25 Method: DPT Monitor Reading (ppm): X	6-7	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 E02111

Sample ID No.: 32SS12000 2
Sample Location: 32SB12
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04-27-10
Time: 8-35
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Gray	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB12 0607
Sample Location: 32SB12
Sampled By: George Ten Eyck
C.O.C. No.: 04-27-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 4-27-10
Time: 8:35
Method: DPT
Monitor Reading (ppm): X

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0607	Gray	silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112G02111

Sample ID No.: 325S13G002
Sample Location: 325B13
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4-27-10
Time: 8:50
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Gray	Silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB130607
Sample Location: 32SB13
Sampled By: George Ten Eyck
C.O.C. No.: 04-27-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04-27-10 Time: 8:55 Method: DPT Monitor Reading (ppm): X	6-7	Brown	Silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 325S140002
Sample Location: 325B14
Sampled By: George Ten Eyck
C.O.C. No.: 4-26-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-26-10	0-2	Brown	Silty Clay
Time: 1200			
Method: DPT			
Monitor Reading (ppm): N			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[ ] Surface Soil
[X] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 22 SB14 0910
Sample Location: 32SB14
Sampled By: Gracey Ten Eyck
C.O.C. No.: 04-26-10

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04-26-10
Time: 12:00
Method: DPT
Monitor Reading (ppm): 10

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
09-10	Gray	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 325S150002
Sample Location: 325B15
Sampled By: George Ten Eyck
C.O.C. No.: 04-27-10

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04-27-10	0-2	Brown	Silty Clay
Time: 9:10			
Method: DPT			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: J2SB150306
Sample Location: J2SB06
Sampled By: George Tan Eyck
C.O.C. No.: 04-27-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04-27-10 Time: 9:10 Method: DPT Monitor Reading (ppm): 0	5-6	Gray	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

Sample ID No.: 3255(6000)
Sample Location: 3258 16
Sampled By: Gregg Ten Eyck
C.O.C. No.: 4-27-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-27-10 Time: 10:15 Method: DPT Monitor Reading (ppm): 0	0-2	Gray	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G 02111

[ ] Surface Soil
[X] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 32SB16 06-07
Sample Location: 32SB16
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-27-10	06-07	Gray	Clay
Time: 10:15			
Method: DPT			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

Sample ID No.: 325170002
Sample Location: 325B17
Sampled By: Gracey Ten Eyck
C.O.C. No.: 4-27-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-27-10 Time: 10-20 Method: DPT Monitor Reading (ppm): 1	0-2	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[ ] Surface Soil
[X] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 325B170607
Sample Location: 325B17
Sampled By: Gregory Ten Eick
C.O.C. No.: 4-27-10

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-27-10 Time: 10:30 Method: DPT Monitor Reading (ppm): 2.2	06-07	Gray	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 325B17 1112
Sample Location: 325B17
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-27-10	11-12	Gray	Silty Clay
Time: 10:45			
Method: DPT			
Monitor Reading (ppm): 3.5			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

[ ] Surface Soil
[X] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 32SB180506
Sample Location: 32SB18
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10 2 of 7

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4-27-10
Time: 11:00
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
05-06	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Sample ID No.: 3255 IK 0002
Sample Location: 3253 IK
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4-27-10
Time: 11:00
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Gray	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 3255190002
Sample Location: 3253.19
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4-27-10
Time: 11:10
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[ ] Surface Soil
[X] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 32SB19 0506
Sample Location: 32SB19
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10 2of2

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4-27-10
Time: 11:10
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0506	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 32SS20002
Sample Location: 32SB20
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4-27-10
Time: 11:20
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB200506
Sample Location: 32SB20
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 4-27-10
Time: 1125
Method: DPT
Monitor Reading (ppm): N

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
05-06	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 32SS210002
Sample Location: 32SB21
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10 2 of 7

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4-27-10
Time: 11:45
Method: DPT
Monitor Reading (ppm): 40

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.: 32SSFD042710-02

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB210S06
Sample Location: 32SB21
Sampled By: Gregory Ten Eyck
C.O.C. No.: 04-27-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04-27-10
Time: 11:45
Method: DPT
Monitor Reading (ppm): X

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
05-06	Gray	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.: 32SBFD042710-02

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 325522 0002
Sample Location: 325B22
Sampled By: Gregory Ten Eyck
C.O.C. No.: 4-27-10

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: ___
- [ ] QA Sample Type: ___

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4-27-10
Time: 12:55
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

[ ] Surface Soil
[X] Subsurface Soil
[ ] Sediment
[ ] Other: _____
[ ] QA Sample Type: _____

Sample ID No.: 32SB220506
Sample Location: 32SB22
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-27-10			
Time: 12:55			
Method: DPT	5-6	Brown	Silty Clay
Monitor Reading (ppm): 1			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

Sample ID No.: 3255230002
Sample Location: 3255323
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4-27-10
Time: 12:55
Method: DPT
Monitor Reading (ppm): 4

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Gray	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB230506
Sample Location: 32SB23
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-27-10	05-06	Brown	Silty Clay
Time: 13:05			
Method: DPT			
Monitor Reading (ppm): Ø			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 32SS24000D
Sample Location: 32-B24
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4-27-10
Time: 13:10
Method: DPT
Monitor Reading (ppm): -7

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Gray	Silty Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[ ] Surface Soil
[X] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 32SB240506
Sample Location: 32SB24
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-27-10			
Time: 13:15			
Method: DPT	05-06	Brown	Silty Clay
Monitor Reading (ppm): X			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 325525 0002
Sample Location: 325B25
Sampled By: George Ten Eyck
C.O.C. No.: 4-27-10

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-27-10	0-2	Gray	Silty Clay
Time: 13:30			
Method: DPT			
Monitor Reading (ppm): Ø			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[ ] Surface Soil
[X] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 32SB25 0607
Sample Location: 32SB25
Sampled By: George Ten Eyck
C.O.C. No.: 04-27-10

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-27-10	05-06	Brown	Silty Clay
Time: 13:30			
Method: DPT			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 32SS26 0002
Sample Location: 32SB26
Sampled By: George Ten Eyck
C.O.C. No.: 04-27-10

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04-27-10
Time: 12:35
Method: DPT
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Gray	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

[ ] Surface Soil
[X] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 32SB260405
Sample Location: 32SB26
Sampled By: George Ten Eyck
C.O.C. No.: 04-27-10

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04-27-10
Time: 13:35
Method: DPT
Monitor Reading (ppm): 4

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
04-05	Gray	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 3055270002
Sample Location: 305527
Sampled By: George Kenyon
C.O.C. No.: 04/27/2010 Pg3

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/27/2010	0-2	Brown	silty clay
Time: 1400			
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
DPHS			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB27-05-06
Sample Location: 32SB27
Sampled By: G. Rostenfuck
C.O.C. No.: 04/27/2010 pg 3

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/27/2010
Time: 1400
Method: LPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
05-06	Brown	gray mottled

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G 02111

Sample ID No.: 2255200002
Sample Location: 22552
Sampled By: Gourostenyck
C.O.C. No.: 04/27/2010 pg 2

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[ ] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/27/2010			
Time: 1425			
Method: DPT	0-2	Brown	Silty clay
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 328-28CE06
Sample Location: 328-28
Sampled By: Chase Kintzick
C.O.C. No.: 04/27/2010 #93

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/27/2010 Time: 1425 Method: DPT Monitor Reading (ppm):	05-06	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G 02111

Sample ID No.: 325SB10002
Sample Location: 325SB1
Sampled By: George Tan Eck
C.O.C. No.: 04/27/2010 pg 5

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other: _____
[ ] QA Sample Type: _____

Type of Sample:
[ ] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04/27/2010
Time: 1430
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB29CO04
Sample Location: 32SB29
Sampled By: [illegible]
C.O.C. No.: 04/27/2010 1493

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/27/2010 Time: 1430 Method: DPT Monitor Reading (ppm):	3-4	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 325S30CC02
Sample Location: 325S30
Sampled By: George Tenwick
C.O.C. No.: 04/27/2010 #34

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[ ] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/27/2010	0-2	Brown	Silty Clay
Time: 1505			
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 225B30005C6
Sample Location: 225B30
Sampled By: Groockenbick
C.O.C. No.: 04/27/2010 pg4

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/27/2010	05-06	gray	silty clay
Time: 1505			
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 325S01CC02
Sample Location: 325S21
Sampled By: Christen Eick
C.O.C. No.: 04/28/2010 pg3

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[ ] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/28/2010 Time: 1010 Method: DPT Monitor Reading (ppm):	0-2	gray and Brown	mottled silty clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PDHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: 225331CC07
Sample Location: 225S31
Sampled By: CHRIS TONKY/CK
C.O.C. No.: 04/28/2010 193

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/28/2010			
Time: 1010	06-07	Light Brown	mottled silty clay
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TPHs			
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G 02111

Sample ID No.: 3255SB0002
Sample Location: 3255B2
Sampled By: [illegible]
C.O.C. No.: 04/27/2010 [illegible]

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[ ] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04/27/2010
Time: 1410
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.: 3255FD042710-03

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB220SD06
Sample Location: 32SB22
Sampled By: [illegible]
C.O.C. No.: 04/27/2010 rg4

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/27/2010 Time: 1410 Method: DPT Monitor Reading (ppm):	05-06	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.: 32SB FD042710-03

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 225S33CC02
Sample Location: 225S33
Sampled By: [illegible]
C.O.C. No.: 04/27/2010 #4

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [ ] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/27/2010 Time: 1525 Method: DPT Monitor Reading (ppm):	0-2	Brown	Silty clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 225B33C500
Sample Location: 225B33
Sampled By: Grace Kentrick
C.O.C. No.: 04/29/2010 rgk

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 1525
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
05-06	Brown	Silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
PCB			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G 02111

Sample ID No.: 325340002
Sample Location: 325324
Sampled By: [illegible]
C.O.C. No.: 04/27/2010 15:4

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[ ] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04/27/2010
Time: 1540
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	Silty clay with some fine sand

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 325P3406C07
Sample Location: 325P34
Sampled By: Chuck Kolyck
C.O.C. No.: 04/27/2010 #94

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/27/2010
Time: 1540
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
06-07	Brown	Silty clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TPHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 325S250002
Sample Location: 325S25
Sampled By: George Henryck
C.O.C. No.: 04/28/2010 pg 3

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [ ] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/28/2010 Time: 1025 Method: DPT Monitor Reading (ppm):	0-2	BROWN	Silty Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 325B35C05C07
Sample Location: 325B35
Sampled By: Christenbury
C.O.C. No.: 04/28/2010 [illegible]

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/28/2010 Time: 1025 Method: DPT Monitor Reading (ppm):	05-07	Brown and Grey	moist silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PDHS			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 3255260002
Sample Location: 225536
Sampled By: Chuck Hancock
C.O.C. No.: 04/27/2010 Pg 4

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/27/2010	0-2	Brown	Silty Clay
Time: 1545			
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB36CE06
Sample Location: 32SB36
Sampled By: George Kenkyk
C.O.C. No.: 04/29/2010 #4

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/27/2010 Time: 1545 Method: DPT Monitor Reading (ppm):	05-06	gray	Clayey Silt

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

Sample ID No.: 325S87CCC2
Sample Location: 325S27
Sampled By: George Hendrick
C.O.C. No.: 04/27/2010 #94

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[ ] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/27/2010 Time: 1600 Method: DPT Monitor Reading (ppm):	0--2	Brown	Silty clay w/ fine sand

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TPHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

Sample ID No.: 22B37G06
Sample Location: 22B37
Sampled By: Chuck Kenock
C.O.C. No.: 04/27/2010 P4

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/27/2010			
Time: 1600			
Method: DPT	05-06	TAN	fine sand to silt
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
TPH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 3255-SB6002
Sample Location: 3255-SB6
Sampled By: [illegible]
C.O.C. No.: 04/28/2010 pg 3

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/28/2010	0-2	Brown	Silty Clay
Time: 0950			
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 225B28C506
Sample Location: 225B28
Sampled By: Crosse/Lenfack
C.O.C. No.: CH2M2010pg3

[ ] Surface Soil
[X] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04/28/2010
Time: 0850
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
00-02	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TMHc			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 22553-0002
Sample Location: 22553
Sampled By: George Tenfack
C.O.C. No.: 04/28/2010 93

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [ ] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/28/2010	0-2	Brown	Silty Clay
Time: 1345			
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TPHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G 02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 22SB39CE07
Sample Location: 22SB39
Sampled By: Carlos Ferrick
C.O.C. No.: 04/29/2010 193

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/29/2010 Time: 1045 Method: DPT Monitor Reading (ppm):	05-07	Lt. Brown	Silty Clay w/ Sand

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
EPH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 325540002
Sample Location: 325540
Sampled By: George Ten Eyck
C.O.C. No.: 04/28/2010 #3

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 04/28/2010
Time: 0900
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 225P40C5C6
Sample Location: 225B40
Sampled By: Grace Tan Eck
C.O.C. No.: 04/28/2010, 33

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/28/2010
Time: 0900
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
05-06	Brown	fine sand moist

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
HMIS			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 32554 0002
Sample Location: 32554
Sampled By: Chuck Ten Eyck
C.O.C. No.: 042812UP93

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04/28/2010
Time: 0920
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	Silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 22SB41G500
Sample Location: 22SB41
Sampled By: George Ten Eyck
C.O.C. No.: 04/28/2010 1/3

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/28/2010
Time: 0920
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-5.0	Brown	fine sand w/ some silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G 02111

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 325420002
Sample Location: 325542
Sampled By: Gregory Ten Eyck
C.O.C. No.: 04/28/2010 pg 3

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04/28/2010
Time: 0930
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 325P42SB6
Sample Location: 325P42
Sampled By: Chuck Ten Eick
C.O.C. No.: 04/28/2010 tgs

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/28/2010
Time: 0930
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
05-06	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 3255-FT0422101-04
Sample Location: 32542
Sampled By: Grace Ten Eyck
C.O.C. No.: 04/28/2010

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/28/2010	N/A	BRN	silty clay
Time: 0000			
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.: 3255-FT0422101-04

Signature(s):

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Project Site Name: NSA Crane OU 273 Tank Farm
Project No.: 112 G 02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 325B-FD042810-04
Sample Location: 325B 325B42
Sampled By: Gerry Ten Eyck
C.O.C. No.: 04/28/2010 FGS

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/28/2010
Time: 0000
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
NA	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TPHC			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
	325B-FD042810-04

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 32554PC002
Sample Location: 32554
Sampled By: George Ten Eick
C.O.C. No.: 04/29/2010 [9]

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 09:15
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	Silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 325P42C5C6
Sample Location: 325B43
Sampled By: Gregory Ten Eyck
C.O.C. No.: 04/29/2010

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 0910
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
C5-C6	gray	Silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 225844CC02
Sample Location: 225844
Sampled By: Crane Tan Eick
C.O.C. No.: 04/29/2010 rg1

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 0926
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	gray	Silty clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 22SB44050W
Sample Location: 22SB44
Sampled By: Chuck Ten Eyck
C.O.C. No.: 04/29/2010

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 0920
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
05-06	gray	moist silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 325450002
Sample Location: 325545
Sampled By: Grace Ten Eyck
C.O.C. No.: 04/29/2010 [illegible]

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 0955
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	gray	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 325P45U607
Sample Location: 325P45
Sampled By: Grace Tan Eck
C.O.C. No.: 04/29/2010 pg1

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 0955
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
06-07	Brown-Gray	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
PIEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G 02111

Sample ID No.: 325SHCC002
Sample Location: 325S46
Sampled By: Gracey Ten Eyck
C.O.C. No.: 04/29/2010191

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/29/2010 Time: 1010 Method: DPT Monitor Reading (ppm):	0-2	Dark Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 3258460304
Sample Location: 3258460
Sampled By: Green Ten Eyck
C.O.C. No.: 04/29/2010

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 1016
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
02-04	Dark gray	moist silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 225470002
Sample Location: 225470
Sampled By: Gerry Ten Eyck
C.O.C. No.: 04/29/2010 [illegible]

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 1040
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	Silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 225R470506
Sample Location: 225R47
Sampled By: Gregory Ten Eyck
C.O.C. No.: 04/29/2010 pg 2

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 1040
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
05-06	Dark gray	firm silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 32549 0002
Sample Location: 32549
Sampled By: Gerry Ten Eyck
C.O.C. No.: 04/29/2010

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/29/2010	0-2	Brown	Silty clay
Time: 1054			
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB400405
Sample Location: 32SB40
Sampled By: Grace Ten Eyck
C.O.C. No.: 04/29/2011 pg 2

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2011
Time: 1634
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
04-05	Light Brown	Silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAILS			
BULK			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 325549 0002
Sample Location: 325549
Sampled By: George Ten Eyck
C.O.C. No.: 04/29/2010 Pg 2

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 1118
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	silty clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TPHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 225P49 0405
Sample Location: 225P49
Sampled By: George Ten Eyck
C.O.C. No.: 04/29/2010 #2

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 1118
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
04-05	gray	fine sand w/ clay moist

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

Sample ID No.: 325550002
Sample Location: 325550
Sampled By: George Ten Eick
C.O.C. No.: 04/29/2010-2

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/29/2010 Time: 1145 Method: DPT Monitor Reading (ppm):	0-2	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TPHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 325B50Cw07
Sample Location: 325B5D
Sampled By: George Ten Eyck
C.O.C. No.: 04/29/2010 pg 2

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 1145
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
06-07	Brown	Sand - w/ gravel

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TPHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 3255-FD042910-05
Sample Location: 3255D
Sampled By: Greg Ten Eyck
C.O.C. No.: 04/29/2010 pg 1

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/29/2010	1-2	Brown	silty clay
Time: 0000			
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TPHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.: 3255-FD042910-05

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB-FD042910-05
Sample Location: 32SB5D
Sampled By: George Ten Eyck
C.O.C. No.: 04/29/2010

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 0000
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
6-7	Brown	Sand w/ gravel

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
LAHs			
PCA			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 2255510002
Sample Location: 325551
Sampled By: George Ten Eyck
C.O.C. No.: 04/29/2010 93

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 1342
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PPH			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[ ] Surface Soil
[X] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 22PS1070?
Sample Location: 22PS1
Sampled By: Chuck Ten Eyck
C.O.C. No.: 04/29/2010 ?

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 1342
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
07-08	gray	sand

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[ ] Surface Soil
[X] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 22SB51415
Sample Location: 22SB51
Sampled By: George Ten Eyck
C.O.C. No.: 04/29/2010

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/29/2010 Time: 1342 Method: DPT Monitor Reading (ppm):	14-15	Reddish Brown	Silty Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 3255SD0002
Sample Location: 3255S2
Sampled By: George Tom Eink
C.O.C. No.: 04/29/2010

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/29/2010 Time: 1420 Method: DPT Monitor Reading (ppm):	0-2	Reddish Brown	Silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TPHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32-B5-08-09
Sample Location: 32-B52
Sampled By: George Ten Eyck
C.O.C. No.: 04/29/2010/93

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/29/2010 Time: 1420 Method: DPT Monitor Reading (ppm):	08-09	gray	clay w/ gravel

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 22SB52MHS
Sample Location: 22SB52
Sampled By: Grace Ten Eyck
C.O.C. No.: 04/28/2010 93

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/28/2010
Time: 1420
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
14-15	gray-brown	silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
MMHS			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 32555PCW2
Sample Location: 32555
Sampled By: George Ten Eyck
C.O.C. No.: 04/29/2010 #3

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04/29/2010
Time: 1515
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32PS30910
Sample Location: 32PS53
Sampled By: George Ten Eyck
C.O.C. No.: 04/21/2010 Pg 3

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/21/2010
Time: 1515
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
9-10	Gray	Silty Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
MTBX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[ ] Surface Soil
[X] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: 325B53 1415
Sample Location: 325B53
Sampled By: Carey Ten Eyck
C.O.C. No.: 04/29/2010

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 04/29/2010 Time: 1515 Method: DPT Monitor Reading (ppm):	14-15'	Brown-gray	mottled clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			
PRX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

Sample ID No.: 3255-FD042810-05
Sample Location: 3255-X2-50
Sampled By: Grace Ten Eyck
C.O.C. No.: 04/28/2010

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[ ] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 04/28/2010
Time: 0000
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-2 ~~N/A~~	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.: 3255-FD042810-05

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB-FD042810-05
Sample Location: 32SB42 50
Sampled By: Greg Ten Eyck
C.O.C. No.: 04/28/2010 #95

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 04/28/2010
Time: 0000
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
N/A 6-7	BROWN	silty clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
EPH's			
BTEX			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.: 32SB-FD042810-05

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Cairo CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB540708
Sample Location: 32SB54
Sampled By: G. Van Eyck
C.O.C. No.: 092010

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9/17/2010 Time: 1600 Method: DPT Monitor Reading (ppm): 1.1	07-08	Grey	Silt w/ Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Naphthalene			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
	~~SB540708~~

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane OU 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB54112
Sample Location: 32SB54
Sampled By: Gt Ten Eyck
C.O.C. No.: 072010 #052

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-17-10	11-12	Grey	Silty Clay
Time: 16:00			
Method: DPT			
Monitor Reading (ppm): Ø			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Naphthalene			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB550708
Sample Location: 32SB55
Sampled By: George Van Eyck
C.O.C. No.: 092010 2of2

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-20-10 Time: 10:40 Method: DPT Monitor Reading (ppm): 0	07-08	Brown	S. Hy Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Naphthalene			

OBSERVATIONS / NOTES:

No Odor

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB55112
Sample Location: 32SB55
Sampled By: George Tenbyk
C.O.C. No.: 092010

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 092010	11-12	Brown	Silty clay
Time: 10:40			
Method: DPT			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Naphthalene			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB561011
Sample Location: 32SB56
Sampled By: George TenEyck
C.O.C. No.: 092010 2of2

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 09-20-10 Time: 10:10 Method: DPT Monitor Reading (ppm): 0.5	10-11	Grey	Silty Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Naphthalene			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB56 1415
Sample Location: 32SB56
Sampled By: George Tenbrink
C.O.C. No.: 092010 2of2

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-20-10	14-15	Brown	Silty Clay
Time: 10:10			
Method: DPT			
Monitor Reading (ppm): .7			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Naphthalene			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.: 32SBFD 092010-01

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 E02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB570708
Sample Location: 32SB57
Sampled By: Gregory Ten Eyck
C.O.C. No.: 092810 3of2

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 09-20-10	07-08	Brown	Silty Clay
Time: 13:42			
Method: DPT			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Naphthalene			

OBSERVATIONS / NOTES:

Difficult Push

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 325B580708
Sample Location: 325B58
Sampled By: George Ten Eyck
C.O.C. No.: 092010 2of2

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 09-20-10
Time: 14 32
Method: DPT
Monitor Reading (ppm): .1

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
07-08	Grey	Fine Sand with Silty Zone

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Naphthalene			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 325B581112
Sample Location: 325B58
Sampled By: George Van Buck
C.O.C. No.: 092010 2.12

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 09-20-10 Time: 14.32 Method: DPT Monitor Reading (ppm): 0	11-12	Grey	S. Ity Clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Naphthalene			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 325B590708
Sample Location: 325B59
Sampled By: George Ten Eyck
C.O.C. No.: 0932810 2of2

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 09-20-10 Time: 10:20 Method: DPT Monitor Reading (ppm): N	07-08	Grey	Silty Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Napthalene			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB59112
Sample Location: 32SB59
Sampled By: George Ta Clark
C.O.C. No.: 092010 2 of 2

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 09-20-10	11-12	Dark Brown	Silty Clay
Time: 10:40			
Method: DPT			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Napthalene			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

Sample ID No.: 32 SB 60 0002
Sample Location: 32 SB 60
Sampled By: G. Tonbyck
C.O.C. No.:

[x] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9/20/2010 Time: 15:28 Method: DPT Monitor Reading (ppm): 0	0 - 2	LT BR & gray mottle	silty clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PHA			

OBSERVATIONS / NOTES:

no odor - Dry

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32 SB 61 0002
Sample Location: 32 SB 61
Sampled By: G. Tom Eyck
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9/20/10	0 - 2	Lt. Brown	Silty clay
Time: 15:40			
Method: DPT			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

No odor Very Dry

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 602111

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32 SB 02 0002
Sample Location: 32 SB 02
Sampled By: G. Tow Eyck
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9/20/2010	0-2	Lt. Br	Silty clay
Time: 15:20			
Method: DPT			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH			

OBSERVATIONS / NOTES:

No odor
Very dry

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 602111

Sample ID No.: 32 SB 63 0002
Sample Location: 32 SB 63
Sampled By: B. Tewbeck
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9/20/2010			
Time: 16:04			
Method: DPT	~~Lt Br~~	Lt Br	Silty clay
Monitor Reading (ppm): 0	0-2		

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs			

OBSERVATIONS / NOTES:

No odor Dry

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 602111

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SB64 0002
Sample Location: 32 SB 64
Sampled By: D. Van Eyck
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9/20/2010			
Time: 13:06	0 - 2	gray	Silt and fine sand some gravel - very dry
Method: DPT			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PHA			

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32 SB 65 0002
Sample Location: 32 SB65
Sampled By: G Tow Eych
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 9/20/10
Time: 12:50
Method: DPT
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-1	gray	
1-2	silty clay	Dk gray w/ Dk Br mottle

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PHA			

OBSERVATIONS / NOTES:

No odor
∅ PID
Collected Field Dup

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.: Field Dup FD 09 2010-02

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G02111

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SD01
Sample Location: Pumpkin creek
Sampled By: RDF/LF
C.O.C. No.: 2144

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/30/10	0-6"	Brown	~~silt~~ clayey silt w/ sand saturated OK
Time: 12:50			
Method: grab			
Monitor Reading (ppm): NA			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
BTEX	En cores		
PAH	4oz glass jars		

OBSERVATIONS / NOTES:

No 4 oz glass jars available
Used En core samplers for BTEX analysis -
Collected north side of creek - move upstream for better access to creek

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: NSA Crane CTO 273 Tank Farm
Project No.: 112 G 02111

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32 SD 02
Sample Location: Cypress Creek
Sampled By: [illegible] LF
C.O.C. No.: 21441

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/30/10 Time: 1:55 Method: Grab Monitor Reading (ppm):	0 - 6"	Brown	Clayey silt w/ sand Saturated OL

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH	4 oz glass jar		
BTEX	4 oz glass jar		

OBSERVATIONS / NOTES:

Field Dup collected at this location - South of creek

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
	32 SD FD 043010-01

Signature(s): [illegible]

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SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane CTO 273 TANK FARM
Project No.: 112 G02111

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32 SD 03
Sample Location: Outfall Creek
Sampled By: RPT-CE
C.O.C. No.: 2144

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4-30-10	0-6"	Brown	Clayey silt w/ sand - saturated - OL
Time: 12:10			
Method: Grab			
Monitor Reading (ppm): NA			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH	4 oz glass jar		
BTEX	4 oz glass jar		
	After spraying w/ CAS		

OBSERVATIONS / NOTES:

South side of stream channel

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: SWMU 32
Project No.: 112G02111

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 3250-04-0006
Sample Location: 3250-04
Sampled By: L. Foster
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 09/21/10 Time: 1000 Method: Trowel/Auger Monitor Reading (ppm): 0.0	0 - 6cm	Br	Silty Sand w/ some clay wet

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
09/21/10	1000	0 - 6cm	Br / Lt Br	Silty Sand w/ some clay wet
Method: Trowel				
Monitor Readings (Range in ppm): 0.0				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
BTEX	3 - 5g Encores	X	
BTEX % Moisture	1 - 4oz Amber glass	X	
PAH	1 - 4oz Amber glass	X	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Lauren Foster

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: SWMU 32
Project No.: 112G02M

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 32SD-05-0006
Sample Location: 32SD-05
Sampled By: L. Foster
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: ~~09/21/10~~			
Time: ~~1040~~			
Method: ~~Trowel~~			
Monitor Reading (ppm): ~~0.0~~			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
09/21/10	1040	0-6 in	Br	Silty sand w/ clay
Method:			Lt Br	wet
Trowel			Lt Br/Red	
Monitor Readings				
(Range in ppm):				
0.0				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
BTEX	3-5g Encores	X	
BTEX & Moisture	1-4oz Amber jar	X	
PAH	1-4oz Amber jar		

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.: 32SD-FD092110-01

Signature(s): Laura Foster

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: NSA Crane CTO 273
Project No.: 112G02111

[] Domestic Well Data
[] Monitoring Well Data
[X] Other Well Type: Temp Monitoring well
[] QA Sample Type:

Sample ID No.: 32G10-G01 32
Sample Location: ~~MW-1~~ GW-01
Sampled By: GT LF
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Date: 4/28/10								
Time: ~~3:32~~								
Method:								

PURGE DATA:

Date: 4/28/10	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0.0								
Well Casing Diameter & Material Type: 1" PVC								
Total Well Depth (TD): 20'								
Static Water Level (WL): 15.85								
One Casing Volume(gal/L): 0.166								
Start Purge (hrs): 15:20								
End Purge (hrs): 15:38								
Total Purge Time (min): 18 min								
Total Vol. Purged (gal/L): 1/2								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

stabilization was not achieved after 3 well volumes - samples collected

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSA Crane CTO F273 Tank Farm
PROJECT NUMBER: 112G02111

WELL ID.: 32RW-01
DATE: 4/28/10

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1522	16.93	100 ml/m								
1527	17.69	125 ml/m	5.39	0.255	56.7	4.28	15.32	43.7	0.12	
1532	17.60	120	5.78	0.254	1743	4.47	14.54	39.0	0.12	
1538	18.80	105	5.28	0.225	9346	2.46	13.94	12.9	0.14	

SIGNATURE(S): _____

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Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSA Crane ITD E273
Project No.: 112G02111

[] Domestic Well Data
[] Monitoring Well Data
[X] Other Well Type: Temp GW well
[] QA Sample Type:

Sample ID No.: 30GW-02
Sample Location: Swmu 32 MW03
Sampled By: AF & JT
C.O.C. No.: 109, 4/29/10
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Date: 4/28/10								
Time: 1208								
Method:								

PURGE DATA:

	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 4/28/2010								
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0.0								
Well Casing Diameter & Material								
Type: 1" PVC								
Total Well Depth (TD): 20'								
Static Water Level (WL): 5.55								
One Casing Volume(gal/L): 0.578								
Start Purge (hrs): 1117								
End Purge (hrs): 1203								
Total Purge Time (min):								
Total Vol. Purged (gal/L): 1.75 gal								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
BTEX	4 HCl Cooler	40 mL	1208
PAH	4 Cooler	2 1 Lt Amber VOA	1205

OBSERVATIONS / NOTES:

Circle if Applicable:
MS/MSD
Duplicate ID No.:

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSA Crane CTO F273 Tank Farm
PROJECT NUMBER: 112G02111

WELL ID.: 32GW02
DATE: 4/28/10

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1123	10.76 ft	180								
1128	10.80 ft	190	6.98	0.861	141.0	1.71	12.84	-14.9	0.43	
1133	10.68 ft	150	6.86	0.856	104.3	1.52	12.61	-16.9	0.42	
1138	10.50 ft	155	6.80	0.848	61.9	1.44	12.54	-18.7	0.42	
1143	10.55 ft	165	6.74	0.818	40.0	1.48	12.10	-9.4	0.40	
1152	9.93 ft	135	6.73	0.816	22.8	1.42	12.98	-3.1	0.40	
1158	9.71 ft	146	6.72	0.809	43.1	1.44	12.94	0.1	0.40	
1203	9.73 ft	140	6.70	0.803	60.9	1.44	12.96	1.9	0.40	

SIGNATURE(S): _____

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSA CRANE CTO 2223
Project No.: 112 E02111

[] Domestic Well Data
[] Monitoring Well Data
[✓] Other Well Type: temporary well
[] QA Sample Type:

Sample ID No.:
Sample Location: 32MW03
Sampled By: L. Foster, B. Collins
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (^{0}C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Date:								
Time:								
Method:								

PURGE DATA:

Date: 4/27/10	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD): 20 ft.								
Static Water Level (WL): 9.12 ft								
One Casing Volume(gal/L):								
Start Purge (hrs): 11:00								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

Purged for 25 minutes to see if it would recover (11am-11:25am) and purged ~~approximately~~ from 9.12 to 11.14 ft.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: NSA Mano CTO E273
Project No.: 112G02111

[] Domestic Well Data
[] Monitoring Well Data
[✓] Other Well Type: Temporary well
[] QA Sample Type:

Sample ID No.: 32GW-03
Sample Location: 32MW03
Sampled By: L. Foster, B. Collins
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Date:								
Time:								
Method:								

PURGE DATA:

	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 4/27/10								
Method: Low flow Peristaltic pump								
Monitor Reading (ppm): 0								
Well Casing Diameter & Material Type: 1 inch diameter PVC								
Total Well Depth (TD): 20 ft.								
Static Water Level (WL): 9.23								
One Casing Volume(gal/L):								
Start Purge (hrs): 1546								
End Purge (hrs): 1637								
Total Purge Time (min): 51 min								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

See low purge sheet for readings
Started ~~pumping~~ purging well earlier to see if it would recover (on another log sheet).

Circle if Applicable:

MS/MSD	Duplicate ID No.: 32GW FD042710-01

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSA Crane CTO F273 Tank Farm
PROJECT NUMBER: 112G02111

WELL ID.: 32MW03
DATE: 4/27/10

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
~~1535~~	~~9.23~~	—								
1546	11.21	140								
1556	11.47	150								
1606	11.85	160								
1616	11.78	150			~~138~~					
1622	11.81	140	7.10	0.973	138	0.45	12.95	-83.9	0.48 ppt	
1627	11.86	150	7.07	0.976	150	0.44	12.76	-81.9	0.49 ppt	
1632	11.84	140	7.05	0.976	36.7	0.49	12.86	-78.8	0.49 ppt	
1637	11.90	150	7.06	0.978	14.5	0.43	12.85	-78.0	0.49 ppt	

SIGNATURE(S): _____

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Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: SWMU 32
Project No.: 112102111

[] Domestic Well Data
[] Monitoring Well Data
[X] Other Well Type: Temporary Well
[] QA Sample Type:

Sample ID No.: 32GW-04
Sample Location: TW-04
Sampled By: L Foster / TC
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity ~~PPT~~	Other
Date: 09/22/10								
Time: 1410								
Method: Peristaltic	Turbid	6.28	429	16.07	1795	8.69	0.21	

PURGE DATA:

	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 09/22/10								
Method: Peristaltic	0.75	6.28	429	16.07	1795	8.69	0.21	
Monitor Reading (ppm): 0.0								
Well Casing Diameter & Material								
Type: 1" PVC								
Total Well Depth (TD): 24 ft								
Static Water Level (WL): 16.58								
One Casing Volume(gal/L): 0.297								
Start Purge (hrs): 1325								
End Purge (hrs): 1355								
Total Purge Time (min): 30								
Total Vol. Purged (gal/L): 0.75								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
BTEX	4°C/HCl	3 - 40 ml glass clear	✓
PAHs	4°C	2 - 1L Amber glass	✓

OBSERVATIONS / NOTES:

well purged dry @ 1355 after 30 min and 0.75 gal purged. Recovered quickly & well was sampled @ 1410.

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Leon Foster

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSA Crane ITO F273 Tank Farm
PROJECT NUMBER: 112G02111

WELL ID.: TW04
DATE: 09/22/10

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1320	18.75	-	-	-	-	-	-	-	-	
1325	20.93	150	-	-	-	-	-	-	-	Begin Purge
1338	22.64	130	6.41	366	75000	10.35	17.65	79.7	0.18	
1345	23.71	130	6.29	429	[illegible]	8.69	16.07	82.5	0.21	
1355					1795					Well purged dry
										purged 0.75 gal
										Sampled @ 1410

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: SWMU 32
Project No.: 112G02111

[] Domestic Well Data
[] Monitoring Well Data
[X] Other Well Type: Temporary Well
[] QA Sample Type:

Sample ID No.: 32GW-05
Sample Location: TW-05
Sampled By: LF / T. Chase
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (ppt)	Other
Date: 09/22/10								
Time: 1225								
Method: Peristaltic	Cloudy	7.10	671	17.05	197	3.94	0.33	

PURGE DATA:

	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 09/22/10								
Method: Peristaltic	1.2	7.10	671	17.05	197	3.94	0.33	
Monitor Reading (ppm): 0.0								
Well Casing Diameter & Material Type: 1" PVC								
Total Well Depth (TD): 24'								
Static Water Level (WL): 16.70								
One Casing Volume(gal/L): 0.297								
Start Purge (hrs): 1150								
End Purge (hrs): 1220								
Total Purge Time (min): 30								
Total Vol. Purged (gal/L): 1.2 gal								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
BTEX	4°C/HCl	3-40 mL glass clear	✓
PAHs	4°C	2-1 L Amber glass	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.: 32GW-FD092210-01	Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSA Crane CTO F273 Tank Farm
PROJECT NUMBER: 112G02111

WELL ID.: TW 05
DATE: 09/22/10

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1140	16.70	–	–	–	–	–	–	–	–	Start Purge
1150	17.38	130	–	–	–	–	–	–	–	Begin Purge
1200	17.53	130	7.26	662	6571	3.54	17.70	93.3	0.32	
1205	17.81	130	7.15	667	2861	3.45	17.58	93.0	0.33	
1210	17.91	130	7.13	669	1535	3.80	17.47	92.7	0.33	
1215	18.02	130	7.10	671	389	4.01	17.14	92.3	0.33	
1220	18.05	130	7.10	671	197	3.94	17.05	91.9	0.33	Final Purge - 1.2 gal Purge

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: SWMU 33
Project No.: 112602M

[] Domestic Well Data
[] Monitoring Well Data
[X] Other Well Type: Temporary Well
[] QA Sample Type:

Sample ID No.: 33GW-06
Sample Location: TW06
Sampled By: L. Foster
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (ppt)	Other
Date: 09/21/10								
Time: 2055								
Method: Peristaltic	Turbid	7.12	715	17.33	1277	5.03	0.35	

PURGE DATA:

	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 09/21/10								
Method: Peristaltic	2.1	7.12	715	17.33	1277	5.03	0.35	
Monitor Reading (ppm): 0.0								
Well Casing Diameter & Material								
Type: 1" PVC								
Total Well Depth (TD): 24'								
Static Water Level (WL): 16.86								
One Casing Volume(gal/L): 0.286								
Start Purge (hrs): 20:00								
End Purge (hrs): 20:50								
Total Purge Time (min): 50 min								
Total Vol. Purged (gal/L): 2.1 gal								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
BTEX	4°C/HCl	3 - 40ml glass clear	✓
PAHs	4°C	2 - 1L Amber glass	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Laura Foster

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSA Crane CTO F273 Tank Farm
PROJECT NUMBER: 112G02111

WELL ID.: TW 06
DATE: 09/21/10

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1944	16.86	—	—	—	—	—	—	—	—	
2000	17.23	100	—	—	—	—	—	—	—	Begin Purge
2020	19.82	110	7.22	717	3315	6.18	18.07	80.6	0.35	Lower Flow Rate
2030	20.91	110	7.20	714	1765	5.62	17.88	80.4	0.35	
2035	21.55	110	7.20	713	1360	5.40	17.80	80.3	0.35	
2040	22.10	110	7.12	713	1344	5.33	17.58	80.5	0.35	
2050	23.15	110	7.12	715	1271	5.63	17.33	80.4	0.35	Final Purge
										WATER level from TOR

SIGNATURE(S): [illegible]

CHAIN OF CUSTODY FORMS

TETRA TECH NUS, INC.

CHAIN OF CUSTODY

NUMBER 2144

PAGE 1 OF 1

PROJECT NO: 112G02111	FACILITY: F-22J Sump 32	PROJECT MANAGER: Tony Klimek	PHONE NUMBER: 513-251-2730	LABORATORY NAME AND CONTACT: Empirical - Kim Kostyn
SAMPLERS (SIGNATURE): [signature]		FIELD OPERATIONS LEADER: George Tev Eyck	PHONE NUMBER: 513-251-2730	ADDRESS: 621 Mainstream Dr, Suite 270
		CARRIER/WAYBILL NUMBER: FEDEX		CITY, STATE: Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: 8-8 PAH	BTEX	BTEX						COMMENTS
		CONTAINER TYPE PLASTIC (P) or GLASS (G)							G	P	G						
		PRESERVATIVE USED							NE	NE	NE						
4/30	12:50	32 SD 01-0006	SS	-	-	SD	G	2	X								MS/MSD
4/30	12:50	32 SD-01-0006	-	-	-	SD	G	3		X							
4/30	11:55	32 SD-02-0006	-	-	-	SD	G	1	X								
4/30	11:55	32 SD-02-0006		-	-	SD	G	2			X						
4/30	12:10	32 SD-03-0006	-	-	-	SD	G	1	X								
4/30	12:10	32 SD 03-0006				SD	G	2			X						
4/30	0000	32 SD FD 043010-01				SD	G	1	X				=	32	SD	02	
4/30	0000	32 SD FD 043010-01	-	-	-	SD	G	2			X						

1. RELINQUISHED BY [signature]	DATE 4/30/10	TIME 1700	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 2

PROJECT NO: 112G02111
SITE NAME: CTO 273
PROJECT MANAGER AND PHONE NUMBER: Tony Klimek 513-251-2730
LABORATORY NAME AND CONTACT: Empirical Laboratories
SAMPLERS (SIGNATURE): [signature]
FIELD OPERATIONS LEADER AND PHONE NUMBER: George TenEyck 513-251-2730
ADDRESS: 621 Mainstream Dr, Suite 270
CARRIER/WAYBILL NUMBER: 8631-3888-4887
CITY, STATE: Nashville, TN 37225

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: Benzo(a) Pyrene								COMMENTS
09/20	12:50	3255-65-0002	SO	G	1	✓								
	13:06	3255-64-0002	SO		1	✓								
	15:28	3255-60-0002	SO		1	✓								
	15:40	3255-61-0002	SO		1	✓								
	15:50	3255-62-0002	SO		1	✓								
	16:03	3255-63-0002	SO		1	✓								
	0000	FD 092010-02	SO		1	✓		32	58	-65-0002				

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY [signature]	1758	09/20/2010	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TINUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 2 OF 2

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G02111	GTOF273	Tony Klimek 513-251-2730	Empirical Laboratories
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George TenEyck 513-251-2730	ADDRESS: 621 Mainstream Dr, Suite 270
		CARRIER/WAYBILL NUMBER	CITY, STATE: Nashville, TN 37225

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	MTBE	Naphthalene							COMMENTS
		CONTAINER TYPE PLASTIC (P) or GLASS (G)				G	G							
		PRESERVATIVE USED				4°C	4°C							
0920	1149	32SB-SM1-0708	SO	G	2	✓								
0920	0000	FD0920W-01	SO	G	1		✓		32SB56 1415					
	1400	32SB-54-0708			1		✓							
	1400	32SB-54-1112					✓							
	1040	32SB-53-1112					✓							
	1040	32SB-55-0708					✓							
	1000	32SB-56-1011					✓							
	1000	32SB-56-1415					✓							
	1341	32SB-57-0708					✓							
	1435	32SB58-0708					✓							
	1435	32SB58-1112					✓							
	1509	32SB-59-0708					✓							
	1509	32SB-59-1112					✓							

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	10.38	0920 2010	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

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FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER PAGE 1 OF 4

PROJECT NO: 112G02111	SITE NAME: F273
PROJECT MANAGER AND PHONE NUMBER	Tony Klimek 513-351-2730
LABORATORY NAME AND CONTACT:	Empirical - Kim Kostelec
SAMPLERS (SIGNATURE)	
FIELD OPERATIONS LEADER AND PHONE NUMBER	George Ten Eyck 513-351-2730
ADDRESS	621 Mainstream Dr. Suite 270
CARRIER/WAYBILL NUMBER	FEDEX
CITY, STATE	Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	BTEX							COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	G							
PRESERVATIVE USED						4°C	4°C HCl							
4/28	1208	32GW-02	GW	G	6	X								MS/MSD
	1208	32GW-02	GW	G	9		X							MS/MSD
	1550	32GW-01	GW	G	2	X								
	1550	32GW-01	GW	G	3		X							
4/28	0000	32SS-FD042910-05	SS	G	1	X			32 SS 50 0102					
	0000	32SB-FD042910-05	SB	G	1	X			32 SB 50 0607					
	0915	32SS-43-0002	SS	G	1	X								
	0910	32SB-43-0506	SB	G	1	X								
	0920	32SS-44-0002	SS	G	1	X								
	0920	32SB-44-0506	SB	G	1	X								
	0955	32SS-45-0002	SS	G	1	X								
	0955	32SB-45-0607	SB	G	1	X								
	1010	32SS-46-0002	SS	G	1	X								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	[illegible]	1700	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

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TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER PAGE 2 OF 4

PROJECT NO: 112G02111
SITE NAME: F-273
PROJECT MANAGER AND PHONE NUMBER: Tony Klimek 513-251-2730
LABORATORY NAME AND CONTACT: Empirical - Kim Kostzer
SAMPLERS (SIGNATURE):
FIELD OPERATIONS LEADER AND PHONE NUMBER: George TenEyck 513-251-2713
ADDRESS: 6321 Mainstream Dr. Suite 210
CARRIER/WAYBILL NUMBER: FedEx
CITY, STATE: Nashville, TN

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G P
PRESERVATIVE USED: 4C 4C

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: PAHs	BTEX							COMMENTS
4/28	1016	32SB-46-0304	SB	G	1	X								
	1040	32SS-47-0002	SS	G	1	X								
	1040	32SB-47-0506	SB	G	1	X								
	1054	32SS-48-0002	SS	G	1	X								
	1054	32SB-48-0405	SB	G	1	X								
	1118	32SS-49-0002	SS	G	1	X								
	1118	32SB-49-0405	SB	G	1	X								
	1145	32SS-50-0002	SS	G	1	X								
	1145	32SB-50-0007	SB	G	1	X								
	0001	32SB-FD042810-45	SB	G	3		X		32	513	52	0607		
	0910	32SB-43-0506	SB	G	3		X							
	0930	32SB-44-0506	SB	G	3		X							
	0955	32SB-45-0007	SB	G	3		X							

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/28/10	1700	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 3 OF 4

PROJECT NO: 112862111	SITE NAME: FS73	PROJECT MANAGER AND PHONE NUMBER: Troy Klimek 513-251-2780	LABORATORY NAME AND CONTACT: Empirical - Kim Kostner
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George Teofyck 513-251-2780	ADDRESS: 6241 Mainstream Dr, Suite 270
		CARRIER/WAYBILL NUMBER: FEDEX	CITY, STATE: Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): 6 P
PRESERVATIVE USED: 4C 4C

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: PAHs	BTEX							COMMENTS
4/20	1016	32SB-46-0204	SB	G	3		X							
	1040	32SB-47-0506	SB	G	3		X							
	1054	32SB-48-0405	SB	G	3		X							
	1118	32SB-49-0405	SB	G	3		X							
	1145	32SB-50-0607	SB	G	3		X							
	1312	32SS-51-0002	SS	G	1	X								
	1312	32SB-51-0206	SB	G	1	X								
	1312	32SB-51-1415	SB	G	1	X								
	1420	32SS-52-0002	SS	G	1	X								
	1420	32SB-52-0809	SB	G	1	X								
	1420	32SB-52-1415	SB	G	1	X								
	1515	32SS-53-0002	SS	G	1	X								
	1515	32SB-53-0910	SB	G	1	X								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/20/10	1700	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

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3/99
FORM NO. TINUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 4 OF 4

PROJECT NO: 112G0211	SITE NAME: F273	PROJECT MANAGER AND PHONE NUMBER: Tony Klimek 513-251-2730	LABORATORY NAME AND CONTACT: Empirical - Kim Kostar
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George Ten Eyck 513-251-2730	ADDRESS: 1621 Mainstream Dr, Suite 270
		CARRIER/WAYBILL NUMBER: FedEx	CITY, STATE: Nashville, TN

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: PAHs	BTEX							COMMENTS
		CONTAINER TYPE PLASTIC (P) or GLASS (G)				G	P							
		PRESERVATIVE USED				4°C	4°C							
4/28	1515	32SB-53-1415	SB	G	1	X								
	1342	32SB-51-0708	SB	G	3		X							
	1342	32SB-51-1415	SB	G	3		X							
	1420	32SB-52-0809	SB	G	3		X							
	1420	32SB-52-1415	SB	G	3		X							
	1515	32SB-53-0910	SB	G	3		X							
↓	1515	32SB-53-1415	SB	G	3		X							

1. RELINQUISHED BY	DATE 4/29/10	TIME 1700	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 3

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112 EC 211	CTO 1223 Sampling	Tony Klimek 513-251-2330	Empirical Laboratories
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
[signature]		George Tewfik 513-251-2330	121 MainStream Dr., Suite 270
		CARRIER/WAYBILL NUMBER	CITY, STATE
		8031 3855 3446 FED EX	Nashville, TN 37205

STANDARD TAT ☒
RUSH TAT ☐
☒ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G P
PRESERVATIVE USED

TYPE OF ANALYSIS

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	BTEX							COMMENTS
4/26	0930	32SS-01-0002			1	X								
	1540	32SB-01-0708			1	X								
	1530	32SS-FD042610			1	X	=	32SS 01-0002						
	1540	32SB-FD042610			1	X	=	32SB 01-0708						
	1005	32SS-02-0002			1	X								
	1015	32SB-02-0607			1	X								
	1015	32SS-03-0002			1	X								
	1015	32SB-03-0607			1	X								
	1030	32SS-04-0002			1	X								
	1030	32SB-04-0506			1	X								
	1035	32SS-05-0002			1	X								
	1035	32SB-05-0506			1	X								
	1055	32SS-06-0002			1	X								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY [signature]	4/26/10	5:35	1. RECEIVED BY		
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 2 OF 3

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G02111	FFD-373 Swamp 32	Terry Minick 512-251-2730	Empirical Laboratories
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George Tim, 512-251-2730	ADDRESS: 1021 Mainstream Dr. Suite 370
		CARRIER/WAYBILL NUMBER: 5431 2508 7446	CITY, STATE: Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: PAHs	BTEX							COMMENTS
		CONTAINER TYPE PLASTIC (P) or GLASS (G)				G	P							
		PRESERVATIVE USED												
4/26	1100	32SB-06-0405			1	X								
	1125	32SS-07-0002			1	X								
	1130	32SB-07-0607			1	X								
	1110	32SS-09-0002			1	X								
	1110	32SB-09-0607			1	X								
	1155	32SS-10-0002			1	X								
	1155	32SB-10-0506			1	X								
	1200	32SS-14-0002			1	X								
	1200	32SB-14-0910			1	X								
	1540	32SB-01-0708			3		X							
	1540	32SB-FD04910-01			3		X							
	1050	32SB-02-0607			3		X							
	1615	32SB-03-0607			3		X							

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
	4/26/10	5:29			
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 3 OF 3

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G02411	STD F373 32	Tom Kimball 513-26-2230	Environmental Laboratories
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
		George Ten Eyck 513-23-7230	621 Mainstream Dr. Suite 270
		CARRIER/WAYBILL NUMBER	CITY, STATE
		8831 3886 3416 Fed Ex	Nashville, TN

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G P

PRESERVATIVE USED

TYPE OF ANALYSIS

DATE YEAR 2000	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	BTEX							COMMENTS
4/26	1100	32SB-04-0506			3		X							
	1135	32SB-05-0506			3		X							
	1100	32SB-06-0405			3		X							
	1130	32SB-07-0607			3		X							
	1110	32SB-09-0607			3		X							
	1135	32SB-10-0506			3		X							
	1200	32SB-14-0710			3		X							

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/26/00	5:39	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 7

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G2211	OTOTFTS	Tony Klimek 513-351-2730	Empirical Laboratories
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George Tenenbaum 513-351-2730	ADDRESS: 621 Wainstrand Dr. Suite 270
		CARRIER/WAYBILL NUMBER: Fed Ex 8021 3888 3402	CITY, STATE: Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G

PRESERVATIVE USED:

TYPE OF ANALYSIS: PAHs

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs								COMMENTS
4/27	0810	32SS-08-0002	SS	G	1	X								
	0810	32SB-08-0607	SB		1	X								
	0820	32SS-11-0002	SS		1	X								
	0825	32SB-11-0607	SB		1	X								
	0835	32SS-12-0002	SS		1	X								
	0835	32SB-12-0607			1	X								
	0850	32SS-13-0002			1	X								
	0855	32SB-13-0607			1	X								
	0910	32SS-15-0002			1	X								
	0910	32SB-15-0506			1	X								
	1015	32SS-16-0002			1	X								
	1015	32SB-16-0607			1	X								
	1020	32SS-17-0002			1	X								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/27/10		1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO TINUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 2 OF 7

PROJECT NO: 112G/2111	SITE NAME: CTO F273	PROJECT MANAGER AND PHONE NUMBER: Tony Elmore 513-782-0173	LABORATORY NAME AND CONTACT: Compuchem
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George Tenfuck 513-251-2773	ADDRESS: 601 Main Stream Dr.
		CARRIER/WAYBILL NUMBER: FedEx 8631 3882 2402	CITY, STATE: Nashville, TN

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G

PRESERVATIVE USED:

TYPE OF ANALYSIS: PAHs

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs								COMMENTS
4/22	1020	325B-17-0607		G	1	X								
	1020	325B-17-1112			1	X								
	1055	325S-18-0002			1	X								
	1055	325B-18-0506			1	X								
	1110	325S-19-0002			1	X								
	1110	325B-19-0506			1	X								
	1135	325S-20-0002			1	X								
	1135	325B-20-0506			1	X								
	1145	325S-21-0002			1	X								
	1145	325B-21-0506			1	X								
	1255	325S-22-0002			1	X								
	1255	325B-22-0506			1	X								
	1305	325S-23-0002			1	X								

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 3 OF 7

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
1360211	CTO 0273	Tom Klimek 513-251-2730	Empirical
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George Ten Eyck 513-251-2730	ADDRESS: 10 Livingston Dr.
		CARRIER/WAYBILL NUMBER: FedEx 8031 2888 3402	CITY, STATE: Oakhill, TN

STANDARD TAT ☐ 10
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED:

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: PAH								COMMENTS
4/7	1305	32SB-23-0506		G	1	X								
	1315	32SS-24-0002			1	X								
	1315	32SB-24-0506			1	X								
	1330	32SS-25-0002			1	X								
	1330	32SB-25-0607			1	X								
	1325	32SS-26-0002			1	X								
	1325	32SB-26-0405			1	X								
	1400	32SS-27-0002			1	X								
	1400	32SB-27-0506			1	X								
	1425	32SS-28-0002			1	X								
	1425	32SB-28-0506			1	X								
	1430	32SS-29-0002			1	X								
	1430	32SB-29-0304			1	X								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY:			1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 4 OF 7

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G0211	CTO F273	Tony Klimek 513-251-2730	Empirical
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George Tenfack 513-251-2730	ADDRESS: 601 Mainstream Dr
		CARRIER/WAYBILL NUMBER: FedEx 8631 8885 3402	CITY, STATE: Nashville, TN

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G

PRESERVATIVE USED:

TYPE OF ANALYSIS: PAHs

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	COMMENTS
4/5	1505	32SS-30-0002		G	1	X	
	1505	32SB-30-0506			1	X	
	1410	32SS-32-0002			1	X	
	1410	32SB-32-0506			1	X	
	1525	32SS-33-0002			1	X	
	1525	32SB-33-0506			1	X	
	1510	32SS-34-0002			1	X	
	1510	32SB-34-0407			1	X	
	1545	32SS-36-0002			1	X	
	1545	32SB-36-0506			1	X	
	1600	32SS-37-0002			1	X	
	1600	32SB-37-0506			1	X	
	1145	32SB-FD042710-02			1	X	= 32SB-24 0506

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/5/10		1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 5 OF 7

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G6211	CTO F273	Tony Klinek 513-251-2730	Empirical
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George Tentvrk 513-251-2730	ADDRESS: 601 Mainstream Dr
		CARRIER/WAYBILL NUMBER: FedEx 8631 3885 3402	CITY, STATE: Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G P

PRESERVATIVE USED

TYPE OF ANALYSIS: DAHS, BTEX

DATE YEAR 2000	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	DAHS	BTEX						COMMENTS
4/5	1145	32SS-FD042710-02		G	1	X			32	SS-	21-	0002	
	1410	32SS-FD042710-03			1	X			32	SS	32	~~0506~~ 0002	
	1410	32SB-FD042710-03			1	X			32	SS	32	~~0002~~ 0506	
	1145	32SB-FD042710-02			3		X		32	SB	21	0506	
	1410	32SB-FD042710-03			3		X		32	SB	32	0506	
	0810	32SB-08-0607			3		X						
	0855	32SB-11-0506			3		X						
	0855	32SB-13-0607			3		X						
	0910	32SB-15-0506			3		X						
	1015	32SB-16-0607			3		X						
	1020	32SB-17-0607			3		X						
	1020	32SB-17-1112			3		X						
	1055	32SB-18-0506			3		X						

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY			1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TINUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 6 OF 7

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G02111	SJO F273	Tony Klimek 513-251-2730	Empirical
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
[illegible]		George TenEyck 513-251-2730	621 Mainstream Dr
		CARRIER/WAYBILL NUMBER	CITY, STATE
		FedEx 863138883402	Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): P

PRESERVATIVE USED:

TYPE OF ANALYSIS: BTEX

DATE YEAR 2000	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	BTEX								COMMENTS
4/27	1110	32SB-19-0506		G	3	X								
	1125	32SB-20-0506			3	X								
	1145	32SB-21-0506			3	X								
	1255	32SB-22-0506			3	X								
	1305	32SB-23-0506			3	X								
	1315	32SB-24-0506			3	X								
	1330	32SB-25-0607			3	X								
	1335	32SB-26-0905			3	X								
	1400	32SB-27-0506			3	X								
	1415	32SB-28-0506			3	X								
	1430	32SB-29-0304			3	X								
	1505	32SB-30-0506			3	X								
	1410	32SB-32-0506			3	X								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY [illegible]	[illegible]		1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 7 OF 7

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G211	CTO F273	Tony Klimek 513-251-2730	Empirical Laboratories
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
[signature]		George Tomek 513-251-2730	601 Mainstream Dr. Suite 270
		CARRIER/WAYBILL NUMBER	CITY, STATE
		FedEX 8631 3888 3402	Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): P

PRESERVATIVE USED:

TYPE OF ANALYSIS: BTEX

DATE YEAR 2000	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	BTEX								COMMENTS
11/07	1535	32SB-33-0506		G	3	X								
	1540	32SB-34-0607			3	X								
	1545	32SB-36-0506			3	X								
	11000	32SB-37-0506			3	X								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY [signature]	11/7/00		1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE ___ OF 5

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:

SAMPLERS (SIGNATURE)

FIELD OPERATIONS LEADER AND PHONE NUMBER

ADDRESS

CARRIER/WAYBILL NUMBER

CITY, STATE

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G)

PRESERVATIVE USED

TYPE OF ANALYSIS

DATE YEAR	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS									COMMENTS
				G	25		X							
			GW	G	25	X	X		= 32 GW 03					
				G										
				G										
04/27	0805	3255-RB042710-01	SS	G	25	X	X							
04/27	1150	3255-RB042710-02	SS	G	25	X	X							
04/27	1510	3255-RB042710-03	SS	G	25	X	X							
04/28	1116	3255-RB042810-01	SS	G	25	X	X							

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
	04/27/10	1525			
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

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FORM NO. TINUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE ___ OF 3

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G07111	SWMU 32	Tony Klimek 513-557-5057	Kim Kostka - Investigated Labs
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
Bobby Collins		George TenEyck	631 Mainstream Dr. Suite 270
		CARRIER/WAYBILL NUMBER	CITY, STATE
			Nashville TN 37228

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C

TYPE OF ANALYSIS: PAHs

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	COMMENTS
4/28	1010	32SS-31-0002	SS	G	3	X	MS/MSD
	1010	32SB-31-0607	SB	G	3	X	MS/MSD
	1025	32SS-35-0002	SS	G	3	X	MS/MSD
	1025	32SB-35-0507	SB	G	3	X	MS/MSD
	0850	32SS-38-0002	SS	G	1	X	
	0850	32SB-38-0506	SB	G	1	X	
	1045	32SS-39-0002	SS	G	3	X	MS/MSD
	1045	32SB-39-0507	SB	G	3	X	MS/MSD
	0900	32SS-40-0002	SS	G	1	X	
	0900	32SB-40-0506	SB	G	1	X	
	0920	32SS-41-0002	SS	G	3	X	MS/MSD
	0920	32SB-41-0506	SB	G	3	X	MS/MSD
	0930	32SS-42-0002	SS	G	1	X	

1. RELINQUISHED BY: Bobby Collins	DATE: 04/28/10	TIME: 1525	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER

PROJECT NO: 112G2211

SITE NAME: SWMU 32

PROJECT MANAGER AND PHONE NUMBER: Tom Klink 615-557-5057

LABORATORY NAME AND CONTACT: Lab Kostner Tampa Lab

SAMPLERS (SIGNATURE): [illegible]

FIELD OPERATIONS LEADER AND PHONE NUMBER: George Van Eyck

ADDRESS: 621 Mainstream Drive, Suite 7[illegible]

CARRIER/WAYBILL NUMBER:

CITY, STATE: Nashville TN 37228

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): P

PRESERVATIVE USED: HCl

TYPE OF ANALYSIS: BTEX

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	BTEX								COMMENTS
4/8	102	32SB-35-0507	SB	G	12	X								MS/MSD
	0850	32SB-38-0506			3	X								
	1045	32SB-39-0507			12	X								MS/MSD
	0900	32SB-40-0506			3	X								
	0910	32SB-41-0506			12	X								MS/MSD
	0930	32SB-42-0506			3	X								
	0000	32SB-FD042810-04			3	X	✓							32 SB 42-0506
	0000	32SB-FD042810-05			3	X	✓							~~32 SB DW 01 0506 0802~~
	1351	32SB-DW01-0809			3	X								32 SB DW 01 0809
	1311	32SB-DW02-0506			3	X								
	1430	32SB-DW03-0504			3	X								
↓	205	32SB-ST01-0503	↓	↓	3	X								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY [illegible]	04/09/10	1575	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 5 OF 5

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
TTGC2111	SWMU 32	Tom Wheel 573-557-5857	Kim Klostzer Empirical Labs
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
B. Tay Collins		George Tom Gych	65 Mainstream Drive Suite 270
		CARRIER/WAYBILL NUMBER	CITY, STATE
			Nashville, TN 37228

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G P
PRESERVATIVE USED: HCl

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: PAHs	BTEX						COMMENTS
4/28	0910	32SB-42-0506	SB	G	1	x			Lab # = 32 SB 42 - 0507				
	0905	32SS-FD042810-01	SS	G	1	x	32 SS 42			0002			
	0900	32SS-FD042810-02	SS	G	1	x	32 SS	DW01	002	~~0806~~			
	0900	32SB-FD042810-01	SB	G	1	x	*	~~32 SB~~	~~DW01~~	~~0002~~			32 SB 42 2007
	0900	32SB-FD042810-02	SB	G	1	x					~~0809~~		32SBDW01 0809
	1254	32SS-DW01-0002	SS	G	1	x							
	1254	32SB-DW01-0809	SB	G	1	x							
	1311	32SS-DW02-0002	SS	G	1	x							
	1311	32SB-DW02-0506	SB	G	1	x							
	1130	32SS-DW03-0002	SS	G	1	x							
	1130	32SB-DW03-0304	SB	G	1	x							
	1205	32SB-ST01-0203	SB	G	1	x							
	1110	32SB-31-0607	SB	G	12		x						MS/MSD

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: B. Tay Collins	4/28/10	1625	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TINUS-001

CALIBRATION LOGS

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME: NSWC CRANE

SITE NAME: SWMU 32

PROJECT No.: 112G02111

INSTRUMENT NAME/MODEL: YSI ~~650 MDS~~ 600 XLM

MANUFACTURER: YSI

SERIAL NUMBER: 01B0583 AB

Date of Calibration	Person Performing Calibration	INITIAL READINGS PH 7	PH 4	COND mS/cm	DO %	ORP mV	pH 10	FINAL READINGS PH 7	PH 4	COND mS/cm	DO %	ORP mV	Calibration Standard (Lot No.)	Remarks and Comments
4/27/10	L. Foster	7.03	3.98	1.000	96%	120 at 12.7°C	10.000	7.01	3.91	1.029 / 10.100	97.4	117.30 12.57°C	Conductivity = 7036	Temp = 14.35°C / 15.5
4/28/10	J. Taylor	6.95	3.85	1.000	97.7%	124.0 @ 10.69°C	10.03	6.88	3.81	1.058 / 10.13	96.5	105.3 @ 10.61	pH 7 = ~~7356~~ 7352	Missing piece of low cal. Called US.
													pH 4 = ~~7356~~ 7584	
													pH 10 = ~~7356~~ 7587	
													~~Temp~~	
													100 mV ORP = 7206	

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME: NSA Crane CTO Tank Farm

SITE NAME: SWMU 32

PROJECT No.: 112G02111

INSTRUMENT NAME/MODEL: MiniRAE PID / 2S

MANUFACTURER: PhotoVac

SERIAL NUMBER: C2 HH 314

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	~~Instrument Settings~~ ~~Pre-calibration~~ AM Cal	~~Post-calibration~~ PM Check	~~Instrument Readings~~ ~~Pre-calibration~~	~~Post-calibration~~	Calibration Standard (Lot No.)	Remarks and Comments
04/20/10	C2 HH 314	L. Foster	0.1	99.8	NA	NA	089779	PID would not light in AM & PM - could not do cal check

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSWC CRANE

INSTRUMENT NAME/MODEL: PID Mini Rae 2000

SITE NAME: SWMU 32

MANUFACTURER: Rae Systems

PROJECT No.: 1126-02111

SERIAL NUMBER: ~~[illegible]~~ 448564X

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	~~Instrument Settings~~ Pre-calibration (calibration)	~~Instrument Settings~~ Post-calibration (calibration)	~~Instrument Readings~~ Pre-calibration (pM cal check)	~~Instrument Readings~~ Post-calibration (pM cal check)	Calibration Standard (Lot No.)	Remarks and Comments
~~4/27/10~~		~~L. Foster~~	~~0.00~~	~~0.00 ppm~~			H09-3732	
4/27/10		L. Foster	0.00	108 ppm	0.0	100		
4/28/10		S. Taylor	0.0	102 ppm	0.0	94.2		

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSWC CRANE

INSTRUMENT NAME/MODEL: LaMotte 2020e Turbidimeter

SITE NAME: SWMU 32

MANUFACTURER: LaMotte

PROJECT No.: 112G02111

SERIAL NUMBER: ME 14040

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	~~Instrument Settings~~ Cal ~~Pre-calibration~~	~~Post-calibration~~	~~Instrument Readings~~ Pre Check ~~Pre-calibration~~	~~Post-calibration~~	Calibration Standard (Lot No.)	Remarks and Comments
4/27/10	NA	L. Foster	0.00	9.95	0.00	11.2	Provided w/ Instrument	
4/27/10	NA	L. Foster	0.00	9.95	0.00	10.36		

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : NSWC CRANE

SITE NAME: SWMU 34

PROJECT No.: 112G02112

INSTRUMENT NAME/MODEL: YSI 556

MANUFACTURER: YSI

SERIAL NUMBER: 07A1477

Date of Calibration	Person Performing Calibration	INITIAL READINGS PH 7	PH 4/10	COND	DO %	ORP Temp	Temp °C	FINAL READINGS PH 7	PH 4/10	COND	DO %	ORP Temp	Calibration Standard (Lot No.)	Remarks and Comments
9/20/10	LP	7.00	4.00 / 10.00	998	93.5	233.0	23.00	7.12	3.87 / 10.00	998	100.6	237.9 / 23.49	pH 7 - #7833	
9/21/10	LP	7.02	4.00 / 10.00	999	106.8	235.6	23.02	7.13	3.70 / 10.00	982	107.1	237.1 / 24.14	pH 4 - #8000	
9/22/10	LF	7.00	4.00 / 10.00	1000	107.0	233.7	23.58	7.32	4.00 / 9.93	976	124.0	238.7 / 23.24	pH 10 - #7742	
													Cond - #7896 - [redacted]	
													Zobell - 100100243	
														[redacted]
														[redacted]
														[redacted]

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME: NSA CRANE ORMO CTO ~~Tank Farm~~ YARD

SITE NAME: SWMU 21

PROJECT No.: 112G0214 22

INSTRUMENT NAME/MODEL: Mini Rae 3000

MANUFACTURER: Rae Systems

SERIAL NUMBER: 592-001027

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
09/13/10		LF	0.0	100	0.0	103	LTA 260-SB-CM	
09/14/10		LF	0.0	101	0.0	102.7	"	
09/15/10		LF	0.0	99.7	0.0	97.4	"	
9/16/10		BC	0.0	99.7	0.1	99.3	"	
9/17/10		LF	0.0	102	0.2	101.8	"	
9/21/10		LF	0.0	99.5	0.1	94.3	"	
9/22/10		LF	0.0	99.2	0.2	100.5	"	

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSA CRANE ~~[illegible]~~

SITE NAME: SWMU 21

PROJECT No.: 112G02122 ~~42G02117~~

INSTRUMENT NAME/MODEL: Micro PID I/S

MANUFACTURER: VE Photovac

SERIAL NUMBER: CI EP 213

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration (AM)	Post-calibration	Pre-calibration (PM)	Post-calibration		
09/13/10		LEP	0.0	95.0	Would not light on site or in pm		LTB 018-MP-CM	

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSWC CRANE

INSTRUMENT NAME/MODEL: CALMOTTE 2020

SITE NAME: SWMU 21

MANUFACTURER: Calmotte

PROJECT No.: 112G02122

SERIAL NUMBER: ME 192108

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings (Alm)		Instrument Readings (Alm)		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
9/22/10		LE	0.0	9.96	0.0	9.67		
9/23/10		LP	0.0	9.97	0.0	9.15		
9/24/10		LP	0.0	9.96	0.0	8.88		

APPENDIX D – DAILY ACTIVITY LOGS, SITE LOGBOOK, GROUNDWATER MEASUREMENT SHEETS

DAILY ACTIVITY LOGS
SITE LOGBOOK
GROUNDWATER LEVEL MEAUSUREMENT SHEETS

DAILY ACTIVITY LOGS

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	4/26/2010
NO.	1
SHEET 1 OF 2	

PROJECT NAME: Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for Solid Waste Management Unit (SWMU) 32, Former Tank Farm Area, located at the Naval Support Activity (NSA), Crane, Indiana.	**PROJECT NO:** 112G02111

FIELD ACTIVITY SUBJECT: Mobilize, safety training, and begin field work

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

07:30 G. Ten Eyck, J. Taylor, and L. Foster (Tetra Tech) arrive at trailer to calibrate equipment and load equipment and supplies.

09:00 Tetra Tech field crew arrived at SWMU 32, met J. Barton, A. Radcliff, and J. McDaniel from Micah Group (subcontracted drillers).

09:30 G. Ten Eyck conducted Site-Specific Health and Safety Training.

10:00 L. Foster and J. Taylor identified and flagged proposed sample locations using a hand-held GPS.

10:15 Began sample collection with boring 32SB02 to 10'. G. Ten Eyck moved proposed sample location 5 feet south due to refusal at 0-1 ft. Flame on FID would not light. L. Foster called technical support and the FID began to work. Completed five more borings; 06, 09,05,10,14.

12:15 Lunch

13:15 L. Foster and J. Taylor identified and flagged monitoring well locations.

13:30 A. Radcliffe prepared screens for temporary wells. Flame on FID would not light. L. Foster called technical support; attempts to repair instrument were unsuccessful. Arranged for delivery of PID on 04/27/10.

14:00 Began drilling TW-01. Moved location due to utilities. Placed MW-01 to 20' .

15:23 Placed 3 MW to 20'.

Placed 3 MW to 20'.

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15:30 Completed borings 32SB01, 04, 03, and 07.

16:00 Completed boring 32SB04 to 6'.

16:15 Completed boring 32SB03 to 7'.

16:25 Completed boring 32SB07 to 7'.

16:30 Tetra Tech field crew returned to trailer; processed and labeled samples

18:00 Packed coolers.

18:30 Departed trailer to FedEx Bloomington

19:00 Arrive at FedEx Bloomington

VISITORS ON SITE: None	**CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:** None
WEATHER CONDITIONS: NA	**IMPORTANT TELEPHONE CALLS**: None

PERSONNEL ON SITE: Lauren Foster(Field Technician), Jessica Taylor (Field technician), Andrew Radcliff (Driller), James McDaniel (Driller), John Barton (Micah Group Project Manager), George ten Eyck (FOL)

SIGNATURE: **DATE:** 04/26/2010

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	4/27/2010
NO.	2
SHEET 1 OF 2	

PROJECT NAME: Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for Solid Waste Management Unit (SWMU) 32, Former Tank Farm Area, located at the Naval Support Activity (NSA), Crane, Indiana.	**PROJECT NO:** 112G02111

FIELD ACTIVITY SUBJECT: Sampling

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

07:00 G. Ten Eyck, J. Taylor, L, Foster, and B. Collins arrived at trailer; calibrated equipment; loaded supplies and equpment.

07:30 G. Ten Eyck and J. Taylor met A. Radcliff and J. McDaniel at site.

08:00 G. Ten Eyck collected equipment rinsate sample (32SSRB042710-01)

08:05 Began soil borings. Completed borings 32SB08, and 32SB11-32SB20.**12:00** Lunch

12:30 PID arrived from Micah Group.

12:45 Completed boring 32SB21'. L. Foster and B. Collins arrived on site.

13:00 Completed boring 32SB22. L. Foster and B. Collins began purge/sampling of MW-03 and collected field duplicates.

13:15 Completed borings 32SB23 – 32SB37.

16:30 G. Ten Eyck and J. Taylor returned to trailer; processed and labeled soil samples

18:00 Packed coolers.

18:30 Departed trailer to FedEx Bloomington

19:00 Arrive at FedEx Bloomington

VISITORS ON SITE: None	**CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:** After being

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	unable to light the FID flame after repeated attempts and guidance from US Environmental (rental company), a PID was obtained from Micah Group and used in place of the FID.
WEATHER CONDITIONS: NA	**IMPORTANT TELEPHONE CALLS**: None
PERSONNEL ON SITE: Lauren Foster (Field Technician), Jessica Taylor (Field technician), Andrew Radcliff (Driller), James McDaniel (Driller), George Ten Eyck (FOL), Betsy Collins (Field Technician)	
SIGNATURE:	**DATE:** 04/27/2010

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	4/28/2010
NO.	2
SHEET 1 OF 2	

PROJECT NAME: Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for Solid Waste Management Unit (SWMU) 32, Former Tank Farm Area, located at the Naval Support Activity (NSA), Crane, Indiana.	**PROJECT NO:** 112G02111

FIELD ACTIVITY SUBJECT: Sampling

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

07:00 G. Ten Eyck and J. Taylor leave hotel; bought tape for cooler

07:35 L. Foster, B. Collins, G. Ten Eyck, and J. Taylor arrived at trailer; calibrated and loaded equipment.

08:10 Arrived at SWMU 32, met J. McDaniel and A. Radcliffe

08:30 Completed borings 32SB31, 32SB35, and 32SB38-32SB42.

12:00 Completed boring 32SBST01

12:30 Sampled the drainage way: 32DW01, 32DW02, 32DW03.

13:35 L. Foster arrived on site.

14:00 L. Foster and J. Taylor sampled MW-02 and collected MS/MSD.

VISITORS ON SITE: None	**CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:** G. Ten Eyck decided to add 7 “step-out” borings.
WEATHER CONDITIONS: NA	**IMPORTANT TELEPHONE CALLS**: None

PERSONNEL ON SITE: Lauren Foster (Field Technician), Jessica Taylor (Field technician), Andrew Radcliff (Driller), J. McDaniel

TETRA TECH NUS, INC.

(Driller), George Ten Eyck (FOL), Betsy Collins (Field Technician)
SIGNATURE: **DATE:** 04/28/2010

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FIELD ACTIVITY DAILY LOG

DATE	4/29/2010
NO.	2
SHEET 1 OF 2	

PROJECT NAME: Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for Solid Waste Management Unit (SWMU) 32, Former Tank Farm Area, located at the Naval Support Activity (NSA), Crane, Indiana.	**PROJECT NO:** 112G02111

FIELD ACTIVITY SUBJECT: Sampling

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

07:30 L. Foster, J. Taylor, B. Collins, and G. Ten Eyck arrived at trailer

08:10 Tetra Tech field crew arrived at SWMU 32

08:30 G. Ten Eyck met with A. Radcliffe and J. McDaniel about additional borings.

09:00 Began boring 32SB43. Completed borings 32SB43 – 32SB48.

11:00 Drilled SB49 showed strong oil odor at 4-5 feet bgs

11:45 Drilled SB 50 found grossly contaminated sand at 6 to 7.5 feet bgs

12:15 Lunch

13:00 Began boring 32SB51. Completed borings 32SB51 – 32SB53. No additional borings were drilled southeast of boring 51 because utility clearance did not extend far enough.

15:45 G. Ten Eyck collected equipment rinsate sample 32SSR042910-02

16:00 Departed SWMU 32, Tetra Tech crew returned to trailer to process and package samples.

19:00 Took 3 coolers to Bloomington to ship via FedEx.

VISITORS ON SITE: None	**CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:** None

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WEATHER CONDITIONS: NA	**IMPORTANT TELEPHONE CALLS**: None
PERSONNEL ON SITE: Lauren Foster (Field Technician), Jessica Taylor (Field technician), Andrew Radcliff (Driller), J. McDaniel, George Ten Eyck (FOL), Betsy Collins (Field Technician)	
SIGNATURE:	**DATE:** 04/29/2010

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	04/30/2010
NO.	2
SHEET 1 OF 2	

PROJECT NAME: Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for Solid Waste Management Unit (SWMU) 32, Former Tank Farm Area, located at the Naval Support Activity (NSA), Crane, Indiana.	**PROJECT NO:** 112G02111

FIELD ACTIVITY SUBJECT: Sampling

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

08:30 B. Collins returned to Pittsburgh, J. Taylor returned to Cincinnati. L. Foster and G. Ten Eyck arrived at trailer after dropping off rental car in Bloomington.

09:30 Packed car with equipment and jars.

11:00 Collected three sediment samples from Culpeper Creek. SD01 was collected from the north side of the Creek due to water flow.

16:00 Logged all actual soil boring and groundwater well locations with a GPS unit.

18:00 Completed COC and packed coolers. Left site for FedEx Bloomington

18:30 Arrived at FedEx Bloomington.

VISITORS ON SITE: None	**CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:** None
WEATHER CONDITIONS: NA	**IMPORTANT TELEPHONE CALLS**: None

PERSONNEL ON SITE: Lauren Foster (Field Technician), Andrew Radcliff (Driller), J. McDaniel (Driller), George Ten Eyck (FOL),

SIGNATURE: **DATE:** 04/30/2010

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	09/17/2010
NO.	2
SHEET 1 OF 2	

PROJECT NAME: Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for Solid Waste Management Unit (SWMU) 32, Former Tank Farm Area, located at the Naval Support Activity (NSA), Crane, Indiana.	**PROJECT NO:** 112G02111

FIELD ACTIVITY SUBJECT: Sampling

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

08:30 G. Ten Eyck, L. Foster, and B. Collins arrived at trailer.

13:30 Walked utilities with C. Chambers and H. Peterson after moving DPT rig from SWMU 21 to SWMU 32.

15:30 Drilled MW-04 to 24 feet.

16:30 Drilled MW-05 to 24 feet.

17:30 Drilled SB54 with no visible contamination zone

19:30 Field crew departed site.

VISITORS ON SITE: None	**CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:** None
WEATHER CONDITIONS: NA	**IMPORTANT TELEPHONE CALLS**: None

PERSONNEL ON SITE: Lauren Foster (Field Technician), Chris Chambers (Driller), Henry Peterson (Driller) George Ten Eyck (FOL), Betsy Collins (Field Technician)

SIGNATURE: **DATE:** 09/17/2010

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	09/19/2010
NO.	2
SHEET 1 OF 2	

PROJECT NAME: Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for Solid Waste Management Unit (SWMU) 32, Former Tank Farm Area, located at the Naval Support Activity (NSA), Crane, Indiana.	**PROJECT NO:** 112G02111

FIELD ACTIVITY SUBJECT: Sampling

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

18:30 G. Ten Eyck arrived at site, identified and flagged sample locations.

19:30 Departed site

VISITORS ON SITE: None	**CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:** None
WEATHER CONDITIONS: NA	**IMPORTANT TELEPHONE CALLS**: None

PERSONNEL ON SITE: George Ten Eyck (FOL)

SIGNATURE: **DATE:** 09/19/2010

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	09/20/2010
NO.	2
SHEET 1 OF 2	

PROJECT NAME: Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for Solid Waste Management Unit (SWMU) 32, Former Tank Farm Area, located at the Naval Support Activity (NSA), Crane, Indiana.	**PROJECT NO:** 112G02111

FIELD ACTIVITY SUBJECT: Sampling

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

07:30 G. Ten Eyck arrived at trailer.

07:45 G. Ten Eyck arrived at site and met C. Chambers and H. Peterson

09:30 Completed drilling MW06

10:00 Drilled additional locations SB54-SB65. Collected two field duplicate samples.

16:15 Drillers plugged holes and left; G. Ten Eyck returned to trailer to process and package samples.

17:30 G. Ten Eyck departed trailer for FedEx.

19:00 L. Foster and T. Cheek arrived on site and logged actual locations of all soil boring and wells using GPS.

VISITORS ON SITE: None	**CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:** None
WEATHER CONDITIONS: NA	**IMPORTANT TELEPHONE CALLS**: None

PERSONNEL ON SITE: Chris Chambers (Driller), Henry Peterson (Driller), George Ten Eyck (FOL), Lauren Foster (Field Technician), Todd Cheek (Field Technican)

SIGNATURE: **DATE:** 09/20/2010

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	09/21/2010
NO.	2
SHEET 1 OF 2	

PROJECT NAME: Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for Solid Waste Management Unit (SWMU) 32, Former Tank Farm Area, located at the Naval Support Activity (NSA), Crane, Indiana.	**PROJECT NO:** 112G02111

FIELD ACTIVITY SUBJECT: Sampling

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

09:30 L. Foster arrived at trailer and loaded equipment.

09:45 L. Foster arrived on site; T. Cheek arrived at trailer.

09:50 L. Foster located and collected 32SD04, 32SD05, 32SD06, and field duplicate sample.

10:30 L. Foster arrives at trailer with samples; L. Foster and T. Cheek depart trailer for SWMU 21.

16:00 Arrived at trailer.

16:10 T. Cheek processed and packaged samples

18:15 T. Cheek departed for FedEx

18:45 T. Cheek arrived at FedEx and dropped off samples

19:10 L Foster arrived on site and recorded water levels for TW04-06

19:45 L. Foster began purge and sampled TW06.

21:30 L. Foster departed site, arrived at trailer.

22:00 L. Foster departed trailer.

VISITORS ON SITE: None	**CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:** None
WEATHER CONDITIONS: NA	**IMPORTANT TELEPHONE CALLS**: None

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PERSONNEL ON SITE: Lauren Foster (Field Technician/FOL), Todd Cheek (Field Technician)	
SIGNATURE:	**DATE:** 09/21/2010

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	09/22/2010
NO.	2
SHEET 1 OF 2	

PROJECT NAME: Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for Solid Waste Management Unit (SWMU) 32, Former Tank Farm Area, located at the Naval Support Activity (NSA), Crane, Indiana.	**PROJECT NO:** 112G02111

FIELD ACTIVITY SUBJECT: Sampling

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

09:15 L. Foster and T. Cheek arrive at trailer.

09:30 Calibrate equipment and load supplies.

11:00 Arrive on site.

12:25 End purge and sampled TW05. Field duplicate sample collected.

14:10 End purge and sampled TW04.

14:45 Abandon temporary wells nd backfill borehole with bentonite chips.

15:15 Returned to trailer. Logged, labeled, processed, packaged, and completed COC for samples.

18:15 L. Foster leaves trailer for FedEx

18:45 L. Foster arrives at FedEx.

19:30 L. Foster arrives at trailer. T. Cheek packs equipment, and field crew departs NSA Crane.

VISITORS ON SITE: None	**CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:** None
WEATHER CONDITIONS: NA	**IMPORTANT TELEPHONE CALLS**: None

PERSONNEL ON SITE: Lauren Foster (Field Technician/FOL), Todd Cheek (Field Technician)

TETRA TECH NUS, INC.

SIGNATURE: **DATE:** 09/22/2010

SITE LOGBOOK

Fed Ex ~~8631 3868 3343~~ 6152-0168-1

SWMU 32 Janet Cox

Task order F273

4/26/10 Monday — Arrived at TRAIL 7:30

collected equipment

Arrived at SWMU 32 9:00

met Drillers -

conducted site safety meeting 9:30 - 10:00

John Barton w/ Micah in attendance

Driller Andrew Radcliff

Driller Asst James - McDaniel

Began w/ boring 32 SB 02 at 10:0

FID is not starting.

32SB02 - concrete 0-1' refusal

moved 5' south

Between 10:15 - 12:15 6 Borings

32-SB-02 (10'), 06 (10'), 09 (10'), 05 (6'), 10 (10'), 14 (10')

lunch 12:15 - 1:00

1:05 - 1:30 located MWs.

Driller prepared screen -

2:00 Push MW-1 moved location - Beacon of utilities -

3:23 placed 3 MWs to 20' collected samples for description - none sent to lab

- Lauren & Jes married said Bony location - AM.
- Jes helped w/ said Bony.
Betsy married in Bloomington Monday afternoon.
Lauren visited since 9

~~Began~~
Lunch 12:15 - 1:00 Jas & I did
Drilled MW-1 Began 1:30 soil Bangs

4/26/10 3:30 Began soil Bangs again
32 SB 01

10:00 Began day w/ SB-2 sampled 10:45
FID not working - only worked for few
STRong odor SB-2

10:30 SB-6 no odor

11:10 SB 9 - Sli odor

11:25 SB-5 FID 4ppm no odor

~~12:00 SB-14~~

11:35 SB 10 FID 30ppm 5-6

12:00 SB-11 FID 10ppm 9-10 feet

1:30 - 3:00 Monitoring wells - MW-1 - 15' Screen 5-20
20 feet each
NO FID 10' Screen 10-20

decided to place now so ~~two~~ Betsy & Laura
could sample Tuesday

15:30
3:30 SB-1 no odor - no FID

16:00 SB-04 " "
16:15 SB-03 " "
16:35 SB-02 very sli odor

4:30 - 6:00 processed samples
packed coolers

Delivered to Fed Ex Bloomington 6:30

	T	
	L	
	Bom	
	FID	
	10	
	10	
	6	
	10	
	10	
	20	
	10	
	7	
	7	
Bom	06'	
MW	30	

4/27 ARRIVED AT 7 AM
TWO collected Flags, ice, Resant sample
JARS - etc -
left Zip lock locks Bag -
met Drillers AT 7:30
collected RESANT SAMPLE
32 S S 1213 04 27 10 - 01 AT 7:30 8 oz
COC

Overview -	25	Boring		Jes + GCT
	08	8:15	7	bagged soil Bungs
	11	8:25	7	
	12	8:45	7	
14 yesterday →	13	9 oz	7	
	15	9:5	7	
	16	10 oz	7	
	17	10:45	15	3 samples
	18	11 oz	7	
	19	11 20	7	
	20		10	
	21	12:45	7	
	22	1 oz	7	
	23	1 15	7	
	24	1 20	7	
	25	1 35	7	
	26		10	
	27	1 50	7	

	28	2:25	7	
	29		7	
	30		7	
31 tomorrow →	32	2:09	7	outside fence
	33	3:30	7	
	34		7	
35 tomorrow →	36		6	
	37	4:03	6	187 feet

PID arrived noon -

Lauren Foster + Betty Collins

Sampled MW-3 w/ DUP's
issues w/ USenvironmental - Flow through tube incomplete

will add Lauren's field notes later
kept on separate pad - will
include Cal log + sampling log

4/27 evening - GET located missing
Soil Boring location

Issues w/ FID - light rain & high
humidity prevented from lighting -

Micah set PID for use

Andrew Radcliff
606-302-0342
James McDavid
859-248-0544

4/20/ Arrived at Trailer 7:35
Cloudy Bought supplies - Tape for locker AM -
Arrived at location 8:10
Drillers Backfilled Boring w/ bentonite
7:30 - 8:00 AM -

Began sampling at 8:30 -

Boring	32 SB 38		6
	40		4
*	41		6
	42	Dup #4	6
*	31		7
*	35		7
*	39		7
Also @ 12:00	32 SB ST 01		15 feet
		Shallow cont.	none deep
	32 SB DW 01		15'
		Maybe something that	8-10'
	32 SB DW 02		7
	SB DW 03	3-4	7'
			90

* Laura Foster reminded us that MS/MSD samples needed collected +

Lauren & Jos collected GW samples at GW # 2 plus MS/MSD because it produced most water - was at 5'

Weds over

9:15 pm talked w/ Tony regarding more Bonys. will add 7 Bonny Thursday 4/29

US Environmental
166 Riverwalk Dr
Waltham MA 02453

781-899-1560

Thursday 4/29
shipping YSI, FID, cal gas back to US
TRIP metc -

have not shipped GPS or T-handle

4/25 Additional Bonny Drilled

Bonj #	Sample		Notes	Depth
SB 43	1-2 +	5-6	no odor	7
SB 44	1-2	5-6	odor, none at 10'	10
SB 45	1-2	6-7	no odor	7
SB 46	1-2	3-4	sl. odor 3-4 ~~no odor at 7~~	7
47	1-2	5-6	no odor	7
48	1-2	6-7	no odor	7
49	1-2	4-5	faint odor (none at 10)	10
50				15
51				15
52				15
53				15
				100

fuel oil

617

4/29/10 Arrived at Tank 7:30

Arrived at Site 32 9:20 GLT S.

met w/ Drillers regarding additional Borings - will do 7' at parameter & contamination -

Begining w/ 9a 32 SB 43 7'

9:26 44 10'

45 7'

46 7

10:40 47 7

48 7'

49

11:20 SB Boring 45 showed oil odor at 4-5' feet in ~~fine silty clay w/ fine silty sand~~ - in fine silty sand w/ clay.

Decided to Drill south (outside fence) to Determine extent -

Drilled ~~SB D~~ SB 50 at 11:45 7'

found ~~gross~~ contaminated sand at 6-7.5 feet - appears to ~~be~~ not be natural sand - coarse grain w/ well rounded gravel - generally well sorted -

Saturate w/ water and strong fuel odor

Visible staining - sampled 6-7

32 SS FD 042910-05 = 32 SS 50 0102

32 SB FD 042910-05 = 32 SB 50 0607

4-29 Afternoon -
Drilled SB 50 51 15'
found same zone at 7-8'
strong fuel odor - 8-10 ~~sandy~~ gray silty clay -
moist - sli odor -
sampled 7-8'

10-5-15 Reddish Brown gray mottled silty
clay - no odor - -
sampled 14-15

SB 52 15'
6-7 feet strong odor.
gray clay w/ gravel - no sand -
not like 51 - 10-15 feet Br. silty clay
sample 1-2, 8-9, 14-15

SB 53 7-10 gray silty clay 15'
semi-moist - sli odor
97'
sample 8-10
11-15 Br gray mottled clay -
sample 14-15

Because no utilities were
cleared for the southeast - no additional
borings were drilled to determine
extent from SB 51

4/29 Rinsate sample collected from
De con Drilling Barrel -
ID AS 32 SS RB 042910-05
to be analyzed for BTEX & PAH

released Drillers At 4^00 -
Drillers moved Drum of De con waste
& purge water to Trailer for
later Disposal - Drum marked as
"non Haz" - closed top -

4/29 Sampled Fed Ex'd 3 Coolers - by 2^pm

4/30 L. Foster & GLT collected three
Sediment samples for Culpper creek -
Approached creek for South
side - were able to access points for
SD 03 & 02 - But had to move
to north side for SD 01
Good water flow and good silt bars for
sediment collection -
Because of the saturated condition of
the sediment - the Lab recommended
allowing BTEX samples in 4 oz glass
jars - Filled to top - Decant as much
water off as possible & store in 4°c Cooler -

Sediment sampling
4/30 were able to do this method
w/ SD 03 and SD 02 but
Because of the additional 11 Soil
Borings - we ran out of 8 oz jars

Used Ex core sampler for BTEX for
SD 01

Began sediment sampling about 11 oz

Arrived at site 8:30 - After dropping
of rental car in Bloomington -
spend 1½ hour packing car w/ equipment
& jars -, logging/drawing areas of
spent ≈ 2 hours ~~sketching~~ at Old Burn
pit SWMU 5.

After sediment sampling & lunch.

logged all soil borings, & GW wells
w/ GPS unit
Sediment sample location were logged
as sample collected.

finished w/ GPS at 4:00
Collected staining points at
Fire hydrant & sewer manway 4" lateral pipe

Sample 32 FD 043012-001
is Field Dup of 32 SD 02-0006
VOCs & SVOCs

MS/MSD collected at 32 SD 01

4-6pm completed COC & packed coolers
& cleaned fixtures between 4-6

left site At 6^00 - Arrived At FedEx 6

Lauren's log. transferred data from 4/27/1

Sw mw 32

GW sampling - Temp wells
0.04 gal is constant = multiply
H_2O column x .04

~~32 Sw~~ 32 mw 01:

Static H_2O unit = 15.78 feet
20.00 - 15.78 = 4.22 feet = T
V = Static casing volume of well
V = T (0.4 gal)
V = 0.1688 gal
3 well vol = 0.5064 gals

32 mw 02:

Static H_2O level = 5.37 feet
T = 20' - 5.37' = 14.63 feet
V = 14.63' (0.04)
V = 0.5852 gal
3 well volume = 1.7556 gal
MS/MSD of ~~Ass~~ GW mw 02

32 MW 03

Static H2O level = 9.12 ft

T = 20' − 9.12 = 10.88 feet

h = 10.88 ft (0.04)

h = 0.4352 gal

3 well volumes = 1.3056 gal.

Ring that secures VSF onto floor
cell is missing - called US Ecs.
At 4pm ~~Thu~~ Tues - they will
send part to arrive 4/29/10
wednesday.

Collected DUP at 32 MW 03 on
4/27/10 @ 16:42 32 GW FD 042710-01

Collected 32-GW-02 @ 1208
4/28/10 MS/MSD locks

32 GW 07 collect 4/28/10
1550.

5-3	Transferred GPS data to computer - sent to Sandy Springs w/ data-request form

Sept 17 -

Moved DPT Rig from Snow 21 to Swmo 32

1:30 called utilities of drilling - talked w/ Jim Woods - Contractor who just place water line near borings 50, 51, & 52 -

located gas, sewer, & electric utilities :

located MW-4, MW-5, MW-6 moved based on utilities

Drilled MW-4 to 24 feet set well

Drilled MW-5 to 24 " well not set correctly - massive Rig issues -

Drilled SB-54, 30 south of 52 - no visible contamination zone as in SB 51 & 52.

Demob from site at 7:30 -

~~9/20~~ GT

9/19 At site 6:30 marked locations

left 7:30

9/20 GT Arrived at trailer 7:30 - at SWMU 32 7:45

Drillers on site -

late Because of phone issues.

placed MW-5 to 24' finish 9:15

Drilled MW-6 - 9:30 finished -

Boring 54 - 65 -

54 - 59 Naphthalene

60 - 65 Benzo(A) pyrene

Field Dup 092010-01 = 325B56 1415

~~Field~~ Naphthalene

Field Dup 092010-02 = 325565 0002

Benzo(a) pyrene

Finish 4:15 Drillers plugged holes - left site

Monitoring wells to be sampled 9/21 or 9/22 -

1900 - L Foster & T Chuck arrived on site and

GPSed in locations of soil borings and wells.

Sept ~~20~~ 21

0945 - L Foster arrived on site.
1000 - L Foster located ~~[illegible]~~ 32SD04 -
Collected 32SD04 0001.
1015 - Located 32SD05.
1020 - Collected 32SD05 0001 - Collected
field duplicate at this location. FD 0921 10-01
1030 - Arrived at trailer with samples.
1100 - Arrived at trailer from swimming 21.
1610 - T. Check labled 30 samples,
generated COCs processed and packaged
30 samples.
1815 - T. Check departed for FedEx
with samples.
1845 - T. Check arrived @ FedEx, shipped
samples.
1900 - L Foster arrived on site.
1910 - L Foster recorded water level measurements
for TW 04, TW05, and TW01.
1944 - Begin purge @ well 01.
2050 - End purge @ well 01
2055 - Collect samples from well 01 - See calcs. page.
2130 - Leave site, return to trailer.
2200 - Leave trailer, return to hotel.

09/22

0915 - L. Foster & T. Chuck arrive at site trailer. T. Chuck drops DOW down sanitary sewer.

0930 - Calibrate equipment, load supplies.

1100 - Arrive on site.

1140 - Begin purge of TW05. (see calculations on page attached)

1220 - End purge at TW05.

1225 - Sample TW05. Duplicate sample collected. ↳ ID as FD 09 22 10-01

1320 - Begin purge at TW04.

1355 - TW04 was purged dry.

1410 - Sampled TW04

~~1500 - Left site, returned to trailer. Abandoned~~

1445 - Pulled up wells, Abandoned wells w/ bentonite

1500 - Left site, returned to trailer.

1515 - Logged samples. Labelled, processed, and packaged samples. Generated COCs

1815 - L. Foster leaves trailer for FedEx.

1845 - L. Foster arrives at FedEx. Ships samples.

1930 - Arrive at trailer. Manager DOW, pack equipment, depart MSA Crane

09/23 0100 - Arrive in Cincinnati OH

GROUNDWATER LEVEL MEASUREMENTS SHEETS

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: NSA CRANE CTO F273
Project No.:
Location: SWMU 32
Personnel: B. Collins, L. Foster
Weather Conditions: Rain (light), ~50°F
Measuring Device: Water level indicator
Tidally Influenced: Yes ___ No X
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
32MW03	4/27/10	10:38	N/A	20 ft	9.12 ft.	N/A	N/A	riser = 1 ft.
32MW02	4/27/10	10:45	N/A	20 ft	5.37 ft	N/A	N/A	riser = 1 ft.
32MW01	4/27/10	10:48	N/A	20 ft	15.78 ft	N/A	N/A	riser = 2 inches
2			460		4.37		455.6	
3			460		8.12		451.8	
1			465		15.6		449.4	

Page ____ of ____

* All measurements to the nearest 0.01 foot

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: NSA CRANE CTO F223 **Project No.:** 112G0211
Location: SWMU 32 **Personnel:** L. Foster
Weather Conditions: Clear, 84°F **Measuring Device:** Heron Water Level Indicator
Tidally Influenced: Yes ___ No X **Remarks:**

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	(TOR) Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments Riser Above Ground Surface
TW04	09/21	1920		24 1/2	17.68			2.17
TW05	09/21	1915		24	16.52			0.9
TW06	09/21	19:00		24	16.84			1.00

Page ___ of ___

* All measurements to the nearest 0.01 foot

APPENDIX E – HEALTH AND SAFETY DOCUMENTATION

HEALTH AND SAFETY DOCUMENTATION

HEALTH AND SAFETY DOCUMENTATION

FIGURE 8-1

SITE-SPECIFIC TRAINING DOCUMENTATION
CRANE SWMU 32

My signature below indicates that I am aware of the potential hazardous nature of performing field investigation activities at NSA Crane, Indiana and that I have received site-specific training which included the elements presented below:

- Names of designated personnel and alternates responsible for site safety and health
- Safety, health, and other hazards present on site
- Use of personal protective equipment
- Safe use of engineering controls and equipment
- Medical surveillance requirements
- Signs and symptoms of overexposure
- Emergency response procedures (evacuation and assembly points)
- Incipient response procedures
- Review of the contents of relevant Material Safety Data Sheets
- Review of the use of Safe Work Permits
- Stop Work Authority Procedures

I have been given the opportunity to ask questions and all of my questions have been answered to my satisfaction. The dates of my training and my medical surveillance requirements indicated below are accurate to the best of my knowledge.

Name (Printed and Signature)	Site-Specific Training Date	40-Hour Training (Date)	8-Hour Refresher Training (Date)	8-Hour Supervisory Training (Date)	Medical Exam
Lauren Foster	04/26/10	08/09	NA	NA	07/09
James MacDonald	"	"	"	"	"
Andrew Pettit					
	"	"	"	"	"
Jessica Taylor	4/26/10	03/10	na	na	03/10
George Van Eyck	4/26/10	08/09	recently	na	08/09
Betsy Collins	4/26/10	10/08	10/09	N/A	10/08
Brian Anderson	9/17/10	3/15/06	3/18/10	N/A	3/16/10
Henry Peterson	9/17/10	4/29/03	3/18/10	N/A	3/15/10

U.S. ENVIRONMENTAL PROTECTION AGENCY

This certifies that

GEORGE TEN EYCK

has completed the

HAZARDOUS MATERIALS INCIDENT RESPONSE OPERATIONS (165.5)

Training Course

3.8 Continuing Education Units

Cincinnati, Ohio

June 19-23, 1995

Presented by the

OFFICE OF EMERGENCY AND REMEDIAL RESPONSE

Mary Smiley

Course Director

Halliburton NUS Corporation

Bruce Potok

Training Coordinator,
Environmental
Response Branch

TETRA TECH

CERTIFICATE OF TRAINING

THIS CERTIFIES THAT

GEORGE L. TEN EYCK

has successfully completed an 8-hour course of instruction in

OSHA 29 CFR 1910.120

GENERAL SITE WORKER REFRESHER AND SUPERVISOR REFRESHER TRAINING

prepared and instructed by
Tetra Tech NUS, Inc.
Cincinnati, Ohio

January 23, 2011

Date of Award

Theodore R. Ellwood
Health and Safety Officer

Certificate #2011-04

Anthony P. Klimek
Office Manager

WORK STATUS REPORT

Employer Copy

TYPE OF EXAMINATION: **Periodic Examination**

EMPLOYEE:	**Ten Eyck, George L.**	**COMPANY:**	**TT/NUS**
ID:		**POSITION:**	**Senior Instructor**
DATE OF EXAM:	**10/20/2010**	**LOCATION:**	**TT/NUS-Cincinnati**
EXPIRATION DATE:	**10/20/2012**	**SITE:**	**Cincinnati**

The following recommendations are based on a review of one or all of the following: a base history questionnaire, supporting diagnostic tests, physical examination, and the essential functions of the position applied for or occupied by the individual named above.

	Yes	No	Undecided
Has the employee any detected medical conditions that would increase his/her risk of material health impairment from occupational exposure in accordance with 29 CFR §1910.120?	☐	X	☐
Does the employee have any limitations in the use of respirators in accordance with 29 CFR §1910.134?	☐	X	☐

STATUS

1. X **QUALIFIED** The examination indicates no significant medical condition. Employee can be assigned any work consistent with skills and training.

2. ☐ **QUALIFIED - WITH LIMITATIONS** The examination indicates that a medical condition currently exists that limits work assignments on the following basis:

3. ☐ **NOT QUALIFIED**

4. ☐ **DEFERRED** The examination indicated that additional information is necessary. The employee has been given the following instructions.

COMMENTS:

I have reviewed the medical data of the above named employee, and informed the employee of the results of the medical examination and any medical conditions that require follow-up examination or treatment.

Name of Physician: Peter P. Greaney, M.D. Date: 10/27/10

Signature: Peter P Greaney MD

Go ahead. Get there.
Cincinnati State
Workforce Development Center

Cincinnati State Technical and Community College
10100 Reading Road
Cincinnati, Ohio 45241

acknowledges that

Lauren E. Foster

has successfully completed the model training curriculum as prescribed by

OSHA 29 CFR 1910.120
USEPA 40 CFT Part 311

for

40 Hour Specialist & General Site Worker

August 24-28, 2009

09/SU THZ 1005 FB

Instructor

TETRA TECH

CERTIFICATE OF TRAINING

THIS CERTIFIES THAT

LAUREN E. FOSTER

has successfully completed an 8-hour course of instruction in

OSHA 29 CFR 1910.120

GENERAL SITE WORKER REFRESHER TRAINING

prepared and instructed by
Tetra Tech NUS, Inc.
Cincinnati, Ohio

August 30, 2010

Date of Award

Theodore R. Ellwood
Health and Safety Officer

Anthony P. Klimek
Office Manager

WORK STATUS REPORT

Employer Copy

TYPE OF EXAMINATION: **Baseline Examination**

EMPLOYEE:	**Foster, Lauren**	**COMPANY:**	**TT/NUS**
ID:		**POSITION:**	**Environmental Scientist**
DATE OF EXAM:	**07/30/2009**	**LOCATION:**	**TT/NUS-Cincinnati**
EXPIRATION DATE:	**07/30/2011**	**SITE:**	

The following recommendations are based on a review of one or all of the following: a base history questionnaire, supporting diagnostic tests, physical examination, and the essential functions of the position applied for or occupied by the individual named above.

	Yes	No	Undecided
Has the employee any detected medical conditions that would increase his/her risk of material health impairment from occupational exposure in accordance with 29 CFR §1910.120?	☐	X	☐
Does the employee have any limitations in the use of respirators in accordance with 29 CFR §1910.134?	☐	X	☐

STATUS

1. X **QUALIFIED** The examination indicates no significant medical condition. Employee can be assigned any work consistent with skills and training.

2. ☐ **QUALIFIED - WITH LIMITATIONS** The examination indicates that a medical condition currently exists that limits work assignments on the following basis:

3. ☐ **NOT QUALIFIED**

4. ☐ **DEFERRED** The examination indicated that additional information is necessary. The employee has been given the following instructions.

COMMENTS: ***Qualified for biennial frequency.***

I have reviewed the medical data of the above named employee, and informed the employee of the results of the medical examination and any medical conditions that require follow-up examination or treatment.

Name of Physician: Peter P. Greaney, M.D. Date: 08/04/09

Signature: Peter P Greaney MD

TETRA TECH

CERTIFICATE OF TRAINING

THIS CERTIFIES THAT

TODD C. CHEEK

has successfully completed the requirements for
40-hours of instruction as required by
OSHA 29 CFR 1910.120(e)(3)(i)

GENERAL SITE WORKER TRAINING

Tetra Tech NUS, Inc.
Cincinnati, Ohio

July 1, 2010

Date of Award

Theodore R. Ellwood
Health and Safety Officer

Anthony P. Klimek
Office Manager

WORK STATUS REPORT

Employer Copy

TYPE OF EXAMINATION: **Baseline Examination**

EMPLOYEE:	**Cheek, Todd**	**COMPANY:**	**TT/NUS**
ID:		**POSITION:**	**Technician IV**
DATE OF EXAM:	**04/20/2010**	**LOCATION:**	**TT/NUS-Cincinnati**
EXPIRATION DATE:	**04/20/2012**	**SITE:**	**Cincinnati**

The following recommendations are based on a review of one or all of the following: a base history questionnaire, supporting diagnostic tests, physical examination, and the essential functions of the position applied for or occupied by the individual named above.

	Yes	No	Undecided
Has the employee any detected medical conditions that would increase his/her risk of material health impairment from occupational exposure in accordance with 29 CFR §1910.120?	☐	☒	☐
Does the employee have any limitations in the use of respirators in accordance with 29 CFR §1910.134?	☐	☒	☐

STATUS

1. ☒ **QUALIFIED** The examination indicates no significant medical condition. Employee can be assigned any work consistent with skills and training.

2. ☐ **QUALIFIED - WITH LIMITATIONS** The examination indicates that a medical condition currently exists that limits work assignments on the following basis:

3. ☐ **NOT QUALIFIED**

4. ☐ **DEFERRED** The examination indicated that additional information is necessary. The employee has been given the following instructions.

COMMENTS: ***Qualified for biennial frequency.***

I have reviewed the medical data of the above named employee, and informed the employee of the results of the medical examination and any medical conditions that require follow-up examination or treatment.

Name of Physician: Peter P. Greaney, M.D. Date: 04/26/10

Signature: Peter P Greaney MD

This certifies that

BETSY COLLINS

has completed

Hazardous Materials Incident Response Operations (165.5)

3.8 Continuing Education Units
Apollo, Pennsylvania
October 6-10 , 2008

Presented by

HST, Inc.

in cooperation with the

U.S. ENVIRONMENTAL PROTECTION AGENCY

ENVIRONMENTAL RESPONSE TRAINING PROGRAM

This course meets the 29 CFR 1910.120(e)(3)(i) requirements of
a minimum of 40 hours of off-site safety training for hazardous waste site workers.

Paul Wolsenrich

Course Director
HST, Inc.

TETRA TECH NUS

CERTIFICATE OF TRAINING

THIS CERTIFIES THAT

Betsy Collins

has successfully completed an 8-hour course of instruction in

OSHA 29 CFR 1910.120

GENERAL SITE WORKER
REFRESHER TRAINING

prepared and instructed by
Tetra Tech NUS, Inc.
Pittsburgh, Pennsylvania

September 18, 2009

Date of Award

Clyde Snyder
Senior Instructor
Training Services

James K. Laffey
Manager
Training Services

WORK STATUS REPORT

Employer Copy

TYPE OF EXAMINATION: **Baseline Examination**

EMPLOYEE:	**Collins, Elizabeth**	**COMPANY:**	**TT/NUS**
SSN:	**XXX-XX-7838**	**POSITION:**	**Not Indicated**
DATE OF EXAM:	**10/31/2008**	**LOCATION:**	**TT/NUS-Pittsburgh**
EXPIRATION DATE:	**10/31/2010**	**SITE:**	**Not Indicated**

The following recommendations are based on a review of one or all of the following: a base history questionnaire, supporting diagnostic tests, physical examination, and the essential functions of the position applied for or occupied by the individual named above.

	Yes	No	Undecided
Has the employee any detected medical conditions that would increase his/her risk of material health impairment from occupational exposure in accordance with 29 CFR §1910.120?	☐	☒	☐
Does the employee have any limitations in the use of respirators in accordance with 29 CFR §1910.134?	☐	☒	☐

STATUS

1. ☒ **QUALIFIED** The examination indicates no significant medical condition. Employee can be assigned any work consistent with skills and training.

2. ☐ **QUALIFIED - WITH LIMITATIONS** The examination indicates that a medical condition currently exists that limits work assignments on the following basis:

3. ☐ **NOT QUALIFIED**

4. ☐ **DEFERRED** The examination indicated that additional information is necessary. The employee has been given the following instructions.

COMMENTS: ***Qualified for biennial status.***

I have reviewed the medical data of the above named employee, and informed the employee of the results of the medical examination and any medical conditions that require follow-up examination or treatment.

Name of Physician: Peter P. Greaney, M.D. Date: 11/07/08

Signature: Peter P Greaney MD

TETRA TECH

CERTIFICATE OF TRAINING

THIS CERTIFIES THAT

JESSICA L. TAYLOR

has successfully completed the requirements for
40-hours of instruction as required by
OSHA 29 CFR 1910.120(e)(3)(i)

GENERAL SITE WORKER TRAINING

Tetra Tech NUS, Inc.
Cincinnati, Ohio

March 29, 2010

Date of Award

Theodore R. Ellwood
Health and Safety Officer

Anthony P. Klimek
Project Manager

WORK STATUS REPORT

Employer Copy

TYPE OF EXAMINATION: **Baseline Examination**

EMPLOYEE:	**Taylor, Jessica**	**COMPANY:**	**TT/NUS**
ID:		**POSITION:**	**Enviromental Science Tech.**
DATE OF EXAM:	**03/18/2010**	**LOCATION:**	**TT/NUS-Cincinnati**
EXPIRATION DATE:	**03/18/2012**	**SITE:**	**Cincinnati**

The following recommendations are based on a review of one or all of the following: a base history questionnaire, supporting diagnostic tests, physical examination, and the essential functions of the position applied for or occupied by the individual named above.

	Yes	No	Undecided
Has the employee any detected medical conditions that would increase his/her risk of material health impairment from occupational exposure in accordance with 29 CFR §1910.120?	☐	X	☐
Does the employee have any limitations in the use of respirators in accordance with 29 CFR §1910.134?	☐	X	☐

STATUS

1. X **QUALIFIED** The examination indicates no significant medical condition. Employee can be assigned any work consistent with skills and training.

2. ☐ **QUALIFIED - WITH LIMITATIONS** The examination indicates that a medical condition currently exists that limits work assignments on the following basis:

3. ☐ **NOT QUALIFIED**

4. ☐ **DEFERRED** The examination indicated that additional information is necessary. The employee has been given the following instructions.

COMMENTS: ***Qualified for Biennial frequency.***

I have reviewed the medical data of the above named employee, and informed the employee of the results of the medical examination and any medical conditions that require follow-up examination or treatment.

Name of Physician: Peter P. Greaney, M.D. Date: 03/24/10

Signature: Peter P Greaney MD

CER COMPLIANCE ENVIRONMENTAL RESOURCES, INC.

7002 Graham Road, Suite 202
Indianapolis, IN 46220
(317) 863-0008
www.esrstaffing.com

CHRISTOPHER W. CHAMBERS

Has completed the 40 Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) course in compliance with 29 CFR 1910.120 (e).
This individual will have met the criteria for certification upon completion of 24 hours of supervised training.

Christopher A. Kinsey, CHMM, CET
Instructor
Completion Date: 03/15/06

HEALTH
&
SAFETY
TRAINING

ARK ENGINEERING SERVICES INC.

Certificate Awarded To:

Christopher Chambers

For Successful Completion of

Annual 8 Hour Refresher Course

Per 29 CFR 1910.120

Henry L. Peterson

3/18/10
Date

HEALTH & SAFETY TRAINING

ARK ENGINEERING SERVICES INC.

Certificate Awarded to:

HENRY L. PETERSON JR.

For Successful Completion of the course on

40 Hour Hazardous Waste Site Operations

Per 29 CFR 1910.120

Wesley K. Paul, P.E.
Course Director

4/29/2003
Date

HEALTH
&
SAFETY
TRAINING

ARK ENGINEERING SERVICES INC.

Certificate Awarded To:

Henry Peterson Jr.

For Successful Completion of

Annual 8 Hour Refresher Course

Per 29 CFR 1910.120

Henry L. Peterson

3/18/10
Date

WILLIAM C. KLECKNER, M.D.
7526 E. 82nd Street
Indianapolis, IN 46256

Telephone: (317) 621-2121

April 19, 2010

To whom it may concern:

Chris Chambers (birthdate 10/11/79) was given a physical exam by me on the 03/16/10. I consider him fit for any physical activity required of him on the job. He is capable of wearing personal protective equipment. This is the first such exam I have ever given Chris.

Sincerely,

William C. Kleckner M.D.
WCK,ksl

St. Vincent
Physician Network

Thomas M. Armstrong, MD
Christine M. Davis, MD
Daniel M. Overcash, MD

5750 W. 56th Street, Suite 150
Indianapolis, IN 46254

(317) 415-7373
Fax: (317) 415-7374

physiciannetwork.stvincent.org

April 16, 2010

Re: Henry Peterson (DOB: 11/2/1953)

To Whom It May Concern:

My patient, Henry Peterson, was in our office on March 15, 2010 for a DOT physical. He was also deemed healthy and fit to be exposed to environmental and hazardous wastes.

Please feel free to contact our office with any further problems or questions at (317) 415-7373 option #1.

Sincerely,

Daniel Overcash, MD

DMO/amw

A member of
ASCENSION HEALTH

Core Values

We are called to:

Service of the Poor
Generosity of spirit for persons most in need.

Reverence
Respect and compassion for the dignity and diversity of life.

Integrity
Inspiring trust through personal leadership.

Wisdom
Integrating excellence and stewardship.

Creativity
Courageous innovation.

Dedication
Affirming the hope and joy of our ministry.

A member of St. Vincent HEALTH

powered by 360training

CERTIFICATE OF COURSE COMPLETION

James W McDaniel	Hazwoper 8 Hour Annual Refresher Course	12/03/2010 01:30 CST
Student's Name	Course Title	Course Completion Date MM / DD / YYYY

1776088

Certificate Number

James W McDaniel

Student's Signature

8

Approved # of Hours

I hereby attest and certify that I personally took the above named safety lesson in accordance to guidelines. I further state that I have paid for the course and that I did not use another's work (Plagiarism). Students should retain certificates and refer to course instructions to receive official certification where necessary.

360training
Corporate Headquarters
13801 N. Mo-Pac, Suite 100
Austin, Texas 78727
tel: 888-360-8764
fax: 512-727-7683
email: support@360training.com

DISCLAIMER: IT IS THE SOLE RESPONSIBILITY OF THE PERSON(S) COMPLETING THIS CERTIFICATE TO COMPLY WITH ALL REQUIREMENTS CONTAINED IN THE DEPARTMENT OF TRANSPORTATION FEDERAL MOTOR CARRIERS SAFETY ADMINISTRATION REGULATIONS 49 CFR PART 391 QUALIFICATIONS OF DRIVERS.

Printed in the United States

MEDICAL EXAMINER'S CERTIFICATE

DRIVER'S NAME James McDaniel

MEDICAL CERTIFICATE EXPIRATION DATE March 9, 2011

MEDICAL EXAMINER'S CERTIFICATE

I certify that I have examined James McDaniel in accordance with the Federal Motor Carrier Safety Regulations (49 CFR 391.41-391.49) and with knowledge of the driving duties, I find this person is qualified; and if applicable, only when:

- ☐ wearing corrective lenses
- ☐ wearing hearing aid
- ☐ accompanied by a _____ waiver/exemption
- ☐ driving within an exempt intracity zone (49 CFR 391.62)
- ☐ accompanied by a Skill Performance Evaluation Certificate (SPE)
- ☐ qualified by operation of 49 CFR 391.64

The information I have provided regarding this physical examination is true and complete. A complete examination form with any attachment enclosures, my findings completely and correctly, and is on file in my office.

SIGNATURE OF MEDICAL EXAMINER: Amy L. Bennett ARNP	TELEPHONE: 859-272-4882	DATE: 3/9/09
PRINTED NAME OF MEDICAL EXAMINER: Amy L. Bennett ARNP	☐ OD ☐ OU ☐ Physician Assistant	☐ Chiropractor ☐ Advanced Practice Nurse
MEDICAL EXAMINER'S LICENSE OR CERTIFICATE NO. (STATE): 28320-KY — 6692 P. KY		
SIGNATURE OF DRIVER: James McDaniel	DRIVER'S LICENSE NO.: M95-625-216	STATE: KY
ADDRESS OF DRIVER: 662 Dovesville Rd Richmond Ky		
MEDICAL CERTIFICATE EXPIRATION DATE: March 9, 2011		

Rocky Mountain Education Center

This is to certify that on December 16, 2005

Andrew Ratliff

diligently and with merit completed training in
RMEC Course #313 - *Hazardous Waste Site Safety*
40-Hour HAZWOPER

Richard Hawkins
Executive Director

4.0 Continuing Education Units (CEU)
Rocky Mountain Education Center ● Red Rocks Community College ● Lakewood, Colorado

MEDICAL EXAMINER'S CERTIFICATE

TC 94-157
Rev. 02/04

I certify that I have examined

Andrew Ratliff

Driver's Name (Print)

In accordance with the Federal Motor Carrier Safety Regulations (49 CFR 391.41-391.49) and with knowledge of the driving duties, I find this person is qualified; and, if applicable, only when:

- ☐ wearing corrective lenses
- ☐ wearing hearing aid
- ☐ accompanied by a _____ waiver/exemption
- ☐ driving within an exempt intracity zone (49 CFR 391.62)
- ☐ accompanied by a Skill Performance Evaluation Certificate (SPE)
- ☐ qualified by operation of 49 CFR 391.64

The information I have provided regarding this physical examination is true and complete. A complete examination form with any attachment embodies my findings completely and correctly, and is on file in my office.

SIGNATURE OF MEDICAL EXAMINER	TELEPHONE	DATE
Kelly Weaver ARNP	502 863 6440	12/02/10

MEDICAL EXAMINER'S NAME (PRINT)	
KELLY WEAVER	☐ MD ☐ DO ☐ Chiropractor ☐ Physician Assistant ☒ Advanced Practice Nurse

MEDICAL EXAMINER'S LICENSE OR CERTIFICATE NO. / ISSUING STATE
4955P / KY

SIGNATURE OF DRIVER	DRIVER'S LICENSE NO.	STATE
[illegible]	K07-642-643	Ky

ADDRESS OF DRIVER
17 Shaler St Covington Ky 41011

MEDICAL CERTIFICATE EXPIRATION DATE
12/02/11

THE NATIONAL ENVIRONMENTAL TRAINERS

Andrew Ratliff

has satisfactorily passed an exam and completed an 8-hour annual refresher training course entitled

Hazardous Waste Operations and Emergency Response

meeting the requirements identified in Title 29 CFR 1910.120.

This course has been awarded 1.34 Industrial Hygiene CM Points by the American Board of Industrial Hygiene-Approval Number 13334. This course is also eligible for .66 Continuance of Certification (COC) points from the Board of Certified Safety Professionals

NATIONAL ENVIRONMENTAL TRAINERS, Inc.

December 14, 2010

Course Number 1001, Awarded 8 PDH's
Florida Board of Professional Engineers
CEU Provider Number 0004284

www.nationalenvironmentaltrainers.com

Signature of Instructor

Clay A. Bednarz, MS, RPIH

APPENDIX F – ANALYTICAL DATA

ANALYTICAL DATA

ANALYTICAL DATA

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	moist
32SS-01-0002	1004244-01	_001	BENZO(A)ANTHRACENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.8	1	14.5
32SS-01-0002-AVG	1004244-01	_001	BENZO(A)ANTHRACENE	1.56	U	1.565	1.565	U	N	UG/KG	1.565	U	7.8	1	14.5
32SS-01-0002	1004244-01	_001	BENZO(A)PYRENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.85	1	14.5
32SS-01-0002-AVG	1004244-01	_001	BENZO(A)PYRENE	1.56	U	1.565	1.565	U	N	UG/KG	1.565	U	5.85	1	14.5
32SS-01-0002	1004244-01	_001	BENZO(B)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.8	1	14.5
32SS-01-0002-AVG	1004244-01	_001	BENZO(B)FLUORANTHE	1.56	U	1.565	1.565	U	N	UG/KG	1.565	U	7.8	1	14.5
32SS-01-0002	1004244-01	_001	BENZO(K)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.8	1	14.5
32SS-01-0002-AVG	1004244-01	_001	BENZO(K)FLUORANTHE	1.56	U	1.565	1.565	U	N	UG/KG	1.565	U	7.8	1	14.5
32SS-01-0002	1004244-01	_001	CHRYSENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.8	1	14.5
32SS-01-0002-AVG	1004244-01	_001	CHRYSENE	1.56	U	1.565	1.565	U	N	UG/KG	1.565	U	7.8	1	14.5
32SS-01-0002	1004244-01	_001	DIBENZ(A,H)ANTHRACE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.85	1	14.5
32SS-01-0002-AVG	1004244-01	_001	DIBENZ(A,H)ANTHRACE	1.56	U	1.565	1.565	U	N	UG/KG	1.565	U	5.85	1	14.5
32SS-01-0002	1004244-01	_001	INDENO(1,2,3-CD)PYRE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.8	1	14.5
32SS-01-0002-AVG	1004244-01	_001	INDENO(1,2,3-CD)PYRE	1.56	U	1.565	1.565	U	N	UG/KG	1.565	U	7.8	1	14.5
32SS-01-0002	1004244-01	_001	NAPHTHALENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.85	1	14.5
32SS-01-0002-AVG	1004244-01	_001	NAPHTHALENE	1.56	U	1.565	1.565	U	N	UG/KG	1.565	U	5.85	1	14.5
32SB-01-0708	1004244-02	_001	BENZENE	0.535	U	0.535	0.535	U	N	UG/KG	0.535	U	5	1	14.6
32SB-01-0708-AVG	1004244-02	_001	BENZENE	0.535	U	0.53	0.53	U	N	UG/KG	0.53	U	5	1	14.6
32SB-01-0708	1004244-02	_001	ETHYLBENZENE	0.853	U	0.853	0.853	U	N	UG/KG	0.853	U	11.4	1	14.6
32SB-01-0708-AVG	1004244-02	_001	ETHYLBENZENE	0.853	U	0.845	0.845	U	N	UG/KG	0.845	U	11.4	1	14.6
32SB-01-0708	1004244-02	_001	TOLUENE	0.978	U	0.978	0.978	U	N	UG/KG	0.978	U	11.4	1	14.6
32SB-01-0708-AVG	1004244-02	_001	TOLUENE	0.978	U	0.969	0.969	U	N	UG/KG	0.969	U	11.4	1	14.6
32SB-01-0708	1004244-02	_001	XYLENE(TOTAL)	0.796	U	0.796	0.796	U	N	UG/KG	0.796	U	11.4	1	14.6
32SB-01-0708-AVG	1004244-02	_001	XYLENE(TOTAL)	0.796	U	0.7885	0.7885	U	N	UG/KG	0.7885	U	11.4	1	14.6
32SB-01-0708	1004244-02	_001	BENZO(A)ANTHRACENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.81	1	14.6
32SB-01-0708-AVG	1004244-02	_001	BENZO(A)ANTHRACENE	1.56	U	1.555	1.555	U	N	UG/KG	1.555	U	7.81	1	14.6
32SB-01-0708	1004244-02	_001	BENZO(A)PYRENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.86	1	14.6
32SB-01-0708-AVG	1004244-02	_001	BENZO(A)PYRENE	1.56	U	1.555	1.555	U	N	UG/KG	1.555	U	5.86	1	14.6
32SB-01-0708	1004244-02	_001	BENZO(B)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.81	1	14.6
32SB-01-0708-AVG	1004244-02	_001	BENZO(B)FLUORANTHE	1.56	U	1.555	1.555	U	N	UG/KG	1.555	U	7.81	1	14.6
32SB-01-0708	1004244-02	_001	BENZO(K)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.81	1	14.6
32SB-01-0708-AVG	1004244-02	_001	BENZO(K)FLUORANTHE	1.56	U	1.555	1.555	U	N	UG/KG	1.555	U	7.81	1	14.6
32SB-01-0708	1004244-02	_001	CHRYSENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.81	1	14.6
32SB-01-0708-AVG	1004244-02	_001	CHRYSENE	1.56	U	1.555	1.555	U	N	UG/KG	1.555	U	7.81	1	14.6
32SB-01-0708	1004244-02	_001	DIBENZ(A,H)ANTHRACE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.86	1	14.6
32SB-01-0708-AVG	1004244-02	_001	DIBENZ(A,H)ANTHRACE	1.56	U	1.555	1.555	U	N	UG/KG	1.555	U	5.86	1	14.6
32SB-01-0708	1004244-02	_001	INDENO(1,2,3-CD)PYRE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.81	1	14.6
32SB-01-0708-AVG	1004244-02	_001	INDENO(1,2,3-CD)PYRE	1.56	U	1.555	1.555	U	N	UG/KG	1.555	U	7.81	1	14.6
32SB-01-0708	1004244-02	_001	NAPHTHALENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.86	1	14.6
32SB-01-0708-AVG	1004244-02	_001	NAPHTHALENE	1.56	U	1.555	1.555	U	N	UG/KG	1.555	U	5.86	1	14.6
32SS-01-0002-D	1004244-03	_001	BENZO(A)ANTHRACENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.9	1	16.1
32SS-01-0002-D	1004244-03	_001	BENZO(A)PYRENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	5.92	1	16.1
32SS-01-0002-D	1004244-03	_001	BENZO(B)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.9	1	16.1
32SS-01-0002-D	1004244-03	_001	BENZO(K)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.9	1	16.1
32SS-01-0002-D	1004244-03	_001	CHRYSENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.9	1	16.1
32SS-01-0002-D	1004244-03	_001	DIBENZ(A,H)ANTHRACE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	5.92	1	16.1
32SS-01-0002-D	1004244-03	_001	INDENO(1,2,3-CD)PYRE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.9	1	16.1
32SS-01-0002-D	1004244-03	_001	NAPHTHALENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	5.92	1	16.1
32SB-01-0708-D	1004244-04	_001	BENZENE	0.525	U	0.525	0.525	U	N	UG/KG	0.525	U	5	1	14.7
32SB-01-0708-D	1004244-04	_001	ETHYLBENZENE	0.837	U	0.837	0.837	U	N	UG/KG	0.837	U	11.2	1	14.7
32SB-01-0708-D	1004244-04	_001	TOLUENE	0.96	U	0.96	0.96	U	N	UG/KG	0.96	U	11.2	1	14.7
32SB-01-0708-D	1004244-04	_001	XYLENE(TOTAL)	0.781	U	0.781	0.781	U	N	UG/KG	0.781	U	11.2	1	14.7
32SB-01-0708-D	1004244-04	_001	BENZO(A)ANTHRACENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.77	1	14.7
32SB-01-0708-D	1004244-04	_001	BENZO(A)PYRENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.82	1	14.7
32SB-01-0708-D	1004244-04	_001	BENZO(B)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.77	1	14.7
32SB-01-0708-D	1004244-04	_001	BENZO(K)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.77	1	14.7
32SB-01-0708-D	1004244-04	_001	CHRYSENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.77	1	14.7
32SB-01-0708-D	1004244-04	_001	DIBENZ(A,H)ANTHRACE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.82	1	14.7
32SB-01-0708-D	1004244-04	_001	INDENO(1,2,3-CD)PYRE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.77	1	14.7
32SB-01-0708-D	1004244-04	_001	NAPHTHALENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.82	1	14.7
32SS-02-0002	1004244-05	_001	BENZO(A)ANTHRACENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	8.07	1	17.3
32SS-02-0002	1004244-05	_001	BENZO(A)PYRENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	6.05	1	17.3
32SS-02-0002	1004244-05	_001	BENZO(B)FLUORANTHE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	8.07	1	17.3
32SS-02-0002	1004244-05	_001	BENZO(K)FLUORANTHE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	8.07	1	17.3

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SS-02-0002	1004244-05	_001	CHRYSENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	8.07	1	17.3
32SS-02-0002	1004244-05	_001	DIBENZ(A,H)ANTHRACE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	6.05	1	17.3
32SS-02-0002	1004244-05	_001	INDENO(1,2,3-CD)PYRE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	8.07	1	17.3
32SS-02-0002	1004244-05	_001	NAPHTHALENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	6.05	1	17.3
32SB-02-0607	1004244-06	_001	BENZENE	32.4	U	32.4	32.4	U	N	UG/KG	32.4	U	275	1	19.5
32SB-02-0607	1004244-06	_001	ETHYLBENZENE	51.6	U	51.6	51.6	U	N	UG/KG	51.6	U	688	1	19.5
32SB-02-0607	1004244-06	_001	TOLUENE	59.2	U	59.2	59.2	U	N	UG/KG	59.2	U	688	1	19.5
32SB-02-0607	1004244-06	_001	XYLENE(TOTAL)	48.2	U	48.2	48.2	U	N	UG/KG	48.2	U	688	1	19.5
32SB-02-0607	1004244-06	_001	BENZO(A)ANTHRACENE	16.4	U	16.4	16.4	U	N	UG/KG	16.4	U	82.3	10	19.5
32SB-02-0607	1004244-06	_001	BENZO(A)PYRENE	16.4	U	16.4	16.4	U	N	UG/KG	16.4	U	61.7	10	19.5
32SB-02-0607	1004244-06	_001	BENZO(B)FLUORANTHE	16.4	U	16.4	16.4	U	N	UG/KG	16.4	U	82.3	10	19.5
32SB-02-0607	1004244-06	_001	BENZO(K)FLUORANTHE	16.4	U	16.4	16.4	U	N	UG/KG	16.4	U	82.3	10	19.5
32SB-02-0607	1004244-06	_001	CHRYSENE	16.4	U	16.4	16.4	U	N	UG/KG	16.4	U	82.3	10	19.5
32SB-02-0607	1004244-06	_001	DIBENZ(A,H)ANTHRACE	16.4	U	16.4	16.4	U	N	UG/KG	16.4	U	61.7	10	19.5
32SB-02-0607	1004244-06	_001	INDENO(1,2,3-CD)PYRE	16.4	U	16.4	16.4	U	N	UG/KG	16.4	U	82.3	10	19.5
32SB-02-0607	1004244-06	_001	NAPHTHALENE	16.4	U	16.4	16.4	U	N	UG/KG	16.4	U	61.7	10	19.5
32SS-03-0002	1004244-07	_001	BENZO(A)ANTHRACENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.81	1	15.2
32SS-03-0002	1004244-07	_001	BENZO(A)PYRENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.86	1	15.2
32SS-03-0002	1004244-07	_001	BENZO(B)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.81	1	15.2
32SS-03-0002	1004244-07	_001	BENZO(K)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.81	1	15.2
32SS-03-0002	1004244-07	_001	CHRYSENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.81	1	15.2
32SS-03-0002	1004244-07	_001	DIBENZ(A,H)ANTHRACE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.86	1	15.2
32SS-03-0002	1004244-07	_001	INDENO(1,2,3-CD)PYRE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.81	1	15.2
32SS-03-0002	1004244-07	_001	NAPHTHALENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.86	1	15.2
32SB-03-0607	1004244-08	_001	BENZENE	0.486	U	0.486	0.486	UJ	N	UG/KG	0.486	UJ	N 5	1	18
32SB-03-0607	1004244-08	_001	ETHYLBENZENE	0.775	U	0.775	0.775	UJ	N	UG/KG	0.775	UJ	N 10.3	1	18
32SB-03-0607	1004244-08	_001	TOLUENE	0.889	U	0.889	0.889	UJ	N	UG/KG	0.889	UJ	N 10.3	1	18
32SB-03-0607	1004244-08	_001	XYLENE(TOTAL)	0.724	U	0.724	0.724	UJ	N	UG/KG	0.724	UJ	N 10.3	1	18
32SB-03-0607	1004244-08	_001	BENZO(A)ANTHRACENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	8.14	1	18
32SB-03-0607	1004244-08	_001	BENZO(A)PYRENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	6.1	1	18
32SB-03-0607	1004244-08	_001	BENZO(B)FLUORANTHE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	8.14	1	18
32SB-03-0607	1004244-08	_001	BENZO(K)FLUORANTHE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	8.14	1	18
32SB-03-0607	1004244-08	_001	CHRYSENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	8.14	1	18
32SB-03-0607	1004244-08	_001	DIBENZ(A,H)ANTHRACE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	6.1	1	18
32SB-03-0607	1004244-08	_001	INDENO(1,2,3-CD)PYRE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	8.14	1	18
32SB-03-0607	1004244-08	_001	NAPHTHALENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	6.1	1	18
32SS-04-0002	1004244-09	_001	BENZO(A)ANTHRACENE	1.64	U	1.64	1.64	U	N	UG/KG	1.64	U	8.2	1	18.7
32SS-04-0002	1004244-09	_001	BENZO(A)PYRENE	1.64	U	1.64	1.64	U	N	UG/KG	1.64	U	6.15	1	18.7
32SS-04-0002	1004244-09	_001	BENZO(B)FLUORANTHE	1.64	U	1.64	1.64	U	N	UG/KG	1.64	U	8.2	1	18.7
32SS-04-0002	1004244-09	_001	BENZO(K)FLUORANTHE	1.64	U	1.64	1.64	U	N	UG/KG	1.64	U	8.2	1	18.7
32SS-04-0002	1004244-09	_001	CHRYSENE	1.64	U	1.64	1.64	U	N	UG/KG	1.64	U	8.2	1	18.7
32SS-04-0002	1004244-09	_001	DIBENZ(A,H)ANTHRACE	1.64	U	1.64	1.64	U	N	UG/KG	1.64	U	6.15	1	18.7
32SS-04-0002	1004244-09	_001	INDENO(1,2,3-CD)PYRE	1.64	U	1.64	1.64	U	N	UG/KG	1.64	U	8.2	1	18.7
32SS-04-0002	1004244-09	_001	NAPHTHALENE	1.64	U	1.64	1.64	U	N	UG/KG	1.64	U	6.15	1	18.7
32SB-04-0506	1004244-10	_001	BENZENE	0.461	U	0.461	0.461	U	N	UG/KG	0.461	U	5	1	14.6
32SB-04-0506	1004244-10	_001	ETHYLBENZENE	0.735	U	0.735	0.735	U	N	UG/KG	0.735	U	9.8	1	14.6
32SB-04-0506	1004244-10	_001	TOLUENE	0.843	U	0.843	0.843	U	N	UG/KG	0.843	U	9.8	1	14.6
32SB-04-0506	1004244-10	_001	XYLENE(TOTAL)	0.686	U	0.686	0.686	U	N	UG/KG	0.686	U	9.8	1	14.6
32SB-04-0506	1004244-10	_001	BENZO(A)ANTHRACENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.76	1	14.6
32SB-04-0506	1004244-10	_001	BENZO(A)PYRENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.81	1	14.6
32SB-04-0506	1004244-10	_001	BENZO(B)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.76	1	14.6
32SB-04-0506	1004244-10	_001	BENZO(K)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.76	1	14.6
32SB-04-0506	1004244-10	_001	CHRYSENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.76	1	14.6
32SB-04-0506	1004244-10	_001	DIBENZ(A,H)ANTHRACE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.81	1	14.6
32SB-04-0506	1004244-10	_001	INDENO(1,2,3-CD)PYRE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.76	1	14.6
32SB-04-0506	1004244-10	_001	NAPHTHALENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.81	1	14.6
32SS-05-0002	1004244-11	_001	BENZO(A)ANTHRACENE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	7.7	1	13.9
32SS-05-0002	1004244-11	_001	BENZO(A)PYRENE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	5.77	1	13.9
32SS-05-0002	1004244-11	_001	BENZO(B)FLUORANTHE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	7.7	1	13.9
32SS-05-0002	1004244-11	_001	BENZO(K)FLUORANTHE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	7.7	1	13.9
32SS-05-0002	1004244-11	_001	CHRYSENE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	7.7	1	13.9
32SS-05-0002	1004244-11	_001	DIBENZ(A,H)ANTHRACE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	5.77	1	13.9
32SS-05-0002	1004244-11	_001	INDENO(1,2,3-CD)PYRE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	7.7	1	13.9
32SS-05-0002	1004244-11	_001	NAPHTHALENE	51.4		51.4	51.4		Y	UG/KG	51.4		5.77	1	13.9

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SB-05-0506	1004244-12	_001	BENZENE	0.472	U	0.472	0.472	UJ	N	UG/KG	0.472 UJ	N	5	1	16.8
32SB-05-0506	1004244-12	_001	ETHYLBENZENE	0.972	J	0.972	0.972	J	Y	UG/KG	0.972 J	NPR	10	1	16.8
32SB-05-0506	1004244-12	_001	TOLUENE	0.863	U	0.863	0.863	UJ	N	UG/KG	0.863 UJ	N	10	1	16.8
32SB-05-0506	1004244-12	_001	XYLENE(TOTAL)	1.27	J	1.27	1.27	J	Y	UG/KG	1.27 J	NPR	10	1	16.8
32SB-05-0506	1004244-12	_001	BENZO(A)ANTHRACENE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		7.96	1	16.8
32SB-05-0506	1004244-12	_001	BENZO(A)PYRENE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		5.97	1	16.8
32SB-05-0506	1004244-12	_001	BENZO(B)FLUORANTHE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		7.96	1	16.8
32SB-05-0506	1004244-12	_001	BENZO(K)FLUORANTHE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		7.96	1	16.8
32SB-05-0506	1004244-12	_001	CHRYSENE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		7.96	1	16.8
32SB-05-0506	1004244-12	_001	DIBENZ(A,H)ANTHRACE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		5.97	1	16.8
32SB-05-0506	1004244-12	_001	INDENO(1,2,3-CD)PYRE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		7.96	1	16.8
32SB-05-0506	1004244-12	_001	NAPHTHALENE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		5.97	1	16.8
32SS-06-0002	1004244-13	_001	BENZO(A)ANTHRACENE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		7.74	1	15.5
32SS-06-0002	1004244-13	_001	BENZO(A)PYRENE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		5.8	1	15.5
32SS-06-0002	1004244-13	_001	BENZO(B)FLUORANTHE	13.5		13.5	13.5		Y	UG/KG	13.5		7.74	1	15.5
32SS-06-0002	1004244-13	_001	BENZO(K)FLUORANTHE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		7.74	1	15.5
32SS-06-0002	1004244-13	_001	CHRYSENE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		7.74	1	15.5
32SS-06-0002	1004244-13	_001	DIBENZ(A,H)ANTHRACE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		5.8	1	15.5
32SS-06-0002	1004244-13	_001	INDENO(1,2,3-CD)PYRE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		7.74	1	15.5
32SS-06-0002	1004244-13	_001	NAPHTHALENE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		5.8	1	15.5
32SB-06-0405	1004244-14	_001	BENZENE	1810	D	1810	1810		Y	UG/KG	1810		419	1	15.6
32SB-06-0405	1004244-14	_001	ETHYLBENZENE	82	JD	82	82	J	Y	UG/KG	82 J	P	1050	1	15.6
32SB-06-0405	1004244-14	_001	TOLUENE	112	JD	112	112	J	Y	UG/KG	112 J	P	1050	1	15.6
32SB-06-0405	1004244-14	_001	XYLENE(TOTAL)	527	JD	527	527	J	Y	UG/KG	527 J	P	1050	1	15.6
32SB-06-0405	1004244-14	_001	BENZO(A)ANTHRACENE	15.3	U	15.3	15.3	U	N	UG/KG	15.3 U		76.5	10	15.6
32SB-06-0405	1004244-14	_001	BENZO(A)PYRENE	15.3	U	15.3	15.3	U	N	UG/KG	15.3 U		57.4	10	15.6
32SB-06-0405	1004244-14	_001	BENZO(B)FLUORANTHE	15.3	U	15.3	15.3	U	N	UG/KG	15.3 U		76.5	10	15.6
32SB-06-0405	1004244-14	_001	BENZO(K)FLUORANTHE	15.3	U	15.3	15.3	U	N	UG/KG	15.3 U		76.5	10	15.6
32SB-06-0405	1004244-14	_001	CHRYSENE	15.3	U	15.3	15.3	U	N	UG/KG	15.3 U		76.5	10	15.6
32SB-06-0405	1004244-14	_001	DIBENZ(A,H)ANTHRACE	15.3	U	15.3	15.3	U	N	UG/KG	15.3 U		57.4	10	15.6
32SB-06-0405	1004244-14	_001	INDENO(1,2,3-CD)PYRE	15.3	U	15.3	15.3	U	N	UG/KG	15.3 U		76.5	10	15.6
32SB-06-0405	1004244-14	_001	NAPHTHALENE	1390	D	1390	1390		Y	UG/KG	1390		57.4	10	15.6
32SS-07-0002	1004244-15	_001	BENZO(A)ANTHRACENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		7.89	1	17.7
32SS-07-0002	1004244-15	_001	BENZO(A)PYRENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ	N	5.91	1	17.7
32SS-07-0002	1004244-15	_001	BENZO(B)FLUORANTHE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ	N	7.89	1	17.7
32SS-07-0002	1004244-15	_001	BENZO(K)FLUORANTHE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ	N	7.89	1	17.7
32SS-07-0002	1004244-15	_001	CHRYSENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		7.89	1	17.7
32SS-07-0002	1004244-15	_001	DIBENZ(A,H)ANTHRACE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ	N	5.91	1	17.7
32SS-07-0002	1004244-15	_001	INDENO(1,2,3-CD)PYRE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ	N	7.89	1	17.7
32SS-07-0002	1004244-15	_001	NAPHTHALENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		5.91	1	17.7
32SB-07-0607	1004244-16	_001	BENZENE	1.77	J	1.77	1.77	J	Y	UG/KG	1.77 J	P	5	1	18.3
32SB-07-0607	1004244-16	_001	ETHYLBENZENE	4.32	J	4.32	4.32	J	Y	UG/KG	4.32 J	P	10.9	1	18.3
32SB-07-0607	1004244-16	_001	TOLUENE	0.935	U	0.935	0.935	U	N	UG/KG	0.935 U		10.9	1	18.3
32SB-07-0607	1004244-16	_001	XYLENE(TOTAL)	8.93	J	8.93	8.93	J	Y	UG/KG	8.93 J	P	10.9	1	18.3
32SB-07-0607	1004244-16	_001	BENZO(A)ANTHRACENE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		7.96	1	18.3
32SB-07-0607	1004244-16	_001	BENZO(A)PYRENE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		5.96	1	18.3
32SB-07-0607	1004244-16	_001	BENZO(B)FLUORANTHE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		7.96	1	18.3
32SB-07-0607	1004244-16	_001	BENZO(K)FLUORANTHE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		7.96	1	18.3
32SB-07-0607	1004244-16	_001	CHRYSENE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		7.96	1	18.3
32SB-07-0607	1004244-16	_001	DIBENZ(A,H)ANTHRACE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		5.96	1	18.3
32SB-07-0607	1004244-16	_001	INDENO(1,2,3-CD)PYRE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		7.96	1	18.3
32SB-07-0607	1004244-16	_001	NAPHTHALENE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		5.96	1	18.3
32SS-09-0002	1004244-17	_001	BENZO(A)ANTHRACENE	1.51	U	1.51	1.51	U	N	UG/KG	1.51 U		7.55	1	13.4
32SS-09-0002	1004244-17	_001	BENZO(A)PYRENE	1.51	U	1.51	1.51	U	N	UG/KG	1.51 U		5.66	1	13.4
32SS-09-0002	1004244-17	_001	BENZO(B)FLUORANTHE	1.51	U	1.51	1.51	U	N	UG/KG	1.51 U		7.55	1	13.4
32SS-09-0002	1004244-17	_001	BENZO(K)FLUORANTHE	1.51	U	1.51	1.51	U	N	UG/KG	1.51 U		7.55	1	13.4
32SS-09-0002	1004244-17	_001	CHRYSENE	1.51	U	1.51	1.51	U	N	UG/KG	1.51 U		7.55	1	13.4
32SS-09-0002	1004244-17	_001	DIBENZ(A,H)ANTHRACE	1.51	U	1.51	1.51	U	N	UG/KG	1.51 U		5.66	1	13.4
32SS-09-0002	1004244-17	_001	INDENO(1,2,3-CD)PYRE	1.51	U	1.51	1.51	U	N	UG/KG	1.51 U		7.55	1	13.4
32SS-09-0002	1004244-17	_001	NAPHTHALENE	1.51	U	1.51	1.51	U	N	UG/KG	1.51 U		5.66	1	13.4
32SB-09-0607	1004244-18	_001	BENZENE	0.573	U	0.573	0.573	U	N	UG/KG	0.573 U		5	1	15.1
32SB-09-0607	1004244-18	_001	ETHYLBENZENE	0.914	U	0.914	0.914	U	N	UG/KG	0.914 U		12.2	1	15.1
32SB-09-0607	1004244-18	_001	TOLUENE	1.05	U	1.05	1.05	U	N	UG/KG	1.05 U		12.2	1	15.1
32SB-09-0607	1004244-18	_001	XYLENE(TOTAL)	0.853	U	0.853	0.853	U	N	UG/KG	0.853 U		12.2	1	15.1

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	moist
32SB-09-0607	1004244-18	_001	BENZO(A)ANTHRACENE	69.8		69.8	69.8		Y	UG/KG	69.8		7.8	1	15.1
32SB-09-0607	1004244-18	_001	BENZO(A)PYRENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.85	1	15.1
32SB-09-0607	1004244-18	_001	BENZO(B)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.8	1	15.1
32SB-09-0607	1004244-18	_001	BENZO(K)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.8	1	15.1
32SB-09-0607	1004244-18	_001	CHRYSENE	75.5		75.5	75.5		Y	UG/KG	75.5		7.8	1	15.1
32SB-09-0607	1004244-18	_001	DIBENZ(A,H)ANTHRACE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.85	1	15.1
32SB-09-0607	1004244-18	_001	INDENO(1,2,3-CD)PYRE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.8	1	15.1
32SB-09-0607	1004244-18	_001	NAPHTHALENE	11.6		11.6	11.6		Y	UG/KG	11.6		5.85	1	15.1
32SS-10-0002	1004244-19	_001	BENZO(A)ANTHRACENE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	7.65	1	12.9
32SS-10-0002	1004244-19	_001	BENZO(A)PYRENE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	5.74	1	12.9
32SS-10-0002	1004244-19	_001	BENZO(B)FLUORANTHE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	7.65	1	12.9
32SS-10-0002	1004244-19	_001	BENZO(K)FLUORANTHE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	7.65	1	12.9
32SS-10-0002	1004244-19	_001	CHRYSENE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	7.65	1	12.9
32SS-10-0002	1004244-19	_001	DIBENZ(A,H)ANTHRACE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	5.74	1	12.9
32SS-10-0002	1004244-19	_001	INDENO(1,2,3-CD)PYRE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	7.65	1	12.9
32SS-10-0002	1004244-19	_001	NAPHTHALENE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	5.74	1	12.9
32SB-10-0506	1004244-20	_001	BENZENE	0.497	U	0.497	0.497	U	N	UG/KG	0.497	U	5	1	20.1
32SB-10-0506	1004244-20	_001	ETHYLBENZENE	0.794	U	0.794	0.794	U	N	UG/KG	0.794	U	10.6	1	20.1
32SB-10-0506	1004244-20	_001	TOLUENE	0.91	U	0.91	0.91	U	N	UG/KG	0.91	U	10.6	1	20.1
32SB-10-0506	1004244-20	_001	XYLENE(TOTAL)	0.741	U	0.741	0.741	U	N	UG/KG	0.741	U	10.6	1	20.1
32SB-10-0506	1004244-20	_001	BENZO(A)ANTHRACENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	8.13	1	20.1
32SB-10-0506	1004244-20	_001	BENZO(A)PYRENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	6.09	1	20.1
32SB-10-0506	1004244-20	_001	BENZO(B)FLUORANTHE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	8.13	1	20.1
32SB-10-0506	1004244-20	_001	BENZO(K)FLUORANTHE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	8.13	1	20.1
32SB-10-0506	1004244-20	_001	CHRYSENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	8.13	1	20.1
32SB-10-0506	1004244-20	_001	DIBENZ(A,H)ANTHRACE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	6.09	1	20.1
32SB-10-0506	1004244-20	_001	INDENO(1,2,3-CD)PYRE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	8.13	1	20.1
32SB-10-0506	1004244-20	_001	NAPHTHALENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	6.09	1	20.1
32SS-14-0002	1004244-21	_001	BENZO(A)ANTHRACENE	1.5	U	1.5	1.5	U	N	UG/KG	1.5	U	7.54	1	13.2
32SS-14-0002	1004244-21	_001	BENZO(A)PYRENE	1.5	U	1.5	1.5	U	N	UG/KG	1.5	U	5.65	1	13.2
32SS-14-0002	1004244-21	_001	BENZO(B)FLUORANTHE	1.5	U	1.5	1.5	U	N	UG/KG	1.5	U	7.54	1	13.2
32SS-14-0002	1004244-21	_001	BENZO(K)FLUORANTHE	1.5	U	1.5	1.5	U	N	UG/KG	1.5	U	7.54	1	13.2
32SS-14-0002	1004244-21	_001	CHRYSENE	1.5	U	1.5	1.5	U	N	UG/KG	1.5	U	7.54	1	13.2
32SS-14-0002	1004244-21	_001	DIBENZ(A,H)ANTHRACE	1.5	U	1.5	1.5	U	N	UG/KG	1.5	U	5.65	1	13.2
32SS-14-0002	1004244-21	_001	INDENO(1,2,3-CD)PYRE	1.5	U	1.5	1.5	U	N	UG/KG	1.5	U	7.54	1	13.2
32SS-14-0002	1004244-21	_001	NAPHTHALENE	1.5	U	1.5	1.5	U	N	UG/KG	1.5	U	5.65	1	13.2
32SB-14-0910	1004244-22	_001	BENZENE	0.542	U	0.542	0.542	U	N	UG/KG	0.542	U	5	1	17.6
32SB-14-0910	1004244-22	_001	ETHYLBENZENE	0.865	U	0.865	0.865	U	N	UG/KG	0.865	U	11.5	1	17.6
32SB-14-0910	1004244-22	_001	TOLUENE	0.992	U	0.992	0.992	U	N	UG/KG	0.992	U	11.5	1	17.6
32SB-14-0910	1004244-22	_001	XYLENE(TOTAL)	0.808	U	0.808	0.808	U	N	UG/KG	0.808	U	11.5	1	17.6
32SB-14-0910	1004244-22	_001	BENZO(A)ANTHRACENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.79	1	17.6
32SB-14-0910	1004244-22	_001	BENZO(A)PYRENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.84	1	17.6
32SB-14-0910	1004244-22	_001	BENZO(B)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.79	1	17.6
32SB-14-0910	1004244-22	_001	BENZO(K)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.79	1	17.6
32SB-14-0910	1004244-22	_001	CHRYSENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.79	1	17.6
32SB-14-0910	1004244-22	_001	DIBENZ(A,H)ANTHRACE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.84	1	17.6
32SB-14-0910	1004244-22	_001	INDENO(1,2,3-CD)PYRE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.79	1	17.6
32SB-14-0910	1004244-22	_001	NAPHTHALENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.84	1	17.6
32SS-08-0002	1004264-01	_002	BENZO(A)ANTHRACENE	1.65	U	1.65	1.65	U	N	UG/KG	1.65	U	8.26	1	19.2
32SS-08-0002	1004264-01	_002	BENZO(A)PYRENE	1.65	U	1.65	1.65	U	N	UG/KG	1.65	U	6.19	1	19.2
32SS-08-0002	1004264-01	_002	BENZO(B)FLUORANTHE	1.65	U	1.65	1.65	U	N	UG/KG	1.65	U	8.26	1	19.2
32SS-08-0002	1004264-01	_002	BENZO(K)FLUORANTHE	1.65	U	1.65	1.65	U	N	UG/KG	1.65	U	8.26	1	19.2
32SS-08-0002	1004264-01	_002	CHRYSENE	1.65	U	1.65	1.65	U	N	UG/KG	1.65	U	8.26	1	19.2
32SS-08-0002	1004264-01	_002	DIBENZ(A,H)ANTHRACE	1.65	U	1.65	1.65	U	N	UG/KG	1.65	U	6.19	1	19.2
32SS-08-0002	1004264-01	_002	INDENO(1,2,3-CD)PYRE	1.65	U	1.65	1.65	U	N	UG/KG	1.65	U	8.26	1	19.2
32SS-08-0002	1004264-01	_002	NAPHTHALENE	1.65	U	1.65	1.65	U	N	UG/KG	1.65	U	6.19	1	19.2
32SB-08-0607	1004264-02	_002	BENZENE	0.467	U	0.467	0.467	U	N	UG/KG	0.467	U	5	1	14
32SB-08-0607	1004264-02	_002	ETHYLBENZENE	0.745	U	0.745	0.745	U	N	UG/KG	0.745	U	9.93	1	14
32SB-08-0607	1004264-02	_002	TOLUENE	0.854	U	0.854	0.854	U	N	UG/KG	0.854	U	9.93	1	14
32SB-08-0607	1004264-02	_002	XYLENE(TOTAL)	0.695	U	0.695	0.695	U	N	UG/KG	0.695	U	9.93	1	14
32SB-08-0607	1004264-02	_002	BENZO(A)ANTHRACENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.76	1	14
32SB-08-0607	1004264-02	_002	BENZO(A)PYRENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.82	1	14
32SB-08-0607	1004264-02	_002	BENZO(B)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.76	1	14
32SB-08-0607	1004264-02	_002	BENZO(K)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.76	1	14

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SB-08-0607	1004264-02	_002	CHRYSENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.76	1	14
32SB-08-0607	1004264-02	_002	DIBENZ(A,H)ANTHRACE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.82	1	14
32SB-08-0607	1004264-02	_002	INDENO(1,2,3-CD)PYRE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.76	1	14
32SB-08-0607	1004264-02	_002	NAPHTHALENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.82	1	14
32SS-11-0002	1004264-03	_002	BENZO(A)ANTHRACENE	15.2	U	15.2	15.2	U	N	UG/KG	15.2	U	76	10	12.3
32SS-11-0002	1004264-03	_002	BENZO(A)PYRENE	15.2	U	15.2	15.2	U	N	UG/KG	15.2	U	57	10	12.3
32SS-11-0002	1004264-03	_002	BENZO(B)FLUORANTHE	15.2	U	15.2	15.2	U	N	UG/KG	15.2	U	76	10	12.3
32SS-11-0002	1004264-03	_002	BENZO(K)FLUORANTHE	15.2	U	15.2	15.2	U	N	UG/KG	15.2	U	76	10	12.3
32SS-11-0002	1004264-03	_002	CHRYSENE	15.2	U	15.2	15.2	U	N	UG/KG	15.2	U	76	10	12.3
32SS-11-0002	1004264-03	_002	DIBENZ(A,H)ANTHRACE	15.2	U	15.2	15.2	UJ	N	UG/KG	15.2	UJ	C 57	10	12.3
32SS-11-0002	1004264-03	_002	INDENO(1,2,3-CD)PYRE	15.2	U	15.2	15.2	UJ	N	UG/KG	15.2	UJ	C 76	10	12.3
32SS-11-0002	1004264-03	_002	NAPHTHALENE	19	JD	19	19	J	Y	UG/KG	19	J	P 57	10	12.3
32SB-11-0607	1004264-04	_002	BENZO(A)ANTHRACENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.89	1	15.5
32SB-11-0607	1004264-04	_002	BENZO(A)PYRENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	5.92	1	15.5
32SB-11-0607	1004264-04	_002	BENZO(B)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.89	1	15.5
32SB-11-0607	1004264-04	_002	BENZO(K)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.89	1	15.5
32SB-11-0607	1004264-04	_002	CHRYSENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.89	1	15.5
32SB-11-0607	1004264-04	_002	DIBENZ(A,H)ANTHRACE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	5.92	1	15.5
32SB-11-0607	1004264-04	_002	INDENO(1,2,3-CD)PYRE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.89	1	15.5
32SB-11-0607	1004264-04	_002	NAPHTHALENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	5.92	1	15.5
32SB-11-0607	1004264-04R	_002	BENZENE	0.463	U	0.463	0.463	UJ	N	UG/KG	0.463	UJ	H 5	1	15.5
32SB-11-0607	1004264-04R	_002	ETHYLBENZENE	0.738	U	0.738	0.738	UJ	N	UG/KG	0.738	UJ	H 9.85	1	15.5
32SB-11-0607	1004264-04R	_002	TOLUENE	0.847	U	0.847	0.847	UJ	N	UG/KG	0.847	UJ	H 9.85	1	15.5
32SB-11-0607	1004264-04R	_002	XYLENE(TOTAL)	0.689	U	0.689	0.689	UJ	N	UG/KG	0.689	UJ	H 9.85	1	15.5
32SS-12-0002	1004264-05	_002	BENZO(A)ANTHRACENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.89	1	15.4
32SS-12-0002	1004264-05	_002	BENZO(A)PYRENE	10.9		10.9	10.9		Y	UG/KG	10.9		5.91	1	15.4
32SS-12-0002	1004264-05	_002	BENZO(B)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.89	1	15.4
32SS-12-0002	1004264-05	_002	BENZO(K)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.89	1	15.4
32SS-12-0002	1004264-05	_002	CHRYSENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.89	1	15.4
32SS-12-0002	1004264-05	_002	DIBENZ(A,H)ANTHRACE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	5.91	1	15.4
32SS-12-0002	1004264-05	_002	INDENO(1,2,3-CD)PYRE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.89	1	15.4
32SS-12-0002	1004264-05	_002	NAPHTHALENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	5.91	1	15.4
32SB-12-0607	1004264-06	_002	BENZENE	0.483	U	0.483	0.483	UJ	N	UG/KG	0.483	UJ	N 5	1	17.5
32SB-12-0607	1004264-06	_002	ETHYLBENZENE	0.77	U	0.77	0.77	UJ	N	UG/KG	0.77	UJ	N 10.3	1	17.5
32SB-12-0607	1004264-06	_002	TOLUENE	0.883	U	0.883	0.883	UJ	N	UG/KG	0.883	UJ	N 10.3	1	17.5
32SB-12-0607	1004264-06	_002	XYLENE(TOTAL)	0.719	U	0.719	0.719	UJ	N	UG/KG	0.719	UJ	N 10.3	1	17.5
32SB-12-0607	1004264-06	_002	BENZO(A)ANTHRACENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	8.08	1	17.5
32SB-12-0607	1004264-06	_002	BENZO(A)PYRENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	6.06	1	17.5
32SB-12-0607	1004264-06	_002	BENZO(B)FLUORANTHE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	8.08	1	17.5
32SB-12-0607	1004264-06	_002	BENZO(K)FLUORANTHE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	8.08	1	17.5
32SB-12-0607	1004264-06	_002	CHRYSENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	8.08	1	17.5
32SB-12-0607	1004264-06	_002	DIBENZ(A,H)ANTHRACE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	6.06	1	17.5
32SB-12-0607	1004264-06	_002	INDENO(1,2,3-CD)PYRE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	8.08	1	17.5
32SB-12-0607	1004264-06	_002	NAPHTHALENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U	6.06	1	17.5
32SS-13-0002	1004264-07	_002	BENZO(A)ANTHRACENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	8.12	1	17.9
32SS-13-0002	1004264-07	_002	BENZO(A)PYRENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	6.09	1	17.9
32SS-13-0002	1004264-07	_002	BENZO(B)FLUORANTHE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	8.12	1	17.9
32SS-13-0002	1004264-07	_002	BENZO(K)FLUORANTHE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	8.12	1	17.9
32SS-13-0002	1004264-07	_002	CHRYSENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	8.12	1	17.9
32SS-13-0002	1004264-07	_002	DIBENZ(A,H)ANTHRACE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	6.09	1	17.9
32SS-13-0002	1004264-07	_002	INDENO(1,2,3-CD)PYRE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	8.12	1	17.9
32SS-13-0002	1004264-07	_002	NAPHTHALENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U	6.09	1	17.9
32SB-13-0607	1004264-08	_002	BENZENE	0.471	U	0.471	0.471	U	N	UG/KG	0.471	U	5	1	14.9
32SB-13-0607	1004264-08	_002	ETHYLBENZENE	0.751	U	0.751	0.751	U	N	UG/KG	0.751	U	10	1	14.9
32SB-13-0607	1004264-08	_002	TOLUENE	0.861	U	0.861	0.861	U	N	UG/KG	0.861	U	10	1	14.9
32SB-13-0607	1004264-08	_002	XYLENE(TOTAL)	0.701	U	0.701	0.701	U	N	UG/KG	0.701	U	10	1	14.9
32SB-13-0607	1004264-08	_002	BENZO(A)ANTHRACENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.84	1	14.9
32SB-13-0607	1004264-08	_002	BENZO(A)PYRENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.88	1	14.9
32SB-13-0607	1004264-08	_002	BENZO(B)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.84	1	14.9
32SB-13-0607	1004264-08	_002	BENZO(K)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.84	1	14.9
32SB-13-0607	1004264-08	_002	CHRYSENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.84	1	14.9
32SB-13-0607	1004264-08	_002	DIBENZ(A,H)ANTHRACE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.88	1	14.9
32SB-13-0607	1004264-08	_002	INDENO(1,2,3-CD)PYRE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.84	1	14.9
32SB-13-0607	1004264-08	_002	NAPHTHALENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.88	1	14.9

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SS-15-0002	1004264-09	_002	BENZO(A)ANTHRACENE	15.9	U	15.9	15.9	U	N	UG/KG	15.9 U		79.6	10	16.2
32SS-15-0002	1004264-09	_002	BENZO(A)PYRENE	15.9	U	15.9	15.9	U	N	UG/KG	15.9 U		59.7	10	16.2
32SS-15-0002	1004264-09	_002	BENZO(B)FLUORANTHE	15.9	U	15.9	15.9	U	N	UG/KG	15.9 U		79.6	10	16.2
32SS-15-0002	1004264-09	_002	BENZO(K)FLUORANTHE	15.9	U	15.9	15.9	U	N	UG/KG	15.9 U		79.6	10	16.2
32SS-15-0002	1004264-09	_002	CHRYSENE	15.9	U	15.9	15.9	U	N	UG/KG	15.9 U		79.6	10	16.2
32SS-15-0002	1004264-09	_002	DIBENZ(A,H)ANTHRACE	15.9	U	15.9	15.9	UJ	N	UG/KG	15.9 UJ	C	59.7	10	16.2
32SS-15-0002	1004264-09	_002	INDENO(1,2,3-CD)PYRE	15.9	U	15.9	15.9	UJ	N	UG/KG	15.9 UJ	C	79.6	10	16.2
32SS-15-0002	1004264-09	_002	NAPHTHALENE	15.9	U	15.9	15.9	U	N	UG/KG	15.9 U		59.7	10	16.2
32SB-15-0506	1004264-10	_002	BENZENE	0.556	U	0.556	0.556	U	N	UG/KG	0.556 U		5	1	15.6
32SB-15-0506	1004264-10	_002	ETHYLBENZENE	0.887	U	0.887	0.887	U	N	UG/KG	0.887 U		11.8	1	15.6
32SB-15-0506	1004264-10	_002	TOLUENE	1.02	U	1.02	1.02	U	N	UG/KG	1.02 U		11.8	1	15.6
32SB-15-0506	1004264-10	_002	XYLENE(TOTAL)	0.828	U	0.828	0.828	U	N	UG/KG	0.828 U		11.8	1	15.6
32SB-15-0506	1004264-10	_002	BENZO(A)ANTHRACENE	46.3		46.3	46.3		Y	UG/KG	46.3		7.9	1	15.6
32SB-15-0506	1004264-10	_002	BENZO(A)PYRENE	56.6		56.6	56.6		Y	UG/KG	56.6		5.92	1	15.6
32SB-15-0506	1004264-10	_002	BENZO(B)FLUORANTHE	74.4		74.4	74.4		Y	UG/KG	74.4		7.9	1	15.6
32SB-15-0506	1004264-10	_002	BENZO(K)FLUORANTHE	34.5		34.5	34.5		Y	UG/KG	34.5		7.9	1	15.6
32SB-15-0506	1004264-10	_002	CHRYSENE	48.4		48.4	48.4		Y	UG/KG	48.4		7.9	1	15.6
32SB-15-0506	1004264-10	_002	DIBENZ(A,H)ANTHRACE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		5.92	1	15.6
32SB-15-0506	1004264-10	_002	INDENO(1,2,3-CD)PYRE	35.3		35.3	35.3		Y	UG/KG	35.3		7.9	1	15.6
32SB-15-0506	1004264-10	_002	NAPHTHALENE	35.5		35.5	35.5		Y	UG/KG	35.5		5.92	1	15.6
32SS-16-0002	1004264-11	_002	BENZO(A)ANTHRACENE	15.4	U	15.4	15.4	U	N	UG/KG	15.4 U		77	10	13.4
32SS-16-0002	1004264-11	_002	BENZO(A)PYRENE	15.4	U	15.4	15.4	U	N	UG/KG	15.4 U		57.7	10	13.4
32SS-16-0002	1004264-11	_002	BENZO(B)FLUORANTHE	15.4	U	15.4	15.4	U	N	UG/KG	15.4 U		77	10	13.4
32SS-16-0002	1004264-11	_002	BENZO(K)FLUORANTHE	15.4	U	15.4	15.4	U	N	UG/KG	15.4 U		77	10	13.4
32SS-16-0002	1004264-11	_002	CHRYSENE	15.4	U	15.4	15.4	U	N	UG/KG	15.4 U		77	10	13.4
32SS-16-0002	1004264-11	_002	DIBENZ(A,H)ANTHRACE	15.4	U	15.4	15.4	UJ	N	UG/KG	15.4 UJ	C	57.7	10	13.4
32SS-16-0002	1004264-11	_002	INDENO(1,2,3-CD)PYRE	15.4	U	15.4	15.4	UJ	N	UG/KG	15.4 UJ	C	77	10	13.4
32SS-16-0002	1004264-11	_002	NAPHTHALENE	94.5	D	94.5	94.5		Y	UG/KG	94.5		57.7	10	13.4
32SB-16-0607	1004264-12	_002	BENZO(A)ANTHRACENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.83	1	14.8
32SB-16-0607	1004264-12	_002	BENZO(A)PYRENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		5.87	1	14.8
32SB-16-0607	1004264-12	_002	BENZO(B)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.83	1	14.8
32SB-16-0607	1004264-12	_002	BENZO(K)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.83	1	14.8
32SB-16-0607	1004264-12	_002	CHRYSENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.83	1	14.8
32SB-16-0607	1004264-12	_002	DIBENZ(A,H)ANTHRACE	1.56	U	1.56	1.56	UJ	N	UG/KG	1.56 UJ	C	5.87	1	14.8
32SB-16-0607	1004264-12	_002	INDENO(1,2,3-CD)PYRE	1.56	U	1.56	1.56	UJ	N	UG/KG	1.56 UJ	C	7.83	1	14.8
32SB-16-0607	1004264-12	_002	NAPHTHALENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		5.87	1	14.8
32SB-16-0607	1004264-12R	_002	BENZENE	0.487	U	0.487	0.487	U	N	UG/KG	0.487 U		5	1	14.8
32SB-16-0607	1004264-12R	_002	ETHYLBENZENE	0.777	U	0.777	0.777	U	N	UG/KG	0.777 U		10.4	1	14.8
32SB-16-0607	1004264-12R	_002	TOLUENE	0.89	U	0.89	0.89	U	N	UG/KG	0.89 U		10.4	1	14.8
32SB-16-0607	1004264-12R	_002	XYLENE(TOTAL)	0.725	U	0.725	0.725	U	N	UG/KG	0.725 U		10.4	1	14.8
32SS-17-0002	1004264-13	_002	BENZO(A)ANTHRACENE	3670	D	3670	3670		Y	UG/KG	3670		74.3	10	10.2
32SS-17-0002	1004264-13	_002	BENZO(A)PYRENE	2900	D	2900	2900		Y	UG/KG	2900		55.7	10	10.2
32SS-17-0002	1004264-13	_002	BENZO(B)FLUORANTHE	4140	D	4140	4140		Y	UG/KG	4140		74.3	10	10.2
32SS-17-0002	1004264-13	_002	BENZO(K)FLUORANTHE	1440	D	1440	1440		Y	UG/KG	1440		74.3	10	10.2
32SS-17-0002	1004264-13	_002	CHRYSENE	3980	D	3980	3980		Y	UG/KG	3980		74.3	10	10.2
32SS-17-0002	1004264-13	_002	DIBENZ(A,H)ANTHRACE	595	D	595	595	J	Y	UG/KG	595 J	PC	55.7	10	10.2
32SS-17-0002	1004264-13	_002	INDENO(1,2,3-CD)PYRE	2530	D	2530	2530	J	Y	UG/KG	2530 J	C	74.3	10	10.2
32SS-17-0002	1004264-13	_002	NAPHTHALENE	238	D	238	238		Y	UG/KG	238		55.7	10	10.2
32SB-17-0607	1004264-14	_002	BENZENE	27.4	U	27.4	27.4	U	N	UG/KG	27.4 U		233	1	17.4
32SB-17-0607	1004264-14	_002	ETHYLBENZENE	43.7	U	43.7	43.7	U	N	UG/KG	43.7 U		582	1	17.4
32SB-17-0607	1004264-14	_002	TOLUENE	50.1	U	50.1	50.1	U	N	UG/KG	50.1 U		582	1	17.4
32SB-17-0607	1004264-14	_002	XYLENE(TOTAL)	40.7	U	40.7	40.7	U	N	UG/KG	40.7 U		582	1	17.4
32SB-17-0607	1004264-14	_002	BENZO(A)ANTHRACENE	213	D	213	213		Y	UG/KG	213		80.8	10	17.4
32SB-17-0607	1004264-14	_002	BENZO(A)PYRENE	112	D	112	112		Y	UG/KG	112		60.5	10	17.4
32SB-17-0607	1004264-14	_002	BENZO(B)FLUORANTHE	104	D	104	104		Y	UG/KG	104		80.8	10	17.4
32SB-17-0607	1004264-14	_002	BENZO(K)FLUORANTHE	16.1	U	16.1	16.1	U	N	UG/KG	16.1 U		80.8	10	17.4
32SB-17-0607	1004264-14	_002	CHRYSENE	289	D	289	289		Y	UG/KG	289		80.8	10	17.4
32SB-17-0607	1004264-14	_002	DIBENZ(A,H)ANTHRACE	16.1	U	16.1	16.1	UJ	N	UG/KG	16.1 UJ	C	60.5	10	17.4
32SB-17-0607	1004264-14	_002	INDENO(1,2,3-CD)PYRE	16.1	U	16.1	16.1	UJ	N	UG/KG	16.1 UJ	C	80.8	10	17.4
32SB-17-0607	1004264-14	_002	NAPHTHALENE	2470	D	2470	2470		Y	UG/KG	2470		60.5	10	17.4
32SB-17-1112	1004264-15	_002	BENZENE	0.535	U	0.535	0.535	U	N	UG/KG	0.535 U		5	1	14
32SB-17-1112	1004264-15	_002	ETHYLBENZENE	0.853	U	0.853	0.853	U	N	UG/KG	0.853 U		11.4	1	14
32SB-17-1112	1004264-15	_002	TOLUENE	0.978	U	0.978	0.978	U	N	UG/KG	0.978 U		11.4	1	14
32SB-17-1112	1004264-15	_002	XYLENE(TOTAL)	0.796	U	0.796	0.796	U	N	UG/KG	0.796 U		11.4	1	14

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SB-17-1112	1004264-15	_002	BENZO(A)ANTHRACENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55 U		7.75	1	14
32SB-17-1112	1004264-15	_002	BENZO(A)PYRENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55 U		5.81	1	14
32SB-17-1112	1004264-15	_002	BENZO(B)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55 U		7.75	1	14
32SB-17-1112	1004264-15	_002	BENZO(K)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55 U		7.75	1	14
32SB-17-1112	1004264-15	_002	CHRYSENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55 U		7.75	1	14
32SB-17-1112	1004264-15	_002	DIBENZ(A,H)ANTHRACE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55 UJ	C	5.81	1	14
32SB-17-1112	1004264-15	_002	INDENO(1,2,3-CD)PYRE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55 UJ	C	7.75	1	14
32SB-17-1112	1004264-15	_002	NAPHTHALENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55 U		5.81	1	14
32SS-18-0002	1004264-16	_002	BENZO(A)ANTHRACENE	689		689	689		Y	UG/KG	689		7.9	1	15.6
32SS-18-0002	1004264-16	_002	BENZO(A)PYRENE	521		521	521		Y	UG/KG	521		5.93	1	15.6
32SS-18-0002	1004264-16	_002	BENZO(B)FLUORANTHE	688		688	688		Y	UG/KG	688		7.9	1	15.6
32SS-18-0002	1004264-16	_002	BENZO(K)FLUORANTHE	239		239	239		Y	UG/KG	239		7.9	1	15.6
32SS-18-0002	1004264-16	_002	CHRYSENE	637		637	637		Y	UG/KG	637		7.9	1	15.6
32SS-18-0002	1004264-16	_002	DIBENZ(A,H)ANTHRACE	87.2		87.2	87.2	J	Y	UG/KG	87.2 J	C	5.93	1	15.6
32SS-18-0002	1004264-16	_002	INDENO(1,2,3-CD)PYRE	435		435	435	J	Y	UG/KG	435 J	C	7.9	1	15.6
32SS-18-0002	1004264-16	_002	NAPHTHALENE	9.93		9.93	9.93		Y	UG/KG	9.93		5.93	1	15.6
32SB-18-0506	1004264-17	_002	BENZENE	0.471	U	0.471	0.471	UJ	N	UG/KG	0.471 UJ	N	5	1	15.5
32SB-18-0506	1004264-17	_002	ETHYLBENZENE	0.752	U	0.752	0.752	UJ	N	UG/KG	0.752 UJ	N	10	1	15.5
32SB-18-0506	1004264-17	_002	TOLUENE	0.862	U	0.862	0.862	UJ	N	UG/KG	0.862 UJ	N	10	1	15.5
32SB-18-0506	1004264-17	_002	XYLENE(TOTAL)	0.702	U	0.702	0.702	UJ	N	UG/KG	0.702 UJ	N	10	1	15.5
32SB-18-0506	1004264-17	_002	BENZO(A)ANTHRACENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		7.89	1	15.5
32SB-18-0506	1004264-17	_002	BENZO(A)PYRENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		5.92	1	15.5
32SB-18-0506	1004264-17	_002	BENZO(B)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		7.89	1	15.5
32SB-18-0506	1004264-17	_002	BENZO(K)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		7.89	1	15.5
32SB-18-0506	1004264-17	_002	CHRYSENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		7.89	1	15.5
32SB-18-0506	1004264-17	_002	DIBENZ(A,H)ANTHRACE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ	C	5.92	1	15.5
32SB-18-0506	1004264-17	_002	INDENO(1,2,3-CD)PYRE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ	C	7.89	1	15.5
32SB-18-0506	1004264-17	_002	NAPHTHALENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		5.92	1	15.5
32SS-19-0002	1004264-18	_002	BENZO(A)ANTHRACENE	15.7	U	15.7	15.7	U	N	UG/KG	15.7 U		78.6	10	15.1
32SS-19-0002	1004264-18	_002	BENZO(A)PYRENE	15.7	U	15.7	15.7	U	N	UG/KG	15.7 U		58.9	10	15.1
32SS-19-0002	1004264-18	_002	BENZO(B)FLUORANTHE	15.7	U	15.7	15.7	U	N	UG/KG	15.7 U		78.6	10	15.1
32SS-19-0002	1004264-18	_002	BENZO(K)FLUORANTHE	15.7	U	15.7	15.7	U	N	UG/KG	15.7 U		78.6	10	15.1
32SS-19-0002	1004264-18	_002	CHRYSENE	15.7	U	15.7	15.7	U	N	UG/KG	15.7 U		78.6	10	15.1
32SS-19-0002	1004264-18	_002	DIBENZ(A,H)ANTHRACE	15.7	U	15.7	15.7	UJ	N	UG/KG	15.7 UJ	C	58.9	10	15.1
32SS-19-0002	1004264-18	_002	INDENO(1,2,3-CD)PYRE	15.7	U	15.7	15.7	UJ	N	UG/KG	15.7 UJ	C	78.6	10	15.1
32SS-19-0002	1004264-18	_002	NAPHTHALENE	15.7	U	15.7	15.7	U	N	UG/KG	15.7 U		58.9	10	15.1
32SB-19-0506	1004264-19	_002	BENZENE	0.488	U	0.488	0.488	U	N	UG/KG	0.488 U		5	1	18.1
32SB-19-0506	1004264-19	_002	ETHYLBENZENE	0.778	U	0.778	0.778	U	N	UG/KG	0.778 U		10.4	1	18.1
32SB-19-0506	1004264-19	_002	TOLUENE	0.892	U	0.892	0.892	U	N	UG/KG	0.892 U		10.4	1	18.1
32SB-19-0506	1004264-19	_002	XYLENE(TOTAL)	0.726	U	0.726	0.726	U	N	UG/KG	0.726 U		10.4	1	18.1
32SB-19-0506	1004264-19	_002	BENZO(A)ANTHRACENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62 U		8.14	1	18.1
32SB-19-0506	1004264-19	_002	BENZO(A)PYRENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62 U		6.1	1	18.1
32SB-19-0506	1004264-19	_002	BENZO(B)FLUORANTHE	1.62	U	1.62	1.62	U	N	UG/KG	1.62 U		8.14	1	18.1
32SB-19-0506	1004264-19	_002	BENZO(K)FLUORANTHE	1.62	U	1.62	1.62	U	N	UG/KG	1.62 U		8.14	1	18.1
32SB-19-0506	1004264-19	_002	CHRYSENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62 U		8.14	1	18.1
32SB-19-0506	1004264-19	_002	DIBENZ(A,H)ANTHRACE	1.62	U	1.62	1.62	UJ	N	UG/KG	1.62 UJ	C	6.1	1	18.1
32SB-19-0506	1004264-19	_002	INDENO(1,2,3-CD)PYRE	1.62	U	1.62	1.62	UJ	N	UG/KG	1.62 UJ	C	8.14	1	18.1
32SB-19-0506	1004264-19	_002	NAPHTHALENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62 U		6.1	1	18.1
32SS-20-0002	1004264-20	_002	BENZO(A)ANTHRACENE	1.7	U	1.7	1.7	U	N	UG/KG	1.7 U		8.53	1	21.8
32SS-20-0002	1004264-20	_002	BENZO(A)PYRENE	1.7	U	1.7	1.7	U	N	UG/KG	1.7 U		6.4	1	21.8
32SS-20-0002	1004264-20	_002	BENZO(B)FLUORANTHE	1.7	U	1.7	1.7	U	N	UG/KG	1.7 U		8.53	1	21.8
32SS-20-0002	1004264-20	_002	BENZO(K)FLUORANTHE	1.7	U	1.7	1.7	U	N	UG/KG	1.7 U		8.53	1	21.8
32SS-20-0002	1004264-20	_002	CHRYSENE	1.7	U	1.7	1.7	U	N	UG/KG	1.7 U		8.53	1	21.8
32SS-20-0002	1004264-20	_002	DIBENZ(A,H)ANTHRACE	1.7	U	1.7	1.7	UJ	N	UG/KG	1.7 UJ	C	6.4	1	21.8
32SS-20-0002	1004264-20	_002	INDENO(1,2,3-CD)PYRE	1.7	U	1.7	1.7	UJ	N	UG/KG	1.7 UJ	C	8.53	1	21.8
32SS-20-0002	1004264-20	_002	NAPHTHALENE	1.7	U	1.7	1.7	U	N	UG/KG	1.7 U		6.4	1	21.8
32SB-20-0506	1004264-21	_002	BENZENE	0.457	U	0.457	0.457	UJ	N	UG/KG	0.457 UJ	N	5	1	14.7
32SB-20-0506	1004264-21	_002	ETHYLBENZENE	1.02	J	1.02	1.02	J	Y	UG/KG	1.02 J	NPR	9.72	1	14.7
32SB-20-0506	1004264-21	_002	TOLUENE	0.836	U	0.836	0.836	UJ	N	UG/KG	0.836 UJ	N	9.72	1	14.7
32SB-20-0506	1004264-21	_002	XYLENE(TOTAL)	1.41	J	1.41	1.41	J	Y	UG/KG	1.41 J	NPR	9.72	1	14.7
32SB-20-0506	1004264-21	_002	BENZO(A)ANTHRACENE	1.56	U	1.56	1.56	UJ	N	UG/KG	1.56 UJ	N	7.82	1	14.7
32SB-20-0506	1004264-21	_002	BENZO(A)PYRENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		5.86	1	14.7
32SB-20-0506	1004264-21	_002	BENZO(B)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.82	1	14.7
32SB-20-0506	1004264-21	_002	BENZO(K)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.82	1	14.7

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SB-20-0506	1004264-21	_002	CHRYSENE	1.56	U	1.56	1.56	UJ	N	UG/KG	1.56 UJ	N	7.82	1	14.7
32SB-20-0506	1004264-21	_002	DIBENZ(A,H)ANTHRACE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		5.86	1	14.7
32SB-20-0506	1004264-21	_002	INDENO(1,2,3-CD)PYRE	1.56	UE	1.56	1.56	U	N	UG/KG	1.56 U		7.82	1	14.7
32SB-20-0506	1004264-21	_002	NAPHTHALENE	1.56	UE	1.56	1.56	UJ	N	UG/KG	1.56 UJ	N	5.86	1	14.7
32SS-21-0002	1004264-22	_002	BENZO(A)ANTHRACENE	16.8		16.8	16.8	J	Y	UG/KG	16.8 J	G	7.78	1	14.3
32SS-21-0002-AVG	1004264-22	_002	BENZO(A)ANTHRACENE	16.8		10.363	10.3625	J	Y	UG/KG	10.3625 J		7.78	1	14.3
32SS-21-0002	1004264-22	_002	BENZO(A)PYRENE	57.4		57.4	57.4	J	Y	UG/KG	57.4 J	G	5.83	1	14.3
32SS-21-0002-AVG	1004264-22	_002	BENZO(A)PYRENE	57.4		30.173	30.1725	J	Y	UG/KG	30.1725 J		5.83	1	14.3
32SS-21-0002	1004264-22	_002	BENZO(B)FLUORANTHE	97.1		97.1	97.1	J	Y	UG/KG	97.1 J	G	7.78	1	14.3
32SS-21-0002-AVG	1004264-22	_002	BENZO(B)FLUORANTHE	97.1		50.513	50.5125	J	Y	UG/KG	50.5125 J		7.78	1	14.3
32SS-21-0002	1004264-22	_002	BENZO(K)FLUORANTHE	33.6		33.6	33.6	J	Y	UG/KG	33.6 J	G	7.78	1	14.3
32SS-21-0002-AVG	1004264-22	_002	BENZO(K)FLUORANTHE	33.6		18.763	18.7625	J	Y	UG/KG	18.7625 J		7.78	1	14.3
32SS-21-0002	1004264-22	_002	CHRYSENE	21.9		21.9	21.9	J	Y	UG/KG	21.9 J	G	7.78	1	14.3
32SS-21-0002-AVG	1004264-22	_002	CHRYSENE	21.9		12.913	12.9125	J	Y	UG/KG	12.9125 J		7.78	1	14.3
32SS-21-0002	1004264-22	_002	DIBENZ(A,H)ANTHRACE	10.7		10.7	10.7		Y	UG/KG	10.7		5.83	1	14.3
32SS-21-0002-AVG	1004264-22	_002	DIBENZ(A,H)ANTHRACE	10.7		6.8225	6.8225	J	Y	UG/KG	6.8225 J		5.83	1	14.3
32SS-21-0002	1004264-22	_002	INDENO(1,2,3-CD)PYRE	50.6		50.6	50.6	J	Y	UG/KG	50.6 J	G	7.78	1	14.3
32SS-21-0002-AVG	1004264-22	_002	INDENO(1,2,3-CD)PYRE	50.6		27.263	27.2625	J	Y	UG/KG	27.2625 J		7.78	1	14.3
32SS-21-0002	1004264-22	_002	NAPHTHALENE	5.83	J	5.83	5.83	J	Y	UG/KG	5.83 J	P	5.83	1	14.3
32SS-21-0002-AVG	1004264-22	_002	NAPHTHALENE	5.83	J	5.83	5.83	J	Y	UG/KG	5.83 J		5.83	1	14.3
32SB-21-0506	1004264-23	_002	BENZENE	0.466	U	0.466	0.466	U	N	UG/KG	0.466 U		5	1	15.2
32SB-21-0506-AVG	1004264-23	_002	BENZENE	0.466	U	0.472	0.472	U	N	UG/KG	0.472 U		5	1	15.2
32SB-21-0506	1004264-23	_002	ETHYLBENZENE	0.743	U	0.743	0.743	U	N	UG/KG	0.743 U		9.91	1	15.2
32SB-21-0506-AVG	1004264-23	_002	ETHYLBENZENE	0.743	U	0.7525	0.7525	U	N	UG/KG	0.7525 U		9.91	1	15.2
32SB-21-0506	1004264-23	_002	TOLUENE	0.852	U	0.852	0.852	U	N	UG/KG	0.852 U		9.91	1	15.2
32SB-21-0506-AVG	1004264-23	_002	TOLUENE	0.852	U	0.863	0.863	U	N	UG/KG	0.863 U		9.91	1	15.2
32SB-21-0506	1004264-23	_002	XYLENE(TOTAL)	0.694	U	0.694	0.694	U	N	UG/KG	0.694 U		9.91	1	15.2
32SB-21-0506-AVG	1004264-23	_002	XYLENE(TOTAL)	0.694	U	0.7025	0.7025	U	N	UG/KG	0.7025 U		9.91	1	15.2
32SB-21-0506	1004264-23	_002	BENZO(A)ANTHRACENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		7.87	1	15.2
32SB-21-0506-AVG	1004264-23	_002	BENZO(A)ANTHRACENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ		7.87	1	15.2
32SB-21-0506	1004264-23	_002	BENZO(A)PYRENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		5.9	1	15.2
32SB-21-0506-AVG	1004264-23	_002	BENZO(A)PYRENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ		5.9	1	15.2
32SB-21-0506	1004264-23	_002	BENZO(B)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		7.87	1	15.2
32SB-21-0506-AVG	1004264-23	_002	BENZO(B)FLUORANTHE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ		7.87	1	15.2
32SB-21-0506	1004264-23	_002	BENZO(K)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		7.87	1	15.2
32SB-21-0506-AVG	1004264-23	_002	BENZO(K)FLUORANTHE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ		7.87	1	15.2
32SB-21-0506	1004264-23	_002	CHRYSENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		7.87	1	15.2
32SB-21-0506-AVG	1004264-23	_002	CHRYSENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ		7.87	1	15.2
32SB-21-0506	1004264-23	_002	DIBENZ(A,H)ANTHRACE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		5.9	1	15.2
32SB-21-0506-AVG	1004264-23	_002	DIBENZ(A,H)ANTHRACE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ		5.9	1	15.2
32SB-21-0506	1004264-23	_002	INDENO(1,2,3-CD)PYRE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		7.87	1	15.2
32SB-21-0506-AVG	1004264-23	_002	INDENO(1,2,3-CD)PYRE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ		7.87	1	15.2
32SB-21-0506	1004264-23	_002	NAPHTHALENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		5.9	1	15.2
32SB-21-0506-AVG	1004264-23	_002	NAPHTHALENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ		5.9	1	15.2
32SS-22-0002	1004264-24	_002	BENZO(A)ANTHRACENE	1.59	U	1.59	1.59	UJ	N	UG/KG	1.59 UJ	C	8	1	16.6
32SS-22-0002	1004264-24	_002	BENZO(A)PYRENE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		6	1	16.6
32SS-22-0002	1004264-24	_002	BENZO(B)FLUORANTHE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		8	1	16.6
32SS-22-0002	1004264-24	_002	BENZO(K)FLUORANTHE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		8	1	16.6
32SS-22-0002	1004264-24	_002	CHRYSENE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		8	1	16.6
32SS-22-0002	1004264-24	_002	DIBENZ(A,H)ANTHRACE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		6	1	16.6
32SS-22-0002	1004264-24	_002	INDENO(1,2,3-CD)PYRE	1.59	U	1.59	1.59	U	N	UG/KG	1.59 U		8	1	16.6
32SS-22-0002	1004264-24	_002	NAPHTHALENE	5.76	J	5.76	5.76	J	Y	UG/KG	5.76 J	P	6	1	16.6
32SB-22-0506	1004264-25	_002	BENZENE	0.548	U	0.548	0.548	U	N	UG/KG	0.548 U		5	1	15.2
32SB-22-0506	1004264-25	_002	ETHYLBENZENE	0.874	U	0.874	0.874	U	N	UG/KG	0.874 U		11.7	1	15.2
32SB-22-0506	1004264-25	_002	TOLUENE	1	U	1	1	U	N	UG/KG	1 U		11.7	1	15.2
32SB-22-0506	1004264-25	_002	XYLENE(TOTAL)	0.816	U	0.816	0.816	U	N	UG/KG	0.816 U		11.7	1	15.2
32SB-22-0506	1004264-25	_002	BENZO(A)ANTHRACENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57 UJ	C	7.87	1	15.2
32SB-22-0506	1004264-25	_002	BENZO(A)PYRENE	10.4		10.4	10.4		Y	UG/KG	10.4		5.9	1	15.2
32SB-22-0506	1004264-25	_002	BENZO(B)FLUORANTHE	6.9	J	6.9	6.9	J	Y	UG/KG	6.9 J	P	7.87	1	15.2
32SB-22-0506	1004264-25	_002	BENZO(K)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		7.87	1	15.2
32SB-22-0506	1004264-25	_002	CHRYSENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		7.87	1	15.2
32SB-22-0506	1004264-25	_002	DIBENZ(A,H)ANTHRACE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		5.9	1	15.2
32SB-22-0506	1004264-25	_002	INDENO(1,2,3-CD)PYRE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		7.87	1	15.2
32SB-22-0506	1004264-25	_002	NAPHTHALENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57 U		5.9	1	15.2

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SS-23-0002	1004264-26	_002	BENZO(A)ANTHRACENE	4.57	J	4.57	4.57	J	Y	UG/KG	4.57 J	P	7.81	1	14.6
32SS-23-0002	1004264-26	_002	BENZO(A)PYRENE	31.8		31.8	31.8		Y	UG/KG	31.8		5.85	1	14.6
32SS-23-0002	1004264-26	_002	BENZO(B)FLUORANTHE	44.1		44.1	44.1		Y	UG/KG	44.1		7.81	1	14.6
32SS-23-0002	1004264-26	_002	BENZO(K)FLUORANTHE	16.2		16.2	16.2		Y	UG/KG	16.2		7.81	1	14.6
32SS-23-0002	1004264-26	_002	CHRYSENE	8.07		8.07	8.07		Y	UG/KG	8.07		7.81	1	14.6
32SS-23-0002	1004264-26	_002	DIBENZ(A,H)ANTHRACE	6.41		6.41	6.41		Y	UG/KG	6.41		5.85	1	14.6
32SS-23-0002	1004264-26	_002	INDENO(1,2,3-CD)PYRE	32.1		32.1	32.1		Y	UG/KG	32.1		7.81	1	14.6
32SS-23-0002	1004264-26	_002	NAPHTHALENE	5.46	J	5.46	5.46	J	Y	UG/KG	5.46 J	P	5.85	1	14.6
32SB-23-0506	1004265-01	_003	BENZENE	0.582	U	0.582	0.582	UJ	N	UG/KG	0.582 UJ	N	5	1	23.8
32SB-23-0506	1004265-01	_003	ETHYLBENZENE	0.929	U	0.929	0.929	UJ	N	UG/KG	0.929 UJ	N	12.4	1	23.8
32SB-23-0506	1004265-01	_003	TOLUENE	1.06	U	1.06	1.06	UJ	N	UG/KG	1.06 UJ	N	12.4	1	23.8
32SB-23-0506	1004265-01	_003	XYLENE(TOTAL)	0.867	U	0.867	0.867	UJ	N	UG/KG	0.867 UJ	N	12.4	1	23.8
32SB-23-0506	1004265-01	_003	BENZO(A)ANTHRACENE	1.75	U	1.75	1.75	U	N	UG/KG	1.75 U		8.76	1	23.8
32SB-23-0506	1004265-01	_003	BENZO(A)PYRENE	1.75	U	1.75	1.75	U	N	UG/KG	1.75 U		6.56	1	23.8
32SB-23-0506	1004265-01	_003	BENZO(B)FLUORANTHE	1.75	U	1.75	1.75	U	N	UG/KG	1.75 U		8.76	1	23.8
32SB-23-0506	1004265-01	_003	BENZO(K)FLUORANTHE	1.75	U	1.75	1.75	U	N	UG/KG	1.75 U		8.76	1	23.8
32SB-23-0506	1004265-01	_003	CHRYSENE	1.75	U	1.75	1.75	U	N	UG/KG	1.75 U		8.76	1	23.8
32SB-23-0506	1004265-01	_003	DIBENZ(A,H)ANTHRACE	1.75	U	1.75	1.75	U	N	UG/KG	1.75 U		6.56	1	23.8
32SB-23-0506	1004265-01	_003	INDENO(1,2,3-CD)PYRE	1.75	U	1.75	1.75	U	N	UG/KG	1.75 U		8.76	1	23.8
32SB-23-0506	1004265-01	_003	NAPHTHALENE	1.75	U	1.75	1.75	U	N	UG/KG	1.75 U		6.56	1	23.8
32SS-24-0002	1004265-02	_003	BENZO(A)ANTHRACENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.84	1	14.9
32SS-24-0002	1004265-02	_003	BENZO(A)PYRENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		5.88	1	14.9
32SS-24-0002	1004265-02	_003	BENZO(B)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.84	1	14.9
32SS-24-0002	1004265-02	_003	BENZO(K)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.84	1	14.9
32SS-24-0002	1004265-02	_003	CHRYSENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.84	1	14.9
32SS-24-0002	1004265-02	_003	DIBENZ(A,H)ANTHRACE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		5.88	1	14.9
32SS-24-0002	1004265-02	_003	INDENO(1,2,3-CD)PYRE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.84	1	14.9
32SS-24-0002	1004265-02	_003	NAPHTHALENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		5.88	1	14.9
32SB-24-0506	1004265-03	_003	BENZENE	0.511	U	0.511	0.511	U	N	UG/KG	0.511 U		5	1	17.4
32SB-24-0506	1004265-03	_003	ETHYLBENZENE	0.815	U	0.815	0.815	U	N	UG/KG	0.815 U		10.9	1	17.4
32SB-24-0506	1004265-03	_003	TOLUENE	0.934	U	0.934	0.934	U	N	UG/KG	0.934 U		10.9	1	17.4
32SB-24-0506	1004265-03	_003	XYLENE(TOTAL)	0.76	U	0.76	0.76	U	N	UG/KG	0.76 U		10.9	1	17.4
32SB-24-0506	1004265-03	_003	BENZO(A)ANTHRACENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61 U		8.07	1	17.4
32SB-24-0506	1004265-03	_003	BENZO(A)PYRENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61 U		6.05	1	17.4
32SB-24-0506	1004265-03	_003	BENZO(B)FLUORANTHE	1.61	U	1.61	1.61	U	N	UG/KG	1.61 U		8.07	1	17.4
32SB-24-0506	1004265-03	_003	BENZO(K)FLUORANTHE	1.61	U	1.61	1.61	U	N	UG/KG	1.61 U		8.07	1	17.4
32SB-24-0506	1004265-03	_003	CHRYSENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61 U		8.07	1	17.4
32SB-24-0506	1004265-03	_003	DIBENZ(A,H)ANTHRACE	1.61	U	1.61	1.61	U	N	UG/KG	1.61 U		6.05	1	17.4
32SB-24-0506	1004265-03	_003	INDENO(1,2,3-CD)PYRE	1.61	U	1.61	1.61	U	N	UG/KG	1.61 U		8.07	1	17.4
32SB-24-0506	1004265-03	_003	NAPHTHALENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61 U		6.05	1	17.4
32SS-25-0002	1004265-04	_003	BENZO(A)ANTHRACENE	15.6	U	15.6	15.6	U	N	UG/KG	15.6 U		78.4	10	14.9
32SS-25-0002	1004265-04	_003	BENZO(A)PYRENE	15.6	U	15.6	15.6	U	N	UG/KG	15.6 U		58.8	10	14.9
32SS-25-0002	1004265-04	_003	BENZO(B)FLUORANTHE	15.6	U	15.6	15.6	U	N	UG/KG	15.6 U		78.4	10	14.9
32SS-25-0002	1004265-04	_003	BENZO(K)FLUORANTHE	15.6	U	15.6	15.6	U	N	UG/KG	15.6 U		78.4	10	14.9
32SS-25-0002	1004265-04	_003	CHRYSENE	15.6	U	15.6	15.6	U	N	UG/KG	15.6 U		78.4	10	14.9
32SS-25-0002	1004265-04	_003	DIBENZ(A,H)ANTHRACE	15.6	U	15.6	15.6	U	N	UG/KG	15.6 U		58.8	10	14.9
32SS-25-0002	1004265-04	_003	INDENO(1,2,3-CD)PYRE	15.6	U	15.6	15.6	U	N	UG/KG	15.6 U		78.4	10	14.9
32SS-25-0002	1004265-04	_003	NAPHTHALENE	15.6	U	15.6	15.6	U	N	UG/KG	15.6 U		58.8	10	14.9
32SB-25-0607	1004265-05	_003	BENZENE	0.442	U	0.442	0.442	U	N	UG/KG	0.442 U		5	1	14.5
32SB-25-0607	1004265-05	_003	ETHYLBENZENE	0.706	U	0.706	0.706	U	N	UG/KG	0.706 U		9.41	1	14.5
32SB-25-0607	1004265-05	_003	TOLUENE	0.81	U	0.81	0.81	U	N	UG/KG	0.81 U		9.41	1	14.5
32SB-25-0607	1004265-05	_003	XYLENE(TOTAL)	0.659	U	0.659	0.659	U	N	UG/KG	0.659 U		9.41	1	14.5
32SB-25-0607	1004265-05	_003	BENZO(A)ANTHRACENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.8	1	14.5
32SB-25-0607	1004265-05	_003	BENZO(A)PYRENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		5.85	1	14.5
32SB-25-0607	1004265-05	_003	BENZO(B)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.8	1	14.5
32SB-25-0607	1004265-05	_003	BENZO(K)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.8	1	14.5
32SB-25-0607	1004265-05	_003	CHRYSENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.8	1	14.5
32SB-25-0607	1004265-05	_003	DIBENZ(A,H)ANTHRACE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		5.85	1	14.5
32SB-25-0607	1004265-05	_003	INDENO(1,2,3-CD)PYRE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		7.8	1	14.5
32SB-25-0607	1004265-05	_003	NAPHTHALENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56 U		5.85	1	14.5
32SS-26-0002	1004265-06	_003	BENZO(A)ANTHRACENE	5.24	J	5.24	5.24	J	Y	UG/KG	5.24 J	P	7.62	1	12.5
32SS-26-0002	1004265-06	_003	BENZO(A)PYRENE	23.1		23.1	23.1		Y	UG/KG	23.1		5.72	1	12.5
32SS-26-0002	1004265-06	_003	BENZO(B)FLUORANTHE	34.8		34.8	34.8		Y	UG/KG	34.8		7.62	1	12.5
32SS-26-0002	1004265-06	_003	BENZO(K)FLUORANTHE	11.4		11.4	11.4		Y	UG/KG	11.4		7.62	1	12.5

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SS-26-0002	1004265-06	_003	CHRYSENE	6.13	J	6.13	6.13	J	Y	UG/KG	6.13 J	P	7.62	1	12.5
32SS-26-0002	1004265-06	_003	DIBENZ(A,H)ANTHRACE	1.52	U	1.52	1.52	U	N	UG/KG	1.52 U		5.72	1	12.5
32SS-26-0002	1004265-06	_003	INDENO(1,2,3-CD)PYRE	17.7		17.7	17.7		Y	UG/KG	17.7		7.62	1	12.5
32SS-26-0002	1004265-06	_003	NAPHTHALENE	3.02	J	3.02	3.02	J	Y	UG/KG	3.02 J	P	5.72	1	12.5
32SB-26-0405	1004265-07	_003	BENZENE	0.412	U	0.412	0.412	U	N	UG/KG	0.412 U		5	1	15.9
32SB-26-0405	1004265-07	_003	ETHYLBENZENE	0.657	U	0.657	0.657	U	N	UG/KG	0.657 U		8.77	1	15.9
32SB-26-0405	1004265-07	_003	TOLUENE	0.754	U	0.754	0.754	U	N	UG/KG	0.754 U		8.77	1	15.9
32SB-26-0405	1004265-07	_003	XYLENE(TOTAL)	0.614	U	0.614	0.614	U	N	UG/KG	0.614 U		8.77	1	15.9
32SB-26-0405	1004265-07	_003	BENZO(A)ANTHRACENE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		7.93	1	15.9
32SB-26-0405	1004265-07	_003	BENZO(A)PYRENE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		5.94	1	15.9
32SB-26-0405	1004265-07	_003	BENZO(B)FLUORANTHE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		7.93	1	15.9
32SB-26-0405	1004265-07	_003	BENZO(K)FLUORANTHE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		7.93	1	15.9
32SB-26-0405	1004265-07	_003	CHRYSENE	3.2	J	3.2	3.2	J	Y	UG/KG	3.2 J	P	7.93	1	15.9
32SB-26-0405	1004265-07	_003	DIBENZ(A,H)ANTHRACE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		5.94	1	15.9
32SB-26-0405	1004265-07	_003	INDENO(1,2,3-CD)PYRE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		7.93	1	15.9
32SB-26-0405	1004265-07	_003	NAPHTHALENE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		5.94	1	15.9
32SS-27-0002	1004265-08	_003	BENZO(A)ANTHRACENE	1.65	U	1.65	1.65	U	N	UG/KG	1.65 U		8.28	1	19.4
32SS-27-0002	1004265-08	_003	BENZO(A)PYRENE	1.65	U	1.65	1.65	U	N	UG/KG	1.65 U		6.2	1	19.4
32SS-27-0002	1004265-08	_003	BENZO(B)FLUORANTHE	1.65	U	1.65	1.65	U	N	UG/KG	1.65 U		8.28	1	19.4
32SS-27-0002	1004265-08	_003	BENZO(K)FLUORANTHE	1.65	U	1.65	1.65	U	N	UG/KG	1.65 U		8.28	1	19.4
32SS-27-0002	1004265-08	_003	CHRYSENE	1.65	U	1.65	1.65	U	N	UG/KG	1.65 U		8.28	1	19.4
32SS-27-0002	1004265-08	_003	DIBENZ(A,H)ANTHRACE	1.65	U	1.65	1.65	U	N	UG/KG	1.65 U		6.2	1	19.4
32SS-27-0002	1004265-08	_003	INDENO(1,2,3-CD)PYRE	1.65	U	1.65	1.65	U	N	UG/KG	1.65 U		8.28	1	19.4
32SS-27-0002	1004265-08	_003	NAPHTHALENE	1.65	U	1.65	1.65	U	N	UG/KG	1.65 U		6.2	1	19.4
32SB-27-0506	1004265-09	_003	BENZENE	0.426	U	0.426	0.426	U	N	UG/KG	0.426 U		5	1	13.9
32SB-27-0506	1004265-09	_003	ETHYLBENZENE	0.68	U	0.68	0.68	U	N	UG/KG	0.68 U		9.07	1	13.9
32SB-27-0506	1004265-09	_003	TOLUENE	0.78	U	0.78	0.78	U	N	UG/KG	0.78 U		9.07	1	13.9
32SB-27-0506	1004265-09	_003	XYLENE(TOTAL)	0.635	U	0.635	0.635	U	N	UG/KG	0.635 U		9.07	1	13.9
32SB-27-0506	1004265-09	_003	BENZO(A)ANTHRACENE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		7.74	1	13.9
32SB-27-0506	1004265-09	_003	BENZO(A)PYRENE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		5.8	1	13.9
32SB-27-0506	1004265-09	_003	BENZO(B)FLUORANTHE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		7.74	1	13.9
32SB-27-0506	1004265-09	_003	BENZO(K)FLUORANTHE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		7.74	1	13.9
32SB-27-0506	1004265-09	_003	CHRYSENE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		7.74	1	13.9
32SB-27-0506	1004265-09	_003	DIBENZ(A,H)ANTHRACE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		5.8	1	13.9
32SB-27-0506	1004265-09	_003	INDENO(1,2,3-CD)PYRE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		7.74	1	13.9
32SB-27-0506	1004265-09	_003	NAPHTHALENE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		5.8	1	13.9
32SS-28-0002	1004265-10	_003	BENZO(A)ANTHRACENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53 UJ	N	7.67	1	13.1
32SS-28-0002	1004265-10	_003	BENZO(A)PYRENE	9.39		9.39	9.39		Y	UG/KG	9.39		5.75	1	13.1
32SS-28-0002	1004265-10	_003	BENZO(B)FLUORANTHE	1.53	U	1.53	1.53	U	N	UG/KG	1.53 U		7.67	1	13.1
32SS-28-0002	1004265-10	_003	BENZO(K)FLUORANTHE	1.53	U	1.53	1.53	U	N	UG/KG	1.53 U		7.67	1	13.1
32SS-28-0002	1004265-10	_003	CHRYSENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53 UJ	N	7.67	1	13.1
32SS-28-0002	1004265-10	_003	DIBENZ(A,H)ANTHRACE	1.53	U	1.53	1.53	U	N	UG/KG	1.53 U		5.75	1	13.1
32SS-28-0002	1004265-10	_003	INDENO(1,2,3-CD)PYRE	1.53	U	1.53	1.53	U	N	UG/KG	1.53 U		7.67	1	13.1
32SS-28-0002	1004265-10	_003	NAPHTHALENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53 UJ	N	5.75	1	13.1
32SB-28-0506	1004265-11	_003	BENZENE	0.449	U	0.449	0.449	UJ	N	UG/KG	0.449 UJ	HN	5	1	15.6
32SB-28-0506	1004265-11	_003	ETHYLBENZENE	0.717	U	0.717	0.717	UJ	N	UG/KG	0.717 UJ	HN	9.55	1	15.6
32SB-28-0506	1004265-11	_003	TOLUENE	0.822	U	0.822	0.822	UJ	N	UG/KG	0.822 UJ	HN	9.55	1	15.6
32SB-28-0506	1004265-11	_003	XYLENE(TOTAL)	0.669	U	0.669	0.669	UJ	N	UG/KG	0.669 UJ	HN	9.55	1	15.6
32SB-28-0506	1004265-11	_003	BENZO(A)ANTHRACENE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		7.9	1	15.6
32SB-28-0506	1004265-11	_003	BENZO(A)PYRENE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		5.92	1	15.6
32SB-28-0506	1004265-11	_003	BENZO(B)FLUORANTHE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		7.9	1	15.6
32SB-28-0506	1004265-11	_003	BENZO(K)FLUORANTHE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		7.9	1	15.6
32SB-28-0506	1004265-11	_003	CHRYSENE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		7.9	1	15.6
32SB-28-0506	1004265-11	_003	DIBENZ(A,H)ANTHRACE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		5.92	1	15.6
32SB-28-0506	1004265-11	_003	INDENO(1,2,3-CD)PYRE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		7.9	1	15.6
32SB-28-0506	1004265-11	_003	NAPHTHALENE	1.58	U	1.58	1.58	U	N	UG/KG	1.58 U		5.92	1	15.6
32SS-29-0002	1004265-12	_003	BENZO(A)ANTHRACENE	1.51	U	1.51	1.51	U	N	UG/KG	1.51 U		7.59	1	12.2
32SS-29-0002	1004265-12	_003	BENZO(A)PYRENE	1.51	U	1.51	1.51	U	N	UG/KG	1.51 U		5.69	1	12.2
32SS-29-0002	1004265-12	_003	BENZO(B)FLUORANTHE	6.56	J	6.56	6.56	J	Y	UG/KG	6.56 J	P	7.59	1	12.2
32SS-29-0002	1004265-12	_003	BENZO(K)FLUORANTHE	1.51	U	1.51	1.51	U	N	UG/KG	1.51 U		7.59	1	12.2
32SS-29-0002	1004265-12	_003	CHRYSENE	1.51	U	1.51	1.51	U	N	UG/KG	1.51 U		7.59	1	12.2
32SS-29-0002	1004265-12	_003	DIBENZ(A,H)ANTHRACE	1.51	U	1.51	1.51	U	N	UG/KG	1.51 U		5.69	1	12.2
32SS-29-0002	1004265-12	_003	INDENO(1,2,3-CD)PYRE	1.51	U	1.51	1.51	U	N	UG/KG	1.51 U		7.59	1	12.2
32SS-29-0002	1004265-12	_003	NAPHTHALENE	1.51	U	1.51	1.51	U	N	UG/KG	1.51 U		5.69	1	12.2

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SB-29-0304	1004265-13	_003	BENZENE	0.525	U	0.525	0.525	U	N	UG/KG	0.525	U	5	1	15.5
32SB-29-0304	1004265-13	_003	ETHYLBENZENE	0.837	U	0.837	0.837	U	N	UG/KG	0.837	U	11.2	1	15.5
32SB-29-0304	1004265-13	_003	TOLUENE	0.96	U	0.96	0.96	U	N	UG/KG	0.96	U	11.2	1	15.5
32SB-29-0304	1004265-13	_003	XYLENE(TOTAL)	0.781	U	0.781	0.781	U	N	UG/KG	0.781	U	11.2	1	15.5
32SB-29-0304	1004265-13	_003	BENZO(A)ANTHRACENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.89	1	15.5
32SB-29-0304	1004265-13	_003	BENZO(A)PYRENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	5.91	1	15.5
32SB-29-0304	1004265-13	_003	BENZO(B)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.89	1	15.5
32SB-29-0304	1004265-13	_003	BENZO(K)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.89	1	15.5
32SB-29-0304	1004265-13	_003	CHRYSENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.89	1	15.5
32SB-29-0304	1004265-13	_003	DIBENZ(A,H)ANTHRACE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	5.91	1	15.5
32SB-29-0304	1004265-13	_003	INDENO(1,2,3-CD)PYRE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.89	1	15.5
32SB-29-0304	1004265-13	_003	NAPHTHALENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	5.91	1	15.5
32SS-30-0002	1004265-14	_003	BENZO(A)ANTHRACENE	1.59	U	1.59	1.59	U	N	UG/KG	1.59	U	7.99	1	16.5
32SS-30-0002	1004265-14	_003	BENZO(A)PYRENE	1.59	U	1.59	1.59	U	N	UG/KG	1.59	U	5.99	1	16.5
32SS-30-0002	1004265-14	_003	BENZO(B)FLUORANTHE	1.59	U	1.59	1.59	U	N	UG/KG	1.59	U	7.99	1	16.5
32SS-30-0002	1004265-14	_003	BENZO(K)FLUORANTHE	1.59	U	1.59	1.59	U	N	UG/KG	1.59	U	7.99	1	16.5
32SS-30-0002	1004265-14	_003	CHRYSENE	1.59	U	1.59	1.59	U	N	UG/KG	1.59	U	7.99	1	16.5
32SS-30-0002	1004265-14	_003	DIBENZ(A,H)ANTHRACE	1.59	U	1.59	1.59	U	N	UG/KG	1.59	U	5.99	1	16.5
32SS-30-0002	1004265-14	_003	INDENO(1,2,3-CD)PYRE	1.59	U	1.59	1.59	U	N	UG/KG	1.59	U	7.99	1	16.5
32SS-30-0002	1004265-14	_003	NAPHTHALENE	1.59	U	1.59	1.59	U	N	UG/KG	1.59	U	5.99	1	16.5
32SB-30-0506	1004265-15	_003	BENZENE	0.519	U	0.519	0.519	U	N	UG/KG	0.519	U	5	1	15
32SB-30-0506	1004265-15	_003	ETHYLBENZENE	0.827	U	0.827	0.827	U	N	UG/KG	0.827	U	11	1	15
32SB-30-0506	1004265-15	_003	TOLUENE	0.949	U	0.949	0.949	U	N	UG/KG	0.949	U	11	1	15
32SB-30-0506	1004265-15	_003	XYLENE(TOTAL)	0.772	U	0.772	0.772	U	N	UG/KG	0.772	U	11	1	15
32SB-30-0506	1004265-15	_003	BENZO(A)ANTHRACENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.84	1	15
32SB-30-0506	1004265-15	_003	BENZO(A)PYRENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.88	1	15
32SB-30-0506	1004265-15	_003	BENZO(B)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.84	1	15
32SB-30-0506	1004265-15	_003	BENZO(K)FLUORANTHE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.84	1	15
32SB-30-0506	1004265-15	_003	CHRYSENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.84	1	15
32SB-30-0506	1004265-15	_003	DIBENZ(A,H)ANTHRACE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.88	1	15
32SB-30-0506	1004265-15	_003	INDENO(1,2,3-CD)PYRE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	7.84	1	15
32SB-30-0506	1004265-15	_003	NAPHTHALENE	1.56	U	1.56	1.56	U	N	UG/KG	1.56	U	5.88	1	15
32SS-32-0002	1004265-16	_003	BENZO(A)ANTHRACENE	1.58	U	1.58	1.58	U	N	UG/KG	1.58	U	7.91	1	15.7
32SS-32-0002-AVG	1004265-16	_003	BENZO(A)ANTHRACENE	1.58	U	4.58	4.58	UJ	N	UG/KG	4.58	UJ	7.91	1	15.7
32SS-32-0002	1004265-16	_003	BENZO(A)PYRENE	1.58	U	1.58	1.58	U	N	UG/KG	1.58	U	5.93	1	15.7
32SS-32-0002-AVG	1004265-16	_003	BENZO(A)PYRENE	1.58	U	3.63	3.63	UJ	N	UG/KG	3.63	UJ	5.93	1	15.7
32SS-32-0002	1004265-16	_003	BENZO(B)FLUORANTHE	1.58	U	1.58	1.58	U	N	UG/KG	1.58	U	7.91	1	15.7
32SS-32-0002-AVG	1004265-16	_003	BENZO(B)FLUORANTHE	1.58	U	4.58	4.58	UJ	N	UG/KG	4.58	UJ	7.91	1	15.7
32SS-32-0002	1004265-16	_003	BENZO(K)FLUORANTHE	1.58	U	1.58	1.58	U	N	UG/KG	1.58	U	7.91	1	15.7
32SS-32-0002-AVG	1004265-16	_003	BENZO(K)FLUORANTHE	1.58	U	4.58	4.58	UJ	N	UG/KG	4.58	UJ	7.91	1	15.7
32SS-32-0002	1004265-16	_003	CHRYSENE	1.58	U	1.58	1.58	U	N	UG/KG	1.58	U	7.91	1	15.7
32SS-32-0002-AVG	1004265-16	_003	CHRYSENE	1.58	U	4.58	4.58	UJ	N	UG/KG	4.58	UJ	7.91	1	15.7
32SS-32-0002	1004265-16	_003	DIBENZ(A,H)ANTHRACE	1.58	U	1.58	1.58	U	N	UG/KG	1.58	U	5.93	1	15.7
32SS-32-0002-AVG	1004265-16	_003	DIBENZ(A,H)ANTHRACE	1.58	U	3.63	3.63	UJ	N	UG/KG	3.63	UJ	5.93	1	15.7
32SS-32-0002	1004265-16	_003	INDENO(1,2,3-CD)PYRE	1.58	U	1.58	1.58	U	N	UG/KG	1.58	U	7.91	1	15.7
32SS-32-0002-AVG	1004265-16	_003	INDENO(1,2,3-CD)PYRE	1.58	U	4.58	4.58	UJ	N	UG/KG	4.58	UJ	7.91	1	15.7
32SS-32-0002	1004265-16	_003	NAPHTHALENE	1.58	U	1.58	1.58	U	N	UG/KG	1.58	U	5.93	1	15.7
32SS-32-0002-AVG	1004265-16	_003	NAPHTHALENE	1.58	U	3.63	3.63	UJ	N	UG/KG	3.63	UJ	5.93	1	15.7
32SB-32-0506	1004265-17	_003	BENZENE	0.463	U	0.463	0.463	U	N	UG/KG	0.463	U	5	1	15.9
32SB-32-0506-AVG	1004265-17	_003	BENZENE	0.463	U	0.449	0.449	U	N	UG/KG	0.449	U	5	1	15.9
32SB-32-0506	1004265-17	_003	ETHYLBENZENE	0.739	U	0.739	0.739	U	N	UG/KG	0.739	U	9.85	1	15.9
32SB-32-0506-AVG	1004265-17	_003	ETHYLBENZENE	0.739	U	0.716	0.716	U	N	UG/KG	0.716	U	9.85	1	15.9
32SB-32-0506	1004265-17	_003	TOLUENE	0.848	U	0.848	0.848	U	N	UG/KG	0.848	U	9.85	1	15.9
32SB-32-0506-AVG	1004265-17	_003	TOLUENE	0.848	U	0.8215	0.8215	U	N	UG/KG	0.8215	U	9.85	1	15.9
32SB-32-0506	1004265-17	_003	XYLENE(TOTAL)	0.69	U	0.69	0.69	U	N	UG/KG	0.69	U	9.85	1	15.9
32SB-32-0506-AVG	1004265-17	_003	XYLENE(TOTAL)	0.69	U	0.6685	0.6685	U	N	UG/KG	0.6685	U	9.85	1	15.9
32SB-32-0506	1004265-17	_003	BENZO(A)ANTHRACENE	1.58	U	1.58	1.58	UJ	N	UG/KG	1.58	UJ	H 7.93	1	15.9
32SB-32-0506-AVG	1004265-17	_003	BENZO(A)ANTHRACENE	1.58	U	4.59	4.59	UJ	N	UG/KG	4.59	UJ	7.93	1	15.9
32SB-32-0506	1004265-17	_003	BENZO(A)PYRENE	1.58	U	1.58	1.58	UJ	N	UG/KG	1.58	UJ	H 5.94	1	15.9
32SB-32-0506-AVG	1004265-17	_003	BENZO(A)PYRENE	1.58	U	3.635	3.635	UJ	N	UG/KG	3.635	UJ	5.94	1	15.9
32SB-32-0506	1004265-17	_003	BENZO(B)FLUORANTHE	1.58	U	1.58	1.58	UJ	N	UG/KG	1.58	UJ	H 7.93	1	15.9
32SB-32-0506-AVG	1004265-17	_003	BENZO(B)FLUORANTHE	1.58	U	4.59	4.59	UJ	N	UG/KG	4.59	UJ	7.93	1	15.9
32SB-32-0506	1004265-17	_003	BENZO(K)FLUORANTHE	1.58	U	1.58	1.58	UJ	N	UG/KG	1.58	UJ	H 7.93	1	15.9
32SB-32-0506-AVG	1004265-17	_003	BENZO(K)FLUORANTHE	1.58	U	4.59	4.59	UJ	N	UG/KG	4.59	UJ	7.93	1	15.9

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SB-32-0506	1004265-17	_003	CHRYSENE	1.58	U	1.58	1.58	UJ	N	UG/KG	1.58	UJ	CH	7.93	1	15.9
32SB-32-0506-AVG	1004265-17	_003	CHRYSENE	1.58	U	4.59	4.59	UJ	N	UG/KG	4.59	UJ		7.93	1	15.9
32SB-32-0506	1004265-17	_003	DIBENZ(A,H)ANTHRACE	1.58	U	1.58	1.58	UJ	N	UG/KG	1.58	UJ	H	5.94	1	15.9
32SB-32-0506-AVG	1004265-17	_003	DIBENZ(A,H)ANTHRACE	1.58	U	3.635	3.635	UJ	N	UG/KG	3.635	UJ		5.94	1	15.9
32SB-32-0506	1004265-17	_003	INDENO(1,2,3-CD)PYRE	1.58	U	1.58	1.58	UJ	N	UG/KG	1.58	UJ	H	7.93	1	15.9
32SB-32-0506-AVG	1004265-17	_003	INDENO(1,2,3-CD)PYRE	1.58	U	4.59	4.59	UJ	N	UG/KG	4.59	UJ		7.93	1	15.9
32SB-32-0506	1004265-17	_003	NAPHTHALENE	1.58	U	1.58	1.58	UJ	N	UG/KG	1.58	UJ	H	5.94	1	15.9
32SB-32-0506-AVG	1004265-17	_003	NAPHTHALENE	1.58	U	3.635	3.635	UJ	N	UG/KG	3.635	UJ		5.94	1	15.9
32SS-33-0002	1004265-18	_003	BENZO(A)ANTHRACENE	7.59	U	7.59	7.59	UJ	N	UG/KG	7.59	UJ	H	38.1	5	12.4
32SS-33-0002	1004265-18	_003	BENZO(A)PYRENE	7.59	U	7.59	7.59	UJ	N	UG/KG	7.59	UJ	H	28.5	5	12.4
32SS-33-0002	1004265-18	_003	BENZO(B)FLUORANTHE	7.59	U	7.59	7.59	UJ	N	UG/KG	7.59	UJ	H	38.1	5	12.4
32SS-33-0002	1004265-18	_003	BENZO(K)FLUORANTHE	7.59	U	7.59	7.59	UJ	N	UG/KG	7.59	UJ	H	38.1	5	12.4
32SS-33-0002	1004265-18	_003	CHRYSENE	7.59	U	7.59	7.59	UJ	N	UG/KG	7.59	UJ	H	38.1	5	12.4
32SS-33-0002	1004265-18	_003	DIBENZ(A,H)ANTHRACE	7.59	U	7.59	7.59	UJ	N	UG/KG	7.59	UJ	CH	28.5	5	12.4
32SS-33-0002	1004265-18	_003	INDENO(1,2,3-CD)PYRE	7.59	U	7.59	7.59	UJ	N	UG/KG	7.59	UJ	H	38.1	5	12.4
32SS-33-0002	1004265-18	_003	NAPHTHALENE	7.59	U	7.59	7.59	UJ	N	UG/KG	7.59	UJ	H	28.5	5	12.4
32SB-33-0506	1004265-19	_003	BENZENE	0.484	U	0.484	0.484	U	N	UG/KG	0.484	U		5	1	13.8
32SB-33-0506	1004265-19	_003	ETHYLBENZENE	0.772	U	0.772	0.772	U	N	UG/KG	0.772	U		10.3	1	13.8
32SB-33-0506	1004265-19	_003	TOLUENE	0.885	U	0.885	0.885	U	N	UG/KG	0.885	U		10.3	1	13.8
32SB-33-0506	1004265-19	_003	XYLENE(TOTAL)	0.72	U	0.72	0.72	U	N	UG/KG	0.72	U		10.3	1	13.8
32SB-33-0506	1004265-19	_003	BENZO(A)ANTHRACENE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	H	7.74	1	13.8
32SB-33-0506	1004265-19	_003	BENZO(A)PYRENE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	H	5.8	1	13.8
32SB-33-0506	1004265-19	_003	BENZO(B)FLUORANTHE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	H	7.74	1	13.8
32SB-33-0506	1004265-19	_003	BENZO(K)FLUORANTHE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	H	7.74	1	13.8
32SB-33-0506	1004265-19	_003	CHRYSENE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	CH	7.74	1	13.8
32SB-33-0506	1004265-19	_003	DIBENZ(A,H)ANTHRACE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	H	5.8	1	13.8
32SB-33-0506	1004265-19	_003	INDENO(1,2,3-CD)PYRE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	H	7.74	1	13.8
32SB-33-0506	1004265-19	_003	NAPHTHALENE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	H	5.8	1	13.8
32SS-34-0002	1004265-20	_003	BENZO(A)ANTHRACENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	7.67	1	13.1
32SS-34-0002	1004265-20	_003	BENZO(A)PYRENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	5.75	1	13.1
32SS-34-0002	1004265-20	_003	BENZO(B)FLUORANTHE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	7.67	1	13.1
32SS-34-0002	1004265-20	_003	BENZO(K)FLUORANTHE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	7.67	1	13.1
32SS-34-0002	1004265-20	_003	CHRYSENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	CH	7.67	1	13.1
32SS-34-0002	1004265-20	_003	DIBENZ(A,H)ANTHRACE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	5.75	1	13.1
32SS-34-0002	1004265-20	_003	INDENO(1,2,3-CD)PYRE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	7.67	1	13.1
32SS-34-0002	1004265-20	_003	NAPHTHALENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	5.75	1	13.1
32SB-34-0607	1004265-21	_003	BENZENE	0.459	U	0.459	0.459	U	N	UG/KG	0.459	U		5	1	15.1
32SB-34-0607	1004265-21	_003	ETHYLBENZENE	0.732	U	0.732	0.732	U	N	UG/KG	0.732	U		9.76	1	15.1
32SB-34-0607	1004265-21	_003	TOLUENE	0.839	U	0.839	0.839	U	N	UG/KG	0.839	U		9.76	1	15.1
32SB-34-0607	1004265-21	_003	XYLENE(TOTAL)	0.683	U	0.683	0.683	U	N	UG/KG	0.683	U		9.76	1	15.1
32SB-34-0607	1004265-21	_003	BENZO(A)ANTHRACENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	H	7.86	1	15.1
32SB-34-0607	1004265-21	_003	BENZO(A)PYRENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	H	5.89	1	15.1
32SB-34-0607	1004265-21	_003	BENZO(B)FLUORANTHE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	H	7.86	1	15.1
32SB-34-0607	1004265-21	_003	BENZO(K)FLUORANTHE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	H	7.86	1	15.1
32SB-34-0607	1004265-21	_003	CHRYSENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	CH	7.86	1	15.1
32SB-34-0607	1004265-21	_003	DIBENZ(A,H)ANTHRACE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	H	5.89	1	15.1
32SB-34-0607	1004265-21	_003	INDENO(1,2,3-CD)PYRE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	H	7.86	1	15.1
32SB-34-0607	1004265-21	_003	NAPHTHALENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	H	5.89	1	15.1
32SS-36-0002	1004265-22	_003	BENZO(A)ANTHRACENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	7.65	1	12.8
32SS-36-0002	1004265-22	_003	BENZO(A)PYRENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	5.73	1	12.8
32SS-36-0002	1004265-22	_003	BENZO(B)FLUORANTHE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	7.65	1	12.8
32SS-36-0002	1004265-22	_003	BENZO(K)FLUORANTHE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	7.65	1	12.8
32SS-36-0002	1004265-22	_003	CHRYSENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	CH	7.65	1	12.8
32SS-36-0002	1004265-22	_003	DIBENZ(A,H)ANTHRACE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	5.73	1	12.8
32SS-36-0002	1004265-22	_003	INDENO(1,2,3-CD)PYRE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	7.65	1	12.8
32SS-36-0002	1004265-22	_003	NAPHTHALENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	5.73	1	12.8
32SB-36-0506	1004265-23	_003	BENZENE	0.462	U	0.462	0.462	UJ	N	UG/KG	0.462	UJ	HN	5	1	13.8
32SB-36-0506	1004265-23	_003	ETHYLBENZENE	0.737	U	0.737	0.737	UJ	N	UG/KG	0.737	UJ	HN	9.83	1	13.8
32SB-36-0506	1004265-23	_003	TOLUENE	0.846	U	0.846	0.846	UJ	N	UG/KG	0.846	UJ	HN	9.83	1	13.8
32SB-36-0506	1004265-23	_003	XYLENE(TOTAL)	0.688	U	0.688	0.688	UJ	N	UG/KG	0.688	UJ	HN	9.83	1	13.8
32SB-36-0506	1004265-23	_003	BENZO(A)ANTHRACENE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	H	7.74	1	13.8
32SB-36-0506	1004265-23	_003	BENZO(A)PYRENE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	H	5.8	1	13.8
32SB-36-0506	1004265-23	_003	BENZO(B)FLUORANTHE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	H	7.74	1	13.8
32SB-36-0506	1004265-23	_003	BENZO(K)FLUORANTHE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	H	7.74	1	13.8

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SB-36-0506	1004265-23	_003	CHRYSENE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	CH	7.74	1	13.8
32SB-36-0506	1004265-23	_003	DIBENZ(A,H)ANTHRACE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	H	5.8	1	13.8
32SB-36-0506	1004265-23	_003	INDENO(1,2,3-CD)PYRE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	H	7.74	1	13.8
32SB-36-0506	1004265-23	_003	NAPHTHALENE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	H	5.8	1	13.8
32SS-37-0002	1004265-24	_003	BENZO(A)ANTHRACENE	7.5	U	7.5	7.5	UJ	N	UG/KG	7.5	UJ	H	37.6	5	11.4
32SS-37-0002	1004265-24	_003	BENZO(A)PYRENE	7.5	U	7.5	7.5	UJ	N	UG/KG	7.5	UJ	H	28.2	5	11.4
32SS-37-0002	1004265-24	_003	BENZO(B)FLUORANTHE	7.5	U	7.5	7.5	UJ	N	UG/KG	7.5	UJ	H	37.6	5	11.4
32SS-37-0002	1004265-24	_003	BENZO(K)FLUORANTHE	7.5	U	7.5	7.5	UJ	N	UG/KG	7.5	UJ	H	37.6	5	11.4
32SS-37-0002	1004265-24	_003	CHRYSENE	7.5	U	7.5	7.5	UJ	N	UG/KG	7.5	UJ	H	37.6	5	11.4
32SS-37-0002	1004265-24	_003	DIBENZ(A,H)ANTHRACE	7.5	U	7.5	7.5	UJ	N	UG/KG	7.5	UJ	CH	28.2	5	11.4
32SS-37-0002	1004265-24	_003	INDENO(1,2,3-CD)PYRE	7.5	U	7.5	7.5	UJ	N	UG/KG	7.5	UJ	H	37.6	5	11.4
32SS-37-0002	1004265-24	_003	NAPHTHALENE	7.5	U	7.5	7.5	UJ	N	UG/KG	7.5	UJ	H	28.2	5	11.4
32SB-37-0506	1004265-25	_003	BENZENE	0.575	U	0.575	0.575	U	N	UG/KG	0.575	U		5	1	20.4
32SB-37-0506	1004265-25	_003	ETHYLBENZENE	0.918	U	0.918	0.918	U	N	UG/KG	0.918	U		12.2	1	20.4
32SB-37-0506	1004265-25	_003	TOLUENE	1.05	U	1.05	1.05	U	N	UG/KG	1.05	U		12.2	1	20.4
32SB-37-0506	1004265-25	_003	XYLENE(TOTAL)	0.857	U	0.857	0.857	U	N	UG/KG	0.857	U		12.2	1	20.4
32SB-37-0506	1004265-25	_003	BENZO(A)ANTHRACENE	394	D	394	394	J	Y	UG/KG	394	J	H	41.9	5	20.4
32SB-37-0506	1004265-25	_003	BENZO(A)PYRENE	121	D	121	121	J	Y	UG/KG	121	J	H	31.4	5	20.4
32SB-37-0506	1004265-25	_003	BENZO(B)FLUORANTHE	8.35	U	8.35	8.35	UJ	N	UG/KG	8.35	UJ	H	41.9	5	20.4
32SB-37-0506	1004265-25	_003	BENZO(K)FLUORANTHE	8.35	U	8.35	8.35	UJ	N	UG/KG	8.35	UJ	H	41.9	5	20.4
32SB-37-0506	1004265-25	_003	CHRYSENE	341	D	341	341	J	Y	UG/KG	341	J	H	41.9	5	20.4
32SB-37-0506	1004265-25	_003	DIBENZ(A,H)ANTHRACE	8.35	U	8.35	8.35	UJ	N	UG/KG	8.35	UJ	CH	31.4	5	20.4
32SB-37-0506	1004265-25	_003	INDENO(1,2,3-CD)PYRE	8.35	U	8.35	8.35	UJ	N	UG/KG	8.35	UJ	H	41.9	5	20.4
32SB-37-0506	1004265-25	_003	NAPHTHALENE	8.35	U	8.35	8.35	UJ	N	UG/KG	8.35	UJ	H	31.4	5	20.4
32SB-21-0506-D	1004265-26	_003	BENZENE	0.478	U	0.478	0.478	U	N	UG/KG	0.478	U		5	1	15.5
32SB-21-0506-D	1004265-26	_003	ETHYLBENZENE	0.762	U	0.762	0.762	U	N	UG/KG	0.762	U		10.2	1	15.5
32SB-21-0506-D	1004265-26	_003	TOLUENE	0.874	U	0.874	0.874	U	N	UG/KG	0.874	U		10.2	1	15.5
32SB-21-0506-D	1004265-26	_003	XYLENE(TOTAL)	0.711	U	0.711	0.711	U	N	UG/KG	0.711	U		10.2	1	15.5
32SB-21-0506-D	1004265-26	_003	BENZO(A)ANTHRACENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	H	7.89	1	15.5
32SB-21-0506-D	1004265-26	_003	BENZO(A)PYRENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	H	5.91	1	15.5
32SB-21-0506-D	1004265-26	_003	BENZO(B)FLUORANTHE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	H	7.89	1	15.5
32SB-21-0506-D	1004265-26	_003	BENZO(K)FLUORANTHE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	H	7.89	1	15.5
32SB-21-0506-D	1004265-26	_003	CHRYSENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	CH	7.89	1	15.5
32SB-21-0506-D	1004265-26	_003	DIBENZ(A,H)ANTHRACE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	H	5.91	1	15.5
32SB-21-0506-D	1004265-26	_003	INDENO(1,2,3-CD)PYRE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	H	7.89	1	15.5
32SB-21-0506-D	1004265-26	_003	NAPHTHALENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	H	5.91	1	15.5
32SS-21-0002-D	1004266-01	_004	BENZO(A)ANTHRACENE	7.85	U	7.85	7.85	UJ	N	UG/KG	7.85	UJ	H	7.85	1	15.1
32SS-21-0002-D	1004266-01	_004	BENZO(A)PYRENE	5.89	U	5.89	5.89	UJ	N	UG/KG	5.89	UJ	HG	5.89	1	15.1
32SS-21-0002-D	1004266-01	_004	BENZO(B)FLUORANTHE	7.85	U	7.85	7.85	UJ	N	UG/KG	7.85	UJ	HG	7.85	1	15.1
32SS-21-0002-D	1004266-01	_004	BENZO(K)FLUORANTHE	7.85	U	7.85	7.85	UJ	N	UG/KG	7.85	UJ	HG	7.85	1	15.1
32SS-21-0002-D	1004266-01	_004	CHRYSENE	7.85	U	7.85	7.85	UJ	N	UG/KG	7.85	UJ	CH	7.85	1	15.1
32SS-21-0002-D	1004266-01	_004	DIBENZ(A,H)ANTHRACE	5.89	U	5.89	5.89	UJ	N	UG/KG	5.89	UJ	H	5.89	1	15.1
32SS-21-0002-D	1004266-01	_004	INDENO(1,2,3-CD)PYRE	7.85	U	7.85	7.85	UJ	N	UG/KG	7.85	UJ	HG	7.85	1	15.1
32SS-21-0002-D	1004266-01	_004	NAPHTHALENE	5.89	U	5.89	5.89	UJ	N	UG/KG	5.89	UJ	H	5.89	1	15.1
32SS-32-0002-D	1004266-02	_004	BENZO(A)ANTHRACENE	7.58	U	7.58	7.58	UJ	N	UG/KG	7.58	UJ	H	7.58	1	12
32SS-32-0002-D	1004266-02	_004	BENZO(A)PYRENE	5.68	U	5.68	5.68	UJ	N	UG/KG	5.68	UJ	H	5.68	1	12
32SS-32-0002-D	1004266-02	_004	BENZO(B)FLUORANTHE	7.58	U	7.58	7.58	UJ	N	UG/KG	7.58	UJ	H	7.58	1	12
32SS-32-0002-D	1004266-02	_004	BENZO(K)FLUORANTHE	7.58	U	7.58	7.58	UJ	N	UG/KG	7.58	UJ	H	7.58	1	12
32SS-32-0002-D	1004266-02	_004	CHRYSENE	7.58	U	7.58	7.58	UJ	N	UG/KG	7.58	UJ	CH	7.58	1	12
32SS-32-0002-D	1004266-02	_004	DIBENZ(A,H)ANTHRACE	5.68	U	5.68	5.68	UJ	N	UG/KG	5.68	UJ	H	5.68	1	12
32SS-32-0002-D	1004266-02	_004	INDENO(1,2,3-CD)PYRE	7.58	U	7.58	7.58	UJ	N	UG/KG	7.58	UJ	H	7.58	1	12
32SS-32-0002-D	1004266-02	_004	NAPHTHALENE	5.68	U	5.68	5.68	UJ	N	UG/KG	5.68	UJ	H	5.68	1	12
32SB-32-0506-D	1004266-03	_004	BENZENE	0.435	U	0.435	0.435	U	N	UG/KG	0.435	U		5	1	12.2
32SB-32-0506-D	1004266-03	_004	ETHYLBENZENE	0.693	U	0.693	0.693	U	N	UG/KG	0.693	U		9.25	1	12.2
32SB-32-0506-D	1004266-03	_004	TOLUENE	0.795	U	0.795	0.795	U	N	UG/KG	0.795	U		9.25	1	12.2
32SB-32-0506-D	1004266-03	_004	XYLENE(TOTAL)	0.647	U	0.647	0.647	U	N	UG/KG	0.647	U		9.25	1	12.2
32SB-32-0506-D	1004266-03	_004	BENZO(A)ANTHRACENE	7.6	U	7.6	7.6	UJ	N	UG/KG	7.6	UJ	H	7.6	1	12.2
32SB-32-0506-D	1004266-03	_004	BENZO(A)PYRENE	5.69	U	5.69	5.69	UJ	N	UG/KG	5.69	UJ	H	5.69	1	12.2
32SB-32-0506-D	1004266-03	_004	BENZO(B)FLUORANTHE	7.6	U	7.6	7.6	UJ	N	UG/KG	7.6	UJ	H	7.6	1	12.2
32SB-32-0506-D	1004266-03	_004	BENZO(K)FLUORANTHE	7.6	U	7.6	7.6	UJ	N	UG/KG	7.6	UJ	H	7.6	1	12.2
32SB-32-0506-D	1004266-03	_004	CHRYSENE	7.6	U	7.6	7.6	UJ	N	UG/KG	7.6	UJ	CH	7.6	1	12.2
32SB-32-0506-D	1004266-03	_004	DIBENZ(A,H)ANTHRACE	5.69	U	5.69	5.69	UJ	N	UG/KG	5.69	UJ	H	5.69	1	12.2
32SB-32-0506-D	1004266-03	_004	INDENO(1,2,3-CD)PYRE	7.6	U	7.6	7.6	UJ	N	UG/KG	7.6	UJ	H	7.6	1	12.2
32SB-32-0506-D	1004266-03	_004	NAPHTHALENE	5.69	U	5.69	5.69	UJ	N	UG/KG	5.69	UJ	H	5.69	1	12.2

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32GW-03	1004277-01	_005	BENZENE	0.14	U	0.14	0.14	U	N	UG/L	0.14	U	1	1	100
32GW-03-AVG	1004277-01	_005	BENZENE	0.14	U	0.14	0.14	U	N	UG/L	0.14	U	1	1	100
32GW-03	1004277-01	_005	ETHYLBENZENE	0.15	U	0.15	0.15	U	N	UG/L	0.15	U	1	1	100
32GW-03-AVG	1004277-01	_005	ETHYLBENZENE	0.15	U	0.15	0.15	U	N	UG/L	0.15	U	1	1	100
32GW-03	1004277-01	_005	TOLUENE	0.19	U	0.19	0.19	U	N	UG/L	0.19	U	1	1	100
32GW-03-AVG	1004277-01	_005	TOLUENE	0.19	U	0.19	0.19	U	N	UG/L	0.19	U	1	1	100
32GW-03	1004277-01	_005	XYLENE(TOTAL)	0.22	U	0.22	0.22	U	N	UG/L	0.22	U	1	1	100
32GW-03-AVG	1004277-01	_005	XYLENE(TOTAL)	0.22	U	0.22	0.22	U	N	UG/L	0.22	U	1	1	100
32GW-03	1004277-01	_005	BENZO(A)ANTHRACENE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ H	0.093	1	100
32GW-03-AVG	1004277-01	_005	BENZO(A)ANTHRACENE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ	0.093	1	100
32GW-03	1004277-01	_005	BENZO(A)PYRENE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ H	0.093	1	100
32GW-03-AVG	1004277-01	_005	BENZO(A)PYRENE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ	0.093	1	100
32GW-03	1004277-01	_005	BENZO(B)FLUORANTHE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ H	0.093	1	100
32GW-03-AVG	1004277-01	_005	BENZO(B)FLUORANTHE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ	0.093	1	100
32GW-03	1004277-01	_005	BENZO(K)FLUORANTHE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ CH	0.093	1	100
32GW-03-AVG	1004277-01	_005	BENZO(K)FLUORANTHE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ	0.093	1	100
32GW-03	1004277-01	_005	CHRYSENE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ H	0.093	1	100
32GW-03-AVG	1004277-01	_005	CHRYSENE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ	0.093	1	100
32GW-03	1004277-01	_005	DIBENZ(A,H)ANTHRACE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ H	0.093	1	100
32GW-03-AVG	1004277-01	_005	DIBENZ(A,H)ANTHRACE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ	0.093	1	100
32GW-03	1004277-01	_005	INDENO(1,2,3-CD)PYRE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ H	0.093	1	100
32GW-03-AVG	1004277-01	_005	INDENO(1,2,3-CD)PYRE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ	0.093	1	100
32GW-03	1004277-01	_005	NAPHTHALENE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ CH	0.093	1	100
32GW-03-AVG	1004277-01	_005	NAPHTHALENE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ	0.093	1	100
32GW-03-D	1004277-02	_005	BENZENE	0.14	U	0.14	0.14	U	N	UG/L	0.14	U	1	1	100
32GW-03-D	1004277-02	_005	ETHYLBENZENE	0.15	U	0.15	0.15	U	N	UG/L	0.15	U	1	1	100
32GW-03-D	1004277-02	_005	TOLUENE	0.19	U	0.19	0.19	U	N	UG/L	0.19	U	1	1	100
32GW-03-D	1004277-02	_005	XYLENE(TOTAL)	0.22	U	0.22	0.22	U	N	UG/L	0.22	U	1	1	100
32GW-03-D	1004277-02	_005	BENZO(A)ANTHRACENE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ H	0.093	1	100
32GW-03-D	1004277-02	_005	BENZO(A)PYRENE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ H	0.093	1	100
32GW-03-D	1004277-02	_005	BENZO(B)FLUORANTHE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ H	0.093	1	100
32GW-03-D	1004277-02	_005	BENZO(K)FLUORANTHE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ CH	0.093	1	100
32GW-03-D	1004277-02	_005	CHRYSENE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ H	0.093	1	100
32GW-03-D	1004277-02	_005	DIBENZ(A,H)ANTHRACE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ H	0.093	1	100
32GW-03-D	1004277-02	_005	INDENO(1,2,3-CD)PYRE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ H	0.093	1	100
32GW-03-D	1004277-02	_005	NAPHTHALENE	0.0187	U	0.0187	0.0187	UJ	N	UG/L	0.0187	UJ CH	0.093	1	100
32SS-RB042710-01	1004277-03	_005	BENZENE	0.14	U	0.14	0.14	U	N	UG/L	0.14	U	1	1	100
32SS-RB042710-01	1004277-03	_005	ETHYLBENZENE	0.15	U	0.15	0.15	U	N	UG/L	0.15	U	1	1	100
32SS-RB042710-01	1004277-03	_005	TOLUENE	0.19	U	0.19	0.19	U	N	UG/L	0.19	U	1	1	100
32SS-RB042710-01	1004277-03	_005	XYLENE(TOTAL)	0.22	U	0.22	0.22	U	N	UG/L	0.22	U	1	1	100
32SS-RB042710-01	1004277-03	_005	BENZO(A)ANTHRACENE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ H	0.094	1	100
32SS-RB042710-01	1004277-03	_005	BENZO(A)PYRENE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ H	0.094	1	100
32SS-RB042710-01	1004277-03	_005	BENZO(B)FLUORANTHE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ H	0.094	1	100
32SS-RB042710-01	1004277-03	_005	BENZO(K)FLUORANTHE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ CH	0.094	1	100
32SS-RB042710-01	1004277-03	_005	CHRYSENE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ H	0.094	1	100
32SS-RB042710-01	1004277-03	_005	DIBENZ(A,H)ANTHRACE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ H	0.094	1	100
32SS-RB042710-01	1004277-03	_005	INDENO(1,2,3-CD)PYRE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ H	0.094	1	100
32SS-RB042710-01	1004277-03	_005	NAPHTHALENE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ CH	0.094	1	100
32SS-RB042710-02	1004277-04	_005	BENZENE	0.14	U	0.14	0.14	U	N	UG/L	0.14	U	1	1	100
32SS-RB042710-02	1004277-04	_005	ETHYLBENZENE	0.15	U	0.15	0.15	U	N	UG/L	0.15	U	1	1	100
32SS-RB042710-02	1004277-04	_005	TOLUENE	0.19	U	0.19	0.19	U	N	UG/L	0.19	U	1	1	100
32SS-RB042710-02	1004277-04	_005	XYLENE(TOTAL)	0.22	U	0.22	0.22	U	N	UG/L	0.22	U	1	1	100
32SS-RB042710-02	1004277-04	_005	BENZO(A)ANTHRACENE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ H	0.098	1	100
32SS-RB042710-02	1004277-04	_005	BENZO(A)PYRENE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ H	0.098	1	100
32SS-RB042710-02	1004277-04	_005	BENZO(B)FLUORANTHE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ H	0.098	1	100
32SS-RB042710-02	1004277-04	_005	BENZO(K)FLUORANTHE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ CH	0.098	1	100
32SS-RB042710-02	1004277-04	_005	CHRYSENE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ H	0.098	1	100
32SS-RB042710-02	1004277-04	_005	DIBENZ(A,H)ANTHRACE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ H	0.098	1	100
32SS-RB042710-02	1004277-04	_005	INDENO(1,2,3-CD)PYRE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ H	0.098	1	100
32SS-RB042710-02	1004277-04	_005	NAPHTHALENE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ CH	0.098	1	100
32SS-RB042710-03	1004277-05	_005	BENZENE	0.14	U	0.14	0.14	U	N	UG/L	0.14	U	1	1	100
32SS-RB042710-03	1004277-05	_005	ETHYLBENZENE	0.15	U	0.15	0.15	U	N	UG/L	0.15	U	1	1	100
32SS-RB042710-03	1004277-05	_005	TOLUENE	0.19	U	0.19	0.19	U	N	UG/L	0.19	U	1	1	100
32SS-RB042710-03	1004277-05	_005	XYLENE(TOTAL)	0.22	U	0.22	0.22	U	N	UG/L	0.22	U	1	1	100

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SS-RB042710-03	1004277-05	_005	BENZO(A)ANTHRACENE	0.0222	U	0.0222	0.0222	UJ	N	UG/L	0.0222	UJ H	0.111	1	100
32SS-RB042710-03	1004277-05	_005	BENZO(A)PYRENE	0.0222	U	0.0222	0.0222	UJ	N	UG/L	0.0222	UJ H	0.111	1	100
32SS-RB042710-03	1004277-05	_005	BENZO(B)FLUORANTHE	0.0222	U	0.0222	0.0222	UJ	N	UG/L	0.0222	UJ H	0.111	1	100
32SS-RB042710-03	1004277-05	_005	BENZO(K)FLUORANTHE	0.0222	U	0.0222	0.0222	UJ	N	UG/L	0.0222	UJ CH	0.111	1	100
32SS-RB042710-03	1004277-05	_005	CHRYSENE	0.0222	U	0.0222	0.0222	UJ	N	UG/L	0.0222	UJ H	0.111	1	100
32SS-RB042710-03	1004277-05	_005	DIBENZ(A,H)ANTHRACE	0.0222	U	0.0222	0.0222	UJ	N	UG/L	0.0222	UJ H	0.111	1	100
32SS-RB042710-03	1004277-05	_005	INDENO(1,2,3-CD)PYRE	0.0222	U	0.0222	0.0222	UJ	N	UG/L	0.0222	UJ H	0.111	1	100
32SS-RB042710-03	1004277-05	_005	NAPHTHALENE	0.0222	U	0.0222	0.0222	UJ	N	UG/L	0.0222	UJ CH	0.111	1	100
32SS-RB042810-04	1004277-06	_005	BENZENE	0.14	U	0.14	0.14	U	N	UG/L	0.14	U	1	1	100
32SS-RB042810-04	1004277-06	_005	ETHYLBENZENE	0.15	U	0.15	0.15	U	N	UG/L	0.15	U	1	1	100
32SS-RB042810-04	1004277-06	_005	TOLUENE	0.19	U	0.19	0.19	U	N	UG/L	0.19	U	1	1	100
32SS-RB042810-04	1004277-06	_005	XYLENE(TOTAL)	0.22	U	0.22	0.22	U	N	UG/L	0.22	U	1	1	100
32SS-RB042810-04	1004277-06	_005	BENZO(A)ANTHRACENE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ H	0.098	1	100
32SS-RB042810-04	1004277-06	_005	BENZO(A)PYRENE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ H	0.098	1	100
32SS-RB042810-04	1004277-06	_005	BENZO(B)FLUORANTHE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ H	0.098	1	100
32SS-RB042810-04	1004277-06	_005	BENZO(K)FLUORANTHE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ H	0.098	1	100
32SS-RB042810-04	1004277-06	_005	CHRYSENE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ H	0.098	1	100
32SS-RB042810-04	1004277-06	_005	DIBENZ(A,H)ANTHRACE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ H	0.098	1	100
32SS-RB042810-04	1004277-06	_005	INDENO(1,2,3-CD)PYRE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ H	0.098	1	100
32SS-RB042810-04	1004277-06	_005	NAPHTHALENE	0.0196	U	0.0196	0.0196	UJ	N	UG/L	0.0196	UJ H	0.098	1	100
32SS-31-0002	1004277-07	_005	BENZO(A)ANTHRACENE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ H	7.75	1	14
32SS-31-0002	1004277-07	_005	BENZO(A)PYRENE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ H	5.81	1	14
32SS-31-0002	1004277-07	_005	BENZO(B)FLUORANTHE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ H	7.75	1	14
32SS-31-0002	1004277-07	_005	BENZO(K)FLUORANTHE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ H	7.75	1	14
32SS-31-0002	1004277-07	_005	CHRYSENE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ CH	7.75	1	14
32SS-31-0002	1004277-07	_005	DIBENZ(A,H)ANTHRACE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ H	5.81	1	14
32SS-31-0002	1004277-07	_005	INDENO(1,2,3-CD)PYRE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ H	7.75	1	14
32SS-31-0002	1004277-07	_005	NAPHTHALENE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ H	5.81	1	14
32SB-31-0607	1004277-08	_005	BENZENE	0.467	U	0.467	0.467	U	N	UG/KG	0.467	U	5	1	12.9
32SB-31-0607	1004277-08	_005	ETHYLBENZENE	0.746	U	0.746	0.746	U	N	UG/KG	0.746	U	9.95	1	12.9
32SB-31-0607	1004277-08	_005	TOLUENE	0.855	U	0.855	0.855	U	N	UG/KG	0.855	U	9.95	1	12.9
32SB-31-0607	1004277-08	_005	XYLENE(TOTAL)	0.696	U	0.696	0.696	U	N	UG/KG	0.696	U	9.95	1	12.9
32SB-31-0607	1004277-08	_005	BENZO(A)ANTHRACENE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	7.66	1	12.9
32SB-31-0607	1004277-08	_005	BENZO(A)PYRENE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	5.74	1	12.9
32SB-31-0607	1004277-08	_005	BENZO(B)FLUORANTHE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	7.66	1	12.9
32SB-31-0607	1004277-08	_005	BENZO(K)FLUORANTHE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	7.66	1	12.9
32SB-31-0607	1004277-08	_005	CHRYSENE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	7.66	1	12.9
32SB-31-0607	1004277-08	_005	DIBENZ(A,H)ANTHRACE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ C	5.74	1	12.9
32SB-31-0607	1004277-08	_005	INDENO(1,2,3-CD)PYRE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ C	7.66	1	12.9
32SB-31-0607	1004277-08	_005	NAPHTHALENE	1.53	UE	1.53	1.53	U	N	UG/KG	1.53	U	5.74	1	12.9
32SS-35-0002	1004277-09	_005	BENZO(A)ANTHRACENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.75	1	14
32SS-35-0002	1004277-09	_005	BENZO(A)PYRENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.81	1	14
32SS-35-0002	1004277-09	_005	BENZO(B)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.75	1	14
32SS-35-0002	1004277-09	_005	BENZO(K)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.75	1	14
32SS-35-0002	1004277-09	_005	CHRYSENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.75	1	14
32SS-35-0002	1004277-09	_005	DIBENZ(A,H)ANTHRACE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ C	5.81	1	14
32SS-35-0002	1004277-09	_005	INDENO(1,2,3-CD)PYRE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ C	7.75	1	14
32SS-35-0002	1004277-09	_005	NAPHTHALENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.81	1	14
32SB-35-0507	1004277-10	_005	BENZENE	0.481	U	0.481	0.481	U	N	UG/KG	0.481	U	5	1	14.3
32SB-35-0507	1004277-10	_005	ETHYLBENZENE	0.767	U	0.767	0.767	U	N	UG/KG	0.767	U	10.2	1	14.3
32SB-35-0507	1004277-10	_005	TOLUENE	0.879	U	0.879	0.879	U	N	UG/KG	0.879	U	10.2	1	14.3
32SB-35-0507	1004277-10	_005	XYLENE(TOTAL)	0.716	UE	0.716	0.716	U	N	UG/KG	0.716	U	10.2	1	14.3
32SB-35-0507	1004277-10	_005	BENZO(A)ANTHRACENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.79	1	14.3
32SB-35-0507	1004277-10	_005	BENZO(A)PYRENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.84	1	14.3
32SB-35-0507	1004277-10	_005	BENZO(B)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.79	1	14.3
32SB-35-0507	1004277-10	_005	BENZO(K)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.79	1	14.3
32SB-35-0507	1004277-10	_005	CHRYSENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.79	1	14.3
32SB-35-0507	1004277-10	_005	DIBENZ(A,H)ANTHRACE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ C	5.84	1	14.3
32SB-35-0507	1004277-10	_005	INDENO(1,2,3-CD)PYRE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ C	7.79	1	14.3
32SB-35-0507	1004277-10	_005	NAPHTHALENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.84	1	14.3
32SS-38-0002	1004277-11	_005	BENZO(A)ANTHRACENE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ H	7.58	1	12
32SS-38-0002	1004277-11	_005	BENZO(A)PYRENE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ H	5.68	1	12
32SS-38-0002	1004277-11	_005	BENZO(B)FLUORANTHE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ H	7.58	1	12
32SS-38-0002	1004277-11	_005	BENZO(K)FLUORANTHE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ H	7.58	1	12

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SS-38-0002	1004277-11	_005	CHRYSENE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	CH	7.58	1	12
32SS-38-0002	1004277-11	_005	DIBENZ(A,H)ANTHRACE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H	5.68	1	12
32SS-38-0002	1004277-11	_005	INDENO(1,2,3-CD)PYRE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H	7.58	1	12
32SS-38-0002	1004277-11	_005	NAPHTHALENE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H	5.68	1	12
32SB-38-0506	1004277-12	_005	BENZENE	0.471	U	0.471	0.471	U	N	UG/KG	0.471	U		5	1	17.1
32SB-38-0506	1004277-12	_005	ETHYLBENZENE	0.752	U	0.752	0.752	U	N	UG/KG	0.752	U		10	1	17.1
32SB-38-0506	1004277-12	_005	TOLUENE	0.862	U	0.862	0.862	U	N	UG/KG	0.862	U		10	1	17.1
32SB-38-0506	1004277-12	_005	XYLENE(TOTAL)	0.702	U	0.702	0.702	U	N	UG/KG	0.702	U		10	1	17.1
32SB-38-0506	1004277-12	_005	BENZO(A)ANTHRACENE	1.61	U	1.61	1.61	UJ	N	UG/KG	1.61	UJ	H	8.05	1	17.1
32SB-38-0506	1004277-12	_005	BENZO(A)PYRENE	1.61	U	1.61	1.61	UJ	N	UG/KG	1.61	UJ	H	6.03	1	17.1
32SB-38-0506	1004277-12	_005	BENZO(B)FLUORANTHE	1.61	U	1.61	1.61	UJ	N	UG/KG	1.61	UJ	H	8.05	1	17.1
32SB-38-0506	1004277-12	_005	BENZO(K)FLUORANTHE	1.61	U	1.61	1.61	UJ	N	UG/KG	1.61	UJ	H	8.05	1	17.1
32SB-38-0506	1004277-12	_005	CHRYSENE	1.61	U	1.61	1.61	UJ	N	UG/KG	1.61	UJ	CH	8.05	1	17.1
32SB-38-0506	1004277-12	_005	DIBENZ(A,H)ANTHRACE	1.61	U	1.61	1.61	UJ	N	UG/KG	1.61	UJ	H	6.03	1	17.1
32SB-38-0506	1004277-12	_005	INDENO(1,2,3-CD)PYRE	1.61	U	1.61	1.61	UJ	N	UG/KG	1.61	UJ	H	8.05	1	17.1
32SB-38-0506	1004277-12	_005	NAPHTHALENE	1.61	U	1.61	1.61	UJ	N	UG/KG	1.61	UJ	H	6.03	1	17.1
32SS-39-0002	1004277-13	_005	BENZO(A)ANTHRACENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U		7.76	1	14.1
32SS-39-0002	1004277-13	_005	BENZO(A)PYRENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U		5.82	1	14.1
32SS-39-0002	1004277-13	_005	BENZO(B)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U		7.76	1	14.1
32SS-39-0002	1004277-13	_005	BENZO(K)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U		7.76	1	14.1
32SS-39-0002	1004277-13	_005	CHRYSENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U		7.76	1	14.1
32SS-39-0002	1004277-13	_005	DIBENZ(A,H)ANTHRACE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	C	5.82	1	14.1
32SS-39-0002	1004277-13	_005	INDENO(1,2,3-CD)PYRE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	C	7.76	1	14.1
32SS-39-0002	1004277-13	_005	NAPHTHALENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U		5.82	1	14.1
32SB-39-0507	1004277-14	_005	BENZENE	0.479	U	0.479	0.479	U	N	UG/KG	0.479	U		5	1	18.1
32SB-39-0507	1004277-14	_005	ETHYLBENZENE	0.764	U	0.764	0.764	U	N	UG/KG	0.764	U		10.2	1	18.1
32SB-39-0507	1004277-14	_005	TOLUENE	0.876	U	0.876	0.876	U	N	UG/KG	0.876	U		10.2	1	18.1
32SB-39-0507	1004277-14	_005	XYLENE(TOTAL)	0.713	U	0.713	0.713	U	N	UG/KG	0.713	U		10.2	1	18.1
32SB-39-0507	1004277-14	_005	BENZO(A)ANTHRACENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U		8.14	1	18.1
32SB-39-0507	1004277-14	_005	BENZO(A)PYRENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U		6.1	1	18.1
32SB-39-0507	1004277-14	_005	BENZO(B)FLUORANTHE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U		8.14	1	18.1
32SB-39-0507	1004277-14	_005	BENZO(K)FLUORANTHE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U		8.14	1	18.1
32SB-39-0507	1004277-14	_005	CHRYSENE	1.62	UE	1.62	1.62	U	N	UG/KG	1.62	U		8.14	1	18.1
32SB-39-0507	1004277-14	_005	DIBENZ(A,H)ANTHRACE	1.62	U	1.62	1.62	UJ	N	UG/KG	1.62	UJ	C	6.1	1	18.1
32SB-39-0507	1004277-14	_005	INDENO(1,2,3-CD)PYRE	1.62	U	1.62	1.62	UJ	N	UG/KG	1.62	UJ	C	8.14	1	18.1
32SB-39-0507	1004277-14	_005	NAPHTHALENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U		6.1	1	18.1
32SS-40-0002	1004277-15	_005	BENZO(A)ANTHRACENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	7.67	1	13.1
32SS-40-0002	1004277-15	_005	BENZO(A)PYRENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	5.75	1	13.1
32SS-40-0002	1004277-15	_005	BENZO(B)FLUORANTHE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	7.67	1	13.1
32SS-40-0002	1004277-15	_005	BENZO(K)FLUORANTHE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	7.67	1	13.1
32SS-40-0002	1004277-15	_005	CHRYSENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	CH	7.67	1	13.1
32SS-40-0002	1004277-15	_005	DIBENZ(A,H)ANTHRACE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	5.75	1	13.1
32SS-40-0002	1004277-15	_005	INDENO(1,2,3-CD)PYRE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	7.67	1	13.1
32SS-40-0002	1004277-15	_005	NAPHTHALENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	H	5.75	1	13.1
32SB-40-0506	1004277-16	_005	BENZENE	0.474	U	0.474	0.474	UJ	N	UG/KG	0.474	UJ	N	5	1	14.7
32SB-40-0506	1004277-16	_005	ETHYLBENZENE	0.757	U	0.757	0.757	UJ	N	UG/KG	0.757	UJ	N	10.1	1	14.7
32SB-40-0506	1004277-16	_005	TOLUENE	0.868	U	0.868	0.868	UJ	N	UG/KG	0.868	UJ	N	10.1	1	14.7
32SB-40-0506	1004277-16	_005	XYLENE(TOTAL)	1.72	J	1.72	1.72	J	Y	UG/KG	1.72	J	PN	10.1	1	14.7
32SB-40-0506	1004277-16	_005	BENZO(A)ANTHRACENE	1.56	U	1.56	1.56	UJ	N	UG/KG	1.56	UJ	H	7.82	1	14.7
32SB-40-0506	1004277-16	_005	BENZO(A)PYRENE	1.56	U	1.56	1.56	UJ	N	UG/KG	1.56	UJ	H	5.86	1	14.7
32SB-40-0506	1004277-16	_005	BENZO(B)FLUORANTHE	1.56	U	1.56	1.56	UJ	N	UG/KG	1.56	UJ	H	7.82	1	14.7
32SB-40-0506	1004277-16	_005	BENZO(K)FLUORANTHE	1.56	U	1.56	1.56	UJ	N	UG/KG	1.56	UJ	H	7.82	1	14.7
32SB-40-0506	1004277-16	_005	CHRYSENE	1.56	U	1.56	1.56	UJ	N	UG/KG	1.56	UJ	CH	7.82	1	14.7
32SB-40-0506	1004277-16	_005	DIBENZ(A,H)ANTHRACE	1.56	U	1.56	1.56	UJ	N	UG/KG	1.56	UJ	H	5.86	1	14.7
32SB-40-0506	1004277-16	_005	INDENO(1,2,3-CD)PYRE	1.56	U	1.56	1.56	UJ	N	UG/KG	1.56	UJ	H	7.82	1	14.7
32SB-40-0506	1004277-16	_005	NAPHTHALENE	1.56	U	1.56	1.56	UJ	N	UG/KG	1.56	UJ	H	5.86	1	14.7
32SS-41-0002	1004277-17	_005	BENZO(A)ANTHRACENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U		7.75	1	13.9
32SS-41-0002	1004277-17	_005	BENZO(A)PYRENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U		5.81	1	13.9
32SS-41-0002	1004277-17	_005	BENZO(B)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U		7.75	1	13.9
32SS-41-0002	1004277-17	_005	BENZO(K)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U		7.75	1	13.9
32SS-41-0002	1004277-17	_005	CHRYSENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U		7.75	1	13.9
32SS-41-0002	1004277-17	_005	DIBENZ(A,H)ANTHRACE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	C	5.81	1	13.9
32SS-41-0002	1004277-17	_005	INDENO(1,2,3-CD)PYRE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	C	7.75	1	13.9
32SS-41-0002	1004277-17	_005	NAPHTHALENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U		5.81	1	13.9

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fc	t_moist
32SB-41-0506	1004277-18	_005	BENZENE	0.487	U	0.487	0.487	U	N	UG/KG	0.487	U	5	1	14.1
32SB-41-0506	1004277-18	_005	ETHYLBENZENE	0.778	U	0.778	0.778	U	N	UG/KG	0.778	U	10.4	1	14.1
32SB-41-0506	1004277-18	_005	TOLUENE	0.892	U	0.892	0.892	U	N	UG/KG	0.892	U	10.4	1	14.1
32SB-41-0506	1004277-18	_005	XYLENE(TOTAL)	0.726	U	0.726	0.726	U	N	UG/KG	0.726	U	10.4	1	14.1
32SB-41-0506	1004277-18	_005	BENZO(A)ANTHRACENE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	C 7.76	1	14.1
32SB-41-0506	1004277-18	_005	BENZO(A)PYRENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.82	1	14.1
32SB-41-0506	1004277-18	_005	BENZO(B)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.76	1	14.1
32SB-41-0506	1004277-18	_005	BENZO(K)FLUORANTHE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	7.76	1	14.1
32SB-41-0506	1004277-18	_005	CHRYSENE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	C 7.76	1	14.1
32SB-41-0506	1004277-18	_005	DIBENZ(A,H)ANTHRACE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	C 5.82	1	14.1
32SB-41-0506	1004277-18	_005	INDENO(1,2,3-CD)PYRE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	C 7.76	1	14.1
32SB-41-0506	1004277-18	_005	NAPHTHALENE	1.55	U	1.55	1.55	U	N	UG/KG	1.55	U	5.82	1	14.1
32SS-42-0002	1004277-19	_005	BENZO(A)ANTHRACENE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	H 7.76	1	14
32SS-42-0002-AVG	1004277-19	_005	BENZO(A)ANTHRACENE	1.55	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	7.76	1	14
32SS-42-0002	1004277-19	_005	BENZO(A)PYRENE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	H 5.81	1	14
32SS-42-0002-AVG	1004277-19	_005	BENZO(A)PYRENE	1.55	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	5.81	1	14
32SS-42-0002	1004277-19	_005	BENZO(B)FLUORANTHE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	H 7.76	1	14
32SS-42-0002-AVG	1004277-19	_005	BENZO(B)FLUORANTHE	1.55	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	7.76	1	14
32SS-42-0002	1004277-19	_005	BENZO(K)FLUORANTHE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	H 7.76	1	14
32SS-42-0002-AVG	1004277-19	_005	BENZO(K)FLUORANTHE	1.55	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	7.76	1	14
32SS-42-0002	1004277-19	_005	CHRYSENE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	CH 7.76	1	14
32SS-42-0002-AVG	1004277-19	_005	CHRYSENE	1.55	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	7.76	1	14
32SS-42-0002	1004277-19	_005	DIBENZ(A,H)ANTHRACE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	H 5.81	1	14
32SS-42-0002-AVG	1004277-19	_005	DIBENZ(A,H)ANTHRACE	1.55	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	5.81	1	14
32SS-42-0002	1004277-19	_005	INDENO(1,2,3-CD)PYRE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	H 7.76	1	14
32SS-42-0002-AVG	1004277-19	_005	INDENO(1,2,3-CD)PYRE	1.55	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	7.76	1	14
32SS-42-0002	1004277-19	_005	NAPHTHALENE	1.55	U	1.55	1.55	UJ	N	UG/KG	1.55	UJ	H 5.81	1	14
32SS-42-0002-AVG	1004277-19	_005	NAPHTHALENE	1.55	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	5.81	1	14
32SB-42-0506	1004277-20	_005	BENZO(A)ANTHRACENE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H 7.57	1	11.9
32SB-42-0506-AVG	1004277-20	_005	BENZO(A)ANTHRACENE	1.51	U	3.5825	3.5825	J	Y	UG/KG	3.5825	J	7.57	1	11.9
32SB-42-0506	1004277-20	_005	BENZO(A)PYRENE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H 5.68	1	11.9
32SB-42-0506-AVG	1004277-20	_005	BENZO(A)PYRENE	1.51	U	2.5575	2.5575	J	Y	UG/KG	2.5575	J	5.68	1	11.9
32SB-42-0506	1004277-20	_005	BENZO(B)FLUORANTHE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H 7.57	1	11.9
32SB-42-0506-AVG	1004277-20	_005	BENZO(B)FLUORANTHE	1.51	U	2.7375	2.7375	J	Y	UG/KG	2.7375	J	7.57	1	11.9
32SB-42-0506	1004277-20	_005	BENZO(K)FLUORANTHE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H 7.57	1	11.9
32SB-42-0506-AVG	1004277-20	_005	BENZO(K)FLUORANTHE	1.51	U	2.8425	2.8425	J	Y	UG/KG	2.8425	J	7.57	1	11.9
32SB-42-0506	1004277-20	_005	CHRYSENE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	CH 7.57	1	11.9
32SB-42-0506-AVG	1004277-20	_005	CHRYSENE	1.51	U	3.3725	3.3725	J	Y	UG/KG	3.3725	J	7.57	1	11.9
32SB-42-0506	1004277-20	_005	DIBENZ(A,H)ANTHRACE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H 5.68	1	11.9
32SB-42-0506-AVG	1004277-20	_005	DIBENZ(A,H)ANTHRACE	1.51	U	3.3625	3.3625	J	Y	UG/KG	3.3625	J	5.68	1	11.9
32SB-42-0506	1004277-20	_005	INDENO(1,2,3-CD)PYRE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H 7.57	1	11.9
32SB-42-0506-AVG	1004277-20	_005	INDENO(1,2,3-CD)PYRE	1.51	U	3.1975	3.1975	J	Y	UG/KG	3.1975	J	7.57	1	11.9
32SB-42-0506	1004277-20	_005	NAPHTHALENE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H 5.68	1	11.9
32SB-42-0506-AVG	1004277-20	_005	NAPHTHALENE	1.51	U	2.2975	2.2975	J	Y	UG/KG	2.2975	J	5.68	1	11.9
32SB-42-0506	1004277-20R	_005	BENZENE	0.486	U	0.486	0.486	UJ	N	UG/KG	0.486	UJ	H 5	1	11.9
32SB-42-0506-AVG	1004277-20R	_005	BENZENE	0.486	U	0.471	0.471	UJ	N	UG/KG	0.471	UJ	5	1	11.9
32SB-42-0506	1004277-20R	_005	ETHYLBENZENE	0.776	U	0.776	0.776	UJ	N	UG/KG	0.776	UJ	H 10.3	1	11.9
32SB-42-0506-AVG	1004277-20R	_005	ETHYLBENZENE	0.776	U	0.752	0.752	UJ	N	UG/KG	0.752	UJ	10.3	1	11.9
32SB-42-0506	1004277-20R	_005	TOLUENE	0.889	U	0.889	0.889	UJ	N	UG/KG	0.889	UJ	H 10.3	1	11.9
32SB-42-0506-AVG	1004277-20R	_005	TOLUENE	0.889	U	0.862	0.862	UJ	N	UG/KG	0.862	UJ	10.3	1	11.9
32SB-42-0506	1004277-20R	_005	XYLENE(TOTAL)	0.724	U	0.724	0.724	UJ	N	UG/KG	0.724	UJ	H 10.3	1	11.9
32SB-42-0506-AVG	1004277-20R	_005	XYLENE(TOTAL)	0.724	U	0.702	0.702	UJ	N	UG/KG	0.702	UJ	10.3	1	11.9
32SS-42-0002-D	1004277-21	_005	BENZO(A)ANTHRACENE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	C 7.59	1	12.1
32SS-42-0002-D	1004277-21	_005	BENZO(A)PYRENE	1.51	U	1.51	1.51	U	N	UG/KG	1.51	U	5.69	1	12.1
32SS-42-0002-D	1004277-21	_005	BENZO(B)FLUORANTHE	1.51	U	1.51	1.51	U	N	UG/KG	1.51	U	7.59	1	12.1
32SS-42-0002-D	1004277-21	_005	BENZO(K)FLUORANTHE	1.51	U	1.51	1.51	U	N	UG/KG	1.51	U	7.59	1	12.1
32SS-42-0002-D	1004277-21	_005	CHRYSENE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	C 7.59	1	12.1
32SS-42-0002-D	1004277-21	_005	DIBENZ(A,H)ANTHRACE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	C 5.69	1	12.1
32SS-42-0002-D	1004277-21	_005	INDENO(1,2,3-CD)PYRE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	C 7.59	1	12.1
32SS-42-0002-D	1004277-21	_005	NAPHTHALENE	1.51	U	1.51	1.51	U	N	UG/KG	1.51	U	5.69	1	12.1
32SS-DW01-0002-D	1004277-22	_005	BENZO(A)ANTHRACENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53	UJ	C 7.68	1	13.2
32SS-DW01-0002-D	1004277-22	_005	BENZO(A)PYRENE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	5.76	1	13.2
32SS-DW01-0002-D	1004277-22	_005	BENZO(B)FLUORANTHE	1.53	U	1.53	1.53	U	N	UG/KG	1.53	U	7.68	1	13.2
32SS-DW01-0002-A	1004277-22	_005	BENZO(K)FLUORANTHE	1.53	U	8.915	8.915	U	N	UG/KG	8.915	U	7.68	1	13.2

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fc	t_moist
32SS-DW01-0002-D	1004277-22	_005	BENZO(K)FLUORANTHE	1.53	U	1.53	1.53	U	N	UG/KG	1.53 U		7.68	1	13.2
32SS-DW01-0002-D	1004277-22	_005	CHRYSENE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53 UJ	C	7.68	1	13.2
32SS-DW01-0002-A	1004277-22	_005	DIBENZ(A,H)ANTHRACE	1.53	U	8.915	8.915	UJ	N	UG/KG	8.915 UJ		5.76	1	13.2
32SS-DW01-0002-D	1004277-22	_005	DIBENZ(A,H)ANTHRACE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53 UJ	C	5.76	1	13.2
32SS-DW01-0002-D	1004277-22	_005	INDENO(1,2,3-CD)PYRE	1.53	U	1.53	1.53	UJ	N	UG/KG	1.53 UJ	C	7.68	1	13.2
32SS-DW01-0002-D	1004277-22	_005	NAPHTHALENE	1.53	U	1.53	1.53	U	N	UG/KG	1.53 U		5.76	1	13.2
32SB-42-0506-D	1004277-23	_005	BENZENE	0.456	U	0.456	0.456	U	N	UG/KG	0.456 U		5	1	11.8
32SB-42-0506-D	1004277-23	_005	ETHYLBENZENE	0.728	U	0.728	0.728	U	N	UG/KG	0.728 U		9.71	1	11.8
32SB-42-0506-D	1004277-23	_005	TOLUENE	0.835	U	0.835	0.835	U	N	UG/KG	0.835 U		9.71	1	11.8
32SB-42-0506-D	1004277-23	_005	XYLENE(TOTAL)	0.68	U	0.68	0.68	U	N	UG/KG	0.68 U		9.71	1	11.8
32SB-42-0506-D	1004277-23	_005	BENZO(A)ANTHRACENE	6.41	J	6.41	6.41	J	Y	UG/KG	6.41 J	PC	7.56	1	11.8
32SB-42-0506-D	1004277-23	_005	BENZO(A)PYRENE	4.36	J	4.36	4.36	J	Y	UG/KG	4.36 J	P	5.67	1	11.8
32SB-42-0506-D	1004277-23	_005	BENZO(B)FLUORANTHE	4.72	J	4.72	4.72	J	Y	UG/KG	4.72 J	P	7.56	1	11.8
32SB-42-0506-D	1004277-23	_005	BENZO(K)FLUORANTHE	4.93	J	4.93	4.93	J	Y	UG/KG	4.93 J	P	7.56	1	11.8
32SB-42-0506-D	1004277-23	_005	CHRYSENE	5.99	J	5.99	5.99	J	Y	UG/KG	5.99 J	PC	7.56	1	11.8
32SB-42-0506-D	1004277-23	_005	DIBENZ(A,H)ANTHRACE	5.97		5.97	5.97	J	Y	UG/KG	5.97 J	C	5.67	1	11.8
32SB-42-0506-D	1004277-23	_005	INDENO(1,2,3-CD)PYRE	5.64	J	5.64	5.64	J	Y	UG/KG	5.64 J	PC	7.56	1	11.8
32SB-42-0506-D	1004277-23	_005	NAPHTHALENE	3.84	J	3.84	3.84	J	Y	UG/KG	3.84 J	P	5.67	1	11.8
32SB-DW01-0809-D	1004277-24	_005	BENZENE	0.527	U	0.527	0.527	U	N	UG/KG	0.527 U		5	1	20.4
32SB-DW01-0809-D	1004277-24	_005	ETHYLBENZENE	0.841	U	0.841	0.841	U	N	UG/KG	0.841 U		11.2	1	20.4
32SB-DW01-0809-D	1004277-24	_005	TOLUENE	0.964	U	0.964	0.964	U	N	UG/KG	0.964 U		11.2	1	20.4
32SB-DW01-0809-D	1004277-24	_005	XYLENE(TOTAL)	0.785	U	0.785	0.785	U	N	UG/KG	0.785 U		11.2	1	20.4
32SB-DW01-0809-D	1004277-24	_005	BENZO(A)ANTHRACENE	16.7	U	16.7	16.7	U	N	UG/KG	16.7 U		83.8	10	20.4
32SB-DW01-0809-D	1004277-24	_005	BENZO(A)PYRENE	16.7	U	16.7	16.7	U	N	UG/KG	16.7 U		62.8	10	20.4
32SB-DW01-0809-D	1004277-24	_005	BENZO(B)FLUORANTHE	16.7	U	16.7	16.7	U	N	UG/KG	16.7 U		83.8	10	20.4
32SB-DW01-0809-D	1004277-24	_005	BENZO(K)FLUORANTHE	16.7	U	16.7	16.7	UJ	N	UG/KG	16.7 UJ	C	83.8	10	20.4
32SB-DW01-0809-D	1004277-24	_005	CHRYSENE	16.7	U	16.7	16.7	U	N	UG/KG	16.7 U		83.8	10	20.4
32SB-DW01-0809-D	1004277-24	_005	DIBENZ(A,H)ANTHRACE	16.7	U	16.7	16.7	U	N	UG/KG	16.7 U		62.8	10	20.4
32SB-DW01-0809-D	1004277-24	_005	INDENO(1,2,3-CD)PYRE	16.7	U	16.7	16.7	U	N	UG/KG	16.7 U		83.8	10	20.4
32SB-DW01-0809-D	1004277-24	_005	NAPHTHALENE	16.7	U	16.7	16.7	U	N	UG/KG	16.7 U		62.8	10	20.4
32SS-DW01-0002	1004277-25	_005	BENZO(A)ANTHRACENE	16.3	U	16.3	16.3	U	N	UG/KG	16.3 U		81.8	10	18.4
32SS-DW01-0002-A	1004277-25	_005	BENZO(A)ANTHRACENE	16.3	U	8.915	8.915	U	N	UG/KG	8.915 U		81.8	10	18.4
32SS-DW01-0002	1004277-25	_005	BENZO(A)PYRENE	16.3	U	16.3	16.3	U	N	UG/KG	16.3 U		61.3	10	18.4
32SS-DW01-0002-A	1004277-25	_005	BENZO(A)PYRENE	16.3	U	8.915	8.915	U	N	UG/KG	8.915 U		61.3	10	18.4
32SS-DW01-0002	1004277-25	_005	BENZO(B)FLUORANTHE	16.3	U	16.3	16.3	U	N	UG/KG	16.3 U		81.8	10	18.4
32SS-DW01-0002-A	1004277-25	_005	BENZO(B)FLUORANTHE	16.3	U	8.915	8.915	U	N	UG/KG	8.915 U		81.8	10	18.4
32SS-DW01-0002	1004277-25	_005	BENZO(K)FLUORANTHE	16.3	U	16.3	16.3	UJ	N	UG/KG	16.3 UJ	C	81.8	10	18.4
32SS-DW01-0002	1004277-25	_005	CHRYSENE	16.3	U	16.3	16.3	U	N	UG/KG	16.3 U		81.8	10	18.4
32SS-DW01-0002-A	1004277-25	_005	CHRYSENE	16.3	U	8.915	8.915	U	N	UG/KG	8.915 U		81.8	10	18.4
32SS-DW01-0002	1004277-25	_005	DIBENZ(A,H)ANTHRACE	16.3	U	16.3	16.3	U	N	UG/KG	16.3 U		61.3	10	18.4
32SS-DW01-0002	1004277-25	_005	INDENO(1,2,3-CD)PYRE	16.3	U	16.3	16.3	U	N	UG/KG	16.3 U		81.8	10	18.4
32SS-DW01-0002-A	1004277-25	_005	INDENO(1,2,3-CD)PYRE	16.3	U	8.915	8.915	U	N	UG/KG	8.915 U		81.8	10	18.4
32SS-DW01-0002	1004277-25	_005	NAPHTHALENE	16.3	U	16.3	16.3	U	N	UG/KG	16.3 U		61.3	10	18.4
32SS-DW01-0002-A	1004277-25	_005	NAPHTHALENE	16.3	U	8.915	8.915	U	N	UG/KG	8.915 U		61.3	10	18.4
32SB-DW01-0809	1004277-26	_005	BENZENE	0.522	U	0.522	0.522	UJ	N	UG/KG	0.522 UJ	HN	5	1	13.5
32SB-DW01-0809-A	1004277-26	_005	BENZENE	0.522	U	0.5245	0.5245	U	N	UG/KG	0.5245 U		5	1	13.5
32SB-DW01-0809	1004277-26	_005	ETHYLBENZENE	0.833	U	0.833	0.833	UJ	N	UG/KG	0.833 UJ	HN	11.1	1	13.5
32SB-DW01-0809-A	1004277-26	_005	ETHYLBENZENE	0.833	U	0.837	0.837	U	N	UG/KG	0.837 U		11.1	1	13.5
32SB-DW01-0809	1004277-26	_005	TOLUENE	0.955	U	0.955	0.955	UJ	N	UG/KG	0.955 UJ	HN	11.1	1	13.5
32SB-DW01-0809-A	1004277-26	_005	TOLUENE	0.955	U	0.9595	0.9595	U	N	UG/KG	0.9595 U		11.1	1	13.5
32SB-DW01-0809	1004277-26	_005	XYLENE(TOTAL)	0.777	U	0.777	0.777	UJ	N	UG/KG	0.777 UJ	HN	11.1	1	13.5
32SB-DW01-0809-A	1004277-26	_005	XYLENE(TOTAL)	0.777	U	0.781	0.781	U	N	UG/KG	0.781 U		11.1	1	13.5
32SB-DW01-0809	1004277-26	_005	BENZO(A)ANTHRACENE	9.44		9.44	9.44	J	Y	UG/KG	9.44 J	C	7.72	1	13.5
32SB-DW01-0809-A	1004277-26	_005	BENZO(A)ANTHRACENE	9.44		9.44	9.44	J	Y	UG/KG	9.44 J		7.72	1	13.5
32SB-DW01-0809	1004277-26	_005	BENZO(A)PYRENE	7.43		7.43	7.43		Y	UG/KG	7.43		5.78	1	13.5
32SB-DW01-0809-A	1004277-26	_005	BENZO(A)PYRENE	7.43		7.43	7.43		Y	UG/KG	7.43		5.78	1	13.5
32SB-DW01-0809	1004277-26	_005	BENZO(B)FLUORANTHE	7.78		7.78	7.78		Y	UG/KG	7.78		7.72	1	13.5
32SB-DW01-0809-A	1004277-26	_005	BENZO(B)FLUORANTHE	7.78		7.78	7.78		Y	UG/KG	7.78		7.72	1	13.5
32SB-DW01-0809	1004277-26	_005	BENZO(K)FLUORANTHE	9.45		9.45	9.45		Y	UG/KG	9.45		7.72	1	13.5
32SB-DW01-0809-A	1004277-26	_005	BENZO(K)FLUORANTHE	9.45		9.45	9.45		Y	UG/KG	9.45		7.72	1	13.5
32SB-DW01-0809	1004277-26	_005	CHRYSENE	15.3		15.3	15.3	J	Y	UG/KG	15.3 J	C	7.72	1	13.5
32SB-DW01-0809-A	1004277-26	_005	CHRYSENE	15.3		15.3	15.3	J	Y	UG/KG	15.3 J		7.72	1	13.5
32SB-DW01-0809	1004277-26	_005	DIBENZ(A,H)ANTHRACE	9.23		9.23	9.23	J	Y	UG/KG	9.23 J	C	5.78	1	13.5
32SB-DW01-0809-A	1004277-26	_005	DIBENZ(A,H)ANTHRACE	9.23		9.23	9.23	J	Y	UG/KG	9.23 J		5.78	1	13.5

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SB-DW01-0809	1004277-26	_005	INDENO(1,2,3-CD)PYRE	7.05	J	7.05	7.05	J	Y	UG/KG	7.05 J	PC	7.72	1	13.5
32SB-DW01-0809-A	1004277-26	_005	INDENO(1,2,3-CD)PYRE	7.05	J	7.05	7.05	J	Y	UG/KG	7.05 J		7.72	1	13.5
32SB-DW01-0809	1004277-26	_005	NAPHTHALENE	1.54	U	1.54	1.54	U	N	UG/KG	1.54 U		5.78	1	13.5
32SB-DW01-0809-A	1004277-26	_005	NAPHTHALENE	1.54	U	9.12	9.12	U	N	UG/KG	9.12 U		5.78	1	13.5
32SS-DW02-0002	1004278-01	_006	BENZO(A)ANTHRACENE	1.65	U	1.65	1.65	UJ	N	UG/KG	1.65 UJ	C	8.27	1	19.3
32SS-DW02-0002	1004278-01	_006	BENZO(A)PYRENE	1.65	U	1.65	1.65	U	N	UG/KG	1.65 U		6.2	1	19.3
32SS-DW02-0002	1004278-01	_006	BENZO(B)FLUORANTHE	1.65	U	1.65	1.65	U	N	UG/KG	1.65 U		8.27	1	19.3
32SS-DW02-0002	1004278-01	_006	BENZO(K)FLUORANTHE	1.65	U	1.65	1.65	U	N	UG/KG	1.65 U		8.27	1	19.3
32SS-DW02-0002	1004278-01	_006	CHRYSENE	1.65	U	1.65	1.65	UJ	N	UG/KG	1.65 UJ	C	8.27	1	19.3
32SS-DW02-0002	1004278-01	_006	DIBENZ(A,H)ANTHRACE	1.65	U	1.65	1.65	UJ	N	UG/KG	1.65 UJ	C	6.2	1	19.3
32SS-DW02-0002	1004278-01	_006	INDENO(1,2,3-CD)PYRE	1.65	U	1.65	1.65	UJ	N	UG/KG	1.65 UJ	C	8.27	1	19.3
32SS-DW02-0002	1004278-01	_006	NAPHTHALENE	1.65	U	1.65	1.65	U	N	UG/KG	1.65 U		6.2	1	19.3
32SB-DW02-0506	1004278-02	_006	BENZENE	0.593	U	0.593	0.593	U	N	UG/KG	0.593 U		5.05	1	21.7
32SB-DW02-0506	1004278-02	_006	ETHYLBENZENE	0.946	U	0.946	0.946	U	N	UG/KG	0.946 U		12.6	1	21.7
32SB-DW02-0506	1004278-02	_006	TOLUENE	1.09	U	1.09	1.09	U	N	UG/KG	1.09 U		12.6	1	21.7
32SB-DW02-0506	1004278-02	_006	XYLENE(TOTAL)	0.883	U	0.883	0.883	U	N	UG/KG	0.883 U		12.6	1	21.7
32SB-DW02-0506	1004278-02	_006	BENZO(A)ANTHRACENE	1.7	U	1.7	1.7	UJ	N	UG/KG	1.7 UJ	C	8.52	1	21.7
32SB-DW02-0506	1004278-02	_006	BENZO(A)PYRENE	1.7	U	1.7	1.7	U	N	UG/KG	1.7 U		6.38	1	21.7
32SB-DW02-0506	1004278-02	_006	BENZO(B)FLUORANTHE	1.7	U	1.7	1.7	U	N	UG/KG	1.7 U		8.52	1	21.7
32SB-DW02-0506	1004278-02	_006	BENZO(K)FLUORANTHE	1.7	U	1.7	1.7	U	N	UG/KG	1.7 U		8.52	1	21.7
32SB-DW02-0506	1004278-02	_006	CHRYSENE	1.7	U	1.7	1.7	UJ	N	UG/KG	1.7 UJ	C	8.52	1	21.7
32SB-DW02-0506	1004278-02	_006	DIBENZ(A,H)ANTHRACE	1.7	U	1.7	1.7	UJ	N	UG/KG	1.7 UJ	C	6.38	1	21.7
32SB-DW02-0506	1004278-02	_006	INDENO(1,2,3-CD)PYRE	1.7	U	1.7	1.7	UJ	N	UG/KG	1.7 UJ	C	8.52	1	21.7
32SB-DW02-0506	1004278-02	_006	NAPHTHALENE	1.7	U	1.7	1.7	U	N	UG/KG	1.7 U		6.38	1	21.7
32SS-DW03-0002	1004278-03	_006	BENZO(A)ANTHRACENE	1.69	U	1.69	1.69	UJ	N	UG/KG	1.69 UJ	C	8.47	1	21.2
32SS-DW03-0002	1004278-03	_006	BENZO(A)PYRENE	1.69	U	1.69	1.69	U	N	UG/KG	1.69 U		6.35	1	21.2
32SS-DW03-0002	1004278-03	_006	BENZO(B)FLUORANTHE	1.69	U	1.69	1.69	U	N	UG/KG	1.69 U		8.47	1	21.2
32SS-DW03-0002	1004278-03	_006	BENZO(K)FLUORANTHE	1.69	U	1.69	1.69	U	N	UG/KG	1.69 U		8.47	1	21.2
32SS-DW03-0002	1004278-03	_006	CHRYSENE	1.69	U	1.69	1.69	UJ	N	UG/KG	1.69 UJ	C	8.47	1	21.2
32SS-DW03-0002	1004278-03	_006	DIBENZ(A,H)ANTHRACE	1.69	U	1.69	1.69	UJ	N	UG/KG	1.69 UJ	C	6.35	1	21.2
32SS-DW03-0002	1004278-03	_006	INDENO(1,2,3-CD)PYRE	1.69	U	1.69	1.69	UJ	N	UG/KG	1.69 UJ	C	8.47	1	21.2
32SS-DW03-0002	1004278-03	_006	NAPHTHALENE	1.69	U	1.69	1.69	U	N	UG/KG	1.69 U		6.35	1	21.2
32SB-DW03-0304	1004278-04	_006	BENZENE	0.503	U	0.503	0.503	U	N	UG/KG	0.503 U		5	1	17.3
32SB-DW03-0304	1004278-04	_006	ETHYLBENZENE	0.803	U	0.803	0.803	U	N	UG/KG	0.803 U		10.7	1	17.3
32SB-DW03-0304	1004278-04	_006	TOLUENE	0.92	U	0.92	0.92	U	N	UG/KG	0.92 U		10.7	1	17.3
32SB-DW03-0304	1004278-04	_006	XYLENE(TOTAL)	0.749	U	0.749	0.749	U	N	UG/KG	0.749 U		10.7	1	17.3
32SB-DW03-0304	1004278-04	_006	BENZO(A)ANTHRACENE	1.61	U	1.61	1.61	UJ	N	UG/KG	1.61 UJ	C	8.07	1	17.3
32SB-DW03-0304	1004278-04	_006	BENZO(A)PYRENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61 U		6.05	1	17.3
32SB-DW03-0304	1004278-04	_006	BENZO(B)FLUORANTHE	1.61	U	1.61	1.61	U	N	UG/KG	1.61 U		8.07	1	17.3
32SB-DW03-0304	1004278-04	_006	BENZO(K)FLUORANTHE	1.61	U	1.61	1.61	U	N	UG/KG	1.61 U		8.07	1	17.3
32SB-DW03-0304	1004278-04	_006	CHRYSENE	1.61	U	1.61	1.61	UJ	N	UG/KG	1.61 UJ	C	8.07	1	17.3
32SB-DW03-0304	1004278-04	_006	DIBENZ(A,H)ANTHRACE	1.61	U	1.61	1.61	UJ	N	UG/KG	1.61 UJ	C	6.05	1	17.3
32SB-DW03-0304	1004278-04	_006	INDENO(1,2,3-CD)PYRE	1.61	U	1.61	1.61	UJ	N	UG/KG	1.61 UJ	C	8.07	1	17.3
32SB-DW03-0304	1004278-04	_006	NAPHTHALENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61 U		6.05	1	17.3
32SB-ST01-0203	1004278-05	_006	BENZENE	0.482	U	0.482	0.482	U	N	UG/KG	0.482 U		5	1	16.9
32SB-ST01-0203	1004278-05	_006	ETHYLBENZENE	0.77	U	0.77	0.77	U	N	UG/KG	0.77 U		10.3	1	16.9
32SB-ST01-0203	1004278-05	_006	TOLUENE	0.883	U	0.883	0.883	U	N	UG/KG	0.883 U		10.3	1	16.9
32SB-ST01-0203	1004278-05	_006	XYLENE(TOTAL)	0.718	U	0.718	0.718	U	N	UG/KG	0.718 U		10.3	1	16.9
32SB-ST01-0203	1004278-05	_006	BENZO(A)ANTHRACENE	1.6	U	1.6	1.6	UJ	N	UG/KG	1.6 UJ	C	8.02	1	16.9
32SB-ST01-0203	1004278-05	_006	BENZO(A)PYRENE	1.6	U	1.6	1.6	U	N	UG/KG	1.6 U		6.01	1	16.9
32SB-ST01-0203	1004278-05	_006	BENZO(B)FLUORANTHE	1.6	U	1.6	1.6	U	N	UG/KG	1.6 U		8.02	1	16.9
32SB-ST01-0203	1004278-05	_006	BENZO(K)FLUORANTHE	1.6	U	1.6	1.6	U	N	UG/KG	1.6 U		8.02	1	16.9
32SB-ST01-0203	1004278-05	_006	CHRYSENE	1.6	U	1.6	1.6	UJ	N	UG/KG	1.6 UJ	C	8.02	1	16.9
32SB-ST01-0203	1004278-05	_006	DIBENZ(A,H)ANTHRACE	1.6	U	1.6	1.6	UJ	N	UG/KG	1.6 UJ	C	6.01	1	16.9
32SB-ST01-0203	1004278-05	_006	INDENO(1,2,3-CD)PYRE	1.6	U	1.6	1.6	UJ	N	UG/KG	1.6 UJ	C	8.02	1	16.9
32SB-ST01-0203	1004278-05	_006	NAPHTHALENE	1.6	U	1.6	1.6	U	N	UG/KG	1.6 U		6.01	1	16.9
TB_7852	1004278-06	_006	BENZENE	0.14	U	0.14	0.14	U	N	UG/L	0.14 U		1	1	100
TB_7852	1004278-06	_006	ETHYLBENZENE	0.15	U	0.15	0.15	U	N	UG/L	0.15 U		1	1	100
TB_7852	1004278-06	_006	TOLUENE	0.19	U	0.19	0.19	U	N	UG/L	0.19 U		1	1	100
TB_7852	1004278-06	_006	XYLENE(TOTAL)	0.22	U	0.22	0.22	U	N	UG/L	0.22 U		1	1	100
32SS-50-0002-D	1004294-01	_007	BENZO(A)ANTHRACENE	74.5	U	74.5	74.5	UJ	N	UG/KG	74.5 UJ	H	373	50	10.7
32SS-50-0002-D	1004294-01	_007	BENZO(A)PYRENE	74.5	U	74.5	74.5	UJ	N	UG/KG	74.5 UJ	H	280	50	10.7
32SS-50-0002-D	1004294-01	_007	BENZO(B)FLUORANTHE	74.5	U	74.5	74.5	UJ	N	UG/KG	74.5 UJ	H	373	50	10.7
32SS-50-0002-D	1004294-01	_007	BENZO(K)FLUORANTHE	74.5	U	74.5	74.5	UJ	N	UG/KG	74.5 UJ	H	373	50	10.7

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SS-50-0002-D	1004294-01	_007	CHRYSENE	74.5	U	74.5	74.5	UJ	N	UG/KG	74.5	UJ	H	373	50	10.7
32SS-50-0002-D	1004294-01	_007	DIBENZ(A,H)ANTHRACE	74.5	U	74.5	74.5	UJ	N	UG/KG	74.5	UJ	H	280	50	10.7
32SS-50-0002-D	1004294-01	_007	INDENO(1,2,3-CD)PYRE	74.5	U	74.5	74.5	UJ	N	UG/KG	74.5	UJ	H	373	50	10.7
32SS-50-0002-D	1004294-01	_007	NAPHTHALENE	74.5	U	74.5	74.5	UJ	N	UG/KG	74.5	UJ	H	280	50	10.7
32SB-50-0607-D	1004294-02	_007	BENZENE	23.7	U	23.7	23.7	UJ	N	UG/KG	23.7	UJ	H	202	1	12.1
32SB-50-0607-D	1004294-02	_007	ETHYLBENZENE	37.8	U	37.8	37.8	UJ	N	UG/KG	37.8	UJ	H	504	1	12.1
32SB-50-0607-D	1004294-02	_007	TOLUENE	43.4	U	43.4	43.4	UJ	N	UG/KG	43.4	UJ	H	504	1	12.1
32SB-50-0607-D	1004294-02	_007	XYLENE(TOTAL)	289	JD	289	289	J	Y	UG/KG	289	J	HP	504	1	12.1
32SB-50-0607-D	1004294-02	_007	BENZO(A)ANTHRACENE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H	7.59	1	12.1
32SB-50-0607-D	1004294-02	_007	BENZO(A)PYRENE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H	5.69	1	12.1
32SB-50-0607-D	1004294-02	_007	BENZO(B)FLUORANTHE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H	7.59	1	12.1
32SB-50-0607-D	1004294-02	_007	BENZO(K)FLUORANTHE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H	7.59	1	12.1
32SB-50-0607-D	1004294-02	_007	CHRYSENE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	CH	7.59	1	12.1
32SB-50-0607-D	1004294-02	_007	DIBENZ(A,H)ANTHRACE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H	5.69	1	12.1
32SB-50-0607-D	1004294-02	_007	INDENO(1,2,3-CD)PYRE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	H	7.59	1	12.1
32SB-50-0607-D	1004294-02	_007	NAPHTHALENE	1.51	U	1.51	1.51	UJ	N	UG/KG	1.51	UJ	GH	5.69	1	12.1
32SS-43-0002	1004294-03	_007	BENZO(A)ANTHRACENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U		8.15	1	18.1
32SS-43-0002	1004294-03	_007	BENZO(A)PYRENE	13.6		13.6	13.6		Y	UG/KG	13.6			6.11	1	18.1
32SS-43-0002	1004294-03	_007	BENZO(B)FLUORANTHE	13.8		13.8	13.8		Y	UG/KG	13.8			8.15	1	18.1
32SS-43-0002	1004294-03	_007	BENZO(K)FLUORANTHE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U		8.15	1	18.1
32SS-43-0002	1004294-03	_007	CHRYSENE	1.62	U	1.62	1.62	UJ	N	UG/KG	1.62	UJ	C	8.15	1	18.1
32SS-43-0002	1004294-03	_007	DIBENZ(A,H)ANTHRACE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U		6.11	1	18.1
32SS-43-0002	1004294-03	_007	INDENO(1,2,3-CD)PYRE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U		8.15	1	18.1
32SS-43-0002	1004294-03	_007	NAPHTHALENE	1.62	U	1.62	1.62	U	N	UG/KG	1.62	U		6.11	1	18.1
32SB-43-0506	1004294-04	_007	BENZENE	23.2	U	23.2	23.2	UJ	N	UG/KG	23.2	UJ	H	197	1	16.7
32SB-43-0506	1004294-04	_007	ETHYLBENZENE	37	U	37	37	UJ	N	UG/KG	37	UJ	H	494	1	16.7
32SB-43-0506	1004294-04	_007	TOLUENE	42.4	U	42.4	42.4	UJ	N	UG/KG	42.4	UJ	H	494	1	16.7
32SB-43-0506	1004294-04	_007	XYLENE(TOTAL)	34.5	U	34.5	34.5	UJ	N	UG/KG	34.5	UJ	H	494	1	16.7
32SB-43-0506	1004294-04	_007	BENZO(A)ANTHRACENE	1.6	U	1.6	1.6	U	N	UG/KG	1.6	U		8.01	1	16.7
32SB-43-0506	1004294-04	_007	BENZO(A)PYRENE	1.6	U	1.6	1.6	U	N	UG/KG	1.6	U		6	1	16.7
32SB-43-0506	1004294-04	_007	BENZO(B)FLUORANTHE	1.6	U	1.6	1.6	U	N	UG/KG	1.6	U		8.01	1	16.7
32SB-43-0506	1004294-04	_007	BENZO(K)FLUORANTHE	1.6	U	1.6	1.6	U	N	UG/KG	1.6	U		8.01	1	16.7
32SB-43-0506	1004294-04	_007	CHRYSENE	1.6	U	1.6	1.6	UJ	N	UG/KG	1.6	UJ	C	8.01	1	16.7
32SB-43-0506	1004294-04	_007	DIBENZ(A,H)ANTHRACE	1.6	U	1.6	1.6	U	N	UG/KG	1.6	U		6	1	16.7
32SB-43-0506	1004294-04	_007	INDENO(1,2,3-CD)PYRE	1.6	U	1.6	1.6	U	N	UG/KG	1.6	U		8.01	1	16.7
32SB-43-0506	1004294-04	_007	NAPHTHALENE	1.6	U	1.6	1.6	U	N	UG/KG	1.6	U		6	1	16.7
32SS-44-0002	1004294-05	_007	BENZO(A)ANTHRACENE	63.5		63.5	63.5		Y	UG/KG	63.5			7.92	1	15.8
32SS-44-0002	1004294-05	_007	BENZO(A)PYRENE	15.3		15.3	15.3		Y	UG/KG	15.3			5.94	1	15.8
32SS-44-0002	1004294-05	_007	BENZO(B)FLUORANTHE	16.8		16.8	16.8		Y	UG/KG	16.8			7.92	1	15.8
32SS-44-0002	1004294-05	_007	BENZO(K)FLUORANTHE	1.58	U	1.58	1.58	U	N	UG/KG	1.58	U		7.92	1	15.8
32SS-44-0002	1004294-05	_007	CHRYSENE	16.6		16.6	16.6	J	Y	UG/KG	16.6	J	C	7.92	1	15.8
32SS-44-0002	1004294-05	_007	DIBENZ(A,H)ANTHRACE	1.58	U	1.58	1.58	U	N	UG/KG	1.58	U		5.94	1	15.8
32SS-44-0002	1004294-05	_007	INDENO(1,2,3-CD)PYRE	1.58	U	1.58	1.58	U	N	UG/KG	1.58	U		7.92	1	15.8
32SS-44-0002	1004294-05	_007	NAPHTHALENE	1.58	U	1.58	1.58	U	N	UG/KG	1.58	U		5.94	1	15.8
32SB-44-0506	1004294-06	_007	BENZENE	25.3	U	25.3	25.3	UJ	N	UG/KG	25.3	UJ	HN	215	1	18.6
32SB-44-0506	1004294-06	_007	ETHYLBENZENE	40.3	U	40.3	40.3	UJ	N	UG/KG	40.3	UJ	HN	538	1	18.6
32SB-44-0506	1004294-06	_007	TOLUENE	46.2	U	46.2	46.2	UJ	N	UG/KG	46.2	UJ	HN	538	1	18.6
32SB-44-0506	1004294-06	_007	XYLENE(TOTAL)	91.2	JD	91.2	91.2	J	Y	UG/KG	91.2	J	HNPI	538	1	18.6
32SB-44-0506	1004294-06	_007	BENZO(A)ANTHRACENE	1.63	U	1.63	1.63	U	N	UG/KG	1.63	U		8.19	1	18.6
32SB-44-0506	1004294-06	_007	BENZO(A)PYRENE	1.63	U	1.63	1.63	U	N	UG/KG	1.63	U		6.14	1	18.6
32SB-44-0506	1004294-06	_007	BENZO(B)FLUORANTHE	1.63	U	1.63	1.63	U	N	UG/KG	1.63	U		8.19	1	18.6
32SB-44-0506	1004294-06	_007	BENZO(K)FLUORANTHE	1.63	U	1.63	1.63	U	N	UG/KG	1.63	U		8.19	1	18.6
32SB-44-0506	1004294-06	_007	CHRYSENE	1.63	U	1.63	1.63	UJ	N	UG/KG	1.63	UJ	C	8.19	1	18.6
32SB-44-0506	1004294-06	_007	DIBENZ(A,H)ANTHRACE	1.63	U	1.63	1.63	U	N	UG/KG	1.63	U		6.14	1	18.6
32SB-44-0506	1004294-06	_007	INDENO(1,2,3-CD)PYRE	1.63	U	1.63	1.63	U	N	UG/KG	1.63	U		8.19	1	18.6
32SB-44-0506	1004294-06	_007	NAPHTHALENE	1.63	U	1.63	1.63	U	N	UG/KG	1.63	U		6.14	1	18.6
32SS-45-0002	1004294-07	_007	BENZO(A)ANTHRACENE	78.2		78.2	78.2		Y	UG/KG	78.2			8.25	1	19.2
32SS-45-0002	1004294-07	_007	BENZO(A)PYRENE	25.9		25.9	25.9		Y	UG/KG	25.9			6.19	1	19.2
32SS-45-0002	1004294-07	_007	BENZO(B)FLUORANTHE	24.8		24.8	24.8		Y	UG/KG	24.8			8.25	1	19.2
32SS-45-0002	1004294-07	_007	BENZO(K)FLUORANTHE	1.65	U	1.65	1.65	U	N	UG/KG	1.65	U		8.25	1	19.2
32SS-45-0002	1004294-07	_007	CHRYSENE	57.4		57.4	57.4	J	Y	UG/KG	57.4	J	C	8.25	1	19.2
32SS-45-0002	1004294-07	_007	DIBENZ(A,H)ANTHRACE	1.65	U	1.65	1.65	U	N	UG/KG	1.65	U		6.19	1	19.2
32SS-45-0002	1004294-07	_007	INDENO(1,2,3-CD)PYRE	1.65	U	1.65	1.65	U	N	UG/KG	1.65	U		8.25	1	19.2
32SS-45-0002	1004294-07	_007	NAPHTHALENE	1.65	U	1.65	1.65	U	N	UG/KG	1.65	U		6.19	1	19.2

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SB-45-0607	1004294-08	_007	BENZENE	46.9	JD	46.9	46.9	J	Y	UG/KG	46.9	J	HPR	218	1	17.5
32SB-45-0607	1004294-08	_007	ETHYLBENZENE	304	JD	304	304	J	Y	UG/KG	304	J	HPR	545	1	17.5
32SB-45-0607	1004294-08	_007	TOLUENE	46.8	U	46.8	46.8	UJ	N	UG/KG	46.8	UJ	H	545	1	17.5
32SB-45-0607	1004294-08	_007	XYLENE(TOTAL)	1200	D	1200	1200	J	Y	UG/KG	1200	J	HR	545	1	17.5
32SB-45-0607	1004294-08	_007	BENZO(A)ANTHRACENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U		8.08	1	17.5
32SB-45-0607	1004294-08	_007	BENZO(A)PYRENE	21.3		21.3	21.3		Y	UG/KG	21.3			6.06	1	17.5
32SB-45-0607	1004294-08	_007	BENZO(B)FLUORANTHE	22.2		22.2	22.2		Y	UG/KG	22.2			8.08	1	17.5
32SB-45-0607	1004294-08	_007	BENZO(K)FLUORANTHE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U		8.08	1	17.5
32SB-45-0607	1004294-08	_007	CHRYSENE	1.61	U	1.61	1.61	UJ	N	UG/KG	1.61	UJ	C	8.08	1	17.5
32SB-45-0607	1004294-08	_007	DIBENZ(A,H)ANTHRACE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U		6.06	1	17.5
32SB-45-0607	1004294-08	_007	INDENO(1,2,3-CD)PYRE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U		8.08	1	17.5
32SB-45-0607	1004294-08	_007	NAPHTHALENE	1.61	U	1.61	1.61	U	N	UG/KG	1.61	U		6.06	1	17.5
32SS-46-0002	1004294-09	_007	BENZO(A)ANTHRACENE	7.62	U	7.62	7.62	U	N	UG/KG	7.62	U		38.2	5	12.7
32SS-46-0002	1004294-09	_007	BENZO(A)PYRENE	7.62	U	7.62	7.62	U	N	UG/KG	7.62	U		28.6	5	12.7
32SS-46-0002	1004294-09	_007	BENZO(B)FLUORANTHE	7.62	U	7.62	7.62	U	N	UG/KG	7.62	U		38.2	5	12.7
32SS-46-0002	1004294-09	_007	BENZO(K)FLUORANTHE	7.62	U	7.62	7.62	U	N	UG/KG	7.62	U		38.2	5	12.7
32SS-46-0002	1004294-09	_007	CHRYSENE	7.62	U	7.62	7.62	U	N	UG/KG	7.62	U		38.2	5	12.7
32SS-46-0002	1004294-09	_007	DIBENZ(A,H)ANTHRACE	7.62	U	7.62	7.62	UJ	N	UG/KG	7.62	UJ	C	28.6	5	12.7
32SS-46-0002	1004294-09	_007	INDENO(1,2,3-CD)PYRE	7.62	U	7.62	7.62	U	N	UG/KG	7.62	U		38.2	5	12.7
32SS-46-0002	1004294-09	_007	NAPHTHALENE	31.4	D	31.4	31.4		Y	UG/KG	31.4			28.6	5	12.7
32SB-46-0304	1004294-10	_007	BENZENE	23.7	U	23.7	23.7	UJ	N	UG/KG	23.7	UJ	H	201	1	12.6
32SB-46-0304	1004294-10	_007	ETHYLBENZENE	37.8	U	37.8	37.8	UJ	N	UG/KG	37.8	UJ	H	504	1	12.6
32SB-46-0304	1004294-10	_007	TOLUENE	43.3	U	43.3	43.3	UJ	N	UG/KG	43.3	UJ	H	504	1	12.6
32SB-46-0304	1004294-10	_007	XYLENE(TOTAL)	35.3	U	35.3	35.3	UJ	N	UG/KG	35.3	UJ	H	504	1	12.6
32SB-46-0304	1004294-10	_007	BENZO(A)ANTHRACENE	7.61	U	7.61	7.61	U	N	UG/KG	7.61	U		38.2	5	12.6
32SB-46-0304	1004294-10	_007	BENZO(A)PYRENE	7.61	U	7.61	7.61	U	N	UG/KG	7.61	U		28.6	5	12.6
32SB-46-0304	1004294-10	_007	BENZO(B)FLUORANTHE	7.61	U	7.61	7.61	U	N	UG/KG	7.61	U		38.2	5	12.6
32SB-46-0304	1004294-10	_007	BENZO(K)FLUORANTHE	7.61	U	7.61	7.61	U	N	UG/KG	7.61	U		38.2	5	12.6
32SB-46-0304	1004294-10	_007	CHRYSENE	7.61	U	7.61	7.61	U	N	UG/KG	7.61	U		38.2	5	12.6
32SB-46-0304	1004294-10	_007	DIBENZ(A,H)ANTHRACE	7.61	U	7.61	7.61	UJ	N	UG/KG	7.61	UJ	C	28.6	5	12.6
32SB-46-0304	1004294-10	_007	INDENO(1,2,3-CD)PYRE	7.61	U	7.61	7.61	U	N	UG/KG	7.61	U		38.2	5	12.6
32SB-46-0304	1004294-10	_007	NAPHTHALENE	7.61	U	7.61	7.61	U	N	UG/KG	7.61	U		28.6	5	12.6
32SS-47-0002	1004294-11	_007	BENZO(A)ANTHRACENE	1.54	U	1.54	1.54	U	N	UG/KG	1.54	U		7.7	1	13.4
32SS-47-0002	1004294-11	_007	BENZO(A)PYRENE	1.54	U	1.54	1.54	U	N	UG/KG	1.54	U		5.77	1	13.4
32SS-47-0002	1004294-11	_007	BENZO(B)FLUORANTHE	1.54	U	1.54	1.54	U	N	UG/KG	1.54	U		7.7	1	13.4
32SS-47-0002	1004294-11	_007	BENZO(K)FLUORANTHE	1.54	U	1.54	1.54	U	N	UG/KG	1.54	U		7.7	1	13.4
32SS-47-0002	1004294-11	_007	CHRYSENE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	C	7.7	1	13.4
32SS-47-0002	1004294-11	_007	DIBENZ(A,H)ANTHRACE	1.54	U	1.54	1.54	U	N	UG/KG	1.54	U		5.77	1	13.4
32SS-47-0002	1004294-11	_007	INDENO(1,2,3-CD)PYRE	1.54	U	1.54	1.54	U	N	UG/KG	1.54	U		7.7	1	13.4
32SS-47-0002	1004294-11	_007	NAPHTHALENE	6		6	6		Y	UG/KG	6			5.77	1	13.4
32SB-47-0506	1004294-12	_007	BENZENE	22.5	U	22.5	22.5	UJ	N	UG/KG	22.5	UJ	H	191	1	15.1
32SB-47-0506	1004294-12	_007	ETHYLBENZENE	35.9	U	35.9	35.9	UJ	N	UG/KG	35.9	UJ	H	479	1	15.1
32SB-47-0506	1004294-12	_007	TOLUENE	41.2	U	41.2	41.2	UJ	N	UG/KG	41.2	UJ	H	479	1	15.1
32SB-47-0506	1004294-12	_007	XYLENE(TOTAL)	77	JD	77	77	J	Y	UG/KG	77	J	HP	479	1	15.1
32SB-47-0506	1004294-12	_007	BENZO(A)ANTHRACENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U		7.85	1	15.1
32SB-47-0506	1004294-12	_007	BENZO(A)PYRENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U		5.89	1	15.1
32SB-47-0506	1004294-12	_007	BENZO(B)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U		7.85	1	15.1
32SB-47-0506	1004294-12	_007	BENZO(K)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U		7.85	1	15.1
32SB-47-0506	1004294-12	_007	CHRYSENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	C	7.85	1	15.1
32SB-47-0506	1004294-12	_007	DIBENZ(A,H)ANTHRACE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U		5.89	1	15.1
32SB-47-0506	1004294-12	_007	INDENO(1,2,3-CD)PYRE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U		7.85	1	15.1
32SB-47-0506	1004294-12	_007	NAPHTHALENE	103		103	103		Y	UG/KG	103			5.89	1	15.1
32SS-48-0002	1004294-13	_007	BENZO(A)ANTHRACENE	1.44	U	1.44	1.44	U	N	UG/KG	1.44	U		7.21	1	7.5
32SS-48-0002	1004294-13	_007	BENZO(A)PYRENE	1.44	U	1.44	1.44	U	N	UG/KG	1.44	U		5.4	1	7.5
32SS-48-0002	1004294-13	_007	BENZO(B)FLUORANTHE	1.44	U	1.44	1.44	U	N	UG/KG	1.44	U		7.21	1	7.5
32SS-48-0002	1004294-13	_007	BENZO(K)FLUORANTHE	1.44	U	1.44	1.44	U	N	UG/KG	1.44	U		7.21	1	7.5
32SS-48-0002	1004294-13	_007	CHRYSENE	1.44	U	1.44	1.44	UJ	N	UG/KG	1.44	UJ	C	7.21	1	7.5
32SS-48-0002	1004294-13	_007	DIBENZ(A,H)ANTHRACE	1.44	U	1.44	1.44	U	N	UG/KG	1.44	U		5.4	1	7.5
32SS-48-0002	1004294-13	_007	INDENO(1,2,3-CD)PYRE	1.44	U	1.44	1.44	U	N	UG/KG	1.44	U		7.21	1	7.5
32SS-48-0002	1004294-13	_007	NAPHTHALENE	1.44	U	1.44	1.44	U	N	UG/KG	1.44	U		5.4	1	7.5
32SB-48-0405	1004294-14	_007	BENZENE	21.4	U	21.4	21.4	UJ	N	UG/KG	21.4	UJ	H	182	1	13.8
32SB-48-0405	1004294-14	_007	ETHYLBENZENE	34.2	U	34.2	34.2	UJ	N	UG/KG	34.2	UJ	H	456	1	13.8
32SB-48-0405	1004294-14	_007	TOLUENE	39.2	U	39.2	39.2	UJ	N	UG/KG	39.2	UJ	H	456	1	13.8
32SB-48-0405	1004294-14	_007	XYLENE(TOTAL)	31.9	U	31.9	31.9	UJ	N	UG/KG	31.9	UJ	H	456	1	13.8

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SB-48-0405	1004294-14	_007	BENZO(A)ANTHRACENE	1.54	U	1.54	1.54	U	N	UG/KG	1.54	U	7.73	1	13.8
32SB-48-0405	1004294-14	_007	BENZO(A)PYRENE	1.54	U	1.54	1.54	U	N	UG/KG	1.54	U	5.8	1	13.8
32SB-48-0405	1004294-14	_007	BENZO(B)FLUORANTHE	1.54	U	1.54	1.54	U	N	UG/KG	1.54	U	7.73	1	13.8
32SB-48-0405	1004294-14	_007	BENZO(K)FLUORANTHE	1.54	U	1.54	1.54	U	N	UG/KG	1.54	U	7.73	1	13.8
32SB-48-0405	1004294-14	_007	CHRYSENE	1.54	U	1.54	1.54	UJ	N	UG/KG	1.54	UJ	C	7.73	1	13.8
32SB-48-0405	1004294-14	_007	DIBENZ(A,H)ANTHRACE	1.54	U	1.54	1.54	U	N	UG/KG	1.54	U	5.8	1	13.8
32SB-48-0405	1004294-14	_007	INDENO(1,2,3-CD)PYRE	1.54	U	1.54	1.54	U	N	UG/KG	1.54	U	7.73	1	13.8
32SB-48-0405	1004294-14	_007	NAPHTHALENE	1.54	U	1.54	1.54	U	N	UG/KG	1.54	U	5.8	1	13.8
32SS-49-0002	1004294-15	_007	BENZO(A)ANTHRACENE	61.5		61.5	61.5		Y	UG/KG	61.5		7.42	1	10.1
32SS-49-0002	1004294-15	_007	BENZO(A)PYRENE	1.48	U	1.48	1.48	U	N	UG/KG	1.48	U	5.56	1	10.1
32SS-49-0002	1004294-15	_007	BENZO(B)FLUORANTHE	1.48	U	1.48	1.48	U	N	UG/KG	1.48	U	7.42	1	10.1
32SS-49-0002	1004294-15	_007	BENZO(K)FLUORANTHE	1.48	U	1.48	1.48	U	N	UG/KG	1.48	U	7.42	1	10.1
32SS-49-0002	1004294-15	_007	CHRYSENE	18.9		18.9	18.9	J	Y	UG/KG	18.9	J	C	7.42	1	10.1
32SS-49-0002	1004294-15	_007	DIBENZ(A,H)ANTHRACE	1.48	U	1.48	1.48	U	N	UG/KG	1.48	U	5.56	1	10.1
32SS-49-0002	1004294-15	_007	INDENO(1,2,3-CD)PYRE	1.48	U	1.48	1.48	U	N	UG/KG	1.48	U	7.42	1	10.1
32SS-49-0002	1004294-15	_007	NAPHTHALENE	273		273	273		Y	UG/KG	273		5.56	1	10.1
32SB-49-0405	1004294-16	_007	BENZENE	327	D	327	327	J	Y	UG/KG	327	J	H	210	1	16.8
32SB-49-0405	1004294-16	_007	ETHYLBENZENE	114	JD	114	114	J	Y	UG/KG	114	J	HP	525	1	16.8
32SB-49-0405	1004294-16	_007	TOLUENE	64.4	JD	64.4	64.4	J	Y	UG/KG	64.4	J	HP	525	1	16.8
32SB-49-0405	1004294-16	_007	XYLENE(TOTAL)	608	D	608	608	J	Y	UG/KG	608	J	H	525	1	16.8
32SB-49-0405	1004294-16	_007	BENZO(A)ANTHRACENE	1.6	U	1.6	1.6	U	N	UG/KG	1.6	U	8.02	1	16.8
32SB-49-0405	1004294-16	_007	BENZO(A)PYRENE	1.6	U	1.6	1.6	U	N	UG/KG	1.6	U	6.01	1	16.8
32SB-49-0405	1004294-16	_007	BENZO(B)FLUORANTHE	1.6	U	1.6	1.6	U	N	UG/KG	1.6	U	8.02	1	16.8
32SB-49-0405	1004294-16	_007	BENZO(K)FLUORANTHE	1.6	U	1.6	1.6	U	N	UG/KG	1.6	U	8.02	1	16.8
32SB-49-0405	1004294-16	_007	CHRYSENE	1.6	U	1.6	1.6	UJ	N	UG/KG	1.6	UJ	C	8.02	1	16.8
32SB-49-0405	1004294-16	_007	DIBENZ(A,H)ANTHRACE	1.6	U	1.6	1.6	U	N	UG/KG	1.6	U	6.01	1	16.8
32SB-49-0405	1004294-16	_007	INDENO(1,2,3-CD)PYRE	1.6	U	1.6	1.6	U	N	UG/KG	1.6	U	8.02	1	16.8
32SB-49-0405	1004294-16	_007	NAPHTHALENE	1.6	U	1.6	1.6	U	N	UG/KG	1.6	U	6.01	1	16.8
32SS-50-0002	1004294-17	_007	BENZO(A)ANTHRACENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.87	1	15.2
32SS-50-0002-AVG	1004294-17	_007	BENZO(A)ANTHRACENE	1.57	U	38.035	38.035	UJ	N	UG/KG	38.035	UJ	7.87	1	15.2
32SS-50-0002	1004294-17	_007	BENZO(A)PYRENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	5.9	1	15.2
32SS-50-0002-AVG	1004294-17	_007	BENZO(A)PYRENE	1.57	U	38.035	38.035	UJ	N	UG/KG	38.035	UJ	5.9	1	15.2
32SS-50-0002	1004294-17	_007	BENZO(B)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.87	1	15.2
32SS-50-0002-AVG	1004294-17	_007	BENZO(B)FLUORANTHE	1.57	U	38.035	38.035	UJ	N	UG/KG	38.035	UJ	7.87	1	15.2
32SS-50-0002	1004294-17	_007	BENZO(K)FLUORANTHE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.87	1	15.2
32SS-50-0002-AVG	1004294-17	_007	BENZO(K)FLUORANTHE	1.57	U	38.035	38.035	UJ	N	UG/KG	38.035	UJ	7.87	1	15.2
32SS-50-0002	1004294-17	_007	CHRYSENE	1.57	U	1.57	1.57	UJ	N	UG/KG	1.57	UJ	C	7.87	1	15.2
32SS-50-0002-AVG	1004294-17	_007	CHRYSENE	1.57	U	38.035	38.035	UJ	N	UG/KG	38.035	UJ	7.87	1	15.2
32SS-50-0002	1004294-17	_007	DIBENZ(A,H)ANTHRACE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	5.9	1	15.2
32SS-50-0002-AVG	1004294-17	_007	DIBENZ(A,H)ANTHRACE	1.57	U	38.035	38.035	UJ	N	UG/KG	38.035	UJ	5.9	1	15.2
32SS-50-0002	1004294-17	_007	INDENO(1,2,3-CD)PYRE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	7.87	1	15.2
32SS-50-0002-AVG	1004294-17	_007	INDENO(1,2,3-CD)PYRE	1.57	U	38.035	38.035	UJ	N	UG/KG	38.035	UJ	7.87	1	15.2
32SS-50-0002	1004294-17	_007	NAPHTHALENE	1.57	U	1.57	1.57	U	N	UG/KG	1.57	U	5.9	1	15.2
32SS-50-0002-AVG	1004294-17	_007	NAPHTHALENE	1.57	U	38.035	38.035	UJ	N	UG/KG	38.035	UJ	5.9	1	15.2
32SB-50-0607	1004294-18	_007	BENZENE	27.4	U	27.4	27.4	UJ	N	UG/KG	27.4	UJ	H	233	1	8.4
32SB-50-0607-AVG	1004294-18	_007	BENZENE	27.4	U	25.55	25.55	UJ	N	UG/KG	25.55	UJ		233	1	8.4
32SB-50-0607	1004294-18	_007	ETHYLBENZENE	87.5	JD	87.5	87.5	J	Y	UG/KG	87.5	J	HPR	583	1	8.4
32SB-50-0607-AVG	1004294-18	_007	ETHYLBENZENE	87.5	JD	53.2	53.2	J	Y	UG/KG	53.2	J		583	1	8.4
32SB-50-0607	1004294-18	_007	TOLUENE	50.1	U	50.1	50.1	UJ	N	UG/KG	50.1	UJ	H	583	1	8.4
32SB-50-0607-AVG	1004294-18	_007	TOLUENE	50.1	U	46.75	46.75	UJ	N	UG/KG	46.75	UJ		583	1	8.4
32SB-50-0607	1004294-18	_007	XYLENE(TOTAL)	803	D	803	803	J	Y	UG/KG	803	J	HP	583	1	8.4
32SB-50-0607-AVG	1004294-18	_007	XYLENE(TOTAL)	803	D	546	546	J	Y	UG/KG	546	J		583	1	8.4
32SB-50-0607	1004294-18	_007	BENZO(A)ANTHRACENE	14.5	U	14.5	14.5	UJ	N	UG/KG	14.5	UJ	N	72.8	10	8.4
32SB-50-0607-AVG	1004294-18	_007	BENZO(A)ANTHRACENE	14.5	U	8.005	8.005	UJ	N	UG/KG	8.005	UJ		72.8	10	8.4
32SB-50-0607	1004294-18	_007	BENZO(A)PYRENE	14.5	U	14.5	14.5	U	N	UG/KG	14.5	U		54.6	10	8.4
32SB-50-0607-AVG	1004294-18	_007	BENZO(A)PYRENE	14.5	U	8.005	8.005	UJ	N	UG/KG	8.005	UJ		54.6	10	8.4
32SB-50-0607	1004294-18	_007	BENZO(B)FLUORANTHE	14.5	U	14.5	14.5	U	N	UG/KG	14.5	U		72.8	10	8.4
32SB-50-0607-AVG	1004294-18	_007	BENZO(B)FLUORANTHE	14.5	U	8.005	8.005	UJ	N	UG/KG	8.005	UJ		72.8	10	8.4
32SB-50-0607	1004294-18	_007	BENZO(K)FLUORANTHE	14.5	U	14.5	14.5	U	N	UG/KG	14.5	U		72.8	10	8.4
32SB-50-0607-AVG	1004294-18	_007	BENZO(K)FLUORANTHE	14.5	U	8.005	8.005	UJ	N	UG/KG	8.005	UJ		72.8	10	8.4
32SB-50-0607	1004294-18	_007	CHRYSENE	14.5	U	14.5	14.5	UJ	N	UG/KG	14.5	UJ	N	72.8	10	8.4
32SB-50-0607-AVG	1004294-18	_007	CHRYSENE	14.5	U	8.005	8.005	UJ	N	UG/KG	8.005	UJ		72.8	10	8.4
32SB-50-0607	1004294-18	_007	DIBENZ(A,H)ANTHRACE	14.5	U	14.5	14.5	U	N	UG/KG	14.5	U		54.6	10	8.4
32SB-50-0607-AVG	1004294-18	_007	DIBENZ(A,H)ANTHRACE	14.5	U	8.005	8.005	UJ	N	UG/KG	8.005	UJ		54.6	10	8.4

nsample	lab_id	sdg	lab_para	lab_resu	lab_val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SB-50-0607	1004294-18	_007	INDENO(1,2,3-CD)PYRE	14.5 U	14.5	14.5	U	N	UG/KG	14.5 U		72.8	10	8.4
32SB-50-0607-AVG	1004294-18	_007	INDENO(1,2,3-CD)PYRE	14.5 U	8.005	8.005	UJ	N	UG/KG	8.005 UJ		72.8	10	8.4
32SB-50-0607	1004294-18	_007	NAPHTHALENE	1360 D	1360	1360	J	Y	UG/KG	1360 J	GN	54.6	10	8.4
32SB-50-0607-AVG	1004294-18	_007	NAPHTHALENE	1360 D	680.38	680.378	J	Y	UG/KG	680.3775 J		54.6	10	8.4
32SS-51-0002	1004294-19	_007	BENZO(A)ANTHRACENE	1.56 U	1.56	1.56	U	N	UG/KG	1.56 U		7.83	1	14.8
32SS-51-0002	1004294-19	_007	BENZO(A)PYRENE	1.56 U	1.56	1.56	U	N	UG/KG	1.56 U		5.87	1	14.8
32SS-51-0002	1004294-19	_007	BENZO(B)FLUORANTHE	1.56 U	1.56	1.56	U	N	UG/KG	1.56 U		7.83	1	14.8
32SS-51-0002	1004294-19	_007	BENZO(K)FLUORANTHE	1.56 U	1.56	1.56	U	N	UG/KG	1.56 U		7.83	1	14.8
32SS-51-0002	1004294-19	_007	CHRYSENE	1.56 U	1.56	1.56	UJ	N	UG/KG	1.56 UJ	C	7.83	1	14.8
32SS-51-0002	1004294-19	_007	DIBENZ(A,H)ANTHRACE	1.56 U	1.56	1.56	U	N	UG/KG	1.56 U		5.87	1	14.8
32SS-51-0002	1004294-19	_007	INDENO(1,2,3-CD)PYRE	1.56 U	1.56	1.56	U	N	UG/KG	1.56 U		7.83	1	14.8
32SS-51-0002	1004294-19	_007	NAPHTHALENE	1.56 U	1.56	1.56	U	N	UG/KG	1.56 U		5.87	1	14.8
32SB-51-0708	1004294-20	_007	BENZO(A)ANTHRACENE	14.5 U	14.5	14.5	U	N	UG/KG	14.5 U		72.8	10	8.4
32SB-51-0708	1004294-20	_007	BENZO(A)PYRENE	14.5 U	14.5	14.5	U	N	UG/KG	14.5 U		54.6	10	8.4
32SB-51-0708	1004294-20	_007	BENZO(B)FLUORANTHE	14.5 U	14.5	14.5	U	N	UG/KG	14.5 U		72.8	10	8.4
32SB-51-0708	1004294-20	_007	BENZO(K)FLUORANTHE	14.5 U	14.5	14.5	U	N	UG/KG	14.5 U		72.8	10	8.4
32SB-51-0708	1004294-20	_007	CHRYSENE	14.5 U	14.5	14.5	U	N	UG/KG	14.5 U		72.8	10	8.4
32SB-51-0708	1004294-20	_007	DIBENZ(A,H)ANTHRACE	14.5 U	14.5	14.5	U	N	UG/KG	14.5 U		54.6	10	8.4
32SB-51-0708	1004294-20	_007	INDENO(1,2,3-CD)PYRE	14.5 U	14.5	14.5	U	N	UG/KG	14.5 U		72.8	10	8.4
32SB-51-0708	1004294-20	_007	NAPHTHALENE	1560 D	1560	1560		Y	UG/KG	1560		54.6	10	8.4
32SB-51-0708	1004294-20R	_007	BENZENE	0.488 U	0.488	0.488	UJ	N	UG/KG	0.488 UJ	H	5	1	8.4
32SB-51-0708	1004294-20R	_007	ETHYLBENZENE	0.778 U	0.778	0.778	UJ	N	UG/KG	0.778 UJ	H	10.4	1	8.4
32SB-51-0708	1004294-20R	_007	TOLUENE	0.893 U	0.893	0.893	UJ	N	UG/KG	0.893 UJ	H	10.4	1	8.4
32SB-51-0708	1004294-20R	_007	XYLENE(TOTAL)	0.726 U	0.726	0.726	UJ	N	UG/KG	0.726 UJ	H	10.4	1	8.4
32SB-51-1415	1004294-21	_007	BENZO(A)ANTHRACENE	3.77 J	3.77	3.77	J	Y	UG/KG	3.77 J	P	7.54	1	11.6
32SB-51-1415	1004294-21	_007	BENZO(A)PYRENE	9.57	9.57	9.57		Y	UG/KG	9.57		5.65	1	11.6
32SB-51-1415	1004294-21	_007	BENZO(B)FLUORANTHE	9.47	9.47	9.47		Y	UG/KG	9.47		7.54	1	11.6
32SB-51-1415	1004294-21	_007	BENZO(K)FLUORANTHE	4.37 J	4.37	4.37	J	Y	UG/KG	4.37 J	CP	7.54	1	11.6
32SB-51-1415	1004294-21	_007	CHRYSENE	5 J	5	5	J	Y	UG/KG	5 J	P	7.54	1	11.6
32SB-51-1415	1004294-21	_007	DIBENZ(A,H)ANTHRACE	1.5 U	1.5	1.5	U	N	UG/KG	1.5 U		5.65	1	11.6
32SB-51-1415	1004294-21	_007	INDENO(1,2,3-CD)PYRE	1.5 U	1.5	1.5	U	N	UG/KG	1.5 U		7.54	1	11.6
32SB-51-1415	1004294-21	_007	NAPHTHALENE	1.5 U	1.5	1.5	U	N	UG/KG	1.5 U		5.65	1	11.6
32SB-51-1415	1004294-21R	_007	BENZENE	23.2 U	23.2	23.2	UJ	N	UG/KG	23.2 UJ	CH	197	1	11.6
32SB-51-1415	1004294-21R	_007	ETHYLBENZENE	37 U	37	37	UJ	N	UG/KG	37 UJ	H	493	1	11.6
32SB-51-1415	1004294-21R	_007	TOLUENE	42.4 U	42.4	42.4	UJ	N	UG/KG	42.4 UJ	H	493	1	11.6
32SB-51-1415	1004294-21R	_007	XYLENE(TOTAL)	34.5 U	34.5	34.5	UJ	N	UG/KG	34.5 UJ	H	493	1	11.6
32SS-52-0002	1004294-22	_007	BENZO(A)ANTHRACENE	1.47 U	1.47	1.47	U	N	UG/KG	1.47 U		7.35	1	9.3
32SS-52-0002	1004294-22	_007	BENZO(A)PYRENE	1.47 U	1.47	1.47	U	N	UG/KG	1.47 U		5.51	1	9.3
32SS-52-0002	1004294-22	_007	BENZO(B)FLUORANTHE	1.47 U	1.47	1.47	U	N	UG/KG	1.47 U		7.35	1	9.3
32SS-52-0002	1004294-22	_007	BENZO(K)FLUORANTHE	1.47 U	1.47	1.47	UJ	N	UG/KG	1.47 UJ	C	7.35	1	9.3
32SS-52-0002	1004294-22	_007	CHRYSENE	1.47 U	1.47	1.47	U	N	UG/KG	1.47 U		7.35	1	9.3
32SS-52-0002	1004294-22	_007	DIBENZ(A,H)ANTHRACE	1.47 U	1.47	1.47	U	N	UG/KG	1.47 U		5.51	1	9.3
32SS-52-0002	1004294-22	_007	INDENO(1,2,3-CD)PYRE	1.47 U	1.47	1.47	U	N	UG/KG	1.47 U		7.35	1	9.3
32SS-52-0002	1004294-22	_007	NAPHTHALENE	1.47 U	1.47	1.47	U	N	UG/KG	1.47 U		5.51	1	9.3
32SB-52-0809	1004294-23	_007	BENZENE	0.556 U	0.556	0.556	UJ	N	UG/KG	0.556 UJ	H	5	1	15.5
32SB-52-0809	1004294-23	_007	ETHYLBENZENE	0.887 U	0.887	0.887	UJ	N	UG/KG	0.887 UJ	H	11.8	1	15.5
32SB-52-0809	1004294-23	_007	TOLUENE	1.02 U	1.02	1.02	UJ	N	UG/KG	1.02 UJ	H	11.8	1	15.5
32SB-52-0809	1004294-23	_007	XYLENE(TOTAL)	0.828 U	0.828	0.828	UJ	N	UG/KG	0.828 UJ	H	11.8	1	15.5
32SB-52-0809	1004294-23	_007	BENZO(A)ANTHRACENE	15.7 U	15.7	15.7	U	N	UG/KG	15.7 U		78.9	10	15.5
32SB-52-0809	1004294-23	_007	BENZO(A)PYRENE	15.7 U	15.7	15.7	U	N	UG/KG	15.7 U		59.1	10	15.5
32SB-52-0809	1004294-23	_007	BENZO(B)FLUORANTHE	15.7 U	15.7	15.7	U	N	UG/KG	15.7 U		78.9	10	15.5
32SB-52-0809	1004294-23	_007	BENZO(K)FLUORANTHE	15.7 U	15.7	15.7	UJ	N	UG/KG	15.7 UJ	C	78.9	10	15.5
32SB-52-0809	1004294-23	_007	CHRYSENE	15.7 U	15.7	15.7	U	N	UG/KG	15.7 U		78.9	10	15.5
32SB-52-0809	1004294-23	_007	DIBENZ(A,H)ANTHRACE	15.7 U	15.7	15.7	U	N	UG/KG	15.7 U		59.1	10	15.5
32SB-52-0809	1004294-23	_007	INDENO(1,2,3-CD)PYRE	15.7 U	15.7	15.7	U	N	UG/KG	15.7 U		78.9	10	15.5
32SB-52-0809	1004294-23	_007	NAPHTHALENE	305 D	305	305		Y	UG/KG	305		59.1	10	15.5
32SB-52-1415	1004294-24	_007	BENZO(A)ANTHRACENE	1.55 U	1.55	1.55	U	N	UG/KG	1.55 U		7.8	1	14.5
32SB-52-1415	1004294-24	_007	BENZO(A)PYRENE	1.55 U	1.55	1.55	U	N	UG/KG	1.55 U		5.85	1	14.5
32SB-52-1415	1004294-24	_007	BENZO(B)FLUORANTHE	1.55 U	1.55	1.55	U	N	UG/KG	1.55 U		7.8	1	14.5
32SB-52-1415	1004294-24	_007	BENZO(K)FLUORANTHE	1.55 U	1.55	1.55	UJ	N	UG/KG	1.55 UJ	C	7.8	1	14.5
32SB-52-1415	1004294-24	_007	CHRYSENE	1.55 U	1.55	1.55	U	N	UG/KG	1.55 U		7.8	1	14.5
32SB-52-1415	1004294-24	_007	DIBENZ(A,H)ANTHRACE	1.55 U	1.55	1.55	U	N	UG/KG	1.55 U		5.85	1	14.5
32SB-52-1415	1004294-24	_007	INDENO(1,2,3-CD)PYRE	1.55 U	1.55	1.55	U	N	UG/KG	1.55 U		7.8	1	14.5
32SB-52-1415	1004294-24	_007	NAPHTHALENE	1.55 U	1.55	1.55	U	N	UG/KG	1.55 U		5.85	1	14.5

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SB-52-1415	1004294-24R	_007	BENZENE	0.482	U	0.482	0.482	UJ	N	UG/KG	0.482 UJ	H	5	1	14.5
32SB-52-1415	1004294-24R	_007	ETHYLBENZENE	0.769	U	0.769	0.769	UJ	N	UG/KG	0.769 UJ	H	10.3	1	14.5
32SB-52-1415	1004294-24R	_007	TOLUENE	0.882	U	0.882	0.882	UJ	N	UG/KG	0.882 UJ	H	10.3	1	14.5
32SB-52-1415	1004294-24R	_007	XYLENE(TOTAL)	0.718	U	0.718	0.718	UJ	N	UG/KG	0.718 UJ	H	10.3	1	14.5
32SS-53-0002	1004294-25	_007	BENZO(A)ANTHRACENE	1.49	U	1.49	1.49	U	N	UG/KG	1.49 U		7.47	1	10.8
32SS-53-0002	1004294-25	_007	BENZO(A)PYRENE	1.49	U	1.49	1.49	U	N	UG/KG	1.49 U		5.6	1	10.8
32SS-53-0002	1004294-25	_007	BENZO(B)FLUORANTHE	1.49	U	1.49	1.49	U	N	UG/KG	1.49 U		7.47	1	10.8
32SS-53-0002	1004294-25	_007	BENZO(K)FLUORANTHE	1.49	U	1.49	1.49	UJ	N	UG/KG	1.49 UJ	C	7.47	1	10.8
32SS-53-0002	1004294-25	_007	CHRYSENE	1.49	U	1.49	1.49	U	N	UG/KG	1.49 U		7.47	1	10.8
32SS-53-0002	1004294-25	_007	DIBENZ(A,H)ANTHRACE	1.49	U	1.49	1.49	U	N	UG/KG	1.49 U		5.6	1	10.8
32SS-53-0002	1004294-25	_007	INDENO(1,2,3-CD)PYRE	1.49	U	1.49	1.49	U	N	UG/KG	1.49 U		7.47	1	10.8
32SS-53-0002	1004294-25	_007	NAPHTHALENE	1.49	U	1.49	1.49	U	N	UG/KG	1.49 U		5.6	1	10.8
32SB-53-0910	1004294-26	_007	BENZENE	0.553	U	0.553	0.553	UJ	N	UG/KG	0.553 UJ	H	5	1	15
32SB-53-0910	1004294-26	_007	ETHYLBENZENE	0.882	U	0.882	0.882	UJ	N	UG/KG	0.882 UJ	H	11.8	1	15
32SB-53-0910	1004294-26	_007	TOLUENE	1.01	U	1.01	1.01	UJ	N	UG/KG	1.01 UJ	H	11.8	1	15
32SB-53-0910	1004294-26	_007	XYLENE(TOTAL)	0.824	U	0.824	0.824	UJ	N	UG/KG	0.824 UJ	H	11.8	1	15
32SB-53-0910	1004294-26	_007	BENZO(A)ANTHRACENE	15.6	U	15.6	15.6	U	N	UG/KG	15.6 U		78.5	10	15
32SB-53-0910	1004294-26	_007	BENZO(A)PYRENE	15.6	U	15.6	15.6	U	N	UG/KG	15.6 U		58.8	10	15
32SB-53-0910	1004294-26	_007	BENZO(B)FLUORANTHE	15.6	U	15.6	15.6	U	N	UG/KG	15.6 U		78.5	10	15
32SB-53-0910	1004294-26	_007	BENZO(K)FLUORANTHE	15.6	U	15.6	15.6	UJ	N	UG/KG	15.6 UJ	C	78.5	10	15
32SB-53-0910	1004294-26	_007	CHRYSENE	15.6	U	15.6	15.6	U	N	UG/KG	15.6 U		78.5	10	15
32SB-53-0910	1004294-26	_007	DIBENZ(A,H)ANTHRACE	15.6	U	15.6	15.6	U	N	UG/KG	15.6 U		58.8	10	15
32SB-53-0910	1004294-26	_007	INDENO(1,2,3-CD)PYRE	15.6	U	15.6	15.6	U	N	UG/KG	15.6 U		78.5	10	15
32SB-53-0910	1004294-26	_007	NAPHTHALENE	15.6	U	15.6	15.6	U	N	UG/KG	15.6 U		58.8	10	15
32SB-53-1415	1004295-01	_008	BENZENE	5	U	0.447	0.447	UJ	N	UG/KG	0.447 UJ	H	5	1	14.2
32SB-53-1415	1004295-01	_008	ETHYLBENZENE	9.51	U	0.713	0.713	UJ	N	UG/KG	0.713 UJ	H	9.51	1	14.2
32SB-53-1415	1004295-01	_008	TOLUENE	9.51	U	0.818	0.818	UJ	N	UG/KG	0.818 UJ	H	9.51	1	14.2
32SB-53-1415	1004295-01	_008	XYLENE(TOTAL)	9.51	U	0.666	0.666	UJ	N	UG/KG	0.666 UJ	H	9.51	1	14.2
32SB-53-1415	1004295-01	_008	BENZO(A)ANTHRACENE	7.78	U	1.55	1.55	U	N	UG/KG	1.55 U		7.78	1	14.2
32SB-53-1415	1004295-01	_008	BENZO(A)PYRENE	6.23		6.23	6.23		Y	UG/KG	6.23		5.83	1	14.2
32SB-53-1415	1004295-01	_008	BENZO(B)FLUORANTHE	4.39	J	4.39	4.39	J	Y	UG/KG	4.39 J	P	7.78	1	14.2
32SB-53-1415	1004295-01	_008	BENZO(K)FLUORANTHE	7.78	U	1.55	1.55	UJ	N	UG/KG	1.55 UJ	C	7.78	1	14.2
32SB-53-1415	1004295-01	_008	CHRYSENE	7.78	U	1.55	1.55	U	N	UG/KG	1.55 U		7.78	1	14.2
32SB-53-1415	1004295-01	_008	DIBENZ(A,H)ANTHRACE	5.83	U	1.55	1.55	U	N	UG/KG	1.55 U		5.83	1	14.2
32SB-53-1415	1004295-01	_008	INDENO(1,2,3-CD)PYRE	7.78	U	1.55	1.55	U	N	UG/KG	1.55 U		7.78	1	14.2
32SB-53-1415	1004295-01	_008	NAPHTHALENE	5.83	U	1.55	1.55	U	N	UG/KG	1.55 U		5.83	1	14.2
32GW-02	1004295-02	_008	BENZENE	1	U	0.14	0.14	U	N	UG/L	0.14 U		1	1	100
32GW-02	1004295-02	_008	ETHYLBENZENE	1	U	0.15	0.15	U	N	UG/L	0.15 U		1	1	100
32GW-02	1004295-02	_008	TOLUENE	1	U	0.19	0.19	U	N	UG/L	0.19 U		1	1	100
32GW-02	1004295-02	_008	XYLENE(TOTAL)	1	U	0.22	0.22	U	N	UG/L	0.22 U		1	1	100
32GW-02	1004295-02	_008	BENZO(A)ANTHRACENE	0.0926	U	0.0189	0.0189	UJ	N	UG/L	0.0189 UJ	H	0.092	1	100
32GW-02	1004295-02	_008	BENZO(A)PYRENE	0.0926	U	0.0189	0.0189	UJ	N	UG/L	0.0189 UJ	H	0.092	1	100
32GW-02	1004295-02	_008	BENZO(B)FLUORANTHE	0.0926	U	0.0189	0.0189	UJ	N	UG/L	0.0189 UJ	H	0.092	1	100
32GW-02	1004295-02	_008	BENZO(K)FLUORANTHE	0.0926	U	0.0189	0.0189	UJ	N	UG/L	0.0189 UJ	H	0.092	1	100
32GW-02	1004295-02	_008	CHRYSENE	0.0926	U	0.0189	0.0189	UJ	N	UG/L	0.0189 UJ	H	0.092	1	100
32GW-02	1004295-02	_008	DIBENZ(A,H)ANTHRACE	0.0926	U	0.0189	0.0189	UJ	N	UG/L	0.0189 UJ	H	0.092	1	100
32GW-02	1004295-02	_008	INDENO(1,2,3-CD)PYRE	0.0926	U	0.0189	0.0189	UJ	N	UG/L	0.0189 UJ	H	0.092	1	100
32GW-02	1004295-02	_008	NAPHTHALENE	0.0402	J	0.0402	0.0402	J	Y	UG/L	0.0402 J	HP	0.092	1	100
32GW-01	1004295-03	_008	BENZENE	1	U	0.14	0.14	U	N	UG/L	0.14 U		1	1	100
32GW-01	1004295-03	_008	ETHYLBENZENE	1	U	0.15	0.15	U	N	UG/L	0.15 U		1	1	100
32GW-01	1004295-03	_008	TOLUENE	1	U	0.19	0.19	U	N	UG/L	0.190 U		1	1	100
32GW-01	1004295-03	_008	XYLENE(TOTAL)	1	U	0.22	0.22	U	N	UG/L	0.22 U		1	1	100
32GW-01	1004295-03	_008	BENZO(A)ANTHRACENE	0.0943	U	0.0189	0.0189	UJ	N	UG/L	0.0189 UJ	H	0.094	1	100
32GW-01	1004295-03	_008	BENZO(A)PYRENE	0.0943	U	0.0189	0.0189	UJ	N	UG/L	0.0189 UJ	H	0.094	1	100
32GW-01	1004295-03	_008	BENZO(B)FLUORANTHE	0.0943	U	0.0189	0.0189	UJ	N	UG/L	0.0189 UJ	H	0.094	1	100
32GW-01	1004295-03	_008	BENZO(K)FLUORANTHE	0.0943	U	0.0189	0.0189	UJ	N	UG/L	0.0189 UJ	H	0.094	1	100
32GW-01	1004295-03	_008	CHRYSENE	0.0943	U	0.0189	0.0189	UJ	N	UG/L	0.0189 UJ	H	0.094	1	100
32GW-01	1004295-03	_008	DIBENZ(A,H)ANTHRACE	0.0943	U	0.0189	0.0189	UJ	N	UG/L	0.0189 UJ	H	0.094	1	100
32GW-01	1004295-03	_008	INDENO(1,2,3-CD)PYRE	0.0943	U	0.0189	0.0189	UJ	N	UG/L	0.0189 UJ	H	0.094	1	100
32GW-01	1004295-03	_008	NAPHTHALENE	0.0943	U	0.0189	0.0189	UJ	N	UG/L	0.0189 UJ	H	0.094	1	100
TB_7809	1004295-04	_008	BENZENE	1	U	0.14	0.14	U	N	UG/L	0.14 U		1	1	100
TB_7809	1004295-04	_008	ETHYLBENZENE	1	U	0.15	0.15	U	N	UG/L	0.15 U		1	1	100
TB_7809	1004295-04	_008	TOLUENE	1	U	0.19	0.19	U	N	UG/L	0.19 U		1	1	100
TB_7809	1004295-04	_008	XYLENE(TOTAL)	1	U	0.22	0.22	U	N	UG/L	0.22 U		1	1	100

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	moist
32SD-01-0006	1005021-01	_009	BENZENE	0.537	U	0.537	0.537	UJ	N	UG/KG	0.537 UJ	H	5	1	18.5
32SD-01-0006	1005021-01	_009	ETHYLBENZENE	0.857	U	0.857	0.857	UJ	N	UG/KG	0.857 UJ	H	11.4	1	18.5
32SD-01-0006	1005021-01	_009	TOLUENE	0.983	U	0.983	0.983	UJ	N	UG/KG	0.983 UJ	H	11.4	1	18.5
32SD-01-0006	1005021-01	_009	XYLENE(TOTAL)	0.8	U	0.8	0.8	UJ	N	UG/KG	0.8 UJ	H	11.4	1	18.5
32SD-01-0006	1005021-01	_009	BENZO(A)ANTHRACENE	2.81	J	2.81	2.81	J	Y	UG/KG	2.81 J	P	8.19	1	18.5
32SD-01-0006	1005021-01	_009	BENZO(A)PYRENE	7.59		7.59	7.59		Y	UG/KG	7.59		6.14	1	18.5
32SD-01-0006	1005021-01	_009	BENZO(B)FLUORANTHE	1.63	U	1.63	1.63	U	N	UG/KG	1.63 U		8.19	1	18.5
32SD-01-0006	1005021-01	_009	BENZO(K)FLUORANTHE	1.63	U	1.63	1.63	UJ	N	UG/KG	1.63 UJ	C	8.19	1	18.5
32SD-01-0006	1005021-01	_009	CHRYSENE	2.97	J	2.97	2.97	J	Y	UG/KG	2.97 J	P	8.19	1	18.5
32SD-01-0006	1005021-01	_009	DIBENZ(A,H)ANTHRACE	1.63	U	1.63	1.63	U	N	UG/KG	1.63 U		6.14	1	18.5
32SD-01-0006	1005021-01	_009	INDENO(1,2,3-CD)PYRE	1.63	U	1.63	1.63	U	N	UG/KG	1.63 U		8.19	1	18.5
32SD-01-0006	1005021-01	_009	NAPHTHALENE	1.63	U	1.63	1.63	U	N	UG/KG	1.63 U		6.14	1	18.5
32SD-02-0006	1005021-02	_009	BENZO(A)ANTHRACENE	6.59	J	6.59	6.59	J	Y	UG/KG	6.59 J	GP	8.27	1	19.4
32SD-02-0006-AVG	1005021-02	_009	BENZO(A)ANTHRACENE	6.59	J	21.495	21.495	J	Y	UG/KG	21.495 J		8.27	1	19.4
32SD-02-0006	1005021-02	_009	BENZO(A)PYRENE	16.7		16.7	16.7	J	Y	UG/KG	16.7 J	G	6.2	1	19.4
32SD-02-0006-AVG	1005021-02	_009	BENZO(A)PYRENE	16.7		50.8	50.8	J	Y	UG/KG	50.8 J		6.2	1	19.4
32SD-02-0006	1005021-02	_009	BENZO(B)FLUORANTHE	21.8		21.8	21.8	J	Y	UG/KG	21.8 J	G	8.27	1	19.4
32SD-02-0006-AVG	1005021-02	_009	BENZO(B)FLUORANTHE	21.8		60.05	60.05	J	Y	UG/KG	60.05 J		8.27	1	19.4
32SD-02-0006	1005021-02	_009	BENZO(K)FLUORANTHE	8.07	J	8.07	8.07	J	Y	UG/KG	8.07 J	CGP	8.27	1	19.4
32SD-02-0006-AVG	1005021-02	_009	BENZO(K)FLUORANTHE	8.07	J	24.085	24.085	J	Y	UG/KG	24.085 J		8.27	1	19.4
32SD-02-0006	1005021-02	_009	CHRYSENE	6.69	J	6.69	6.69	J	Y	UG/KG	6.69 J	GP	8.27	1	19.4
32SD-02-0006-AVG	1005021-02	_009	CHRYSENE	6.69	J	26.095	26.095	J	Y	UG/KG	26.095 J		8.27	1	19.4
32SD-02-0006	1005021-02	_009	DIBENZ(A,H)ANTHRACE	1.65	U	1.65	1.65	UJ	N	UG/KG	1.65 UJ	G	6.2	1	19.4
32SD-02-0006-AVG	1005021-02	_009	DIBENZ(A,H)ANTHRACE	1.65	U	7.3125	7.3125	J	Y	UG/KG	7.3125 J		6.2	1	19.4
32SD-02-0006	1005021-02	_009	INDENO(1,2,3-CD)PYRE	8.51		8.51	8.51	J	Y	UG/KG	8.51 J	G	8.27	1	19.4
32SD-02-0006-AVG	1005021-02	_009	INDENO(1,2,3-CD)PYRE	8.51		41.555	41.555	J	Y	UG/KG	41.555 J		8.27	1	19.4
32SD-02-0006	1005021-02	_009	NAPHTHALENE	1.65	U	1.65	1.65	UJ	N	UG/KG	1.65 UJ	G	6.2	1	19.4
32SD-02-0006-AVG	1005021-02	_009	NAPHTHALENE	1.65	U	1.4425	1.4425	J	Y	UG/KG	1.4425 J		6.2	1	19.4
32SD-02-0006	1005021-02R	_009	BENZENE	56.1	JD	56.1	56.1	J	Y	UG/KG	56.1 J	HP	248	1	19.4
32SD-02-0006-AVG	1005021-02R	_009	BENZENE	56.1	JD	34.175	34.175	J	Y	UG/KG	34.175 J		248	1	19.4
32SD-02-0006	1005021-02R	_009	ETHYLBENZENE	65.7	JD	65.7	65.7	J	Y	UG/KG	65.7 J	HP	619	1	19.4
32SD-02-0006-AVG	1005021-02R	_009	ETHYLBENZENE	65.7	JD	42.625	42.625	J	Y	UG/KG	42.625 J		619	1	19.4
32SD-02-0006	1005021-02R	_009	TOLUENE	62.6	JD	62.6	62.6	J	Y	UG/KG	62.6 J	HP	619	1	19.4
32SD-02-0006-AVG	1005021-02R	_009	TOLUENE	62.6	JD	42.5	42.5	J	Y	UG/KG	42.5 J		619	1	19.4
32SD-02-0006	1005021-02R	_009	XYLENE(TOTAL)	220	JD	220	220	J	Y	UG/KG	220 J	HP	619	1	19.4
32SD-02-0006-AVG	1005021-02R	_009	XYLENE(TOTAL)	220	JD	119.13	119.125	J	Y	UG/KG	119.125 J		619	1	19.4
32SD-03-0006	1005021-03	_009	BENZENE	0.54	U	0.54	0.54	UJ	N	UG/KG	0.54 UJ	HN	5	1	19.2
32SD-03-0006	1005021-03	_009	ETHYLBENZENE	0.862	U	0.862	0.862	UJ	N	UG/KG	0.862 UJ	HN	11.5	1	19.2
32SD-03-0006	1005021-03	_009	TOLUENE	0.989	U	0.989	0.989	UJ	N	UG/KG	0.989 UJ	HN	11.5	1	19.2
32SD-03-0006	1005021-03	_009	XYLENE(TOTAL)	0.805	U	0.805	0.805	UJ	N	UG/KG	0.805 UJ	HN	11.5	1	19.2
32SD-03-0006	1005021-03	_009	BENZO(A)ANTHRACENE	11		11	11		Y	UG/KG	11		8.25	1	19.2
32SD-03-0006	1005021-03	_009	BENZO(A)PYRENE	20.1		20.1	20.1		Y	UG/KG	20.1		6.19	1	19.2
32SD-03-0006	1005021-03	_009	BENZO(B)FLUORANTHE	25.2		25.2	25.2		Y	UG/KG	25.2		8.25	1	19.2
32SD-03-0006	1005021-03	_009	BENZO(K)FLUORANTHE	7.67	J	7.67	7.67	J	Y	UG/KG	7.67 J	CP	8.25	1	19.2
32SD-03-0006	1005021-03	_009	CHRYSENE	21.5		21.5	21.5		Y	UG/KG	21.5		8.25	1	19.2
32SD-03-0006	1005021-03	_009	DIBENZ(A,H)ANTHRACE	1.65	U	1.65	1.65	U	N	UG/KG	1.65 U		6.19	1	19.2
32SD-03-0006	1005021-03	_009	INDENO(1,2,3-CD)PYRE	9.62		9.62	9.62		Y	UG/KG	9.62		8.25	1	19.2
32SD-03-0006	1005021-03	_009	NAPHTHALENE	1.65	U	1.65	1.65	U	N	UG/KG	1.65 U		6.19	1	19.2
32SD-02-0006-D	1005021-04	_009	BENZO(A)ANTHRACENE	36.4		36.4	36.4	J	Y	UG/KG	36.4 J	G	8.13	1	17.9
32SD-02-0006-D	1005021-04	_009	BENZO(A)PYRENE	84.9		84.9	84.9	J	Y	UG/KG	84.9 J	G	6.09	1	17.9
32SD-02-0006-D	1005021-04	_009	BENZO(B)FLUORANTHE	98.3		98.3	98.3	J	Y	UG/KG	98.3 J	G	8.13	1	17.9
32SD-02-0006-D	1005021-04	_009	BENZO(K)FLUORANTHE	40.1		40.1	40.1	J	Y	UG/KG	40.1 J	CG	8.13	1	17.9
32SD-02-0006-D	1005021-04	_009	CHRYSENE	45.5		45.5	45.5	J	Y	UG/KG	45.5 J	G	8.13	1	17.9
32SD-02-0006-D	1005021-04	_009	DIBENZ(A,H)ANTHRACE	13.8		13.8	13.8	J	Y	UG/KG	13.8 J	G	6.09	1	17.9
32SD-02-0006-D	1005021-04	_009	INDENO(1,2,3-CD)PYRE	74.6		74.6	74.6	J	Y	UG/KG	74.6 J	G	8.13	1	17.9
32SD-02-0006-D	1005021-04	_009	NAPHTHALENE	2.06	J	2.06	2.06	J	Y	UG/KG	2.06 J	CGP	6.09	1	17.9
32SD-02-0006-D	1005021-04R	_009	BENZENE	24.5	U	24.5	24.5	UJ	N	UG/KG	24.5 UJ	H	208	1	17.9
32SD-02-0006-D	1005021-04R	_009	ETHYLBENZENE	39.1	U	39.1	39.1	UJ	N	UG/KG	39.1 UJ	H	521	1	17.9
32SD-02-0006-D	1005021-04R	_009	TOLUENE	44.8	U	44.8	44.8	UJ	N	UG/KG	44.8 UJ	H	521	1	17.9
32SD-02-0006-D	1005021-04R	_009	XYLENE(TOTAL)	36.5	U	36.5	36.5	UJ	N	UG/KG	36.5 UJ	H	521	1	17.9
32SS-RB042910-05	1005021-05	_009	BENZENE	0.14	U	0.14	0.14	U	N	UG/L	0.14 U		1	1	100
32SS-RB042910-05	1005021-05	_009	ETHYLBENZENE	0.15	U	0.15	0.15	U	N	UG/L	0.15 U		1	1	100
32SS-RB042910-05	1005021-05	_009	TOLUENE	0.648	J	0.648	0.648	J	Y	UG/L	0.648 J	P	1	1	100
32SS-RB042910-05	1005021-05	_009	XYLENE(TOTAL)	0.22	U	0.22	0.22	U	N	UG/L	0.22 U		1	1	100

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SS-RB042910-05	1005021-05	_009	BENZO(A)ANTHRACENE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ CH	0.094	1	100
32SS-RB042910-05	1005021-05	_009	BENZO(A)PYRENE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ H	0.094	1	100
32SS-RB042910-05	1005021-05	_009	BENZO(B)FLUORANTHE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ H	0.094	1	100
32SS-RB042910-05	1005021-05	_009	BENZO(K)FLUORANTHE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ H	0.094	1	100
32SS-RB042910-05	1005021-05	_009	CHRYSENE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ CH	0.094	1	100
32SS-RB042910-05	1005021-05	_009	DIBENZ(A,H)ANTHRACE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ H	0.094	1	100
32SS-RB042910-05	1005021-05	_009	INDENO(1,2,3-CD)PYRE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ H	0.094	1	100
32SS-RB042910-05	1005021-05	_009	NAPHTHALENE	0.0189	U	0.0189	0.0189	UJ	N	UG/L	0.0189	UJ H	0.094	1	100
32SS-TB042910-01	1005021-06	_009	BENZENE	0.14	U	0.14	0.14	U	N	UG/L	0.14	U	1	1	100
32SS-TB042910-01	1005021-06	_009	ETHYLBENZENE	0.15	U	0.15	0.15	U	N	UG/L	0.15	U	1	1	100
32SS-TB042910-01	1005021-06	_009	TOLUENE	0.19	U	0.19	0.19	U	N	UG/L	0.19	U	1	1	100
32SS-TB042910-01	1005021-06	_009	XYLENE(TOTAL)	0.22	U	0.22	0.22	U	N	UG/L	0.22	U	1	1	100
32SB-ST01-0708	1009148-01	_010	METHYL TERT-BUTYL E	5	U	0.317	0.317	U	N	UG/KG	0.317	U	5	1	16.5
32SB-56-1415-D	1009148-02	_010	NAPHTHALENE	7.99	U	1.59	1.59	U	N	UG/KG	1.59	U	7.99	1	18.7
32SB-54-0708	1009148-03	_010	NAPHTHALENE	3.95	J	3.95	3.95	J	Y	UG/KG	3.95	J P	7.65	1	14
32SB-54-1112	1009148-04	_010	NAPHTHALENE	7.58	U	1.51	1.51	U	N	UG/KG	1.51	U	7.58	1	16.5
32SB-55-1112	1009148-05	_010	NAPHTHALENE	9.47	U	1.89	1.89	U	N	UG/KG	1.89	U	9.47	1	29.6
32SB-55-0708	1009148-06	_010	NAPHTHALENE	7.84	U	1.56	1.56	U	N	UG/KG	1.56	U	7.84	1	17.1
32SB-56-1011	1009148-07	_010	NAPHTHALENE	13.5		13.5	13.5		Y	UG/KG	13.5		7.78	1	17
32SB-56-1415	1009148-08	_010	NAPHTHALENE	8.11	U	1.62	1.62	U	N	UG/KG	1.62	U	8.11	1	18.9
32SB-56-1415-AVG	1009148-08	_010	NAPHTHALENE	1.62	U	1.605	1.605	U	N	UG/KG	1.605	U	8.11	1	18.9
32SB-57-0708	1009148-09	_010	NAPHTHALENE	7.01	U	1.4	1.4	U	N	UG/KG	1.4	U	7.01	1	6.8
32SB-58-0708	1009148-10	_010	NAPHTHALENE	5.11	J	5.11	5.11	J	Y	UG/KG	5.11	J P	7.3	1	11
32SB-58-1112	1009148-11	_010	NAPHTHALENE	7.68	U	1.53	1.53	U	N	UG/KG	1.53	U	7.68	1	15.5
32SB-59-0708	1009148-12	_010	NAPHTHALENE	7.42	U	1.48	1.48	U	N	UG/KG	1.48	U	7.42	1	14.6
32SB-59-1112	1009148-13	_010	NAPHTHALENE	7.85	U	1.56	1.56	U	N	UG/KG	1.56	U	7.85	1	17.7
32SS-65-0002	1009148-14	_010	BENZO(A)PYRENE	79.1		79.1	79.1	J	Y	UG/KG	79.1	J G	7.95	1	17.7
32SS-65-0002-AVG	1009148-14	_010	BENZO(A)PYRENE	79.1		201.05	201.05	J	Y	UG/KG	201.05	J	7.95	1	17.7
32SS-64-0002	1009148-15	_010	BENZO(A)PYRENE	3450	D	3450	3450		Y	UG/KG	3450		34.7	5	4.4
32SS-60-0002	1009148-16	_010	BENZO(A)PYRENE	11.5		11.5	11.5		Y	UG/KG	11.5		7.41	1	11.2
32SS-61-0002	1009148-17	_010	BENZO(A)PYRENE	8.65	U	1.72	1.72	U	N	UG/KG	1.72	U	8.65	1	24.4
32SS-62-0002	1009148-18	_010	BENZO(A)PYRENE	8.71	U	1.74	1.74	U	N	UG/KG	1.74	U	8.71	1	24.9
32SS-63-0002	1009148-19	_010	BENZO(A)PYRENE	157		157	157		Y	UG/KG	157		8.78	1	24.5
32SS-65-0002-D	1009148-20	_010	BENZO(A)PYRENE	323		323	323	J	Y	UG/KG	323	J G	8.07	1	19
32SD-04-0006	1009166-01	_011	BENZENE	5	QU	0.526	0.526	U	N	UG/KG	0.526	U	5	1	17.2
32SD-04-0006	1009166-01	_011	ETHYLBENZENE	11.2	QU	0.84	0.84	U	N	UG/KG	0.84	U	11.2	1	17.2
32SD-04-0006	1009166-01	_011	TOLUENE	11.2	QU	0.963	0.963	U	N	UG/KG	0.963	U	11.2	1	17.2
32SD-04-0006	1009166-01	_011	XYLENE(TOTAL)	11.2	QU	0.784	0.784	U	N	UG/KG	0.784	U	11.2	1	17.2
32SD-04-0006	1009166-01	_011	BENZO(A)ANTHRACENE	7.85	U	1.56	1.56	U	N	UG/KG	1.56	U	7.85	1	17.2
32SD-04-0006	1009166-01	_011	BENZO(A)PYRENE	5.88	U	1.56	1.56	U	N	UG/KG	1.56	U	5.88	1	17.2
32SD-04-0006	1009166-01	_011	BENZO(B)FLUORANTHE	6.36	J	6.36	6.36	J	Y	UG/KG	6.36	J P	7.85	1	17.2
32SD-04-0006	1009166-01	_011	BENZO(K)FLUORANTHE	7.85	U	1.56	1.56	U	N	UG/KG	1.56	U	7.85	1	17.2
32SD-04-0006	1009166-01	_011	CHRYSENE	7.85	U	1.56	1.56	U	N	UG/KG	1.56	U	7.85	1	17.2
32SD-04-0006	1009166-01	_011	DIBENZ(A,H)ANTHRACE	5.88	U	1.56	1.56	U	N	UG/KG	1.56	U	5.88	1	17.2
32SD-04-0006	1009166-01	_011	INDENO(1,2,3-CD)PYRE	3.88	J	3.88	3.88	J	Y	UG/KG	3.88	J P	7.85	1	17.2
32SD-04-0006	1009166-01	_011	NAPHTHALENE	5.88	U	1.56	1.56	U	N	UG/KG	1.56	U	5.88	1	17.2
32SD-05-0006	1009166-02	_011	BENZENE	5	QU	0.582	0.582	U	N	UG/KG	0.582	U	5	1	18.2
32SD-05-0006-AVG	1009166-02	_011	BENZENE	0.582	QU	0.577	0.577	U	N	UG/KG	0.577	U	5	1	18.2
32SD-05-0006	1009166-02	_011	ETHYLBENZENE	12.4	QU	0.928	0.928	U	N	UG/KG	0.928	U	12.4	1	18.2
32SD-05-0006-AVG	1009166-02	_011	ETHYLBENZENE	0.928	QU	0.92	0.92	U	N	UG/KG	0.92	U	12.4	1	18.2
32SD-05-0006	1009166-02	_011	TOLUENE	12.4	QU	1.06	1.06	U	N	UG/KG	1.06	U	12.4	1	18.2
32SD-05-0006-AVG	1009166-02	_011	TOLUENE	1.06	QU	1.055	1.055	U	N	UG/KG	1.055	U	12.4	1	18.2
32SD-05-0006	1009166-02	_011	XYLENE(TOTAL)	12.4	QU	0.867	0.867	U	N	UG/KG	0.867	U	12.4	1	18.2
32SD-05-0006-AVG	1009166-02	_011	XYLENE(TOTAL)	0.867	QU	0.8595	0.8595	U	N	UG/KG	0.8595	U	12.4	1	18.2
32SD-05-0006	1009166-02	_011	BENZO(A)ANTHRACENE	8.1	U	1.62	1.62	U	N	UG/KG	1.62	U	8.1	1	18.2
32SD-05-0006-AVG	1009166-02	_011	BENZO(A)ANTHRACENE	1.62	U	1.625	1.625	U	N	UG/KG	1.625	U	8.1	1	18.2
32SD-05-0006	1009166-02	_011	BENZO(A)PYRENE	6.08	U	1.62	1.62	U	N	UG/KG	1.62	U	6.08	1	18.2
32SD-05-0006-AVG	1009166-02	_011	BENZO(A)PYRENE	1.62	U	1.625	1.625	U	N	UG/KG	1.625	U	6.08	1	18.2
32SD-05-0006	1009166-02	_011	BENZO(B)FLUORANTHE	8.1	U	1.62	1.62	U	N	UG/KG	1.62	U	8.1	1	18.2
32SD-05-0006-AVG	1009166-02	_011	BENZO(B)FLUORANTHE	1.62	U	1.435	1.435	J	Y	UG/KG	1.435	J	8.1	1	18.2
32SD-05-0006	1009166-02	_011	BENZO(K)FLUORANTHE	8.1	U	1.62	1.62	U	N	UG/KG	1.62	U	8.1	1	18.2
32SD-05-0006-AVG	1009166-02	_011	BENZO(K)FLUORANTHE	1.62	U	1.515	1.515	J	Y	UG/KG	1.515	J	8.1	1	18.2
32SD-05-0006	1009166-02	_011	CHRYSENE	8.1	U	1.62	1.62	U	N	UG/KG	1.62	U	8.1	1	18.2
32SD-05-0006-AVG	1009166-02	_011	CHRYSENE	1.62	U	1.625	1.625	U	N	UG/KG	1.625	U	8.1	1	18.2

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct	_moist
32SD-05-0006	1009166-02	_011	DIBENZ(A,H)ANTHRACE	6.08	U	1.62	1.62	U	N	UG/KG	1.62 U		6.08	1	18.2
32SD-05-0006-AVG	1009166-02	_011	DIBENZ(A,H)ANTHRACE	1.62	U	1.285	1.285	J	Y	UG/KG	1.285 J		6.08	1	18.2
32SD-05-0006	1009166-02	_011	INDENO(1,2,3-CD)PYRE	8.1	U	1.62	1.62	U	N	UG/KG	1.62 U		8.1	1	18.2
32SD-05-0006-AVG	1009166-02	_011	INDENO(1,2,3-CD)PYRE	1.62	U	1.29	1.29	J	Y	UG/KG	1.29 J		8.1	1	18.2
32SD-05-0006	1009166-02	_011	NAPHTHALENE	6.08	U	1.62	1.62	U	N	UG/KG	1.62 U		6.08	1	18.2
32SD-05-0006-AVG	1009166-02	_011	NAPHTHALENE	1.62	U	1.625	1.625	U	N	UG/KG	1.625 U		6.08	1	18.2
32SD-05-0006-D	1009166-03	_011	BENZENE	5	QU	0.572	0.572	U	N	UG/KG	0.572 U		5	1	18.9
32SD-05-0006-D	1009166-03	_011	ETHYLBENZENE	12.2	QU	0.912	0.912	U	N	UG/KG	0.912 U		12.2	1	18.9
32SD-05-0006-D	1009166-03	_011	TOLUENE	12.2	QU	1.05	1.05	U	N	UG/KG	1.05 U		12.2	1	18.9
32SD-05-0006-D	1009166-03	_011	XYLENE(TOTAL)	12.2	QU	0.852	0.852	U	N	UG/KG	0.852 U		12.2	1	18.9
32SD-05-0006-D	1009166-03	_011	BENZO(A)ANTHRACENE	8.17	U	1.63	1.63	U	N	UG/KG	1.63 U		8.17	1	18.9
32SD-05-0006-D	1009166-03	_011	BENZO(A)PYRENE	6.13	U	1.63	1.63	U	N	UG/KG	1.63 U		6.13	1	18.9
32SD-05-0006-D	1009166-03	_011	BENZO(B)FLUORANTHE	2.06	J	2.06	2.06	J	Y	UG/KG	2.06 J	P	8.17	1	18.9
32SD-05-0006-D	1009166-03	_011	BENZO(K)FLUORANTHE	2.22	J	2.22	2.22	J	Y	UG/KG	2.22 J	P	8.17	1	18.9
32SD-05-0006-D	1009166-03	_011	CHRYSENE	8.17	U	1.63	1.63	U	N	UG/KG	1.63 U		8.17	1	18.9
32SD-05-0006-D	1009166-03	_011	DIBENZ(A,H)ANTHRACE	1.76	J	1.76	1.76	J	Y	UG/KG	1.76 J	P	6.13	1	18.9
32SD-05-0006-D	1009166-03	_011	INDENO(1,2,3-CD)PYRE	1.77	J	1.77	1.77	J	Y	UG/KG	1.77 J	P	8.17	1	18.9
32SD-05-0006-D	1009166-03	_011	NAPHTHALENE	6.13	U	1.63	1.63	U	N	UG/KG	1.63 U		6.13	1	18.9
TB_7808	1009166-04	_011	BENZENE	1	U	0.14	0.14	U	N	UG/L	0.14 U		1	1	100
TB_7808	1009166-04	_011	ETHYLBENZENE	1	U	0.15	0.15	U	N	UG/L	0.15 U		1	1	100
TB_7808	1009166-04	_011	TOLUENE	1	U	0.19	0.19	U	N	UG/L	0.19 U		1	1	100
TB_7808	1009166-04	_011	XYLENE(TOTAL)	1	U	0.22	0.22	U	N	UG/L	0.22 U		1	1	100
32GW-04	1009179-01	_011	BENZENE	1	U	0.14	0.14	U	N	UG/L	0.14 U		1	1	100
32GW-04	1009179-01	_011	ETHYLBENZENE	1	U	0.15	0.15	U	N	UG/L	0.15 U		1	1	100
32GW-04	1009179-01	_011	TOLUENE	1	U	0.19	0.19	U	N	UG/L	0.19 U		1	1	100
32GW-04	1009179-01	_011	XYLENE(TOTAL)	1	U	0.22	0.22	U	N	UG/L	0.22 U		1	1	100
32GW-04	1009179-01	_011	BENZO(A)ANTHRACENE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187 U		0.093	1	100
32GW-04	1009179-01	_011	BENZO(A)PYRENE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187 U		0.093	1	100
32GW-04	1009179-01	_011	BENZO(B)FLUORANTHE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187 U		0.093	1	100
32GW-04	1009179-01	_011	BENZO(K)FLUORANTHE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187 U		0.093	1	100
32GW-04	1009179-01	_011	CHRYSENE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187 U		0.093	1	100
32GW-04	1009179-01	_011	DIBENZ(A,H)ANTHRACE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187 U		0.093	1	100
32GW-04	1009179-01	_011	INDENO(1,2,3-CD)PYRE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187 U		0.093	1	100
32GW-04	1009179-01	_011	NAPHTHALENE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187 U		0.093	1	100
32GW-05	1009179-02	_011	BENZENE	1	U	0.14	0.14	U	N	UG/L	0.14 U		1	1	100
32GW-05-AVG	1009179-02	_011	BENZENE	0.14	U	0.14	0.14	U	N	UG/L	0.14 U		1	1	100
32GW-05	1009179-02	_011	ETHYLBENZENE	1	U	0.15	0.15	U	N	UG/L	0.15 U		1	1	100
32GW-05-AVG	1009179-02	_011	ETHYLBENZENE	0.15	U	0.15	0.15	U	N	UG/L	0.15 U		1	1	100
32GW-05	1009179-02	_011	TOLUENE	1	U	0.19	0.19	U	N	UG/L	0.19 U		1	1	100
32GW-05-AVG	1009179-02	_011	TOLUENE	0.19	U	0.19	0.19	U	N	UG/L	0.19 U		1	1	100
32GW-05	1009179-02	_011	XYLENE(TOTAL)	1	U	0.22	0.22	U	N	UG/L	0.22 U		1	1	100
32GW-05-AVG	1009179-02	_011	XYLENE(TOTAL)	0.22	U	0.22	0.22	U	N	UG/L	0.22 U		1	1	100
32GW-05	1009179-02	_011	BENZO(A)ANTHRACENE	0.0943	U	0.0189	0.0189	U	N	UG/L	0.0189 U		0.094	1	100
32GW-05-AVG	1009179-02	_011	BENZO(A)ANTHRACENE	0.0189	U	0.0188	0.0188	U	N	UG/L	0.0188 U		0.094	1	100
32GW-05	1009179-02	_011	BENZO(A)PYRENE	0.0943	U	0.0189	0.0189	U	N	UG/L	0.0189 U		0.094	1	100
32GW-05-AVG	1009179-02	_011	BENZO(A)PYRENE	0.0189	U	0.0188	0.0188	U	N	UG/L	0.0188 U		0.094	1	100
32GW-05	1009179-02	_011	BENZO(B)FLUORANTHE	0.0943	U	0.0189	0.0189	U	N	UG/L	0.0189 U		0.094	1	100
32GW-05-AVG	1009179-02	_011	BENZO(B)FLUORANTHE	0.0189	U	0.0188	0.0188	U	N	UG/L	0.0188 U		0.094	1	100
32GW-05	1009179-02	_011	BENZO(K)FLUORANTHE	0.0943	U	0.0189	0.0189	U	N	UG/L	0.0189 U		0.094	1	100
32GW-05-AVG	1009179-02	_011	BENZO(K)FLUORANTHE	0.0189	U	0.0188	0.0188	U	N	UG/L	0.0188 U		0.094	1	100
32GW-05	1009179-02	_011	CHRYSENE	0.0943	U	0.0189	0.0189	U	N	UG/L	0.0189 U		0.094	1	100
32GW-05-AVG	1009179-02	_011	CHRYSENE	0.0189	U	0.0188	0.0188	U	N	UG/L	0.0188 U		0.094	1	100
32GW-05	1009179-02	_011	DIBENZ(A,H)ANTHRACE	0.0943	U	0.0189	0.0189	U	N	UG/L	0.0189 U		0.094	1	100
32GW-05-AVG	1009179-02	_011	DIBENZ(A,H)ANTHRACE	0.0189	U	0.0188	0.0188	U	N	UG/L	0.0188 U		0.094	1	100
32GW-05	1009179-02	_011	INDENO(1,2,3-CD)PYRE	0.0943	U	0.0189	0.0189	U	N	UG/L	0.0189 U		0.094	1	100
32GW-05-AVG	1009179-02	_011	INDENO(1,2,3-CD)PYRE	0.0189	U	0.0188	0.0188	U	N	UG/L	0.0188 U		0.094	1	100
32GW-05	1009179-02	_011	NAPHTHALENE	0.0943	U	0.0189	0.0189	U	N	UG/L	0.0189 U		0.094	1	100
32GW-05-AVG	1009179-02	_011	NAPHTHALENE	0.0189	U	0.0188	0.0188	U	N	UG/L	0.0188 U		0.094	1	100
32GW-06	1009179-03	_011	BENZENE	1	U	0.14	0.14	U	N	UG/L	0.14 U		1	1	100
32GW-06	1009179-03	_011	ETHYLBENZENE	1	U	0.15	0.15	U	N	UG/L	0.15 U		1	1	100
32GW-06	1009179-03	_011	TOLUENE	1	U	0.19	0.19	U	N	UG/L	0.19 U		1	1	100
32GW-06	1009179-03	_011	XYLENE(TOTAL)	1	U	0.22	0.22	U	N	UG/L	0.22 U		1	1	100
32GW-06	1009179-03	_011	BENZO(A)ANTHRACENE	0.0469	J	0.0469	0.0469	J	Y	UG/L	0.0469 J	P	0.093	1	100
32GW-06	1009179-03	_011	BENZO(A)PYRENE	0.0374	J	0.0374	0.0374	J	Y	UG/L	0.0374 J	P	0.093	1	100

nsample	lab_id	sdg	lab_para	lab_resu	lab_	val_res	result	val_c	qual	units	ourresult	qual_	crdl_crq	dil_fct_moist
32GW-06	1009179-03	_011	BENZO(B)FLUORANTHE	0.0558	J	0.0558	0.0558	J	Y	UG/L	0.0558	J	P	0.093	1	100
32GW-06	1009179-03	_011	BENZO(K)FLUORANTHE	0.0562	J	0.0562	0.0562	J	Y	UG/L	0.0562	J	P	0.093	1	100
32GW-06	1009179-03	_011	CHRYSENE	0.0514	J	0.0514	0.0514	J	Y	UG/L	0.0514	J	P	0.093	1	100
32GW-06	1009179-03	_011	DIBENZ(A,H)ANTHRACE	0.0515	BJ	0.0187	0.0187	U	N	UG/L	0.0187	U	A	0.093	1	100
32GW-06	1009179-03	_011	INDENO(1,2,3-CD)PYRE	0.052	BJ	0.0187	0.0187	U	N	UG/L	0.0187	U	A	0.093	1	100
32GW-06	1009179-03	_011	NAPHTHALENE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187	U		0.093	1	100
32GW-05-D	1009179-04	_011	BENZENE	1	U	0.14	0.14	U	N	UG/L	0.14	U		1	1	100
32GW-05-D	1009179-04	_011	ETHYLBENZENE	1	U	0.15	0.15	U	N	UG/L	0.15	U		1	1	100
32GW-05-D	1009179-04	_011	TOLUENE	1	U	0.19	0.19	U	N	UG/L	0.19	U		1	1	100
32GW-05-D	1009179-04	_011	XYLENE(TOTAL)	1	U	0.22	0.22	U	N	UG/L	0.22	U		1	1	100
32GW-05-D	1009179-04	_011	BENZO(A)ANTHRACENE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187	U		0.093	1	100
32GW-05-D	1009179-04	_011	BENZO(A)PYRENE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187	U		0.093	1	100
32GW-05-D	1009179-04	_011	BENZO(B)FLUORANTHE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187	U		0.093	1	100
32GW-05-D	1009179-04	_011	BENZO(K)FLUORANTHE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187	U		0.093	1	100
32GW-05-D	1009179-04	_011	CHRYSENE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187	U		0.093	1	100
32GW-05-D	1009179-04	_011	DIBENZ(A,H)ANTHRACE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187	U		0.093	1	100
32GW-05-D	1009179-04	_011	INDENO(1,2,3-CD)PYRE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187	U		0.093	1	100
32GW-05-D	1009179-04	_011	NAPHTHALENE	0.0935	U	0.0187	0.0187	U	N	UG/L	0.0187	U		0.093	1	100
TB_011	1009179-05	_011	BENZENE	1	U	0.14	0.14	U	N	UG/L	0.14	U		1	1	100
TB_011	1009179-05	_011	ETHYLBENZENE	1	U	0.15	0.15	U	N	UG/L	0.15	U		1	1	100
TB_011	1009179-05	_011	TOLUENE	1	U	0.19	0.19	U	N	UG/L	0.19	U		1	1	100
TB_011	1009179-05	_011	XYLENE(TOTAL)	1	U	0.22	0.22	U	N	UG/L	0.22	U		1	1	100

APPENDIX G – DATA VALIDATION REPORTS

DATA VALIDAITON REPORTS

DATA VALIDATION REPORTS

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**T.KLIMEK**	**DATE:**	**AUGUST 3, 2010**
FROM:	**JOSEPH KALINYAK**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION: VOC / PAH**
NSWC CRANE, CTO F273
SDG CTOF273_001

SAMPLES: 11 / Soil / VOC (benzene, ethyl benzene, toluene, total xylenes)

32SB-01-0708	32SB-02-0607	32SB-03-0607
32SB-04-0506	32SB-05-0506	32SB-06-0405
32SB-07-0607	32SB-09-0607	32SB-10-0506
32SB-14-0910	32SB-FD042610	

22 / Soil / PAH

32SB-01-0708	32SB-02-0607	32SB-03-0607
32SB-04-0506	32SB-05-0506	32SB-06-0405
32SB-07-0607	32SB-09-0607	32SB-10-0506
32SB-14-0910	32SB-FD042610	32SS-01-0002
32SS-02-0002	32SS-03-0002	32SS-04-0002
32SS-05-0002	32SS-06-0002	32SS-07-0002
32SS-09-0002	32SS-10-0002	32SS-14-0002
32SS-FD042610		

OVERVIEW

The sample set for NSWC Crane, CTO F273, SDG CTOF273_001 consisted of twenty-two (22) soil samples including two (2) field duplicate samples. Eleven (11) samples were analyzed for a short list of four (4) volatile organic compounds (VOC), benzene, ethyl benzene, toluene, and total xylenes, and all twenty-two (22) samples were analyzed for a list of eight (8) polynuclear aromatic hydrocarbons (PAH), benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene. The two (2) field duplicate pairs included in this sample delivery group (SDG) were: 32SB-FD042610 / 32SB-01-0708 and 32SS-FD042610 / 32SS-01-0002.

The samples were collected by TetraTech NUS on April 26, 2010 and analyzed by Empirical Laboratories, LLC. All analyses were conducted using USEPA SW-846 Methods 8260B and 8270C analytical and reporting protocols.

The data contained in this SDG were fully validated with regard to the following parameters:

*	•	Data Completeness
	•	Holding Times
*	•	GC/MS Tuning
*	•	Initial and Continuing Calibration
*	•	Laboratory Blank Analyses
	•	Surrogate Recoveries
*	•	Blank Spike/Blank Spike Duplicate Results
*	•	Matrix Spike/Matrix Spike Duplicate Results
	•	Internal Standard Recoveries
*	•	Field Duplicate Results

* • Compound Quantitation
* • Compound Identification
* • Detection Limits

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

VOC

The initial analysis of sample 32SB-03-0607 had percent recoveries (%R) for all three internal standards less than the quality control limit (and >10%). The sample re-analysis also had %Rs for all three internal standards less than the quality control limit. Additionally, the holding time of 14 days from sampling to analysis was exceeded for the sample 32SB-03-0607 re-analysis. As a result of no improvement in the internal standard %Rs and the exceedance of the hold time for the sample re-analysis, the original VOC results for sample 32SB-03-0607 were reported and these non-detected results were qualified estimated, (UJ).

The initial analysis of sample 32SB-05-0506 had percent recoveries (%R) for all three internal standards less than the quality control limit (and >10%). The sample was not re-analyzed. The positive and non-detected VOC results for sample 32SB-05-0506 were qualified estimated, (J) and (UJ), respectively.

The surrogate %Rs were greater than the quality control limit for bromofluorobenzene and toluene-d8 for sample 32SB-05-0506. The positive results for the sample were qualified estimated, (J), and the non-detected were not qualified.

The surrogate %R was greater than the quality control limit for bromofluorobenzene for sample 32SB-02-0607. All results for the sample were non-detected which were not qualified.

Sample 32SB-02-0607 was diluted 50X due to high VOC levels. Sample 32SB-06-0405 was diluted 100X for the VOC analysis due to high levels of non-target VOC analytes but did not contain any positive VOC target compound concentrations.

PAH

The %R for the internal standard perylene-d12 was less than the quality control limit (and >10%) for sample 32SS-07-0002. No re-analysis of the sample was performed. PAH results for the analytes associated with this internal standard, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenzo(a,h)anthracene, were non-detected, and these non-detected results were qualified estimated, (UJ).

Samples 32SB-02-0607 and 32SB-06-0405 were analyzed at a 10X dilution resulting in elevated reporting limits and minimum detection limits for the non-detected analytes. As a result of the elevated reporting limits the sample 32SB-02-0607 non-detected naphthalene result was greater than the project quantitation level (PQL) listed in the Statement of Work (SOW).

ADDITIONAL COMMENTS

Positive results less than the reporting limit (RL) were qualified as estimated, (J), due to uncertainty near the detection limit.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Volatile fraction samples 32SB-03-0607 and 32SB-05-0506 VOC results were qualified due to internal standard percent recoveries less than the quality control limit. Sample 32SB-05-0506 positive results were qualified due to surrogate percent recoveries greater than the quality control limit. Some sample 32SS-07-0002 PAH non-detected results were qualified due to the %R for an internal standard less than the quality control limit. Sample 32SB-02-0607 non-detected naphthalene result was greater than the project quantitation level (PQL) listed in the Statement of Work (SOW) as it was analyzed at a 10X dilution.

Other factors affecting data quality: Positive results less than the reporting limit (RL) were qualified estimated, (J), due to uncertainty near the detection limit.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999) and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006). The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech NUS
Joseph Kalinyak
Chemist/Data Validator

TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

APPENDIX C

SUPPORT DOCUMENTATION

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Value Qualifier Key (Val Qual)

J – The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

UJ – The result is an estimated non-detected quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

U - Value is a non-detect as reported by the laboratory.

UR – Non-detected result is considered rejected, (UR), as a result of technical non-compliances.

DATA QUALIFICATION CODE (QUAL CODE)

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's r < 0.995 / ICP PDS Recovery Noncompliance
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; e.g. chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient r < 0.995
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 02111	NSAMPLE	32SB-01-0708			32SB-02-0607			32SB-03-0607			32SB-04-0506		
SDG: CTOF273_001	LAB_ID	1004244-02			1004244-06			1004244-08			1004244-10		
FRACTION: OV	SAMP_DATE	4/26/2010			4/26/2010			4/26/2010			4/26/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	85.4			80.5			82.0			85.4		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.535	U		32.4	U		0.486	UJ	N	0.461	U	
ETHYLBENZENE		0.853	U		51.6	U		0.775	UJ	N	0.735	U	
TOLUENE		0.978	U		59.2	U		0.889	UJ	N	0.843	U	
TOTAL XYLENES		0.796	U		48.2	U		0.724	UJ	N	0.686	U	

PROJ_NO: 02111	NSAMPLE	32SB-05-0506			32SB-06-0405			32SB-07-0607			32SB-09-0607		
SDG: CTOF273_001	LAB_ID	1004244-12			1004244-14			1004244-16			1004244-18		
FRACTION: OV	SAMP_DATE	4/26/2010			4/26/2010			4/26/2010			4/26/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	83.2			84.4			81.7			84.9		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.472	UJ	N	1810			1.77	J	P	0.573	U	
ETHYLBENZENE		0.972	J	NPR	82	J	P	4.32	J	P	0.914	U	
TOLUENE		0.863	UJ	N	112	J	P	0.935	U		1.05	U	
TOTAL XYLENES		1.27	J	NPR	527	J	P	8.93	J	P	0.853	U	

PROJ_NO: 02111	NSAMPLE	32SB-10-0506			32SB-14-0910			32SB-FD042610		
SDG: CTOF273_001	LAB_ID	1004244-20			1004244-22			1004244-04		
FRACTION: OV	SAMP_DATE	4/26/2010			4/26/2010			4/26/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	79.9			82.4			85.3		
	DUP_OF							32SB-01-0708		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.497	U		0.542	U		0.525	U	
ETHYLBENZENE		0.794	U		0.865	U		0.837	U	
TOLUENE		0.91	U		0.992	U		0.96	U	
TOTAL XYLENES		0.741	U		0.808	U		0.781	U	

PROJ_NO: 02111	NSAMPLE	32SB-01-0708			32SB-02-0607			32SB-03-0607			32SB-04-0506		
SDG: CTOF273_001	LAB_ID	1004244-02			1004244-06			1004244-08			1004244-10		
FRACTION: PAH	SAMP_DATE	4/26/2010			4/26/2010			4/26/2010			4/26/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	85.4			80.5			82.0			85.4		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.56	U		16.4	U		1.62	U		1.55	U	
BENZO(A)PYRENE		1.56	U		16.4	U		1.62	U		1.55	U	
BENZO(B)FLUORANTHENE		1.56	U		16.4	U		1.62	U		1.55	U	
BENZO(K)FLUORANTHENE		1.56	U		16.4	U		1.62	U		1.55	U	
CHRYSENE		1.56	U		16.4	U		1.62	U		1.55	U	
DIBENZO(A,H)ANTHRACENE		1.56	U		16.4	U		1.62	U		1.55	U	
INDENO(1,2,3-CD)PYRENE		1.56	U		16.4	U		1.62	U		1.55	U	
NAPHTHALENE		1.56	U		16.4	U		1.62	U		1.55	U	

PROJ_NO: 02111	NSAMPLE	32SB-05-0506			32SB-06-0405			32SB-07-0607			32SB-09-0607		
SDG: CTOF273_001	LAB_ID	1004244-12			1004244-14			1004244-16			1004244-18		
FRACTION: PAH	SAMP_DATE	4/26/2010			4/26/2010			4/26/2010			4/26/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	83.2			84.4			81.7			84.9		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.59	U		15.3	U		1.59	U		69.8		
BENZO(A)PYRENE		1.59	U		15.3	U		1.59	U		1.56	U	
BENZO(B)FLUORANTHENE		1.59	U		15.3	U		1.59	U		1.56	U	
BENZO(K)FLUORANTHENE		1.59	U		15.3	U		1.59	U		1.56	U	
CHRYSENE		1.59	U		15.3	U		1.59	U		75.5		
DIBENZO(A,H)ANTHRACENE		1.59	U		15.3	U		1.59	U		1.56	U	
INDENO(1,2,3-CD)PYRENE		1.59	U		15.3	U		1.59	U		1.56	U	
NAPHTHALENE		1.59	U		1390			1.59	U		11.6		

PROJ_NO: 02111	NSAMPLE	32SB-10-0506			32SB-14-0910			32SB-FD042610			32SS-01-0002		
SDG: CTOF273_001	LAB_ID	1004244-20			1004244-22			1004244-04			1004244-01		
FRACTION: PAH	SAMP_DATE	4/26/2010			4/26/2010			4/26/2010			4/26/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	79.9			82.4			85.3			85.5		
	DUP_OF							32SB-01-0708					
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.62	U		1.55	U		1.55	U		1.56	U	
BENZO(A)PYRENE		1.62	U		1.55	U		1.55	U		1.56	U	
BENZO(B)FLUORANTHENE		1.62	U		1.55	U		1.55	U		1.56	U	
BENZO(K)FLUORANTHENE		1.62	U		1.55	U		1.55	U		1.56	U	
CHRYSENE		1.62	U		1.55	U		1.55	U		1.56	U	
DIBENZO(A,H)ANTHRACENE		1.62	U		1.55	U		1.55	U		1.56	U	
INDENO(1,2,3-CD)PYRENE		1.62	U		1.55	U		1.55	U		1.56	U	
NAPHTHALENE		1.62	U		1.55	U		1.55	U		1.56	U	

PROJ_NO: 02111	NSAMPLE	32SS-02-0002			32SS-03-0002			32SS-04-0002			32SS-05-0002		
SDG: CTOF273_001	LAB_ID	1004244-05			1004244-07			1004244-09			1004244-11		
FRACTION: PAH	SAMP_DATE	4/26/2010			4/26/2010			4/26/2010			4/26/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	82.7			84.8			81.3			86.1		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.61	U		1.56	U		1.64	U		1.53	U	
BENZO(A)PYRENE		1.61	U		1.56	U		1.64	U		1.53	U	
BENZO(B)FLUORANTHENE		1.61	U		1.56	U		1.64	U		1.53	U	
BENZO(K)FLUORANTHENE		1.61	U		1.56	U		1.64	U		1.53	U	
CHRYSENE		1.61	U		1.56	U		1.64	U		1.53	U	
DIBENZO(A,H)ANTHRACENE		1.61	U		1.56	U		1.64	U		1.53	U	
INDENO(1,2,3-CD)PYRENE		1.61	U		1.56	U		1.64	U		1.53	U	
NAPHTHALENE		1.61	U		1.56	U		1.64	U		51.4		

PROJ_NO: 02111 SDG: CTOF273_001 FRACTION: PAH MEDIA: SOIL	NSAMPLE	32SS-06-0002			32SS-07-0002			32SS-09-0002			32SS-10-0002		
	LAB_ID	1004244-13			1004244-15			1004244-17			1004244-19		
	SAMP_DATE	4/26/2010			4/26/2010			4/26/2010			4/26/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	84.5			82.3			86.6			87.1		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.54	U		1.57	U		1.51	U		1.53	U	
BENZO(A)PYRENE		1.54	U		1.57	UJ	N	1.51	U		1.53	U	
BENZO(B)FLUORANTHENE		13.5			1.57	UJ	N	1.51	U		1.53	U	
BENZO(K)FLUORANTHENE		1.54	U		1.57	UJ	N	1.51	U		1.53	U	
CHRYSENE		1.54	U		1.57	U		1.51	U		1.53	U	
DIBENZO(A,H)ANTHRACENE		1.54	U		1.57	UJ	N	1.51	U		1.53	U	
INDENO(1,2,3-CD)PYRENE		1.54	U		1.57	UJ	N	1.51	U		1.53	U	
NAPHTHALENE		1.54	U		1.57	U		1.51	U		1.53	U	

PROJ_NO: 02111	NSAMPLE	32SS-14-0002			32SS-FD042610		
SDG: CTOF273_001	LAB_ID	1004244-21			1004244-03		
FRACTION: PAH	SAMP_DATE	4/26/2010			4/26/2010		
MEDIA: SOIL	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	86.8			83.9		
	DUP_OF				32SS-01-0002		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.5	U		1.57	U	
BENZO(A)PYRENE		1.5	U		1.57	U	
BENZO(B)FLUORANTHENE		1.5	U		1.57	U	
BENZO(K)FLUORANTHENE		1.5	U		1.57	U	
CHRYSENE		1.5	U		1.57	U	
DIBENZO(A,H)ANTHRACENE		1.5	U		1.57	U	
INDENO(1,2,3-CD)PYRENE		1.5	U		1.57	U	
NAPHTHALENE		1.5	U		1.57	U	

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

ANALYSIS DATA SHEET

32SB-01-0708

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-02	File ID:	0424402.D
Sampled:	04/26/10 15:40	Prepared:	05/08/10 15:02	Analyzed:	05/08/10 16:25
Solids:	85.36	Preparation:	5035	Dilution:	1

Batch: 0E08007 Sequence: 0E13716 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.535	5.00	U
100-41-4	Ethylbenzene		0.853	11.4	U
108-88-3	Toluene		0.978	11.4	U
1330-20-7	Xylenes (total)		0.796	11.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	34.12	36.03	106	85 - 120	
Dibromofluoromethane	34.12	33.79	99.0	80 - 125	
1,2-Dichloroethane-d4	34.12	33.23	97.4	75 - 140	
Toluene-d8	34.12	35.66	105	85 - 115	

ANALYSIS DATA SHEET

32SB-02-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-06	File ID:	0424406D.D
Sampled:	04/26/10 10:45	Prepared:	05/08/10 15:37	Analyzed:	05/09/10 09:14
Solids:	80.52	Preparation:	5035	Dilution:	50

Batch: 0E08008 Sequence: 0E13717 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		32.4	275	U
100-41-4	Ethylbenzene		51.6	688	U
108-88-3	Toluene		59.2	688	U
1330-20-7	Xylenes (total)		48.2	688	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	41.31	56.63	137	85 - 120	*
Dibromofluoromethane	41.31	42.85	104	80 - 125	
1,2-Dichloroethane-d4	41.31	42.73	103	75 - 140	
Toluene-d8	41.31	45.63	110	85 - 115	

ANALYSIS DATA SHEET

32SB-03-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-08	File ID:	0424408.D
Sampled:	04/26/10 16:15	Prepared:	05/08/10 15:02	Analyzed:	05/08/10 17:26
Solids:	81.97	Preparation:	5035	Dilution:	1

Batch: 0E08007 Sequence: 0E13716 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.486	5.00	I, U
100-41-4	Ethylbenzene		0.775	10.3	I, U
108-88-3	Toluene		0.889	10.3	I, U
1330-20-7	Xylenes (total)		0.724	10.3	I, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	31.02	34.30	111	85 - 120	
Dibromofluoromethane	31.02	29.93	96.5	80 - 125	
1,2-Dichloroethane-d4	31.02	30.90	99.6	75 - 140	
Toluene-d8	31.02	32.63	105	85 - 115	

ANALYSIS DATA SHEET

32SB-03-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-08RE1	File ID:	0424408.D
Sampled:	04/26/10 16:15	Prepared:	05/20/10 11:09	Analyzed:	05/20/10 18:45
Solids:	81.97	Preparation:	5035	Dilution:	1

Batch: 0E20008 Sequence: 0E14105 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.516	5.00	H1, U, I
100-41-4	Ethylbenzene		0.823	11.0	H1, U, I
108-88-3	Toluene		0.944	11.0	H1, U, I
1330-20-7	Xylenes (total)	2.21	0.768	11.0	H1, J, I

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	32.91	35.04	106	85 - 120	
Dibromofluoromethane	32.91	31.39	95.4	80 - 125	
1,2-Dichloroethane-d4	32.91	30.92	93.9	75 - 140	
Toluene-d8	32.91	35.26	107	85 - 115	

ANALYSIS DATA SHEET

32SB-04-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-10	File ID:	0424410.D
Sampled:	04/26/10 16:00	Prepared:	05/08/10 15:02	Analyzed:	05/08/10 17:57
Solids:	85.43	Preparation:	5035	Dilution:	1

Batch: 0E08007 Sequence: 0E13716 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.461	5.00	U
100-41-4	Ethylbenzene		0.735	9.80	U
108-88-3	Toluene		0.843	9.80	U
1330-20-7	Xylenes (total)		0.686	9.80	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.41	31.43	107	85 - 120	
Dibromofluoromethane	29.41	29.46	100	80 - 125	
1,2-Dichloroethane-d4	29.41	30.16	103	75 - 140	
Toluene-d8	29.41	30.85	105	85 - 115	

ANALYSIS DATA SHEET

32SB-05-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-12	File ID:	0424412.D
Sampled:	04/26/10 11:25	Prepared:	05/08/10 15:37	Analyzed:	05/09/10 08:13
Solids:	83.19	Preparation:	5035	Dilution:	1

Batch: 0E08008 Sequence: 0E13717 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.472	5.00	I, U
100-41-4	Ethylbenzene	0.972	0.753	10.0	I, J
108-88-3	Toluene		0.863	10.0	I, U
1330-20-7	Xylenes (total)	1.27	0.702	10.0	I, J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.10	48.78	162	85 - 120	*
Dibromofluoromethane	30.10	29.90	99.3	80 - 125	
1,2-Dichloroethane-d4	30.10	30.25	101	75 - 140	
Toluene-d8	30.10	36.30	121	85 - 115	*

ANALYSIS DATA SHEET

32SB-06-0405

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-14	File ID:	0424414D.D
Sampled:	04/26/10 11:00	Prepared:	05/08/10 15:37	Analyzed:	05/09/10 09:44
Solids:	84.37	Preparation:	5035	Dilution:	100
Batch:	0E08008	Sequence:	0E13717	Calibration:	0130002
Instrument:	MS-VOA4				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene	1810	49.2	419	D
100-41-4	Ethylbenzene	82.0	78.5	1050	J, D
108-88-3	Toluene	112	90.1	1050	D, J
1330-20-7	Xylenes (total)	527	73.3	1050	D, J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	31.41	35.46	113	85 - 120	
Dibromofluoromethane	31.41	32.50	103	80 - 125	
1,2-Dichloroethane-d4	31.41	29.20	92.9	75 - 140	
Toluene-d8	31.41	32.96	105	85 - 115	

ANALYSIS DATA SHEET

32SB-07-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-16	File ID:	0424416.D
Sampled:	04/26/10 16:30	Prepared:	05/08/10 15:02	Analyzed:	05/08/10 18:28
Solids:	81.65	Preparation:	5035	Dilution:	1

Batch: 0E08007 Sequence: 0E13716 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene	1.77	0.511	5.00	J
100-41-4	Ethylbenzene	4.32	0.816	10.9	J
108-88-3	Toluene		0.935	10.9	U
1330-20-7	Xylenes (total)	8.93	0.761	10.9	J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	32.63	34.68	106	85 - 120	
Dibromofluoromethane	32.63	31.76	97.3	80 - 125	
1,2-Dichloroethane-d4	32.63	31.04	95.1	75 - 140	
Toluene-d8	32.63	34.90	107	85 - 115	

ANALYSIS DATA SHEET

32SB-09-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-18	File ID:	0424418.D
Sampled:	04/26/10 11:10	Prepared:	05/08/10 15:02	Analyzed:	05/08/10 18:58
Solids:	84.94	Preparation:	5035	Dilution:	1

Batch: 0E08007 Sequence: 0E13716 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.573	5.00	U
100-41-4	Ethylbenzene		0.914	12.2	U
108-88-3	Toluene		1.05	12.2	U
1330-20-7	Xylenes (total)		0.853	12.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	36.56	39.36	108	85 - 120	
Dibromofluoromethane	36.56	36.46	99.7	80 - 125	
1,2-Dichloroethane-d4	36.56	34.84	95.3	75 - 140	
Toluene-d8	36.56	39.01	107	85 - 115	

ANALYSIS DATA SHEET

32SB-10-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-20	File ID:	0424420.D
Sampled:	04/26/10 11:35	Prepared:	05/08/10 15:37	Analyzed:	05/09/10 08:43
Solids:	79.93	Preparation:	5035	Dilution:	1

Batch: 0E08008 Sequence: 0E13717 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.497	5.00	U
100-41-4	Ethylbenzene		0.794	10.6	U
108-88-3	Toluene		0.910	10.6	U
1330-20-7	Xylenes (total)		0.741	10.6	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	31.75	34.27	108	85 - 120	
Dibromofluoromethane	31.75	31.87	100	80 - 125	
1,2-Dichloroethane-d4	31.75	30.26	95.3	75 - 140	
Toluene-d8	31.75	34.56	109	85 - 115	

ANALYSIS DATA SHEET

32SB-14-0910

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-22	File ID:	0424422.D
Sampled:	04/26/10 12:00	Prepared:	05/08/10 15:02	Analyzed:	05/08/10 19:29
Solids:	82.37	Preparation:	5035	Dilution:	1

Batch: 0E08007 Sequence: 0E13716 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.542	5.00	U
100-41-4	Ethylbenzene		0.865	11.5	U
108-88-3	Toluene		0.992	11.5	U
1330-20-7	Xylenes (total)		0.808	11.5	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	34.62	35.86	104	85 - 120	
Dibromofluoromethane	34.62	33.21	95.9	80 - 125	
1,2-Dichloroethane-d4	34.62	32.76	94.6	75 - 140	
Toluene-d8	34.62	36.07	104	85 - 115	

ANALYSIS DATA SHEET

32SB-FD042610

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_001	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Soil	Laboratory ID:	1004244-04	File ID:	0424404.D
Sampled:	04/26/10 15:40	Prepared:	05/08/10 15:02	Analyzed:	05/08/10 16:56
Solids:	85.32	Preparation:	5035	Dilution:	1

Batch: 0E08007 Sequence: 0E13716 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.525	5.00	U
100-41-4	Ethylbenzene		0.837	11.2	U
108-88-3	Toluene		0.960	11.2	U
1330-20-7	Xylenes (total)		0.781	11.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	33.49	35.62	106	85 - 120	
Dibromofluoromethane	33.49	32.78	97.9	80 - 125	
1,2-Dichloroethane-d4	33.49	31.12	92.9	75 - 140	
Toluene-d8	33.49	34.03	102	85 - 115	

ANALYSIS DATA SHEET

32SB-01-0708

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-02	File ID:	0424402.D
Sampled:	04/26/10 15:40	Prepared:	05/10/10 10:30	Analyzed:	06/04/10 19:43
Solids:	85.36	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.56	7.81	U
50-32-8	Benzo(a)pyrene		1.56	5.86	U
205-99-2	Benzo(b)fluoranthene		1.56	7.81	X, U
207-08-9	Benzo(k)fluoranthene		1.56	7.81	U
218-01-9	Chrysene		1.56	7.81	U
53-70-3	Dibenz(a,h)anthracene		1.56	5.86	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.56	7.81	U
91-20-3	Naphthalene		1.56	5.86	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3905	2730	69.9	14 - 129	
Terphenyl-d14	3905	2752	70.5	14 - 129	

ANALYSIS DATA SHEET

32SB-02-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-06	File ID:	424406D2.D
Sampled:	04/26/10 10:45	Prepared:	05/10/10 10:30	Analyzed:	06/05/10 09:38
Solids:	80.52	Preparation:	EXT_3546	Dilution:	10

Batch: 0E08014 Sequence: 0F15603 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		16.4	82.3	U
50-32-8	Benzo(a)pyrene		16.4	61.7	U
205-99-2	Benzo(b)fluoranthene		16.4	82.3	U
207-08-9	Benzo(k)fluoranthene		16.4	82.3	U
218-01-9	Chrysene		16.4	82.3	U
53-70-3	Dibenz(a,h)anthracene		16.4	61.7	U
193-39-5	Indeno(1,2,3-cd)pyrene		16.4	82.3	U
91-20-3	Naphthalene		16.4	61.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4113	2370	57.6	14 - 129	
Terphenyl-d14	4113	2317	56.3	14 - 129	

ANALYSIS DATA SHEET

32SB-03-0607

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_001	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Soil	Laboratory ID:	1004244-08	File ID:	0424408.D
Sampled:	04/26/10 16:15	Prepared:	05/10/10 10:30	Analyzed:	06/04/10 23:07
Solids:	81.97	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.62	8.14	U
50-32-8	Benzo(a)pyrene		1.62	6.10	U
205-99-2	Benzo(b)fluoranthene		1.62	8.14	X, U
207-08-9	Benzo(k)fluoranthene		1.62	8.14	U
218-01-9	Chrysene		1.62	8.14	U
53-70-3	Dibenz(a,h)anthracene		1.62	6.10	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.62	8.14	U
91-20-3	Naphthalene		1.62	6.10	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4067	2485	61.1	14 - 129	
Terphenyl-d14	4067	2720	66.9	14 - 129	

ANALYSIS DATA SHEET

32SB-04-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-10	File ID:	0424410.D
Sampled:	04/26/10 16:00	Prepared:	05/10/10 10:30	Analyzed:	06/05/10 00:16
Solids:	85.43	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.76	U
50-32-8	Benzo(a)pyrene		1.55	5.81	U
205-99-2	Benzo(b)fluoranthene		1.55	7.76	X, U
207-08-9	Benzo(k)fluoranthene		1.55	7.76	U
218-01-9	Chrysene		1.55	7.76	U
53-70-3	Dibenz(a,h)anthracene		1.55	5.81	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.76	U
91-20-3	Naphthalene		1.55	5.81	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3876	2559	66.0	14 - 129	
Terphenyl-d14	3876	2807	72.4	14 - 129	

ANALYSIS DATA SHEET

32SB-05-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-12	File ID:	0424412.D
Sampled:	04/26/10 11:25	Prepared:	05/10/10 10:30	Analyzed:	06/05/10 00:50
Solids:	83.19	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.59	7.96	U
50-32-8	Benzo(a)pyrene		1.59	5.97	U
205-99-2	Benzo(b)fluoranthene		1.59	7.96	X, U
207-08-9	Benzo(k)fluoranthene		1.59	7.96	U
218-01-9	Chrysene		1.59	7.96	U
53-70-3	Dibenz(a,h)anthracene		1.59	5.97	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.59	7.96	U
91-20-3	Naphthalene		1.59	5.97	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3980	2614	65.7	14 - 129	
Terphenyl-d14	3980	2805	70.5	14 - 129	

ANALYSIS DATA SHEET

32SB-06-0405

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-14	File ID:	424414D2.D
Sampled:	04/26/10 11:00	Prepared:	05/10/10 10:30	Analyzed:	06/05/10 12:21
Solids:	84.37	Preparation:	EXT_3546	Dilution:	10

Batch: 0E08014 Sequence: 0F15603 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		15.3	76.5	U
50-32-8	Benzo(a)pyrene		15.3	57.4	U
205-99-2	Benzo(b)fluoranthene		15.3	76.5	U
207-08-9	Benzo(k)fluoranthene		15.3	76.5	U
218-01-9	Chrysene		15.3	76.5	U
53-70-3	Dibenz(a,h)anthracene		15.3	57.4	U
193-39-5	Indeno(1,2,3-cd)pyrene		15.3	76.5	U
91-20-3	Naphthalene	1390	15.3	57.4	D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3824	2708	70.8	14 - 129	
Terphenyl-d14	3824	2564	67.1	14 - 129	

ANALYSIS DATA SHEET

32SB-07-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-16	File ID:	0424416.D
Sampled:	04/26/10 16:30	Prepared:	05/10/10 10:30	Analyzed:	06/05/10 01:58
Solids:	81.65	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.59	7.96	U
50-32-8	Benzo(a)pyrene		1.59	5.96	U
205-99-2	Benzo(b)fluoranthene		1.59	7.96	X, U
207-08-9	Benzo(k)fluoranthene		1.59	7.96	U
218-01-9	Chrysene		1.59	7.96	U
53-70-3	Dibenz(a,h)anthracene		1.59	5.96	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.59	7.96	U
91-20-3	Naphthalene		1.59	5.96	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3976	2444	61.5	14 - 129	
Terphenyl-d14	3976	2618	65.8	14 - 129	

ANALYSIS DATA SHEET

32SB-09-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-18	File ID:	0424418.D
Sampled:	04/26/10 11:10	Prepared:	05/10/10 10:30	Analyzed:	06/05/10 03:07
Solids:	84.94	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	69.8	1.56	7.80	
50-32-8	Benzo(a)pyrene		1.56	5.85	U
205-99-2	Benzo(b)fluoranthene		1.56	7.80	X, U
207-08-9	Benzo(k)fluoranthene		1.56	7.80	U
218-01-9	Chrysene	75.5	1.56	7.80	
53-70-3	Dibenz(a,h)anthracene		1.56	5.85	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.56	7.80	U
91-20-3	Naphthalene	11.6	1.56	5.85	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3899	2800	71.8	14 - 129	
Terphenyl-d14	3899	2719	69.7	14 - 129	

ANALYSIS DATA SHEET

32SB-10-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-20	File ID:	0424420.D
Sampled:	04/26/10 11:35	Prepared:	05/10/10 10:30	Analyzed:	06/05/10 06:48
Solids:	79.93	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15603 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.62	8.13	U
50-32-8	Benzo(a)pyrene		1.62	6.09	U
205-99-2	Benzo(b)fluoranthene		1.62	8.13	U
207-08-9	Benzo(k)fluoranthene		1.62	8.13	U
218-01-9	Chrysene		1.62	8.13	U
53-70-3	Dibenz(a,h)anthracene		1.62	6.09	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.62	8.13	U
91-20-3	Naphthalene		1.62	6.09	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4062	2549	62.7	14 - 129	
Terphenyl-d14	4062	2657	65.4	14 - 129	

ANALYSIS DATA SHEET

32SB-14-0910

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-22	File ID:	0424422.D
Sampled:	04/26/10 12:00	Prepared:	05/10/10 13:35	Analyzed:	06/04/10 20:34
Solids:	82.37	Preparation:	EXT_3546	Dilution:	1

Batch: 0E09003 Sequence: 0F15602 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.79	U
50-32-8	Benzo(a)pyrene		1.55	5.84	U
205-99-2	Benzo(b)fluoranthene		1.55	7.79	U
207-08-9	Benzo(k)fluoranthene		1.55	7.79	U
218-01-9	Chrysene		1.55	7.79	U
53-70-3	Dibenz(a,h)anthracene		1.55	5.84	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.79	U
91-20-3	Naphthalene		1.55	5.84	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3891	3007	77.3	14 - 129	
Terphenyl-d14	3891	3225	82.9	14 - 129	

ANALYSIS DATA SHEET

32SB-FD042610

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-04	File ID:	0424404.D
Sampled:	04/26/10 15:40	Prepared:	05/10/10 10:30	Analyzed:	06/04/10 20:51
Solids:	85.32	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.77	U
50-32-8	Benzo(a)pyrene		1.55	5.82	U
205-99-2	Benzo(b)fluoranthene		1.55	7.77	X, U
207-08-9	Benzo(k)fluoranthene		1.55	7.77	U
218-01-9	Chrysene		1.55	7.77	U
53-70-3	Dibenz(a,h)anthracene		1.55	5.82	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.77	U
91-20-3	Naphthalene		1.55	5.82	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3881	2541	65.5	14 - 129	
Terphenyl-d14	3881	2719	70.1	14 - 129	

ANALYSIS DATA SHEET

32SS-01-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-01	File ID:	0424401.D
Sampled:	04/26/10 15:30	Prepared:	05/10/10 10:30	Analyzed:	06/04/10 19:09
Solids:	85.49	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.56	7.80	U
50-32-8	Benzo(a)pyrene		1.56	5.85	U
205-99-2	Benzo(b)fluoranthene		1.56	7.80	X, U
207-08-9	Benzo(k)fluoranthene		1.56	7.80	U
218-01-9	Chrysene		1.56	7.80	U
53-70-3	Dibenz(a,h)anthracene		1.56	5.85	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.56	7.80	U
91-20-3	Naphthalene		1.56	5.85	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3899	2559	65.6	14 - 129	
Terphenyl-d14	3899	2740	70.3	14 - 129	

ANALYSIS DATA SHEET

32SS-02-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-05	File ID:	0424405.D
Sampled:	04/26/10 10:45	Prepared:	05/10/10 10:30	Analyzed:	06/04/10 21:25
Solids:	82.66	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.61	8.07	U
50-32-8	Benzo(a)pyrene		1.61	6.05	U
205-99-2	Benzo(b)fluoranthene		1.61	8.07	X, U
207-08-9	Benzo(k)fluoranthene		1.61	8.07	U
218-01-9	Chrysene		1.61	8.07	U
53-70-3	Dibenz(a,h)anthracene		1.61	6.05	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.61	8.07	U
91-20-3	Naphthalene		1.61	6.05	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4033	2293	56.8	14 - 129	
Terphenyl-d14	4033	2285	56.7	14 - 129	

ANALYSIS DATA SHEET

32SS-03-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-07	File ID:	0424407.D
Sampled:	04/26/10 16:15	Prepared:	05/10/10 10:30	Analyzed:	06/04/10 22:33
Solids:	84.82	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.56	7.81	U
50-32-8	Benzo(a)pyrene		1.56	5.86	U
205-99-2	Benzo(b)fluoranthene		1.56	7.81	X, U
207-08-9	Benzo(k)fluoranthene		1.56	7.81	U
218-01-9	Chrysene		1.56	7.81	U
53-70-3	Dibenz(a,h)anthracene		1.56	5.86	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.56	7.81	U
91-20-3	Naphthalene		1.56	5.86	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3904	2606	66.8	14 - 129	
Terphenyl-d14	3904	2803	71.8	14 - 129	

ANALYSIS DATA SHEET

32SS-04-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-09	File ID:	0424409.D
Sampled:	04/26/10 16:00	Prepared:	05/10/10 10:30	Analyzed:	06/04/10 23:41
Solids:	81.30	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.64	8.20	U
50-32-8	Benzo(a)pyrene		1.64	6.15	U
205-99-2	Benzo(b)fluoranthene		1.64	8.20	X, U
207-08-9	Benzo(k)fluoranthene		1.64	8.20	U
218-01-9	Chrysene		1.64	8.20	U
53-70-3	Dibenz(a,h)anthracene		1.64	6.15	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.64	8.20	U
91-20-3	Naphthalene		1.64	6.15	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4100	2578	62.9	14 - 129	
Terphenyl-d14	4100	2906	70.9	14 - 129	

ANALYSIS DATA SHEET

32SS-05-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-11	File ID:	0424411.D
Sampled:	04/26/10 11:25	Prepared:	05/10/10 10:30	Analyzed:	06/05/10 07:56
Solids:	86.08	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15603 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.53	7.70	U
50-32-8	Benzo(a)pyrene		1.53	5.77	U
205-99-2	Benzo(b)fluoranthene		1.53	7.70	U
207-08-9	Benzo(k)fluoranthene		1.53	7.70	U
218-01-9	Chrysene		1.53	7.70	U
53-70-3	Dibenz(a,h)anthracene		1.53	5.77	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.53	7.70	U
91-20-3	Naphthalene	51.4	1.53	5.77	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3847	2645	68.8	14 - 129	
Terphenyl-d14	3847	2527	65.7	14 - 129	

ANALYSIS DATA SHEET

32SS-06-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-13	File ID:	0424413.D
Sampled:	04/26/10 10:55	Prepared:	05/10/10 10:30	Analyzed:	06/05/10 07:22
Solids:	84.46	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15603 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.54	7.74	U
50-32-8	Benzo(a)pyrene		1.54	5.80	U
205-99-2	Benzo(b)fluoranthene	13.5	1.54	7.74	
207-08-9	Benzo(k)fluoranthene		1.54	7.74	U
218-01-9	Chrysene		1.54	7.74	U
53-70-3	Dibenz(a,h)anthracene		1.54	5.80	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.54	7.74	U
91-20-3	Naphthalene		1.54	5.80	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3869	2584	66.8	14 - 129	
Terphenyl-d14	3869	2983	77.1	14 - 129	

ANALYSIS DATA SHEET

32SS-07-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-15	File ID:	0424415.D
Sampled:	04/26/10 16:25	Prepared:	05/10/10 10:30	Analyzed:	06/05/10 01:24
Solids:	82.34	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.57	7.89	U
50-32-8	Benzo(a)pyrene		1.57	5.91	I, U
205-99-2	Benzo(b)fluoranthene		1.57	7.89	I, X, U
207-08-9	Benzo(k)fluoranthene		1.57	7.89	I, U
218-01-9	Chrysene		1.57	7.89	U
53-70-3	Dibenz(a,h)anthracene		1.57	5.91	I, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.57	7.89	I, U
91-20-3	Naphthalene		1.57	5.91	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3943	2970	75.3	14 - 129	
Terphenyl-d14	3943	2950	74.8	14 - 129	

ANALYSIS DATA SHEET

32SS-09-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-17	File ID:	0424417.D
Sampled:	04/26/10 11:10	Prepared:	05/10/10 10:30	Analyzed:	06/05/10 02:32
Solids:	86.63	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.51	7.55	U
50-32-8	Benzo(a)pyrene		1.51	5.66	U
205-99-2	Benzo(b)fluoranthene		1.51	7.55	X, U
207-08-9	Benzo(k)fluoranthene		1.51	7.55	U
218-01-9	Chrysene		1.51	7.55	U
53-70-3	Dibenz(a,h)anthracene		1.51	5.66	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.51	7.55	U
91-20-3	Naphthalene		1.51	5.66	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3772	2675	70.9	14 - 129	
Terphenyl-d14	3772	2769	73.4	14 - 129	

ANALYSIS DATA SHEET

32SS-10-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-19	File ID:	0424419.D
Sampled:	04/26/10 11:35	Prepared:	05/10/10 10:30	Analyzed:	06/05/10 03:41
Solids:	87.14	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.53	7.65	U
50-32-8	Benzo(a)pyrene		1.53	5.74	U
205-99-2	Benzo(b)fluoranthene		1.53	7.65	X, U
207-08-9	Benzo(k)fluoranthene		1.53	7.65	U
218-01-9	Chrysene		1.53	7.65	U
53-70-3	Dibenz(a,h)anthracene		1.53	5.74	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.53	7.65	U
91-20-3	Naphthalene		1.53	5.74	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3825	2214	57.9	14 - 129	
Terphenyl-d14	3825	2551	66.7	14 - 129	

ANALYSIS DATA SHEET

32SS-14-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-21	File ID:	0424421.D
Sampled:	04/26/10 12:00	Prepared:	05/10/10 13:35	Analyzed:	06/04/10 19:58
Solids:	86.78	Preparation:	EXT_3546	Dilution:	1

Batch: 0E09003 Sequence: 0F15602 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.50	7.54	U
50-32-8	Benzo(a)pyrene		1.50	5.65	U
205-99-2	Benzo(b)fluoranthene		1.50	7.54	U
207-08-9	Benzo(k)fluoranthene		1.50	7.54	U
218-01-9	Chrysene		1.50	7.54	U
53-70-3	Dibenz(a,h)anthracene		1.50	5.65	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.50	7.54	U
91-20-3	Naphthalene		1.50	5.65	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3766	2616	69.5	14 - 129	
Terphenyl-d14	3766	2683	71.3	14 - 129	

ANALYSIS DATA SHEET

32SS-FD042610

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004244-03	File ID:	0424403.D
Sampled:	04/26/10 15:30	Prepared:	05/10/10 10:30	Analyzed:	06/04/10 20:17
Solids:	83.92	Preparation:	EXT_3546	Dilution:	1

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.57	7.90	U
50-32-8	Benzo(a)pyrene		1.57	5.92	U
205-99-2	Benzo(b)fluoranthene		1.57	7.90	X, U
207-08-9	Benzo(k)fluoranthene		1.57	7.90	U
218-01-9	Chrysene		1.57	7.90	U
53-70-3	Dibenz(a,h)anthracene		1.57	5.92	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.57	7.90	U
91-20-3	Naphthalene		1.57	5.92	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3946	2439	61.8	14 - 129	
Terphenyl-d14	3946	2658	67.4	14 - 129	

HOLDTIME

SDG CTOF273_001

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV	UG/KG	32SB-07-0607	1004244-16	NM	04/26/2010	05/08/2010	05/08/2010	12	0	12
OV	UG/KG	32SB-01-0708	1004244-02	NM	04/26/2010	05/08/2010	05/08/2010	12	0	12
OV	UG/KG	32SB-FD042610	1004244-04	NM	04/26/2010	05/08/2010	05/08/2010	12	0	12
OV	UG/KG	32SB-14-0910	1004244-22	NM	04/26/2010	05/08/2010	05/08/2010	12	0	12
OV	UG/KG	32SB-09-0607	1004244-18	NM	04/26/2010	05/08/2010	05/08/2010	12	0	12
OV	UG/KG	32SB-06-0405	1004244-14	NM	04/26/2010	05/08/2010	05/09/2010	12	1	13
OV	UG/KG	32SB-05-0506	1004244-12	NM	04/26/2010	05/08/2010	05/09/2010	12	1	13
OV	UG/KG	32SB-04-0506	1004244-10	NM	04/26/2010	05/08/2010	05/08/2010	12	0	12
OV	UG/KG	32SB-03-0607	1004244-08RE1	NM	04/26/2010	05/20/2010	05/20/2010	24	0	24
OV	UG/KG	32SB-03-0607	1004244-08	NM	04/26/2010	05/08/2010	05/08/2010	12	0	12
OV	UG/KG	32SB-02-0607	1004244-06	NM	04/26/2010	05/08/2010	05/09/2010	12	1	13
OV	UG/KG	32SB-10-0506	1004244-20	NM	04/26/2010	05/08/2010	05/09/2010	12	1	13
SIM	UG/KG	32SB-06-0405	1004244-14	NM	04/26/2010	05/10/2010	06/05/2010	14	26	40
SIM	UG/KG	32SB-05-0506	1004244-12	NM	04/26/2010	05/10/2010	06/05/2010	14	26	40
SIM	UG/KG	32SB-01-0708	1004244-02	NM	04/26/2010	05/10/2010	06/04/2010	14	25	39

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
SIM	UG/KG	32SB-02-0607	1004244-06	NM	04/26/2010	05/10/2010	06/05/2010	14	26	40
SIM	UG/KG	32SB-03-0607	1004244-08	NM	04/26/2010	05/10/2010	06/04/2010	14	25	39
SIM	UG/KG	32SS-02-0002	1004244-05	NM	04/26/2010	05/10/2010	06/04/2010	14	25	39
SIM	UG/KG	32SS-14-0002	1004244-21	NM	04/26/2010	05/10/2010	06/04/2010	14	25	39
SIM	UG/KG	32SS-10-0002	1004244-19	NM	04/26/2010	05/10/2010	06/05/2010	14	26	40
SIM	UG/KG	32SS-09-0002	1004244-17	NM	04/26/2010	05/10/2010	06/05/2010	14	26	40
SIM	UG/KG	32SS-07-0002	1004244-15	NM	04/26/2010	05/10/2010	06/05/2010	14	26	40
SIM	UG/KG	32SS-06-0002	1004244-13	NM	04/26/2010	05/10/2010	06/05/2010	14	26	40
SIM	UG/KG	32SS-05-0002	1004244-11	NM	04/26/2010	05/10/2010	06/05/2010	14	26	40
SIM	UG/KG	32SB-04-0506	1004244-10	NM	04/26/2010	05/10/2010	06/05/2010	14	26	40
SIM	UG/KG	32SS-03-0002	1004244-07	NM	04/26/2010	05/10/2010	06/04/2010	14	25	39
SIM	UG/KG	32SS-FD042610	1004244-03	NM	04/26/2010	05/10/2010	06/04/2010	14	25	39
SIM	UG/KG	32SS-01-0002	1004244-01	NM	04/26/2010	05/10/2010	06/04/2010	14	25	39
SIM	UG/KG	32SB-FD042610	1004244-04	NM	04/26/2010	05/10/2010	06/04/2010	14	25	39
SIM	UG/KG	32SB-14-0910	1004244-22	NM	04/26/2010	05/10/2010	06/04/2010	14	25	39
SIM	UG/KG	32SB-10-0506	1004244-20	NM	04/26/2010	05/10/2010	06/05/2010	14	26	40
SIM	UG/KG	32SB-09-0607	1004244-18	NM	04/26/2010	05/10/2010	06/05/2010	14	26	40
SIM	UG/KG	32SB-07-0607	1004244-16	NM	04/26/2010	05/10/2010	06/05/2010	14	26	40

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
SIM	UG/KG	32SS-04-0002	1004244-09	NM	04/26/2010	05/10/2010	06/04/2010	14	25	39

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 3

PROJECT NO: 112G02111	SITE NAME: ~~FANI~~ CTO F273 Summ 32	PROJECT MANAGER AND PHONE NUMBER: Tony Klimek 513-251-2730	LABORATORY NAME AND CONTACT: Empirical Laboratories
SAMPLERS (SIGNATURE):		FIELD OPERATIONS LEADER AND PHONE NUMBER: George TenEyck 513-251-2730	ADDRESS: 621 MainStream Dr., Suite 270
		CARRIER/WAYBILL NUMBER: 8631 3889 3446 FED EX	CITY, STATE: Nashville, TN 37228

STANDARD TAT ☒
RUSH TAT ☐
☒ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G P

PRESERVATIVE USED

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	BTEX							COMMENTS 1004244
4/26	1530	32SS-01-0002			1	X								-01
	1540	32SB-01-0708			1	X								-02
	1530	32SS-FD042610			1	X								-03
	1540	32SB-FD042610			1	X								-04
	1045	32SS-02-0002			1	X								-05
	1045	32SB-02-0607			1	X								-06
	1615	32SS-03-0002			1	X								-07
	1615	32SB-03-0607			1	X								-08
	1600	32SS-04-0002			1	X								-09
	1600	32SB-04-0506			1	X								-10
	1125	32SS-05-0002			1	X								-11
	1125	32SB-05-0506			1	X								-12
	1055	32SS-06-0002			1	X								-13

1. RELINQUISHED BY: G. TenEyck	DATE 4/26/10	TIME 5:39	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY: [signature]	DATE 4/27/10	TIME 08:30

COMMENTS: 1.1°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

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CTOF273_001 Summ Package

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 2 OF 3

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G02111	CTO F273 SWMU 32	Tony Klimek 512-251-2730	Empirical Laboratories
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George Tew Eyd 513-251-2730	ADDRESS: 621 Mainstream Dr. Suite 270
		CARRIER/WAYBILL NUMBER: 8631 3888 3446 Fex Ex	CITY, STATE: Nashville, TN

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G P

PRESERVATIVE USED

TYPE OF ANALYSIS: PAHs, BTEX

1004244

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	BTEX							COMMENTS
4/26	1100	32SB-06-0405			1	X								-14
	1625	32SS-07-0002			1	X								-15
	1630	32SB-07-0607			1	X								-16
	1110	32SS-09-0002			1	X								-17
	1110	32SB-09-0607			1	X								-18
	1135	32SS-10-0002			1	X								-19
	1135	32SB-10-0506			1	X								-20
	1200	32SS-14-0002			1	X								-21
	1200	32SB-14-0910			1	X								-22
	1540	32SB-01-0708			3		X							-02
	1540	32SB-FD042610-01			3		X							-04
	1050	32SB-02-0607			3		X							-06
	1615	32SB-03-0607			3		X							-08

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/27/10	5:35	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	4/27/10	08:30

COMMENTS: 1.1°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

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CTOF273_001 Summ Package

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 3 OF 3

PROJECT NO: 112G02111	SITE NAME: SWMU CTO F273 32	PROJECT MANAGER AND PHONE NUMBER: Tony Klimek 513-287-2230	LABORATORY NAME AND CONTACT: Empirical Laboratories
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George Ten Eyck 513-251-2230	ADDRESS: 621 Mainstream Dr, Suite 270
		CARRIER/WAYBILL NUMBER: 8631 3888 3446 Fed Ex	CITY, STATE: Nashville, TN

STANDARD TAT [X]
RUSH TAT [ ]
[ ] 24 hr. [ ] 48 hr. [ ] 72 hr. [ ] 7 day [ ] 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G P

PRESERVATIVE USED:

TYPE OF ANALYSIS: PAHs, BTEX

1004244

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	BTEX							COMMENTS
4/26	1600	32SB-04-0506			3		X							-10
	1125	32SB-05-0506			3		X							-12
	1100	32SB-06-0405			3		X							-14
	1630	32SB-07-0607			3		X							-16
	1110	32SB-09-0607			3		X							-18
	1135	32SB-10-0506			3		X							-20
	1200	32SB-14-0910			3		X							-22

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/26/10	5:39	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	4/27/10	08:30

COMMENTS: 1.1°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TINUS-001

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004244 Number of Coolers: 1 of 2

Client: TTNUS Project: CTO F273

Date/Time Received: **4/27/10** **08:30** Date cooler(s) opened: **4/27/10**

Opened By (print): Will Schuck (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 3435

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 1 Seal date: 4/26/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 1.1 °C

Dates samples were logged-in: **4/27/10**

9. Initial this form to acknowledge login of sample(s): (Name): Will Schuck (Initial): WS
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004244 Number of Coolers: 2 of 2

Client: TTNUS Project: CTO - F273

Date/Time Received: **4/27/10** **08:30** Date cooler(s) opened: **4/27/10**

Opened By (print): Will Schwab (signature): [illegible]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 3457

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 1 Seal date: 4/26/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 2.8 °C

~~Dates samples were logged-in:~~ **4/27/10**

9. Initial this form to acknowledge login of sample(s): (Name): _____ (Initial): _____
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

See page 1 of 2

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

WORK ORDER

Printed: 5/5/2010 8:14:23PM

1004244

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32

Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Report To:
Tetra Tech NUS, Inc. (T010)
Tobrena Skeen
Foster Plaza 7, 661 Anderson Drive
Pittsburgh, PA 15220
Phone: (412) 921-8182
Fax: (412) 921-4040

Invoice To:
Tetra Tech NUS, Inc. (T010)
Accounts Payable
Foster Plaza 7, 661 Anderson Drive
Pittsburgh, PA 15220
Phone :(412) 921-8182
Fax: (412) 921-4040

Date Due: 05/18/2010 16:00 (15 day TAT)
Received By: William Schwab
Date Received: 04/27/2010 08:30
Logged In By: William Schwab
Date Logged In: 04/27/2010 15:33

Samples Received at: 1.1°C
Custody Seals Yes
Received On Ice Yes
Containers Intact Yes
COC/Labels Agree Yes
Preservation Confir Yes

Analysis	Due	TAT	Expires	Comments
1004244-01 32SS-01-0002 [Solid] Sampled 04/26/2010 15:30 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 15:30	
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 15:30	See version
1004244-02 32SB-01-0708 [Solid] Sampled 04/26/2010 15:40 Central				**DoD QSM 4.1**
VOC_8260B_BTEXMN	05/13/2010 14:00	15	05/10/2010 15:40	ENCORES
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 15:40	See version
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 15:40	
1004244-03 32SS-FD042610 [Solid] Sampled 04/26/2010 15:30 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 15:30	See version
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 15:30	
1004244-04 32SB-FD042610 [Solid] Sampled 04/26/2010 15:40 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 15:40	
VOC_8260B_BTEXMN	05/13/2010 14:00	15	05/10/2010 15:40	ENCORES
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 15:40	See version
1004244-05 32SS-02-0002 [Solid] Sampled 04/26/2010 10:45 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 10:45	
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 10:45	See version

WORK ORDER

Printed: 5/5/2010 8:14:23PM

1004244

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32

Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Analysis	Due	TAT	Expires	Comments
1004244-06 32SB-02-0607 [Solid] Sampled 04/26/2010 10:45 Central				**DoD QSM 4.1**
VOC_8260B_BTEXMN	05/13/2010 14:00	15	05/10/2010 10:45	ENCORES
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 10:45	
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 10:45	See version
1004244-07 32SS-03-0002 [Solid] Sampled 04/26/2010 16:15 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 16:15	
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 16:15	See version
1004244-08 32SB-03-0607 [Solid] Sampled 04/26/2010 16:15 Central				**DoD QSM 4.1**
VOC_8260B_BTEXMN	05/13/2010 14:00	15	05/10/2010 16:15	ENCORES
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 16:15	See version
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 16:15	
1004244-09 32SS-04-0002 [Solid] Sampled 04/26/2010 16:00 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 16:00	
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 16:00	See version
1004244-10 32SB-04-0506 [Solid] Sampled 04/26/2010 16:00 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 16:00	See version
VOC_8260B_BTEXMN	05/13/2010 14:00	15	05/10/2010 16:00	ENCORES
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 16:00	
1004244-11 32SS-05-0002 [Solid] Sampled 04/26/2010 11:25 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 11:25	See version
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 11:25	
1004244-12 32SB-05-0506 [Solid] Sampled 04/26/2010 11:25 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 11:25	
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 11:25	See version
VOC_8260B_BTEXMN	05/13/2010 14:00	15	05/10/2010 11:25	ENCORES
1004244-13 32SS-06-0002 [Solid] Sampled 04/26/2010 10:55 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 10:55	
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 10:55	See version
1004244-14 32SB-06-0405 [Solid] Sampled 04/26/2010 11:00 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 11:00	
VOC_8260B_BTEXMN	05/13/2010 14:00	15	05/10/2010 11:00	ENCORES
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 11:00	See version

WORK ORDER

Printed: 5/5/2010 8:14:23PM

1004244

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32

Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Analysis	Due	TAT	Expires	Comments
1004244-15 32SS-07-0002 [Solid] Sampled 04/26/2010 16:25 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 16:25	
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 16:25	See version
1004244-16 32SB-07-0607 [Solid] Sampled 04/26/2010 16:30 Central				**DoD QSM 4.1**
VOC_8260B_BTEXMN	05/13/2010 14:00	15	05/10/2010 16:30	ENCORES
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 16:30	
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 16:30	See version
1004244-17 32SS-09-0002 [Solid] Sampled 04/26/2010 11:10 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 11:10	See version
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 11:10	
1004244-18 32SB-09-0607 [Solid] Sampled 04/26/2010 11:10 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 11:10	See version
VOC_8260B_BTEXMN	05/13/2010 14:00	15	05/10/2010 11:10	ENCORES
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 11:10	
1004244-19 32SS-10-0002 [Solid] Sampled 04/26/2010 11:35 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 11:35	See version
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 11:35	
1004244-20 32SB-10-0506 [Solid] Sampled 04/26/2010 11:35 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 11:35	
VOC_8260B_BTEXMN	05/13/2010 14:00	15	05/10/2010 11:35	ENCORES
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 11:35	See version
1004244-21 32SS-14-0002 [Solid] Sampled 04/26/2010 12:00 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 12:00	See version
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 12:00	
1004244-22 32SB-14-0910 [Solid] Sampled 04/26/2010 12:00 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/13/2010 14:00	15	05/10/2010 12:00	See version
VOC_8260B_BTEXMN	05/13/2010 14:00	15	05/10/2010 12:00	ENCORES
WC_PERCENT_SOLIDS_2540B	05/13/2010 14:00	15	05/03/2010 12:00	

Reviewed By

Date

Sample Delivery Group Assignment Form

CLIENT: Tetra Tech NUS, Inc. (T010)
PROJECT NAME: CTOF273 NSA Crane SMU32
SDG #: CTOF273_001
MATRIX: Soil

QC LEVEL: EDD/IV
Report Due: 5/18/2010
Client Sample Count: 21

Sample Type	Sampled	Received	Lab ID	Client ID	SM2540B	SW8260B	SW8270C
Client Sample	4/26/2010	4/27/2010	1004244-01	32SS-01-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-02	32SB-01-0708	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Field Duplicate	4/26/2010	4/27/2010	1004244-03	32SS-FD042610	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-04	32SB-FD042610	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-05	32SS-02-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-06	32SB-02-0607	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-07	32SS-03-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-08	32SB-03-0607	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-09	32SS-04-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-10	32SB-04-0506	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-11	32SS-05-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-12	32SB-05-0506	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-13	32SS-06-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-14	32SB-06-0405	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-15	32SS-07-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-16	32SB-07-0607	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-17	32SS-09-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-18	32SB-09-0607	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-19	32SS-10-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-20	32SB-10-0506	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-21	32SS-14-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/26/2010	4/27/2010	1004244-22	32SB-14-0910	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1

Sample Delivery Group Case Narrative

Receipt Information

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision

This is an original submittal of the final report package.

Analytical Information

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. The following information is provided specific to individual methods:

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.
B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.
C: The peak was manually integrated to correct the baseline from the original chromatogram.
D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

SW8260B:

The reanalysis of sample 1004244-08RE1 was performed outside the method holding time; however, the sample was analyzed within a 2X of the holding time and the original analysis was performed within holding time.

The internal standards failed criteria in sample 1004244-08 and 1004244-08RE1 and the associated analytes are flagged.

The surrogate failed criteria in sample 1004244-06 for Bromofluorobenzene and in 1004244-12 for Bromofluorobenzene and Toluene-d8. No additional anomalies or deviations are noted and the data is properly qualified.

SW8270C PAHs:
Continuing calibration standards 0F15601-CCV1 failed criteria for Benzo(b)fluoranthene. Sample 1004244-15 failed internal standard criteria and the affected analytes are qualified.

No additional anomalies or deviations are noted and the data is properly qualified.

Data Qualifiers

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL), also known as Reporting Limit **(RL),** is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

*: A failing quality control criteria is associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time

I: The Internal Standard failed criteria.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the EQL. One should feel confident that the result is greater than zero and less than the EQL.

M: Indicates that the sample matrix interfered with the quantitation of the analyte.

In dual column analysis the result is reported from the column with the lower concentration. In metals, the qualifier indicates that the parameters MDL/RL has been raised.

N: The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The RPD and/or percent recovery failed in the associated Blank Spike and/or Blank Spike Duplicate.

R: The RPD and/or percent recovery failed in the associated Matrix Spike and/or Matrix Spike Duplicate.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

LIMS Definitions / Naming Conventions:
The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

BLK: LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

BS: LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes

within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "**RE**" implies that the sample was either re-prepped, re-analyzed straight; or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:
I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, Ms. Marcia K. McGinnity is authorized to sign this Statement of Data Authenticity.

Mr. Rick D. Davis
Laboratory Technical Director / VP Operations

Data for SW8260B Forms

HOLDING TIME SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_001

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SB-01-0708	04/26/10 15:40	04/27/10 08:30	05/08/10 15:02	N/A	14.00	05/08/10 16:25	12.03	14.00	
32SB-FD042610	04/26/10 15:40	04/27/10 08:30	05/08/10 15:02	N/A	14.00	05/08/10 16:56	12.05	14.00	
32SB-02-0607	04/26/10 10:45	04/27/10 08:30	05/08/10 15:37	N/A	14.00	05/09/10 09:14	12.94	14.00	
32SB-03-0607	04/26/10 16:15	04/27/10 08:30	05/08/10 15:02	N/A	14.00	05/08/10 17:26	12.05	14.00	
32SB-03-0607	04/26/10 16:15	04/27/10 08:30	05/20/10 11:09	N/A	14.00	05/20/10 18:45	24.10	14.00	*
32SB-04-0506	04/26/10 16:00	04/27/10 08:30	05/08/10 15:02	N/A	14.00	05/08/10 17:57	12.08	14.00	
32SB-05-0506	04/26/10 11:25	04/27/10 08:30	05/08/10 15:37	N/A	14.00	05/09/10 08:13	12.87	14.00	
32SB-06-0405	04/26/10 11:00	04/27/10 08:30	05/08/10 15:37	N/A	14.00	05/09/10 09:44	12.95	14.00	
32SB-07-0607	04/26/10 16:30	04/27/10 08:30	05/08/10 15:02	N/A	14.00	05/08/10 18:28	12.08	14.00	
32SB-09-0607	04/26/10 11:10	04/27/10 08:30	05/08/10 15:02	N/A	14.00	05/08/10 18:58	12.33	14.00	
32SB-10-0506	04/26/10 11:35	04/27/10 08:30	05/08/10 15:37	N/A	14.00	05/09/10 08:43	12.88	14.00	
32SB-14-0910	04/26/10 12:00	04/27/10 08:30	05/08/10 15:02	N/A	14.00	05/08/10 19:29	12.31	14.00	

ANALYSIS SEQUENCE SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13002	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13002-TUN1	SEQ-TUN1.D	05/07/10 18:43
Cal Standard	0E13002-CAL1	SEQ-CAL1.D	05/07/10 19:17
Cal Standard	0E13002-CAL2	SEQ-CAL2.D	05/07/10 19:47
Cal Standard	0E13002-CAL3	SEQ-CAL3.D	05/07/10 20:18
Cal Standard	0E13002-CAL4	SEQ-CAL4.D	05/07/10 20:49
Cal Standard	0E13002-CAL5	SEQ-CAL5.D	05/07/10 21:20
Cal Standard	0E13002-CAL6	SEQ-CAL6.D	05/07/10 21:51
Cal Standard	0E13002-CAL7	SEQ-CAL7.D	05/07/10 22:21
Cal Standard	0E13002-CAL8	SEQ-CAL8.D	05/07/10 22:52
Initial Cal Check	0E13002-ICV1	SEQ-ICV1.D	05/07/10 23:22
Cal Standard	0E13002-CAL9	SEQ-CAL9.D	05/07/10 23:53
Cal Standard	0E13002-CALA	SEQ-CALA.D	05/08/10 00:24
Cal Standard	0E13002-CALB	SEQ-CALB.D	05/08/10 00:55
Cal Standard	0E13002-CALC	SEQ-CALC.D	05/08/10 01:25
Cal Standard	0E13002-CALD	SEQ-CALD.D	05/08/10 01:56
Cal Standard	0E13002-CALE	SEQ-CALE.D	05/08/10 02:27
Cal Standard	0E13002-CALF	SEQ-CALF.D	05/08/10 02:57
Cal Standard	0E13002-CALG	SEQ-CALG.D	05/08/10 03:28
MS Tune	0E13002-TUN2	SEQ-TUN2.D	05/08/10 04:29
Cal Standard	0E13002-CALH	SEQ-CALH.D	05/08/10 04:59
Cal Standard	0E13002-CALI	SEQ-CALI.D	05/08/10 05:30
Cal Standard	0E13002-CALJ	SEQ-CALJ.D	05/08/10 06:01
Cal Standard	0E13002-CALK	SEQ-CALK.D	05/08/10 06:31
Cal Standard	0E13002-CALL	SEQ-CALL.D	05/08/10 07:02
Cal Standard	0E13002-CALM	SEQ-CALM.D	05/08/10 07:32
Cal Standard	0E13002-CALN	SEQ-CALN.D	05/08/10 08:03
Cal Standard	0E13002-CALO	SEQ-CALO.D	05/08/10 08:34

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13909	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13909-TUN1	SEQ-TUN1.D	05/16/10 13:42
Cal Standard	0E13909-CAL1	SEQ-CAL1.D	05/16/10 14:17
Cal Standard	0E13909-CAL2	SEQ-CAL2.D	05/16/10 14:57
Cal Standard	0E13909-CAL3	SEQ-CAL3.D	05/16/10 15:36
Cal Standard	0E13909-CAL4	SEQ-CAL4.D	05/16/10 16:15
Cal Standard	0E13909-CAL5	SEQ-CAL5.D	05/16/10 16:54
Cal Standard	0E13909-CAL6	SEQ-CAL6.D	05/16/10 17:34
Cal Standard	0E13909-CAL7	SEQ-CAL7.D	05/16/10 18:13
Cal Standard	0E13909-CAL8	SEQ-CAL8.D	05/16/10 18:52
Initial Cal Check	0E13909-ICV1	SEQ-ICV1.D	05/16/10 19:31

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/07/10
Instrument ID:	MS-VOA4	Injection Time:	18:43
Sequence:	0E13002	Lab Sample ID:	0E13002-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	32.2	PASS
75	30 - 60% of 95	50.5	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.01	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	70.3	PASS
175	5 - 9% of 174	7.68	PASS
176	95 - 101% of 174	95.1	PASS
177	5 - 9% of 176	5.92	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/08/10
Instrument ID:	MS-VOA4	Injection Time:	04:29
Sequence:	0E13002	Lab Sample ID:	0E13002-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	25.2	PASS
75	30 - 60% of 95	44.3	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.93	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	72	PASS
175	5 - 9% of 174	8.06	PASS
176	95 - 101% of 174	95.2	PASS
177	5 - 9% of 176	6.4	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/16/10
Instrument ID:	MS-VOA1	Injection Time:	13:42
Sequence:	0E13909	Lab Sample ID:	0E13909-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	21.1	PASS
75	30 - 60% of 95	47.2	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.37	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	67.1	PASS
175	5 - 9% of 174	7.31	PASS
176	95 - 101% of 174	95.7	PASS
177	5 - 9% of 176	6.29	PASS

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0130002	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/7/2010 9:01:33AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	1.072069	4.777662	13.77363	2.989758E-02			15	
Bromofluorobenzene	0.8397075	6.434109	18.2985	2.305661E-02			15	
Ethylbenzene	2.911353	12.32509	17.49371	7.889913E-03			CCC (20)	
Naphthalene	1.929638	13.77676	21.93187	8.914289E-03			15	
Methyl t-Butyl Ether	0.7656045	3.435099	10.40713	4.151465E-02			15	
Toluene	1.422543	12.62549	16.10688	1.093417E-02			CCC (20)	
m,p-Xylene	2.139192	17.90708	17.64143	1.326399E-02		0.9998704	0.99	
o-Xylene	2.105664	14.8487	17.96983	3.930673E-03			15	
Xylenes (total)	2.150116	17.06447	0	0		0.9998992	0.99	
Dibromofluoromethane	0.3074291	2.04296	12.30138	4.654776E-02			15	
1,2-Dichloroethane-d4	6.679317E-02	3.711545	12.98763	2.467597E-02			15	
Toluene-d8	2.047687	4.711146	16.03913	1.096841E-02			15	

INITIAL CALIBRATION DATA

SW8260B

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0130002

Matrix: Solid

SDG: CTOF273_001

Project: CTOF273 NSA Crane SMU32

Instrument: MS-VOA4

Calibration Date: 5/7/2010 9:01:33AM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	2	1.13638	5	1.113923	10	1.069691	20	1.047044	50	1.126233	100	1.057035
Bromofluorobenzene	30	0.8846721	30	0.9104435	30	0.8610809	30	0.8588492	30	0.867862	30	0.7879964
Ethylbenzene	2	3.331158	5	3.153623	10	3.114148	20	3.015259	50	2.910124	100	2.521414
Naphthalene	2	2.470337	5	1.852099	10	1.646383	20	1.717441	50	1.801752	100	1.884442
Methyl t-Butyl Ether	2	0.7969955	5	0.796735	10	0.728012	20	0.7537659	50	0.7784933	100	0.7330195
Toluene	2	1.570187	5	1.586991	10	1.57589	20	1.509771	50	1.481994	100	1.312711
m,p-Xylene	4	2.582962	10	2.477808	20	2.32912	40	2.236494	100	2.066496	200	1.743448
o-Xylene	2	~~2.569758~~	5	2.496181	10	2.312136	20	2.243775	50	2.086956	100	1.841351
Xylenes (total)	6	2.578561	15	2.483932	30	2.323459	60	2.238921	150	2.073316	300	1.776083
Dibromofluoromethane	30	0.3069083	30	0.3147323	30	0.3099265	30	0.3135239	30	0.2991118	30	0.2971875
1,2-Dichloroethane-d4	30	0.0664376	30	6.752242E-02	30	6.287745E-02	30	6.802164E-02	30	6.758075E-02	30	6.344994E-02
Toluene-d8	30	2.144667	30	2.165168	30	2.129097	30	2.075069	30	2.030148	30	1.966816

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0130002	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/7/2010 9:01:33AM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	150	1.042579	200	0.9836647								
Bromofluorobenzene	30	0.7859964	30	0.7607597	30		30		30		30	
Ethylbenzene	150	2.333743	200	~~2.050154~~								
Naphthalene	150	2.157997	200	1.906651								
Methyl t-Butyl Ether	150	0.7624283	200	0.7753865								
Toluene	150	1.216632	200	1.126169								
m,p-Xylene	300	1.538018	400	~~1.301391~~								
o-Xylene	150	1.653588	200	~~1.515691~~								
Xylenes (total)	450	1.576541	600	~~1.372824~~								
Dibromofluoromethane	30	0.3090162	30	0.3090261	30		30		30		30	
1,2-Dichloroethane-d4	30	6.826151E-02	30	7.019407E-02	30		30		30		30	
Toluene-d8	30	1.970166	30	1.900366	30		30		30		30	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0130002	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/7/2010 9:01:33AM

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene	30		30		30		30		30		30	
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane	30		30		30		30		30		30	
1,2-Dichloroethane-d4	30		30		30		30		30		30	
Toluene-d8	30		30		30		30		30		30	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0130002	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/7/2010 9:01:33AM

Compound	Level 19		Level 20		Level 21		Level 22		Level 23		Level 24	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene	30		30		30		30		30		30	
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane	30		30		30		30		30		30	
1,2-Dichloroethane-d4	30		30		30		30		30		30	
Toluene-d8	30		30		30		30		30		30	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_001

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Calibration: 0141001

Instrument: MS-VOA1

Matrix: Water

Calibration Date: 5/16/2010 5:53:49AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	0.9538096	3.675415	14.21375	4.186609E-02			15	
Bromofluorobenzene	0.806614	6.33105	22.47137	1.987755E-02			15	
Ethylbenzene	2.625901	8.273184	20.69738	1.993286E-02			CCC (20)	
Naphthalene	1.42045	7.973596	29.36488	1.155791E-02			15	
Methyl t-Butyl Ether	0.4789501	5.76918	10.66088	8.608269E-02			15	
Toluene	1.306087	5.445475	17.8805	2.681495E-02			CCC (20)	
m,p-Xylene	1.994748	13.5635	21.01925	2.161043E-02			15	
o-Xylene	1.962043	8.658804	21.74325	2.516958E-02			15	
Xylenes (total)	1.983846	11.91374	0	0			15	
Dibromofluoromethane	0.2558456	1.002136	12.42088	3.528492E-02			15	
1,2-Dichloroethane-d4	6.111453E-02	2.620876	13.20788	4.616384E-02			15	
Toluene-d8	2.151044	5.303775	17.753	2.907062E-02			15	

INITIAL CALIBRATION DATA
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0141001	Instrument:	MS-VOA1
Matrix:	Water	Calibration Date:	5/16/2010 5:53:49AM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	2	0.8849878	5	0.972602	10	0.9853452	20	0.943815	50	0.9214057	100	0.9822208
Bromofluorobenzene	30	0.8611234	30	0.8606347	30	0.8363984	30	0.8372024	30	0.801363	30	0.7779574
Ethylbenzene	2	2.950846	5	2.888922	10	2.737467	20	2.627149	50	2.492771	100	2.522396
Naphthalene	2	1.271417	5	1.526757	10	1.403937	20	1.281606	50	1.333712	100	1.484289
Methyl t-Butyl Ether	2	0.4452765	5	0.4884644	10	0.4810369	20	0.4423394	50	0.4561748	100	0.5007352
Toluene	2	1.369272	5	1.377616	10	1.393225	20	1.317638	50	1.257523	100	1.290759
m,p-Xylene	4	2.449439	10	2.289064	20	2.11532	40	1.974326	100	1.847361	200	1.846925
o-Xylene	2	2.195524	5	2.183794	10	2.051667	20	1.972249	50	1.848001	100	1.892363
Xylenes (total)	6	2.3648	15	2.253974	30	2.094102	60	1.973633	150	1.847574	300	1.86207
Dibromofluoromethane	30	0.2537246	30	0.2587008	30	0.2560301	30	0.2532324	30	0.2526237	30	0.257224
1,2-Dichloroethane-d4	30	6.211388E-02	30	6.375223E-02	30	6.152346E-02	30	6.172243E-02	30	5.841071E-02	30	6.104017E-02
Toluene-d8	30	2.281891	30	2.253988	30	2.228989	30	2.216471	30	2.151398	30	2.07829

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0141001	Instrument:	MS-VOA1
Matrix:	Water	Calibration Date:	5/16/2010 5:53:49AM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	150	0.9741708	200	0.9659294								
Bromofluorobenzene	30	0.7561767	30	0.7220561	30		30		30		30	
Ethylbenzene	150	2.452987	200	2.334669								
Naphthalene	150	1.511979	200	1.549901								
Methyl t-Butyl Ether	150	0.5096833	200	0.5078905								
Toluene	150	1.24974	200	1.192926								
m,p-Xylene	300	1.7773	400	1.658249								
o-Xylene	150	1.81764	200	1.735105								
Xylenes (total)	450	1.790747	600	1.683867								
Dibromofluoromethane	30	0.2596112	30	0.255618	30		30		30		30	
1,2-Dichloroethane-d4	30	6.061878E-02	30	5.973461E-02	30		30		30		30	
Toluene-d8	30	2.024174	30	1.973151	30		30		30		30	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0141001	Instrument:	MS-VOA1
Matrix:	Water	Calibration Date:	5/16/2010 5:53:49AM

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene	30		30		30		30		30		30	
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane	30		30		30		30		30		30	
1,2-Dichloroethane-d4	30		30		30		30		30		30	
Toluene-d8	30		30		30		30		30		30	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0141001	Instrument:	MS-VOA1
Matrix:	Water	Calibration Date:	5/16/2010 5:53:49AM

Compound	Level 19		Level 20		Level 21		Level 22		Level 23		Level 24	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene	30		30		30		30		30		30	
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane	30		30		30		30		30		30	
1,2-Dichloroethane-d4	30		30		30		30		30		30	
Toluene-d8	30		30		30		30		30		30	

ANALYSIS SEQUENCE SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13716
Calibration: 0130002

SDG: CTOF273_001
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13716-TUN1	SEQ-TUN1.D	05/08/10 12:32
Calibration Check	0E13716-CCV1	SEQ-CCV1.D	05/08/10 13:03
LCS	0E08007-BS1	V4LCS01.D	05/08/10 14:22
Blank	0E08007-BLK1	V4BLK01.D	05/08/10 15:54
32SB-01-0708	1004244-02	0424402.D	05/08/10 16:25
32SB-FD042610	1004244-04	0424404.D	05/08/10 16:56
32SB-03-0607	1004244-08	0424408.D	05/08/10 17:26
32SB-04-0506	1004244-10	0424410.D	05/08/10 17:57
32SB-07-0607	1004244-16	0424416.D	05/08/10 18:28
32SB-09-0607	1004244-18	0424418.D	05/08/10 18:58
32SB-14-0910	1004244-22	0424422.D	05/08/10 19:29

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/08/10
Instrument ID:	MS-VOA4	Injection Time:	12:32
Sequence:	0E13716	Lab Sample ID:	0E13716-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	28.8	PASS
75	30 - 60% of 95	46.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.94	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	58.6	PASS
175	5 - 9% of 174	8.37	PASS
176	95 - 101% of 174	96.3	PASS
177	5 - 9% of 176	7.23	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/07/10 09:01
Sequence:	0E13716	Injection Date:	05/08/10
Lab Sample ID:	0E13716-CCV1	Injection Time:	13:03

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	109.7	1.072069	1.175855		9.7	20
Ethylbenzene	A	100.0	82.88	2.911353	2.41281		-17.1	20
Naphthalene	A	100.0	97.42	1.929638	1.8798		-2.6	20
Methyl t-Butyl Ether	A	100.0	110.5	0.7656045	0.8457061		10.5	20
Toluene	A	100.0	86.43	1.422543	1.229534		-13.6	20
m,p-Xylene	Q	200.0	184.8	2.139192	1.640378		-7.6	20
o-Xylene	A	100.0	84.27	2.105664	1.774481		-15.7	20
Xylenes (total)	Q	300.0	269.1	2.150116	1.685079		-10.3	20
Bromofluorobenzene	A	30.00	29.04	0.8397075	0.8128482		-3.2	20
Dibromofluoromethane	A	30.00	34.47	0.3074291	0.3532023		14.9	20
1,2-Dichloroethane-d4	A	30.00	34.60	6.679317E-02	7.702959E-02		15.3	20
Toluene-d8	A	30.00	29.17	2.047687	1.9913		-2.8	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13717	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13717-TUN1	SEQ-TUNE.D	05/09/10 00:04
Calibration Check	0E13717-CCV1	SEQ-CCV3.D	05/09/10 00:35
LCS	0E08008-BS1	V4LCSE01.D	05/09/10 01:36
Blank	0E08008-BLK1	V4BLKE01.D	05/09/10 03:07
32SB-05-0506	1004244-12	0424412.D	05/09/10 08:13
32SB-10-0506	1004244-20	0424420.D	05/09/10 08:43
32SB-02-0607	1004244-06	0424406D.D	05/09/10 09:14
32SB-06-0405	1004244-14	0424414D.D	05/09/10 09:44
LCS Dup	0E08008-BSD1	V4LCSDE1.D	05/09/10 10:15

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUNE.D	Injection Date:	05/09/10
Instrument ID:	MS-VOA4	Injection Time:	00:04
Sequence:	0E13717	Lab Sample ID:	0E13717-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	26.5	PASS
75	30 - 60% of 95	45.5	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.62	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	75.4	PASS
175	5 - 9% of 174	8.6	PASS
176	95 - 101% of 174	97.6	PASS
177	5 - 9% of 176	7.19	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-CCV3.D	Calibration Date:	05/07/10 09:01
Sequence:	0E13717	Injection Date:	05/09/10
Lab Sample ID:	0E13717-CCV1	Injection Time:	00:35

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	96.70	1.072069	1.036658		-3.3	20
Ethylbenzene	A	100.0	86.23	2.911353	2.510407		-13.8	20
Naphthalene	A	100.0	99.80	1.929638	1.925803		-0.2	20
Methyl t-Butyl Ether	A	100.0	94.11	0.7656045	0.7205409		-5.9	20
Toluene	A	100.0	89.26	1.422543	1.269721		-10.7	20
m,p-Xylene	Q	200.0	194.9	2.139192	1.704976		-2.6	20
o-Xylene	A	100.0	85.13	2.105664	1.792548		-14.9	20
Xylenes (total)	Q	300.0	280.0	2.150116	1.734167		-6.7	20
Bromofluorobenzene	A	30.00	31.08	0.8397075	0.8699476		3.6	20
Dibromofluoromethane	A	30.00	29.92	0.3074291	0.3066275		-0.3	20
1,2-Dichloroethane-d4	A	30.00	29.56	6.679317E-02	6.581605E-02		-1.5	20
Toluene-d8	A	30.00	30.62	2.047687	2.090068		2.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14105	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14105-TUN1	SEQ-TUN1.D	05/20/10 13:38
Calibration Check	0E14105-CCV1	SEQ-CCV1.D	05/20/10 14:10
LCS	0E20008-BS1	V1LCS1.D	05/20/10 15:29
Blank	0E20008-BLK1	V1BLK01.D	05/20/10 17:26
32SB-03-0607	1004244-08RE1	0424408.D	05/20/10 18:45
LCS Dup	0E20008-BSD1	V1LCSD1.D	05/20/10 23:18

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/20/10
Instrument ID:	MS-VOA1	Injection Time:	13:38
Sequence:	0E14105	Lab Sample ID:	0E14105-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	21.7	PASS
75	30 - 60% of 95	45.6	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.35	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	67.6	PASS
175	5 - 9% of 174	6.92	PASS
176	95 - 101% of 174	95.4	PASS
177	5 - 9% of 176	6.29	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA1	Calibration:	0141001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/16/10 05:53
Sequence:	0E14105	Injection Date:	05/20/10
Lab Sample ID:	0E14105-CCV1	Injection Time:	14:10

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	89.38	0.9538096	0.852482		-10.6	20
Ethylbenzene	A	100.0	85.50	2.625901	2.245226		-14.5	20
Naphthalene	A	100.0	83.43	1.42045	1.185048		-16.6	20
Methyl t-Butyl Ether	A	100.0	77.28	0.4789501	0.370126		-22.7	20 *
Toluene	A	100.0	87.09	1.306087	1.137517		-12.9	20
m,p-Xylene	A	200.0	165.1	1.994748	1.646864		-17.4	20
o-Xylene	A	100.0	83.92	1.962043	1.646635		-16.1	20
Xylenes (total)	A	300.0	249.0	1.983846	1.646787		-17.0	20
Bromofluorobenzene	A	30.00	29.53	0.806614	0.7940735		-1.6	20
Dibromofluoromethane	A	30.00	28.34	0.2558456	0.2417086		-5.5	20
1,2-Dichloroethane-d4	A	30.00	27.00	6.111453E-02	5.500776E-02		-10.0	20
Toluene-d8	A	30.00	29.52	2.151044	2.116707		-1.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_001

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E08007 Batch Matrix: Solid

Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E08007-BLK1	05/08/10 13:00	5.00	5.00
LCS	0E08007-BS1	05/08/10 13:00	5.00	5.00
32SB-01-0708	1004244-02	05/08/10 15:02	5.15	5.00
32SB-FD042610	1004244-04	05/08/10 15:02	5.25	5.00
32SB-03-0607	1004244-08	05/08/10 15:02	5.90	5.00
32SB-04-0506	1004244-10	05/08/10 15:02	5.97	5.00
32SB-07-0607	1004244-16	05/08/10 15:02	5.63	5.00
32SB-09-0607	1004244-18	05/08/10 15:02	4.83	5.00
32SB-14-0910	1004244-22	05/08/10 15:02	5.26	5.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_001	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E08007-BLK1	File ID:	V4BLK01.D
Sampled:		Prepared:		Analyzed:	05/08/10 15:54
Solids:		Preparation:	5035	Dilution:	

Batch: 0E08007 Sequence: 0E13716 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.85	106	85 - 120	
Dibromofluoromethane	30.00	29.65	98.8	80 - 125	
1,2-Dichloroethane-d4	30.00	32.27	108	75 - 140	
Toluene-d8	30.00	31.16	104	85 - 115	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E08007	Laboratory ID:	0E08007-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	49.91	99.8	75 - 125
Ethylbenzene	50.00	48.74	97.5	75 - 125
Toluene	50.00	50.60	101	70 - 125
Xylenes (total)	150.0	145.2	96.8	75 - 125

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_001

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E08008 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E08008-BLK1	05/08/10 15:37	5.00	5.00
LCS	0E08008-BS1	05/08/10 15:37	5.00	5.00
LCS Dup	0E08008-BSD1	05/08/10 15:37	5.00	5.00
32SB-02-0607	1004244-06	05/08/10 15:37	4.51	5.00
32SB-05-0506	1004244-12	05/08/10 15:37	5.99	5.00
32SB-06-0405	1004244-14	05/08/10 15:37	5.66	5.00
32SB-10-0506	1004244-20	05/08/10 15:37	5.91	5.00

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_001
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Matrix:
Laboratory ID: 0E08008-BLK1
File ID: V4BLKE01.D
Sampled:
Prepared:
Analyzed: 05/09/10 03:07
Solids:
Preparation: 5035
Dilution:
Batch: 0E08008
Sequence: 0E13717
Calibration: 0130002
Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	32.28	108	85 - 120	
Dibromofluoromethane	30.00	31.33	104	80 - 125	
1,2-Dichloroethane-d4	30.00	32.30	108	75 - 140	
Toluene-d8	30.00	31.96	107	85 - 115	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E08008	Laboratory ID:	0E08008-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	47.34	94.7	75 - 125
Ethylbenzene	50.00	47.00	94.0	75 - 125
Toluene	50.00	48.37	96.7	70 - 125
Xylenes (total)	150.0	135.9	90.6	75 - 125

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS	
					RPD	REC.
Benzene	50.00	51.20	102	7.83	30	75 - 125
Ethylbenzene	50.00	46.92	93.8	0.169	30	75 - 125
Toluene	50.00	48.71	97.4	0.708	30	70 - 125
Xylenes (total)	150.0	142.9	95.3	5.06	30	75 - 125

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_001

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E20008 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E20008-BLK1	05/20/10 11:09	5.00	5.00
LCS	0E20008-BS1	05/20/10 11:09	5.00	5.00
LCS Dup	0E20008-BSD1	05/20/10 11:09	5.00	5.00
32SB-03-0607	1004244-08RE1	05/20/10 11:09	5.56	5.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_001	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E20008-BLK1	File ID:	V1BLK01.D
Sampled:		Prepared:		Analyzed:	05/20/10 17:26
Solids:		Preparation:	5035	Dilution:	

Batch: 0E20008 Sequence: 0E14105 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.63	105	85 - 120	
Dibromofluoromethane	30.00	30.62	102	80 - 125	
1,2-Dichloroethane-d4	30.00	31.37	105	75 - 140	
Toluene-d8	30.00	30.27	101	85 - 115	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E20008	Laboratory ID:	0E20008-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	54.00	108	75 - 125
Ethylbenzene	50.00	53.23	106	75 - 125
Toluene	50.00	52.95	106	70 - 125
Xylenes (total)	150.0	156.6	104	75 - 125

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzene	50.00	44.68	89.4	18.9	30	75 - 125
Ethylbenzene	50.00	45.71	91.4	15.2	30	75 - 125
Toluene	50.00	46.44	92.9	13.1	30	70 - 125
Xylenes (total)	150.0	136.3	90.9	13.9	30	75 - 125

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13716

SDG: CTOF273_001
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E13716-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/08/10 13:03			
Fluorobenzene	514218	14.044	672772	14.056	76	50 - 200	-0.0120	+/-0.50	
Chlorobenzene-d5	287590	17.311	278531	17.313	103	50 - 200	-0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	198695	19.367	217185	19.369	91	50 - 200	-0.0020	+/-0.50	
LCS (0E08007-BS1)			Lab File ID: V4LCS01.D			Analyzed: 05/08/10 14:22			
Fluorobenzene	603982	14.039	514218	14.044	117	50 - 200	-0.0050	+/-0.50	
Chlorobenzene-d5	271336	17.305	287590	17.311	94	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	208017	19.362	198695	19.367	105	50 - 200	-0.0050	+/-0.50	
Blank (0E08007-BLK1)			Lab File ID: V4BLK01.D			Analyzed: 05/08/10 15:54			
Fluorobenzene	637894	14.038	514218	14.044	124	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	281619	17.305	287590	17.311	98	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	227075	19.361	198695	19.367	114	50 - 200	-0.0060	+/-0.50	
32SB-01-0708 (1004244-02)			Lab File ID: 0424402.D			Analyzed: 05/08/10 16:25			
Fluorobenzene	631182	14.037	514218	14.044	123	50 - 200	-0.0070	+/-0.50	
Chlorobenzene-d5	274342	17.304	287590	17.311	95	50 - 200	-0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	212436	19.361	198695	19.367	107	50 - 200	-0.0060	+/-0.50	
32SB-FD042610 (1004244-04)			Lab File ID: 0424404.D			Analyzed: 05/08/10 16:56			
Fluorobenzene	579814	14.035	514218	14.044	113	50 - 200	-0.0090	+/-0.50	
Chlorobenzene-d5	249453	17.301	287590	17.311	87	50 - 200	-0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	193699	19.358	198695	19.367	97	50 - 200	-0.0090	+/-0.50	
32SB-03-0607 (1004244-08)			Lab File ID: 0424408.D			Analyzed: 05/08/10 17:26			
Fluorobenzene	208331	14.034	514218	14.044	41	50 - 200	-0.0100	+/-0.50	*
Chlorobenzene-d5	92031	17.31	287590	17.311	32	50 - 200	-0.0010	+/-0.50	*
1,4-Dichlorobenzene-d4	68518	19.367	198695	19.367	34	50 - 200	0.0000	+/-0.50	*
32SB-04-0506 (1004244-10)			Lab File ID: 0424410.D			Analyzed: 05/08/10 17:57			
Fluorobenzene	625303	14.043	514218	14.044	122	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	271585	17.309	287590	17.311	94	50 - 200	-0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	206585	19.366	198695	19.367	104	50 - 200	-0.0010	+/-0.50	
32SB-07-0607 (1004244-16)			Lab File ID: 0424416.D			Analyzed: 05/08/10 18:28			
Fluorobenzene	449054	14.038	514218	14.044	87	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	196966	17.305	287590	17.311	68	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	148260	19.361	198695	19.367	75	50 - 200	-0.0060	+/-0.50	
32SB-09-0607 (1004244-18)			Lab File ID: 0424418.D			Analyzed: 05/08/10 18:58			
Fluorobenzene	603921	14.033	514218	14.044	117	50 - 200	-0.0110	+/-0.50	
Chlorobenzene-d5	258212	17.309	287590	17.311	90	50 - 200	-0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	196298	19.366	198695	19.367	99	50 - 200	-0.0010	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13716	Instrument:	MS-VOA4
		Calibration:	0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
32SB-14-0910 (1004244-22)			Lab File ID: 0424422.D			Analyzed: 05/08/10 19:29			
Fluorobenzene	638242	14.032	514218	14.044	124	50 - 200	-0.0120	+/-0.50	
Chlorobenzene-d5	275470	17.309	287590	17.311	96	50 - 200	-0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	210642	19.365	198695	19.367	106	50 - 200	-0.0020	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13717

SDG: CTOF273_001
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E13717-CCV1)			Lab File ID: SEQ-CCV3.D			Analyzed: 05/09/10 00:35			
Fluorobenzene	592044	14.044	672772	14.056	88	50 - 200	-0.0120	+/-0.50	
Chlorobenzene-d5	285408	17.311	278531	17.313	102	50 - 200	-0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	200098	19.367	217185	19.369	92	50 - 200	-0.0020	+/-0.50	
LCS (0E08008-BS1)			Lab File ID: V4LCSE01.D			Analyzed: 05/09/10 01:36			
Fluorobenzene	637222	14.043	592044	14.044	108	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	279866	17.31	285408	17.311	98	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	214884	19.367	200098	19.367	107	50 - 200	0.0000	+/-0.50	
Blank (0E08008-BLK1)			Lab File ID: V4BLKE01.D			Analyzed: 05/09/10 03:07			
Fluorobenzene	630072	14.039	592044	14.044	106	50 - 200	-0.0050	+/-0.50	
Chlorobenzene-d5	287825	17.306	285408	17.311	101	50 - 200	-0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	227710	19.362	200098	19.367	114	50 - 200	-0.0050	+/-0.50	
32SB-05-0506 (1004244-12)			Lab File ID: 0424412.D			Analyzed: 05/09/10 08:13			
Fluorobenzene	292209	14.039	592044	14.044	49	50 - 200	-0.0050	+/-0.50	*
Chlorobenzene-d5	116037	17.305	285408	17.311	41	50 - 200	-0.0060	+/-0.50	*
1,4-Dichlorobenzene-d4	66647	19.362	200098	19.367	33	50 - 200	-0.0050	+/-0.50	*
32SB-10-0506 (1004244-20)			Lab File ID: 0424420.D			Analyzed: 05/09/10 08:43			
Fluorobenzene	600290	14.033	592044	14.044	101	50 - 200	-0.0110	+/-0.50	
Chlorobenzene-d5	257217	17.299	285408	17.311	90	50 - 200	-0.0120	+/-0.50	
1,4-Dichlorobenzene-d4	218550	19.356	200098	19.367	109	50 - 200	-0.0110	+/-0.50	
32SB-02-0607 (1004244-06)			Lab File ID: 0424406D.D			Analyzed: 05/09/10 09:14			
Fluorobenzene	556428	14.033	592044	14.044	94	50 - 200	-0.0110	+/-0.50	
Chlorobenzene-d5	240798	17.3	285408	17.311	84	50 - 200	-0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	212418	19.357	200098	19.367	106	50 - 200	-0.0100	+/-0.50	
32SB-06-0405 (1004244-14)			Lab File ID: 0424414D.D			Analyzed: 05/09/10 09:44			
Fluorobenzene	559061	14.032	592044	14.044	94	50 - 200	-0.0120	+/-0.50	
Chlorobenzene-d5	243626	17.299	285408	17.311	85	50 - 200	-0.0120	+/-0.50	
1,4-Dichlorobenzene-d4	214835	19.356	200098	19.367	107	50 - 200	-0.0110	+/-0.50	
LCS Dup (0E08008-BSD1)			Lab File ID: V4LCSDE1.D			Analyzed: 05/09/10 10:15			
Fluorobenzene	544954	14.034	592044	14.044	92	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	246986	17.3	285408	17.311	87	50 - 200	-0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	214262	19.357	200098	19.367	107	50 - 200	-0.0100	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14105	Instrument:	MS-VOA1
		Calibration:	0141001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E14105-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/20/10 14:10			
Fluorobenzene	2441510	14.573	2403751	14.57	102	50 - 200	0.0030	+/-0.50	
Chlorobenzene-d5	1066089	20.324	960429	20.321	111	50 - 200	0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	819746	24.828	805672	24.823	102	50 - 200	0.0050	+/-0.50	
LCS (0E20008-BS1)			Lab File ID: V1LCS1.D			Analyzed: 05/20/10 15:29			
Fluorobenzene	2650496	14.572	2441510	14.573	109	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	1148925	20.324	1066089	20.324	108	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	906986	24.82	819746	24.828	111	50 - 200	-0.0080	+/-0.50	
Blank (0E20008-BLK1)			Lab File ID: V1BLK01.D			Analyzed: 05/20/10 17:26			
Fluorobenzene	2472993	14.575	2441510	14.573	101	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	1034994	20.323	1066089	20.324	97	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	854031	24.822	819746	24.828	104	50 - 200	-0.0060	+/-0.50	
32SB-03-0607 (1004244-08RE1)			Lab File ID: 0424408.D			Analyzed: 05/20/10 18:45			
Fluorobenzene	764976	14.576	2441510	14.573	31	50 - 200	0.0030	+/-0.50	*
Chlorobenzene-d5	307440	20.323	1066089	20.324	29	50 - 200	-0.0010	+/-0.50	*
1,4-Dichlorobenzene-d4	241031	24.822	819746	24.828	29	50 - 200	-0.0060	+/-0.50	*
LCS Dup (0E20008-BSD1)			Lab File ID: V1LCSD1.D			Analyzed: 05/20/10 23:18			
Fluorobenzene	2825815	14.575	2441510	14.573	116	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	1107707	20.319	1066089	20.324	104	50 - 200	-0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	862673	24.814	819746	24.828	105	50 - 200	-0.0140	+/-0.50	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13717	Instrument:	MS-VOA4
		Calibration:	0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E13717-CCV1) ug/L				Lab File ID: SEQ-CCV3.D		Analyzed: 05/09/10 00:35		
Bromofluorobenzene	30.00	104	80 - 120	18.285	18.285	0.0000	+/-1.000	
Dibromofluoromethane	30.00	99.7	80 - 120	12.282	12.282	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	98.5	80 - 120	12.971	12.971	0.0000	+/-1.000	
Toluene-d8	30.00	102	80 - 120	16.031	16.031	0.0000	+/-1.000	
LCS (0E08008-BS1) ug/Kg wet				Lab File ID: V4LCSE01.D		Analyzed: 05/09/10 01:36		
Bromofluorobenzene	30.00	103	85 - 120	18.284	18.285	-0.0010	+/-1.000	
Dibromofluoromethane	30.00	99.2	80 - 125	12.292	12.282	0.0100	+/-1.000	
1,2-Dichloroethane-d4	30.00	94.7	75 - 140	12.971	12.971	0.0000	+/-1.000	
Toluene-d8	30.00	105	85 - 115	16.031	16.031	0.0000	+/-1.000	
Blank (0E08008-BLK1) ug/Kg wet				Lab File ID: V4BLKE01.D		Analyzed: 05/09/10 03:07		
Bromofluorobenzene	30.00	108	85 - 120	18.28	18.285	-0.0050	+/-1.000	
Dibromofluoromethane	30.00	104	80 - 125	12.288	12.282	0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	108	75 - 140	12.967	12.971	-0.0040	+/-1.000	
Toluene-d8	30.00	107	85 - 115	16.027	16.031	-0.0040	+/-1.000	
32SB-05-0506 (1004244-12) ug/Kg dry				Lab File ID: 0424412.D		Analyzed: 05/09/10 08:13		
Bromofluorobenzene	30.10	162	85 - 120	18.279	18.285	-0.0060	+/-1.000	*
Dibromofluoromethane	30.10	99.3	80 - 125	12.277	12.282	-0.0050	+/-1.000	
1,2-Dichloroethane-d4	30.10	101	75 - 140	12.966	12.971	-0.0050	+/-1.000	
Toluene-d8	30.10	121	85 - 115	16.026	16.031	-0.0050	+/-1.000	*
32SB-10-0506 (1004244-20) ug/Kg dry				Lab File ID: 0424420.D		Analyzed: 05/09/10 08:43		
Bromofluorobenzene	31.75	108	85 - 120	18.283	18.285	-0.0020	+/-1.000	
Dibromofluoromethane	31.75	100	80 - 125	12.271	12.282	-0.0110	+/-1.000	
1,2-Dichloroethane-d4	31.75	95.3	75 - 140	12.97	12.971	-0.0010	+/-1.000	
Toluene-d8	31.75	109	85 - 115	16.02	16.031	-0.0110	+/-1.000	
32SB-02-0607 (1004244-06) ug/Kg dry				Lab File ID: 0424406D.D		Analyzed: 05/09/10 09:14		
Bromofluorobenzene	41.31	137	85 - 120	18.284	18.285	-0.0010	+/-1.000	*
Dibromofluoromethane	41.31	104	80 - 125	12.272	12.282	-0.0100	+/-1.000	
1,2-Dichloroethane-d4	41.31	103	75 - 140	12.961	12.971	-0.0100	+/-1.000	
Toluene-d8	41.31	110	85 - 115	16.021	16.031	-0.0100	+/-1.000	
32SB-06-0405 (1004244-14) ug/Kg dry				Lab File ID: 0424414D.D		Analyzed: 05/09/10 09:44		
Bromofluorobenzene	31.41	113	85 - 120	18.283	18.285	-0.0020	+/-1.000	
Dibromofluoromethane	31.41	103	80 - 125	12.271	12.282	-0.0110	+/-1.000	
1,2-Dichloroethane-d4	31.41	92.9	75 - 140	12.96	12.971	-0.0110	+/-1.000	
Toluene-d8	31.41	105	85 - 115	16.02	16.031	-0.0110	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13717	Instrument:	MS-VOA4
		Calibration:	0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
LCS Dup (0E08008-BSD1) ug/Kg wet				Lab File ID: V4LCSDE1.D		Analyzed: 05/09/10 10:15		
Bromofluorobenzene	30.00	99.8	85 - 120	18.284	18.285	-0.0010	+/-1.000	
Dibromofluoromethane	30.00	96.2	80 - 125	12.282	12.282	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	97.6	75 - 140	12.971	12.971	0.0000	+/-1.000	
Toluene-d8	30.00	104	85 - 115	16.021	16.031	-0.0100	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14105	Instrument:	MS-VOA1
		Calibration:	0141001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E14105-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/20/10 14:10		
Bromofluorobenzene	30.00	98.4	80 - 120	22.473	22.473	0.0000	+/-1.000	
Dibromofluoromethane	30.00	94.5	80 - 120	12.412	12.412	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	90.0	80 - 120	13.211	13.211	0.0000	+/-1.000	
Toluene-d8	30.00	98.4	80 - 120	17.751	17.751	0.0000	+/-1.000	
LCS (0E20008-BS1) ug/Kg wet				Lab File ID: V1LCS1.D		Analyzed: 05/20/10 15:29		
Bromofluorobenzene	30.00	99.5	85 - 120	22.462	22.473	-0.0110	+/-1.000	
Dibromofluoromethane	30.00	96.6	80 - 125	12.412	12.412	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	89.3	75 - 140	13.211	13.211	0.0000	+/-1.000	
Toluene-d8	30.00	99.6	85 - 115	17.754	17.751	0.0030	+/-1.000	
Blank (0E20008-BLK1) ug/Kg wet				Lab File ID: V1BLK01.D		Analyzed: 05/20/10 17:26		
Bromofluorobenzene	30.00	105	85 - 120	22.471	22.473	-0.0020	+/-1.000	
Dibromofluoromethane	30.00	102	80 - 125	12.416	12.412	0.0040	+/-1.000	
1,2-Dichloroethane-d4	30.00	105	75 - 140	13.198	13.211	-0.0130	+/-1.000	
Toluene-d8	30.00	101	85 - 115	17.752	17.751	0.0010	+/-1.000	
32SB-03-0607 (1004244-08RE1) ug/Kg dry				Lab File ID: 0424408.D		Analyzed: 05/20/10 18:45		
Bromofluorobenzene	32.91	106	85 - 120	22.47	22.473	-0.0030	+/-1.000	
Dibromofluoromethane	32.91	95.4	80 - 125	12.403	12.412	-0.0090	+/-1.000	
1,2-Dichloroethane-d4	32.91	93.9	75 - 140	13.2	13.211	-0.0110	+/-1.000	
Toluene-d8	32.91	107	85 - 115	17.753	17.751	0.0020	+/-1.000	
LCS Dup (0E20008-BSD1) ug/Kg wet				Lab File ID: V1LCSD1.D		Analyzed: 05/20/10 23:18		
Bromofluorobenzene	30.00	99.4	85 - 120	22.46	22.473	-0.0130	+/-1.000	
Dibromofluoromethane	30.00	98.8	80 - 125	12.404	12.412	-0.0080	+/-1.000	
1,2-Dichloroethane-d4	30.00	88.2	75 - 140	13.201	13.211	-0.0100	+/-1.000	
Toluene-d8	30.00	104	85 - 115	17.744	17.751	-0.0070	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13716	Instrument:	MS-VOA4
		Calibration:	0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E13716-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/08/10 13:03		
Bromofluorobenzene	30.00	96.8	80 - 120	18.285	18.285	0.0000	+/-1.000	
Dibromofluoromethane	30.00	115	80 - 120	12.282	12.282	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	115	80 - 120	12.971	12.971	0.0000	+/-1.000	
Toluene-d8	30.00	97.2	80 - 120	16.031	16.031	0.0000	+/-1.000	
LCS (0E08007-BS1) ug/Kg wet				Lab File ID: V4LCS01.D		Analyzed: 05/08/10 14:22		
Bromofluorobenzene	30.00	100	85 - 120	18.289	18.285	0.0040	+/-1.000	
Dibromofluoromethane	30.00	98.7	80 - 125	12.287	12.282	0.0050	+/-1.000	
1,2-Dichloroethane-d4	30.00	95.9	75 - 140	12.966	12.971	-0.0050	+/-1.000	
Toluene-d8	30.00	103	85 - 115	16.026	16.031	-0.0050	+/-1.000	
Blank (0E08007-BLK1) ug/Kg wet				Lab File ID: V4BLK01.D		Analyzed: 05/08/10 15:54		
Bromofluorobenzene	30.00	106	85 - 120	18.289	18.285	0.0040	+/-1.000	
Dibromofluoromethane	30.00	98.8	80 - 125	12.276	12.282	-0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	108	75 - 140	12.975	12.971	0.0040	+/-1.000	
Toluene-d8	30.00	104	85 - 115	16.025	16.031	-0.0060	+/-1.000	
32SB-01-0708 (1004244-02) ug/Kg dry				Lab File ID: 0424402.D		Analyzed: 05/08/10 16:25		
Bromofluorobenzene	34.12	106	85 - 120	18.288	18.285	0.0030	+/-1.000	
Dibromofluoromethane	34.12	99.0	80 - 125	12.276	12.282	-0.0060	+/-1.000	
1,2-Dichloroethane-d4	34.12	97.4	75 - 140	12.965	12.971	-0.0060	+/-1.000	
Toluene-d8	34.12	105	85 - 115	16.025	16.031	-0.0060	+/-1.000	
32SB-FD042610 (1004244-04) ug/Kg dry				Lab File ID: 0424404.D		Analyzed: 05/08/10 16:56		
Bromofluorobenzene	33.49	106	85 - 120	18.285	18.285	0.0000	+/-1.000	
Dibromofluoromethane	33.49	97.9	80 - 125	12.283	12.282	0.0010	+/-1.000	
1,2-Dichloroethane-d4	33.49	92.9	75 - 140	12.972	12.971	0.0010	+/-1.000	
Toluene-d8	33.49	102	85 - 115	16.022	16.031	-0.0090	+/-1.000	
32SB-03-0607 (1004244-08) ug/Kg dry				Lab File ID: 0424408.D		Analyzed: 05/08/10 17:26		
Bromofluorobenzene	31.02	111	85 - 120	18.285	18.285	0.0000	+/-1.000	
Dibromofluoromethane	31.02	96.5	80 - 125	12.282	12.282	0.0000	+/-1.000	
1,2-Dichloroethane-d4	31.02	99.6	75 - 140	12.981	12.971	0.0100	+/-1.000	
Toluene-d8	31.02	105	85 - 115	16.021	16.031	-0.0100	+/-1.000	
32SB-04-0506 (1004244-10) ug/Kg dry				Lab File ID: 0424410.D		Analyzed: 05/08/10 17:57		
Bromofluorobenzene	29.41	107	85 - 120	18.283	18.285	-0.0020	+/-1.000	
Dibromofluoromethane	29.41	100	80 - 125	12.281	12.282	-0.0010	+/-1.000	
1,2-Dichloroethane-d4	29.41	103	75 - 140	12.97	12.971	-0.0010	+/-1.000	
Toluene-d8	29.41	105	85 - 115	16.03	16.031	-0.0010	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13716	Instrument:	MS-VOA4
		Calibration:	0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
32SB-07-0607 (1004244-16) ug/Kg dry				Lab File ID: 0424416.D		Analyzed: 05/08/10 18:28		
Bromofluorobenzene	32.63	106	85 - 120	18.289	18.285	0.0040	+/-1.000	
Dibromofluoromethane	32.63	97.3	80 - 125	12.287	12.282	0.0050	+/-1.000	
1,2-Dichloroethane-d4	32.63	95.1	75 - 140	12.975	12.971	0.0040	+/-1.000	
Toluene-d8	32.63	107	85 - 115	16.026	16.031	-0.0050	+/-1.000	
32SB-09-0607 (1004244-18) ug/Kg dry				Lab File ID: 0424418.D		Analyzed: 05/08/10 18:58		
Bromofluorobenzene	36.56	108	85 - 120	18.284	18.285	-0.0010	+/-1.000	
Dibromofluoromethane	36.56	99.7	80 - 125	12.281	12.282	-0.0010	+/-1.000	
1,2-Dichloroethane-d4	36.56	95.3	75 - 140	12.97	12.971	-0.0010	+/-1.000	
Toluene-d8	36.56	107	85 - 115	16.02	16.031	-0.0110	+/-1.000	
32SB-14-0910 (1004244-22) ug/Kg dry				Lab File ID: 0424422.D		Analyzed: 05/08/10 19:29		
Bromofluorobenzene	34.62	104	85 - 120	18.283	18.285	-0.0020	+/-1.000	
Dibromofluoromethane	34.62	95.9	80 - 125	12.281	12.282	-0.0010	+/-1.000	
1,2-Dichloroethane-d4	34.62	94.6	75 - 140	12.97	12.971	-0.0010	+/-1.000	
Toluene-d8	34.62	104	85 - 115	16.02	16.031	-0.0110	+/-1.000	

Data for SW8270C (PAH) Forms

HOLDING TIME SUMMARY
SW8270C

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_001
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SS-01-0002	04/26/10 15:30	04/27/10 08:30	05/10/10 10:30	13.79	14.00	06/04/10 19:09	25.36	40.00	
32SB-01-0708	04/26/10 15:40	04/27/10 08:30	05/10/10 10:30	13.78	14.00	06/04/10 19:43	25.38	40.00	
32SS-FD042610	04/26/10 15:30	04/27/10 08:30	05/10/10 10:30	13.79	14.00	06/04/10 20:17	25.41	40.00	
32SB-FD042610	04/26/10 15:40	04/27/10 08:30	05/10/10 10:30	13.78	14.00	06/04/10 20:51	25.43	40.00	
32SS-02-0002	04/26/10 10:45	04/27/10 08:30	05/10/10 10:30	13.99	14.00	06/04/10 21:25	25.45	40.00	
32SB-02-0607	04/26/10 10:45	04/27/10 08:30	05/10/10 10:30	13.99	14.00	06/05/10 09:38	25.96	40.00	
32SS-03-0002	04/26/10 16:15	04/27/10 08:30	05/10/10 10:30	13.76	14.00	06/04/10 22:33	25.50	40.00	
32SB-03-0607	04/26/10 16:15	04/27/10 08:30	05/10/10 10:30	13.76	14.00	06/04/10 23:07	25.53	40.00	
32SS-04-0002	04/26/10 16:00	04/27/10 08:30	05/10/10 10:30	13.77	14.00	06/04/10 23:41	25.55	40.00	
32SB-04-0506	04/26/10 16:00	04/27/10 08:30	05/10/10 10:30	13.77	14.00	06/05/10 00:16	25.57	40.00	
32SS-05-0002	04/26/10 11:25	04/27/10 08:30	05/10/10 10:30	13.96	14.00	06/05/10 07:56	25.89	40.00	
32SB-05-0506	04/26/10 11:25	04/27/10 08:30	05/10/10 10:30	13.96	14.00	06/05/10 00:50	25.60	40.00	
32SS-06-0002	04/26/10 10:55	04/27/10 08:30	05/10/10 10:30	13.98	14.00	06/05/10 07:22	25.87	40.00	
32SB-06-0405	04/26/10 11:00	04/27/10 08:30	05/10/10 10:30	13.98	14.00	06/05/10 12:21	26.08	40.00	
32SS-07-0002	04/26/10 16:25	04/27/10 08:30	05/10/10 10:30	13.75	14.00	06/05/10 01:24	25.62	40.00	
32SB-07-0607	04/26/10 16:30	04/27/10 08:30	05/10/10 10:30	13.75	14.00	06/05/10 01:58	25.64	40.00	
32SS-09-0002	04/26/10 11:10	04/27/10 08:30	05/10/10 10:30	13.97	14.00	06/05/10 02:32	25.67	40.00	
32SB-09-0607	04/26/10 11:10	04/27/10 08:30	05/10/10 10:30	13.97	14.00	06/05/10 03:07	25.69	40.00	
32SS-10-0002	04/26/10 11:35	04/27/10 08:30	05/10/10 10:30	13.95	14.00	06/05/10 03:41	25.72	40.00	
32SB-10-0506	04/26/10 11:35	04/27/10 08:30	05/10/10 10:30	13.95	14.00	06/05/10 06:48	25.85	40.00	
32SS-14-0002	04/26/10 12:00	04/27/10 08:30	05/10/10 13:35	14.07	14.00	06/04/10 19:58	25.27	40.00	
32SB-14-0910	04/26/10 12:00	04/27/10 08:30	05/10/10 13:35	14.07	14.00	06/04/10 20:34	25.29	40.00	

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	9L35713	Instrument:	MS-BNA4
Calibration:	0098001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	9L35713-TUN1	DF1112B1.D	11/12/09 15:24
Cal Standard	9L35713-CAL2	cal2.D	11/12/09 15:43
Cal Standard	9L35713-CAL3	cal3.D	11/12/09 16:16
Cal Standard	9L35713-CAL4	cal4.D	11/12/09 16:50
Cal Standard	9L35713-CAL5	cal5.D	11/12/09 17:24
Cal Standard	9L35713-CAL6	cal6.D	11/12/09 17:58
Cal Standard	9L35713-CAL7	cal7.D	11/12/09 18:32
Cal Standard	9L35713-CAL8	cal8.D	11/12/09 19:06
Cal Standard	9L35713-CAL9	cal9.D	11/12/09 19:40
Cal Standard	9L35713-CALA	cal10.D	11/12/09 20:14
Cal Standard	9L35713-CALB	cal11.D	11/12/09 20:48
Cal Standard	9L35713-CALC	cal12.D	11/12/09 21:22
Initial Cal Check	9L35713-ICV1	ICV1.D	11/12/09 21:55

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	DF1112B1.D	Injection Date:	11/12/09
Instrument ID:	MS-BNA4	Injection Time:	15:24
Sequence:	9L35713	Lab Sample ID:	9L35713-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	42.1	PASS
68	Less than 2% of 69	1.55	PASS
69	Less than 200% of 198	48.6	PASS
70	Less than 2% of 69	0.491	PASS
127	40 - 60% of 198	54.8	PASS
197	Less than 1% of 198	0.528	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.05	PASS
275	10 - 30% of 198	21.8	PASS
365	1 - 200% of 198	2.27	PASS
441	0.001 - 100% of 443	77.8	PASS
442	40 - 200% of 198	60.7	PASS
443	17 - 23% of 442	20.7	PASS

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_001
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Calibration: 0098001
Instrument: MS-BNA4
Matrix: Water
Calibration Date: 11/12/2009 11:02:39AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.7457972	3.344503	9.800818	0.1353256			CCC (30)	
Acenaphthylene	0.9996575	4.521048	9.399819	0.1010786			15	
Anthracene	0.9948455	3.948054	13.76409	0.1121442			15	
Benzo(a)anthracene	0.7581512	9.598749	21.23564	8.644244E-02			15	
Benzo(a)pyrene	0.9592349	4.958823	25.12336	4.929242E-02			CCC (30)	
Benzo(b)fluoranthene	1.176864	5.852981	24.48764	8.052193E-02			15	
Benzo(g,h,i)perylene	0.8650452	8.212902	27.60627	8.125964E-02			15	
Benzo(k)fluoranthene	1.169451	7.140033	24.55273	7.841296E-02			15	
Chrysene	0.7324149	6.693602	21.33455	9.451961E-02			15	
Dibenz(a,h)anthracene	0.7647294	14.42237	27.17082	6.002815E-02			15	
Fluoranthene	1.030294	4.044356	17.02718	8.925874E-02			CCC (30)	
Fluorene	0.7457374	2.820772	11.06573	0.1195426			15	
2-Fluorobiphenyl	0.8655987	4.501562	8.293182	0.1186146			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	0.7715006	14.30866	27.10836	7.208997E-02			15	
1-Methylnaphthalene	0.7407783	4.834185	7.780455	0.1110235			15	
2-Methylnaphthalene	0.8009425	4.585363	7.604364	0.1026839			15	
Naphthalene	1.224033	6.200049	6.526273	0.1202152			15	
Nitrobenzene-d5							15	
Phenanthrene	1.064344	3.658701	13.61682	0.1199225			15	
Phenol-d6							15	
Pyrene	1.038027	4.119068	17.66	9.533415E-02			15	
Terphenyl-d14	0.776943	6.066613	18.31836	7.278378E-02			15	
2,4,6-Tribromophenol	0.1486418	13.96698	11.68556	0.1738714			15	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION DATA

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0098001	Instrument:	MS-BNA4
Matrix:	Water	Calibration Date:	11/12/2009 11:02:39AM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	0.05	0.7539309	0.1	0.7503073	0.25	0.768767	0.5	0.7568112	1	0.7370196	2	0.7459197
Acenaphthylene	0.05	0.9606713	0.1	0.9510809	0.25	0.9914017	0.5	0.9949361	1	0.9835879	2	1.00239
Anthracene	0.05	1.002039	0.1	0.9583342	0.25	1.009638	0.5	1.016999	1	0.9857789	2	1.008466
Benzo(a)anthracene	0.05	0.7163863	0.1	0.6525396	0.25	0.6686962	0.5	0.7311725	1	0.7139785	2	0.7422729
Benzo(a)pyrene	0.05	0.9180826	0.1	0.9277713	0.25	0.9171977	0.5	0.9521588	1	0.9076612	2	0.9364602
Benzo(b)fluoranthene	0.05	1.130268	0.1	1.07393	0.25	1.126651	0.5	1.142477	1	1.114895	2	1.156432
Benzo(g,h,i)perylene	0.05	0.8452024	0.1	0.7808392	0.25	0.7757333	0.5	0.857647	1	0.8120143	2	0.7948757
Benzo(k)fluoranthene	0.05	1.255414	0.1	1.209373	0.25	1.177126	0.5	1.184989	1	1.159359	2	1.167765
Chrysene	0.05	0.6824687	0.1	0.6600447	0.25	0.6802794	0.5	0.7632552	1	0.7224827	2	0.7411857
Dibenz(a,h)anthracene	0.05	0.6648759	0.1	0.6283833	0.25	0.6405993	0.5	0.7205704	1	0.7031075	2	0.682905
Fluoranthene	0.05	1.063796	0.1	0.9886064	0.25	1.02033	0.5	1.033758	1	1.019383	2	1.046735
Fluorene	0.05	0.7480492	0.1	0.7315194	0.25	0.7576392	0.5	0.7507404	1	0.7332491	2	0.7413528
2-Fluorobiphenyl	0.05	0.8404894	0.1	0.8723531	0.25	0.9006965	0.5	0.889582	1	0.8745376	2	0.8824086
2-Fluorophenol	0.1		0.2		0.5		1		2		4	
Indeno(1,2,3-cd)pyrene	0.05	0.6415542	0.1	0.6804172	0.25	0.6505592	0.5	0.7148773	1	0.6952532	2	0.6999829
1-Methylnaphthalene	0.05	0.76491	0.1	0.7638567	0.25	0.7834786	0.5	0.7478426	1	0.738161	2	0.7366986
2-Methylnaphthalene	0.05	0.8359801	0.1	0.7812343	0.25	0.8398501	0.5	0.802558	1	0.7961968	2	0.7948828
Naphthalene	0.05	1.347685	0.1	1.225697	0.25	1.261854	0.5	1.261558	1	1.214559	2	1.217678
Nitrobenzene-d5	0.05		0.1		0.25		0.5		1		2	
Phenanthrene	0.05	1.109967	0.1	1.048899	0.25	1.10165	0.5	1.088964	1	1.053725	2	1.069243
Phenol-d6	0.1		0.2		0.5		1		2		4	
Pyrene	0.05	1.023703	0.1	1.010517	0.25	1.044288	0.5	1.053237	1	1.022654	2	1.052758
Terphenyl-d14	0.05	0.8014743	0.1	0.792366	0.25	0.8388997	0.5	0.8485896	1	0.737305	2	0.7578167
2,4,6-Tribromophenol	0.1	~~9.940007E-02~~	0.2	~~9.698688E-02~~	0.5	0.1118322	1	0.1261892	2	0.1326213	4	0.1448347
Acenaphthene-d10	1		1		1		1		1		1	
Chrysene-d12	1		1		1		1		1		1	

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0098001	Instrument:	MS-BNA4
Matrix:	Water	Calibration Date:	11/12/2009 11:02:39AM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	5	0.7582583	10	0.7560949	20	0.7485443	40	0.7535901	50	0.6745263		
Acenaphthylene	5	1.055811	10	1.061519	20	1.0319	40	1.042741	50	0.9201937		
Anthracene	5	1.057032	10	1.03929	20	0.9809122	40	0.9700486	50	0.9147624		
Benzo(a)anthracene	5	0.8304942	10	0.8168799	20	0.752069	40	0.8753804	50	0.8397931		
Benzo(a)pyrene	5	1.028444	10	1.048643	20	0.9904805	40	0.9865028	50	0.9381823		
Benzo(b)fluoranthene	5	1.266465	10	1.271342	20	1.182943	40	1.269569	50	1.210528		
Benzo(g,h,i)perylene	5	0.9032267	10	0.9774642	20	0.9365976	40	0.9535296	50	0.8783668		
Benzo(k)fluoranthene	5	1.288024	10	1.226115	20	1.139186	40	1.062242	50	0.9943718		
Chrysene	5	0.8133009	10	0.7873273	20	0.7043946	40	0.7776537	50	0.7241708		
Dibenz(a,h)anthracene	5	0.8199422	10	0.8779499	20	0.8892525	40	0.9182126	50	0.8662251		
Fluoranthene	5	1.099824	10	1.089751	20	0.9905759	40	1.010809	50	0.9696705		
Fluorene	5	0.7774791	10	0.7614425	20	0.7485748	40	0.7571561	50	0.6959085		
2-Fluorobiphenyl	5	0.8813109	10	0.8771855	20	0.8678436	40	0.8781761	50	0.7570024		
2-Fluorophenol	10		20		40		80		100			
Indeno(1,2,3-cd)pyrene	5	0.8103948	10	0.8916495	20	0.8777567	40	0.9363458	50	0.8877157		
1-Methylnaphthalene	5	0.7586414	10	0.7422957	20	0.7298204	40	0.7388618	50	0.6439939		
2-Methylnaphthalene	5	0.8263398	10	0.8137484	20	0.8069974	40	0.8085536	50	0.7040261		
Naphthalene	5	1.247954	10	1.2342	20	1.210706	40	1.214362	50	1.02811		
Nitrobenzene-d5	5		10		20		40		50			
Phenanthrene	5	1.102685	10	1.083995	20	1.038977	40	1.028591	50	0.9810874		
Phenol-d6	10		20		40		80		100			
Pyrene	5	1.117608	10	1.100292	20	0.9886932	40	1.028681	50	0.9758617		
Terphenyl-d14	5	0.8024013	10	0.7986364	20	0.7150069	40	0.7429393	50	0.7109379		
2,4,6-Tribromophenol	10	0.1607078	20	0.165969	40	0.1673591	80	0.168706	100	0.1595565		
Acenaphthene-d10	1		1		1		1		1			
Chrysene-d12	1		1		1		1		1			

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15601	Instrument:	MS-BNA4
Calibration:	0098001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15601-TUN1	SEQ-TUN1.D	06/04/10 17:09
Calibration Check	0F15601-CCV1	SEQ-CCV1.D	06/04/10 17:26
LCS	0E08014-BS1	E08014L1.D	06/04/10 18:00
Blank	0E08014-BLK1	E08014B1.D	06/04/10 18:35
32SS-01-0002	1004244-01	0424401.D	06/04/10 19:09
32SB-01-0708	1004244-02	0424402.D	06/04/10 19:43
32SS-FD042610	1004244-03	0424403.D	06/04/10 20:17
32SB-FD042610	1004244-04	0424404.D	06/04/10 20:51
32SS-02-0002	1004244-05	0424405.D	06/04/10 21:25
32SS-03-0002	1004244-07	0424407.D	06/04/10 22:33
32SB-03-0607	1004244-08	0424408.D	06/04/10 23:07
32SS-04-0002	1004244-09	0424409.D	06/04/10 23:41
32SB-04-0506	1004244-10	0424410.D	06/05/10 00:16
32SB-05-0506	1004244-12	0424412.D	06/05/10 00:50
32SS-07-0002	1004244-15	0424415.D	06/05/10 01:24
32SB-07-0607	1004244-16	0424416.D	06/05/10 01:58
32SS-09-0002	1004244-17	0424417.D	06/05/10 02:32
32SB-09-0607	1004244-18	0424418.D	06/05/10 03:07
32SS-10-0002	1004244-19	0424419.D	06/05/10 03:41
32SS-01-0002	0E08014-MS1	0424401M.D	06/05/10 04:15
32SS-01-0002	0E08014-MSD1	0424401S.D	06/05/10 04:49

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/04/10
Instrument ID:	MS-BNA4	Injection Time:	17:09
Sequence:	0F15601	Lab Sample ID:	0F15601-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	47.5	PASS
68	Less than 2% of 69	1.6	PASS
69	Less than 200% of 198	41	PASS
70	Less than 2% of 69	0.539	PASS
127	40 - 60% of 198	52.3	PASS
197	Less than 1% of 198	0.811	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.7	PASS
275	10 - 30% of 198	28.4	PASS
365	1 - 200% of 198	4.46	PASS
441	0.001 - 100% of 443	82.9	PASS
442	40 - 200% of 198	134	PASS
443	17 - 23% of 442	19.7	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0098001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	11/12/09 11:02
Sequence:	0F15601	Injection Date:	06/04/10
Lab Sample ID:	0F15601-CCV1	Injection Time:	17:26

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.445	0.7457972	0.8121753		8.9	20
Acenaphthylene	A	5.000	6.124	0.9996575	1.224386		22.5	20 *
Anthracene	A	5.000	5.440	0.9948455	1.082338		8.8	20
Benzo(a)anthracene	A	5.000	4.738	0.7581512	0.7183908		-5.2	20
Benzo(a)pyrene	A	5.000	5.864	0.9592349	1.124937		17.3	20
Benzo(b)fluoranthene	A	5.000	6.014	1.176864	1.41543		20.3	20 *
Benzo(g,h,i)perylene	A	5.000	4.999	0.8650452	0.8649362		-0.01	20
Benzo(k)fluoranthene	A	5.000	5.753	1.169451	1.345619		15.1	20
Chrysene	A	5.000	4.750	0.7324149	0.6957961		-5.0	20
Dibenz(a,h)anthracene	A	5.000	5.859	0.7647294	0.8961594		17.2	20
Fluoranthene	A	5.000	5.281	1.030294	1.088214		5.6	20
Fluorene	A	5.000	5.293	0.7457374	0.7894618		5.9	20
Indeno(1,2,3-cd)pyrene	A	5.000	5.870	0.7715006	0.9056766		17.4	20
1-Methylnaphthalene	A	5.000	5.084	0.7407783	0.7532125		1.7	20
2-Methylnaphthalene	A	5.000	5.366	0.8009425	0.8596654		7.3	20
Naphthalene	A	5.000	5.320	1.224033	1.302278		6.4	20
Phenanthrene	A	5.000	5.169	1.064344	1.100276		3.4	20
Pyrene	A	5.000	5.368	1.038027	1.114472		7.4	20
2-Fluorobiphenyl	A	5.000	5.031	0.8655987	0.8709663		0.6	20
Terphenyl-d14	A	5.000	4.985	0.776943	0.7745849		-0.3	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15603	Instrument:	MS-BNA4
Calibration:	0098001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15603-TUN1	SEQ-TUN2.D	06/05/10 05:56
Calibration Check	0F15603-CCV1	SEQ-CCV2.D	06/05/10 06:14
32SB-10-0506	1004244-20	0424420.D	06/05/10 06:48
32SS-06-0002	1004244-13	0424413.D	06/05/10 07:22
32SS-05-0002	1004244-11	0424411.D	06/05/10 07:56
32SB-02-0607	1004244-06	424406D2.D	06/05/10 09:38
32SB-06-0405	1004244-14	424414D2.D	06/05/10 12:21

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	06/05/10
Instrument ID:	MS-BNA4	Injection Time:	05:56
Sequence:	0F15603	Lab Sample ID:	0F15603-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	38.8	PASS
68	Less than 2% of 69	1.68	PASS
69	Less than 200% of 198	34.3	PASS
70	Less than 2% of 69	0.602	PASS
127	40 - 60% of 198	48	PASS
197	Less than 1% of 198	0.777	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.74	PASS
275	10 - 30% of 198	29.6	PASS
365	1 - 200% of 198	5.12	PASS
441	0.001 - 100% of 443	83.2	PASS
442	40 - 200% of 198	160	PASS
443	17 - 23% of 442	19.9	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0098001
Lab File ID:	SEQ-CCV2.D	Calibration Date:	11/12/09 11:02
Sequence:	0F15603	Injection Date:	06/05/10
Lab Sample ID:	0F15603-CCV1	Injection Time:	06:14

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.158	0.7457972	0.7693338		3.2	20
Acenaphthylene	A	5.000	5.698	0.9996575	1.139246		14.0	20
Anthracene	A	5.000	5.406	0.9948455	1.075619		8.1	20
Benzo(a)anthracene	A	5.000	4.401	0.7581512	0.6673625		-12.0	20
Benzo(a)pyrene	A	5.000	5.815	0.9592349	1.115629		16.3	20
Benzo(b)fluoranthene	A	5.000	5.872	1.176864	1.382091		17.4	20
Benzo(g,h,i)perylene	A	5.000	4.782	0.8650452	0.8272727		-4.4	20
Benzo(k)fluoranthene	A	5.000	5.959	1.169451	1.393785		19.2	20
Chrysene	A	5.000	4.355	0.7324149	0.6379586		-12.9	20
Dibenz(a,h)anthracene	A	5.000	5.240	0.7647294	0.8015174		4.8	20
Fluoranthene	A	5.000	5.273	1.030294	1.086578		5.5	20
Fluorene	A	5.000	4.909	0.7457374	0.7321774		-1.8	20
Indeno(1,2,3-cd)pyrene	A	5.000	5.274	0.7715006	0.8138522		5.5	20
1-Methylnaphthalene	A	5.000	4.909	0.7407783	0.7273671		-1.8	20
2-Methylnaphthalene	A	5.000	5.127	0.8009425	0.821224		2.5	20
Naphthalene	A	5.000	5.034	1.224033	1.232451		0.7	20
Phenanthrene	A	5.000	5.193	1.064344	1.105428		3.9	20
Pyrene	A	5.000	5.333	1.038027	1.107143		6.7	20
2-Fluorobiphenyl	A	5.000	4.807	0.8655987	0.8321381		-3.9	20
Terphenyl-d14	A	5.000	4.882	0.776943	0.7586571		-2.4	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15501	Instrument:	MS-BNA3
Calibration:	0156001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15501-TUN1	SEQ-TUN1.D	06/03/10 10:13
Cal Standard	0F15501-CAL1	SEQ-CAL1.D	06/03/10 10:34
Cal Standard	0F15501-CAL2	SEQ-CAL2.D	06/03/10 11:11
Cal Standard	0F15501-CAL3	SEQ-CAL3.D	06/03/10 11:47
Cal Standard	0F15501-CAL4	SEQ-CAL4.D	06/03/10 12:23
Cal Standard	0F15501-CAL5	SEQ-CAL5.D	06/03/10 13:00
Cal Standard	0F15501-CAL6	SEQ-CAL6.D	06/03/10 13:36
Cal Standard	0F15501-CAL7	SEQ-CAL7.D	06/03/10 14:13
Cal Standard	0F15501-CAL8	SEQ-CAL8.D	06/03/10 14:49
Cal Standard	0F15501-CAL9	SEQ-CAL9.D	06/03/10 15:26
Cal Standard	0F15501-CALA	SEQ-CALA.D	06/03/10 16:03
Cal Standard	0F15501-CALB	SEQ-CALB.D	06/03/10 16:39
Initial Cal Check	0F15501-ICV1	SEQ-ICV1.D	06/03/10 17:16

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/03/10
Instrument ID:	MS-BNA3	Injection Time:	10:13
Sequence:	0F15501	Lab Sample ID:	0F15501-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	41.5	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	48.5	PASS
70	Less than 2% of 69	0.535	PASS
127	40 - 60% of 198	57.2	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.15	PASS
275	10 - 30% of 198	21.3	PASS
365	1 - 200% of 198	2.05	PASS
441	0.001 - 100% of 443	71.8	PASS
442	40 - 200% of 198	42.1	PASS
443	17 - 23% of 442	20.3	PASS

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Calibration: 0156001
Matrix: Water

SDG: CTOF273_001
Project: CTOF273 NSA Crane SMU32
Instrument: MS-BNA3
Calibration Date: 6/3/2010 10:00:02AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.6012431	7.184963	9.083455	0.1514793			CCC (30)	
Acenaphthylene	0.9158405	9.534423	8.697545	0.1224601			15	
Anthracene	0.8705871	12.60701	12.99	0.1331843			15	
Benzo(a)anthracene	0.7827159	11.93588	20.47909	0.1037901			15	
Benzo(a)pyrene	1.030906	16.82034	24.56209	9.824416E-02		0.9996429	CCC (30)	
Benzo(b)fluoranthene	1.129732	17.94265	23.74682	0.1340174	0.9995021		0.995	
Benzo(g,h,i)perylene	0.9698277	5.644128	26.92336	0.1059566			15	
Benzo(k)fluoranthene	1.107235	15.53366	23.83891	0.1427109		0.9995849	0.99	
Chrysene	0.8305551	8.726862	20.58036	0.113825			15	
Dibenz(a,h)anthracene	0.855389	11.29456	26.542	7.745018E-02			15	
Fluoranthene	0.933897	12.06893	16.25082	0.108705			CCC (30)	
Fluorene	0.6453976	9.224112	10.32127	0.1362755			15	
2-Fluorobiphenyl	0.694446	6.728885	7.654455	0.1153448			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	0.9165747	14.56335	26.47864	8.292637E-02			15	
1-Methylnaphthalene	0.582316	8.672515	7.157364	0.1267128			15	
2-Methylnaphthalene	0.6301093	6.416041	6.996091	9.985584E-02			15	
Naphthalene	0.9310503	9.373293	5.993454	0.1135701			15	
Nitrobenzene-d5							15	
Phenanthrene	0.9661153	6.161989	12.843	0.1252231			15	
Phenol-d6							15	
Pyrene	0.9799586	10.54414	16.87882	0.1189006			15	
Terphenyl-d14	0.6581084	10.97145	17.571	8.350396E-02			15	
2,4,6-Tribromophenol	7.286756E-02	24.60508	10.93736	0.1598562	0.9994666		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION DATA

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0156001	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	6/3/2010 10:00:02AM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	0.05	0.6887374	0.1	0.6102112	0.25	0.5761253	0.5	0.5776617	1	0.6553898	2	0.6294555
Acenaphthylene	0.05	0.7880351	0.1	0.8217325	0.25	0.8647101	0.5	0.9131058	1	1.037771	2	1.030506
Anthracene	0.05	0.6688778	0.1	0.7488617	0.25	0.7754771	0.5	0.8142023	1	1.021439	2	0.956963
Benzo(a)anthracene	0.05	0.6801384	0.1	0.6164626	0.25	0.6899172	0.5	0.7070394	1	0.8133413	2	0.817746
Benzo(a)pyrene	0.05	0.8423956	0.1	0.7159641	0.25	0.8221258	0.5	0.9278189	1	1.125508	2	1.044545
Benzo(b)fluoranthene	0.05	0.8322323	0.1	0.7969726	0.25	0.8997674	0.5	1.021327	1	1.235345	2	1.197305
Benzo(g,h,i)perylene	0.05	0.9756806	0.1	0.8810967	0.25	0.9167138	0.5	0.9668029	1	1.083948	2	0.9887047
Benzo(k)fluoranthene	0.05	0.7988385	0.1	0.8457854	0.25	1.026941	0.5	1.116021	1	1.344609	2	1.261387
Chrysene	0.05	0.884876	0.1	0.852523	0.25	0.839287	0.5	0.8622205	1	0.9274874	2	0.8848117
Dibenz(a,h)anthracene	0.05	0.6940109	0.1	0.7369952	0.25	0.7385505	0.5	0.8090594	1	0.9697665	2	0.9073038
Fluoranthene	0.05	0.7589624	0.1	0.7961671	0.25	0.7895931	0.5	0.9280486	1	1.055173	2	1.046544
Fluorene	0.05	0.571218	0.1	0.5629992	0.25	0.5755492	0.5	0.6067879	1	0.7388494	2	0.6856866
2-Fluorobiphenyl	0.05	0.6897611	0.1	0.645387	0.25	0.6959309	0.5	0.7248683	1	0.7704467	2	0.7671633
2-Fluorophenol	0.1		0.2		0.5		1		2		4	
Indeno(1,2,3-cd)pyrene	0.05	0.7224682	0.1	0.7250516	0.25	0.7677667	0.5	0.8152105	1	1.003223	2	0.9124935
1-Methylnaphthalene	0.05	0.6613025	0.1	0.6154363	0.25	0.57843	0.5	0.606636	1	0.634109	2	0.6263848
2-Methylnaphthalene	0.05	0.6430809	0.1	0.56048	0.25	0.6342816	0.5	0.6196611	1	0.7064815	2	0.6781234
Naphthalene	0.05	1.067911	0.1	0.957957	0.25	0.9674469	0.5	0.9957184	1	1.039278	2	0.9436075
Nitrobenzene-d5	0.05		0.1		0.25		0.5		1		2	
Phenanthrene	0.05	0.9129251	0.1	0.9264201	0.25	0.9274397	0.5	0.9330612	1	1.09318	2	1.026951
Phenol-d6	0.1		0.2		0.5		1		2		4	
Pyrene	0.05	0.8805765	0.1	0.8095096	0.25	0.9019806	0.5	0.9547064	1	1.132414	2	1.093554
Terphenyl-d14	0.05	0.5486968	0.1	0.5291297	0.25	0.6158804	0.5	0.6422557	1	0.7516004	2	0.6945365
2,4,6-Tribromophenol	0.1	3.777409E-02	0.2	4.744532E-02	0.5	6.116313E-02	1	6.110979E-02	2	8.439665E-02	4	7.936563E-02
Acenaphthene-d10	1		1		1		1		1		1	
Chrysene-d12	1		1		1		1		1		1	

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0156001	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	6/3/2010 10:00:02AM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	5	0.6002718	10	0.5806503	20	0.5973085	40	0.5419444	50	0.5559183		
Acenaphthylene	5	0.996145	10	0.9522535	20	0.9740831	40	0.8437298	50	0.8521731		
Anthracene	5	0.979197	10	0.9469419	20	0.9395354	40	0.8610334	50	0.8639298		
Benzo(a)anthracene	5	0.8684765	10	0.8689523	20	0.9041125	40	0.8252984	50	0.8183905		
Benzo(a)pyrene	5	1.161679	10	1.190829	20	1.204541	40	1.139674	50	1.164882		
Benzo(b)fluoranthene	5	1.256836	10	1.303416	20	1.338558	40	1.256523	50	1.288767		
Benzo(g,h,i)perylene	5	1.033172	10	0.9653504	20	0.9758677	40	0.9357831	50	0.9449846		
Benzo(k)fluoranthene	5	1.247367	10	1.220529	20	1.199914	40	1.062619	50	1.055571		
Chrysene	5	0.8571933	10	0.8178722	20	0.8108023	40	0.7058679	50	0.6931645		
Dibenz(a,h)anthracene	5	0.9728076	10	0.8740959	20	0.9219851	40	0.8782113	50	0.9064931		
Fluoranthene	5	1.057894	10	1.030243	20	0.9916996	40	0.9091715	50	0.9093705		
Fluorene	5	0.6976308	10	0.6827717	20	0.6924626	40	0.6368748	50	0.6485439		
2-Fluorobiphenyl	5	0.6983717	10	0.6741065	20	0.7014284	40	0.6312498	50	0.6401928		
2-Fluorophenol	10		20		40		80		100			
Indeno(1,2,3-cd)pyrene	5	1.012459	10	0.989698	20	1.043266	40	1.037456	50	1.053229		
1-Methylnaphthalene	5	0.5732521	10	0.5494585	20	0.5301068	40	0.5110041	50	0.5193554		
2-Methylnaphthalene	5	0.6516727	10	0.6303897	20	0.6140409	40	0.5901664	50	0.6028238		
Naphthalene	5	0.8905291	10	0.8801026	20	0.897545	40	0.8002282	50	0.801229		
Nitrobenzene-d5	5		10		20		40		50			
Phenanthrene	5	1.014187	10	0.9957043	20	0.9686654	40	0.909254	50	0.9194809		
Phenol-d6	10		20		40		80		100			
Pyrene	5	1.077181	10	1.060542	20	1.026275	40	0.9179219	50	0.9248837		
Terphenyl-d14	5	0.7256615	10	0.7216351	20	0.7091201	40	0.6431398	50	0.6575362		
2,4,6-Tribromophenol	10	8.592749E-02	20	8.619644E-02	40	8.909966E-02	80	8.342171E-02	100	8.564323E-02		
Acenaphthene-d10	1		1		1		1		1			
Chrysene-d12	1		1		1		1		1			

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15602	Instrument:	MS-BNA3
Calibration:	0156001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15602-TUN1	SEQ-TUN1.D	06/04/10 17:48
Calibration Check	0F15602-CCV1	SEQ-CCV1.D	06/04/10 18:09
LCS	0E09003-BS1	E09003L1.D	06/04/10 18:45
Blank	0E09003-BLK1	E09003B1.D	06/04/10 19:21
32SS-14-0002	1004244-21	0424421.D	06/04/10 19:58
32SB-14-0910	1004244-22	0424422.D	06/04/10 20:34

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/04/10
Instrument ID:	MS-BNA3	Injection Time:	17:48
Sequence:	0F15602	Lab Sample ID:	0F15602-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	37.5	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	43.3	PASS
70	Less than 2% of 69	0.464	PASS
127	40 - 60% of 198	52.8	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.93	PASS
275	10 - 30% of 198	25.1	PASS
365	1 - 200% of 198	3.1	PASS
441	0.001 - 100% of 443	78.6	PASS
442	40 - 200% of 198	72.8	PASS
443	17 - 23% of 442	18.8	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0156001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	06/03/10 10:00
Sequence:	0F15602	Injection Date:	06/04/10
Lab Sample ID:	0F15602-CCV1	Injection Time:	18:09

		* CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.304	0.6012431	0.6378367		6.1	20
Acenaphthylene	A	5.000	5.558	0.9158405	1.01808		11.2	20
Anthracene	A	5.000	5.822	0.8705871	1.013762		16.4	20
Benzo(a)anthracene	A	5.000	5.558	0.7827159	0.870043		11.2	20
Benzo(a)pyrene	Q	5.000	5.307	1.030906	1.246557		6.1	20
Benzo(b)fluoranthene	L	5.000	5.357	1.129732	1.373434		7.1	20
Benzo(g,h,i)perylene	A	5.000	4.033	0.9698277	0.782339		-19.3	20
Benzo(k)fluoranthene	Q	5.000	5.321	1.107235	1.332247		6.4	20
Chrysene	A	5.000	4.918	0.8305551	0.8169306		-1.6	20
Dibenz(a,h)anthracene	A	5.000	4.392	0.855389	0.7513983		-12.2	20
Fluoranthene	A	5.000	5.761	0.933897	1.076068		15.2	20
Fluorene	A	5.000	5.654	0.6453976	0.729791		13.1	20
Indeno(1,2,3-cd)pyrene	A	5.000	4.326	0.9165747	0.7930041		-13.5	20
1-Methylnaphthalene	A	5.000	5.292	0.582316	0.6162986		5.8	20
2-Methylnaphthalene	A	5.000	5.563	0.6301093	0.7010979		11.3	20
Naphthalene	A	5.000	5.142	0.9310503	0.9574915		2.8	20
Phenanthrene	A	5.000	5.549	0.9661153	1.072176		11.0	20
Pyrene	A	5.000	5.593	0.9799586	1.096246		11.9	20
2-Fluorobiphenyl	A	5.000	5.595	0.694446	0.7770695		11.9	20
Terphenyl-d14	A	5.000	5.814	0.6581084	0.7652855		16.3	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_001

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E08014

Batch Matrix: Solid

Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E08014-BLK1	05/10/10 10:30	15.00	1.00
LCS	0E08014-BS1	05/10/10 10:30	15.00	1.00
32SS-01-0002	0E08014-MS1	05/10/10 10:30	15.10	1.00
32SS-01-0002	0E08014-MSD1	05/10/10 10:30	15.10	1.00
32SS-01-0002	1004244-01	05/10/10 10:30	15.00	1.00
32SB-01-0708	1004244-02	05/10/10 10:30	15.00	1.00
32SS-FD042610	1004244-03	05/10/10 10:30	15.10	1.00
32SB-FD042610	1004244-04	05/10/10 10:30	15.10	1.00
32SS-02-0002	1004244-05	05/10/10 10:30	15.00	1.00
32SB-02-0607	1004244-06	05/10/10 10:30	15.10	1.00
32SS-03-0002	1004244-07	05/10/10 10:30	15.10	1.00
32SB-03-0607	1004244-08	05/10/10 10:30	15.00	1.00
32SS-04-0002	1004244-09	05/10/10 10:30	15.00	1.00
32SB-04-0506	1004244-10	05/10/10 10:30	15.10	1.00
32SS-05-0002	1004244-11	05/10/10 10:30	15.10	1.00
32SB-05-0506	1004244-12	05/10/10 10:30	15.10	1.00
32SS-06-0002	1004244-13	05/10/10 10:30	15.30	1.00
32SB-06-0405	1004244-14	05/10/10 10:30	15.50	1.00
32SS-07-0002	1004244-15	05/10/10 10:30	15.40	1.00
32SB-07-0607	1004244-16	05/10/10 10:30	15.40	1.00
32SS-09-0002	1004244-17	05/10/10 10:30	15.30	1.00
32SB-09-0607	1004244-18	05/10/10 10:30	15.10	1.00
32SS-10-0002	1004244-19	05/10/10 10:30	15.00	1.00
32SB-10-0506	1004244-20	05/10/10 10:30	15.40	1.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_001	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E08014-BLK1	File ID:	E08014B1.D
Sampled:		Prepared:		Analyzed:	06/04/10 18:35
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E08014 Sequence: 0F15601 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.33	6.67	U
50-32-8	Benzo(a)pyrene		1.33	5.00	U
205-99-2	Benzo(b)fluoranthene		1.33	6.67	X, U
207-08-9	Benzo(k)fluoranthene		1.33	6.67	U
218-01-9	Chrysene		1.33	6.67	U
53-70-3	Dibenz(a,h)anthracene		1.33	5.00	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.33	6.67	U
91-20-3	Naphthalene		1.33	5.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	2611	78.3	14 - 129	
Terphenyl-d14	3333	2711	81.3	14 - 129	

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_001

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

~~Matrix: Solid~~

Batch: 0E08014

Laboratory ID: 0E08014-BS1

Preparation: EXT_3546

Initial/Final: 15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.67	60.14	90.2	31 - 146
Benzo(a)pyrene	66.67	65.44	98.2	28 - 128
Benzo(b)fluoranthene	66.67	67.33	101	30 - 139
Benzo(k)fluoranthene	66.67	67.83	102	42 - 129
Chrysene	66.67	58.91	88.4	39 - 134
Dibenz(a,h)anthracene	66.67	79.74	120	30 - 138
Indeno(1,2,3-cd)pyrene	66.67	78.48	118	17 - 164
Naphthalene	66.67	54.17	81.3	29 - 106

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SS-01-0002

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_001

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E08014

% Solids: 85.49

Source Sample Name: **1004244-01**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	77.46	ND	43.03	55.6		31 - 146
Benzo(a)pyrene	77.46	ND	55.58	71.7		28 - 128
Benzo(b)fluoranthene	77.46	ND	67.61	87.3		30 - 139
Benzo(k)fluoranthene	77.46	ND	66.41	85.7		42 - 129
Chrysene	77.46	ND	41.73	53.9		39 - 134
Dibenz(a,h)anthracene	77.46	ND	53.79	69.4		30 - 138
Indeno(1,2,3-cd)pyrene	77.46	ND	52.29	67.5		17 - 164
Naphthalene	77.46	ND	43.05	55.6		29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzo(a)anthracene	77.46	43.85	56.6	1.87		30	31 - 146
Benzo(a)pyrene	77.46	61.62	79.6	10.3		30	28 - 128
Benzo(b)fluoranthene	77.46	71.99	92.9	6.28		30	30 - 139
Benzo(k)fluoranthene	77.46	69.18	89.3	4.09		30	42 - 129
Chrysene	77.46	44.48	57.4	6.39		30	39 - 134
Dibenz(a,h)anthracene	77.46	61.86	79.9	14.0		30	30 - 138
Indeno(1,2,3-cd)pyrene	77.46	59.00	76.2	12.1		30	17 - 164
Naphthalene	77.46	53.65	69.3	21.9		30	29 - 106

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_001

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E09003

Batch Matrix: Solid

Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E09003-BLK1	05/10/10 13:35	15.30	1.00
LCS	0E09003-BS1	05/10/10 13:35	15.10	1.00
32SS-14-0002	1004244-21	05/10/10 13:35	15.30	1.00
32SB-14-0910	1004244-22	05/10/10 13:35	15.60	1.00

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E09003	Laboratory ID:	0E09003-BS1
Preparation:	EXT_3546	Initial/Final:	15.1 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.23	55.13	83.2	31 - 146
Benzo(a)pyrene	66.23	48.26	72.9	28 - 128
Benzo(b)fluoranthene	66.23	47.36	71.5	30 - 139
Benzo(k)fluoranthene	66.23	49.61	74.9	42 - 129
Chrysene	66.23	54.78	82.7	39 - 134
Dibenz(a,h)anthracene	66.23	43.62	65.9	30 - 138
Indeno(1,2,3-cd)pyrene	66.23	36.91	55.7	17 - 164
Naphthalene	66.23	49.62	74.9	29 - 106

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_001	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E09003-BLK1	File ID:	E09003B1.D
Sampled:		Prepared:		Analyzed:	06/04/10 19:21
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E09003 Sequence: 0F15602 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.30	6.54	U
50-32-8	Benzo(a)pyrene		1.30	4.90	U
205-99-2	Benzo(b)fluoranthene		1.30	6.54	U
207-08-9	Benzo(k)fluoranthene		1.30	6.54	U
218-01-9	Chrysene		1.30	6.54	U
53-70-3	Dibenz(a,h)anthracene		1.30	4.90	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.30	6.54	U
91-20-3	Naphthalene		1.30	4.90	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3268	2689	82.3	14 - 129	
Terphenyl-d14	3268	2793	85.5	14 - 129	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0F15601

SDG: CTOF273_001
Project: CTOF273 NSA Crane SMU32
Instrument: MS-BNA4
Calibration: 0098001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15601-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 06/04/10 17:26		
2-Fluorobiphenyl	5.000	101	80 - 120	8.125	8.125	0.0000	+/-0.500	
Terphenyl-d14	5.000	99.7	80 - 120	18.119	18.119	0.0000	+/-0.500	
LCS (0E08014-BS1) ug/Kg wet				Lab File ID: E08014L1.D		Analyzed: 06/04/10 18:00		
2-Fluorobiphenyl	3333	72.6	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3333	74.5	14 - 129	18.137	18.119	0.0180	+/-0.500	
Blank (0E08014-BLK1) ug/Kg wet				Lab File ID: E08014B1.D		Analyzed: 06/04/10 18:35		
2-Fluorobiphenyl	3333	78.3	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3333	81.3	14 - 129	18.137	18.119	0.0180	+/-0.500	
32SS-01-0002 (1004244-01) ug/Kg dry				Lab File ID: 0424401.D		Analyzed: 06/04/10 19:09		
2-Fluorobiphenyl	3899	65.6	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3899	70.3	14 - 129	18.137	18.119	0.0180	+/-0.500	
32SB-01-0708 (1004244-02) ug/Kg dry				Lab File ID: 0424402.D		Analyzed: 06/04/10 19:43		
2-Fluorobiphenyl	3905	69.9	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3905	70.5	14 - 129	18.128	18.119	0.0090	+/-0.500	
32SS-FD042610 (1004244-03) ug/Kg dry				Lab File ID: 0424403.D		Analyzed: 06/04/10 20:17		
2-Fluorobiphenyl	3946	61.8	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3946	67.4	14 - 129	18.128	18.119	0.0090	+/-0.500	
32SB-FD042610 (1004244-04) ug/Kg dry				Lab File ID: 0424404.D		Analyzed: 06/04/10 20:51		
2-Fluorobiphenyl	3881	65.5	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3881	70.1	14 - 129	18.128	18.119	0.0090	+/-0.500	
32SS-02-0002 (1004244-05) ug/Kg dry				Lab File ID: 0424405.D		Analyzed: 06/04/10 21:25		
2-Fluorobiphenyl	4033	56.8	14 - 129	8.125	8.125	0.0000	+/-0.500	
Terphenyl-d14	4033	56.7	14 - 129	18.128	18.119	0.0090	+/-0.500	
32SS-03-0002 (1004244-07) ug/Kg dry				Lab File ID: 0424407.D		Analyzed: 06/04/10 22:33		
2-Fluorobiphenyl	3904	66.8	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3904	71.8	14 - 129	18.128	18.119	0.0090	+/-0.500	
32SB-03-0607 (1004244-08) ug/Kg dry				Lab File ID: 0424408.D		Analyzed: 06/04/10 23:07		
2-Fluorobiphenyl	4067	61.1	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	4067	66.9	14 - 129	18.128	18.119	0.0090	+/-0.500	
32SS-04-0002 (1004244-09) ug/Kg dry				Lab File ID: 0424409.D		Analyzed: 06/04/10 23:41		
2-Fluorobiphenyl	4100	62.9	14 - 129	8.125	8.125	0.0000	+/-0.500	
Terphenyl-d14	4100	70.9	14 - 129	18.137	18.119	0.0180	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15601	Instrument:	MS-BNA4
		Calibration:	0098001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
32SB-04-0506 (1004244-10) ug/Kg dry				Lab File ID: 0424410.D		Analyzed: 06/05/10 00:16		
2-Fluorobiphenyl	3876	66.0	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3876	72.4	14 - 129	18.128	18.119	0.0090	+/-0.500	
32SB-05-0506 (1004244-12) ug/Kg dry				Lab File ID: 0424412.D		Analyzed: 06/05/10 00:50		
2-Fluorobiphenyl	3980	65.7	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3980	70.5	14 - 129	18.146	18.119	0.0270	+/-0.500	
32SS-07-0002 (1004244-15) ug/Kg dry				Lab File ID: 0424415.D		Analyzed: 06/05/10 01:24		
2-Fluorobiphenyl	3943	75.3	14 - 129	8.143	8.125	0.0180	+/-0.500	
Terphenyl-d14	3943	74.8	14 - 129	18.146	18.119	0.0270	+/-0.500	
32SB-07-0607 (1004244-16) ug/Kg dry				Lab File ID: 0424416.D		Analyzed: 06/05/10 01:58		
2-Fluorobiphenyl	3976	61.5	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3976	65.8	14 - 129	18.137	18.119	0.0180	+/-0.500	
32SS-09-0002 (1004244-17) ug/Kg dry				Lab File ID: 0424417.D		Analyzed: 06/05/10 02:32		
2-Fluorobiphenyl	3772	70.9	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3772	73.4	14 - 129	18.137	18.119	0.0180	+/-0.500	
32SB-09-0607 (1004244-18) ug/Kg dry				Lab File ID: 0424418.D		Analyzed: 06/05/10 03:07		
2-Fluorobiphenyl	3899	71.8	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3899	69.7	14 - 129	18.146	18.119	0.0270	+/-0.500	
32SS-10-0002 (1004244-19) ug/Kg dry				Lab File ID: 0424419.D		Analyzed: 06/05/10 03:41		
2-Fluorobiphenyl	3825	57.9	14 - 129	8.125	8.125	0.0000	+/-0.500	
Terphenyl-d14	3825	66.7	14 - 129	18.128	18.119	0.0090	+/-0.500	
Matrix Spike (0E08014-MS1) ug/Kg dry				Lab File ID: 0424401M.D		Analyzed: 06/05/10 04:15		
2-Fluorobiphenyl	3873	54.5	14 - 129	8.125	8.125	0.0000	+/-0.500	
Terphenyl-d14	3873	60.2	14 - 129	18.128	18.119	0.0090	+/-0.500	
Matrix Spike Dup (0E08014-MSD1) ug/Kg dry				Lab File ID: 0424401S.D		Analyzed: 06/05/10 04:49		
2-Fluorobiphenyl	3873	66.2	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3873	66.5	14 - 129	18.128	18.119	0.0090	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15602	Instrument:	MS-BNA3
		Calibration:	0156001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15602-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 06/04/10 18:09		
2-Fluorobiphenyl	5.000	112	80 - 120	7.616	7.616	0.0000	+/-0.500	
Terphenyl-d14	5.000	116	80 - 120	17.521	17.521	0.0000	+/-0.500	
LCS (0E09003-BS1) ug/Kg wet				Lab File ID: E09003L1.D		Analyzed: 06/04/10 18:45		
2-Fluorobiphenyl	3311	82.3	14 - 129	7.623	7.616	0.0070	+/-0.500	
Terphenyl-d14	3311	88.7	14 - 129	17.538	17.521	0.0170	+/-0.500	
Blank (0E09003-BLK1) ug/Kg wet				Lab File ID: E09003B1.D		Analyzed: 06/04/10 19:21		
2-Fluorobiphenyl	3268	82.3	14 - 129	7.614	7.616	-0.0020	+/-0.500	
Terphenyl-d14	3268	85.5	14 - 129	17.538	17.521	0.0170	+/-0.500	
32SS-14-0002 (1004244-21) ug/Kg dry				Lab File ID: 0424421.D		Analyzed: 06/04/10 19:58		
2-Fluorobiphenyl	3766	69.5	14 - 129	7.623	7.616	0.0070	+/-0.500	
Terphenyl-d14	3766	71.3	14 - 129	17.538	17.521	0.0170	+/-0.500	
32SB-14-0910 (1004244-22) ug/Kg dry				Lab File ID: 0424422.D		Analyzed: 06/04/10 20:34		
2-Fluorobiphenyl	3891	77.3	14 - 129	7.622	7.616	0.0060	+/-0.500	
Terphenyl-d14	3891	82.9	14 - 129	17.537	17.521	0.0160	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15603	Instrument:	MS-BNA4
		Calibration:	0098001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15603-CCV1) ug/mL				Lab File ID: SEQ-CCV2.D		Analyzed: 06/05/10 06:14		
2-Fluorobiphenyl	5.000	96.1	80 - 120	8.125	8.125	0.0000	+/-0.500	
Terphenyl-d14	5.000	97.6	80 - 120	18.109	18.109	0.0000	+/-0.500	
32SB-10-0506 (1004244-20) ug/Kg dry				Lab File ID: 0424420.D		Analyzed: 06/05/10 06:48		
2-Fluorobiphenyl	4062	62.7	14 - 129	8.125	8.125	0.0000	+/-0.500	
Terphenyl-d14	4062	65.4	14 - 129	18.128	18.109	0.0190	+/-0.500	
32SS-06-0002 (1004244-13) ug/Kg dry				Lab File ID: 0424413.D		Analyzed: 06/05/10 07:22		
2-Fluorobiphenyl	3869	66.8	14 - 129	8.181	8.125	0.0560	+/-0.500	
Terphenyl-d14	3869	77.1	14 - 129	18.174	18.109	0.0650	+/-0.500	
32SS-05-0002 (1004244-11) ug/Kg dry				Lab File ID: 0424411.D		Analyzed: 06/05/10 07:56		
2-Fluorobiphenyl	3847	68.8	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3847	65.7	14 - 129	18.147	18.109	0.0380	+/-0.500	
32SB-02-0607 (1004244-06) ug/Kg dry				Lab File ID: 424406D2.D		Analyzed: 06/05/10 09:38		
2-Fluorobiphenyl	4113	57.6	14 - 129	8.144	8.125	0.0190	+/-0.500	
Terphenyl-d14	4113	56.3	14 - 129	18.119	18.109	0.0100	+/-0.500	
32SB-06-0405 (1004244-14) ug/Kg dry				Lab File ID: 424414D2.D		Analyzed: 06/05/10 12:21		
2-Fluorobiphenyl	3824	70.8	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3824	67.1	14 - 129	18.128	18.109	0.0190	+/-0.500	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0F15601

SDG: CTOF273_001
Project: CTOF273 NSA Crane SMU32
Instrument: MS-BNA4
Calibration: 0098001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15601-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 06/04/10 17:26			
Phenanthrene-d10	143175	13.35	196258	13.55	73	50 - 200	-0.2000	+/-0.50	
Perylene-d12	59366	25.1	108221	25.217	55	50 - 200	-0.1170	+/-0.50	
LCS (0E08014-BS1)			Lab File ID: E08014L1.D			Analyzed: 06/04/10 18:00			
Phenanthrene-d10	131724	13.349	143175	13.35	92	50 - 200	-0.0010	+/-0.50	
Perylene-d12	66849	25.1	59366	25.1	113	50 - 200	0.0000	+/-0.50	
Blank (0E08014-BLK1)			Lab File ID: E08014B1.D			Analyzed: 06/04/10 18:35			
Phenanthrene-d10	110836	13.35	143175	13.35	77	50 - 200	0.0000	+/-0.50	
Perylene-d12	44071	25.1	59366	25.1	74	50 - 200	0.0000	+/-0.50	
32SS-01-0002 (1004244-01)			Lab File ID: 0424401.D			Analyzed: 06/04/10 19:09			
Phenanthrene-d10	115855	13.35	143175	13.35	81	50 - 200	0.0000	+/-0.50	
Perylene-d12	41418	25.1	59366	25.1	70	50 - 200	0.0000	+/-0.50	
32SB-01-0708 (1004244-02)			Lab File ID: 0424402.D			Analyzed: 06/04/10 19:43			
Phenanthrene-d10	105660	13.349	143175	13.35	74	50 - 200	-0.0010	+/-0.50	
Perylene-d12	37438	25.1	59366	25.1	63	50 - 200	0.0000	+/-0.50	
32SS-FD042610 (1004244-03)			Lab File ID: 0424403.D			Analyzed: 06/04/10 20:17			
Phenanthrene-d10	112775	13.349	143175	13.35	79	50 - 200	-0.0010	+/-0.50	
Perylene-d12	40607	25.1	59366	25.1	68	50 - 200	0.0000	+/-0.50	
32SB-FD042610 (1004244-04)			Lab File ID: 0424404.D			Analyzed: 06/04/10 20:51			
Phenanthrene-d10	110086	13.35	143175	13.35	77	50 - 200	0.0000	+/-0.50	
Perylene-d12	39352	25.1	59366	25.1	66	50 - 200	0.0000	+/-0.50	
32SS-02-0002 (1004244-05)			Lab File ID: 0424405.D			Analyzed: 06/04/10 21:25			
Phenanthrene-d10	123794	13.35	143175	13.35	86	50 - 200	0.0000	+/-0.50	
Perylene-d12	61193	25.1	59366	25.1	103	50 - 200	0.0000	+/-0.50	
32SS-03-0002 (1004244-07)			Lab File ID: 0424407.D			Analyzed: 06/04/10 22:33			
Phenanthrene-d10	109286	13.349	143175	13.35	76	50 - 200	-0.0010	+/-0.50	
Perylene-d12	52485	25.1	59366	25.1	88	50 - 200	0.0000	+/-0.50	
32SB-03-0607 (1004244-08)			Lab File ID: 0424408.D			Analyzed: 06/04/10 23:07			
Phenanthrene-d10	105806	13.349	143175	13.35	74	50 - 200	-0.0010	+/-0.50	
Perylene-d12	39396	25.1	59366	25.1	66	50 - 200	0.0000	+/-0.50	
32SS-04-0002 (1004244-09)			Lab File ID: 0424409.D			Analyzed: 06/04/10 23:41			
Phenanthrene-d10	112044	13.349	143175	13.35	78	50 - 200	-0.0010	+/-0.50	
Perylene-d12	54648	25.1	59366	25.1	92	50 - 200	0.0000	+/-0.50	
32SB-04-0506 (1004244-10)			Lab File ID: 0424410.D			Analyzed: 06/05/10 00:16			
Phenanthrene-d10	106270	13.349	143175	13.35	74	50 - 200	-0.0010	+/-0.50	
Perylene-d12	38301	25.1	59366	25.1	65	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0F15601

SDG: CTOF273_001
Project: CTOF273 NSA Crane SMU32
Instrument: MS-BNA4
Calibration: 0098001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
32SB-05-0506 (1004244-12)			Lab File ID: 0424412.D			Analyzed: 06/05/10 00:50			
Phenanthrene-d10	115681	13.359	143175	13.35	81	50 - 200	0.0090	+/-0.50	
Perylene-d12	42675	25.119	59366	25.1	72	50 - 200	0.0190	+/-0.50	
32SS-07-0002 (1004244-15)			Lab File ID: 0424415.D			Analyzed: 06/05/10 01:24			
Phenanthrene-d10	108966	13.387	143175	13.35	76	50 - 200	0.0370	+/-0.50	
Perylene-d12	26627	25.1	59366	25.1	45	50 - 200	0.0000	+/-0.50	*
32SB-07-0607 (1004244-16)			Lab File ID: 0424416.D			Analyzed: 06/05/10 01:58			
Phenanthrene-d10	106239	13.35	143175	13.35	74	50 - 200	0.0000	+/-0.50	
Perylene-d12	31334	25.1	59366	25.1	53	50 - 200	0.0000	+/-0.50	
32SS-09-0002 (1004244-17)			Lab File ID: 0424417.D			Analyzed: 06/05/10 02:32			
Phenanthrene-d10	106490	13.349	143175	13.35	74	50 - 200	-0.0010	+/-0.50	
Perylene-d12	33116	25.1	59366	25.1	56	50 - 200	0.0000	+/-0.50	
32SB-09-0607 (1004244-18)			Lab File ID: 0424418.D			Analyzed: 06/05/10 03:07			
Phenanthrene-d10	116159	13.359	143175	13.35	81	50 - 200	0.0090	+/-0.50	
Perylene-d12	47672	25.128	59366	25.1	80	50 - 200	0.0280	+/-0.50	
32SS-10-0002 (1004244-19)			Lab File ID: 0424419.D			Analyzed: 06/05/10 03:41			
Phenanthrene-d10	112112	13.349	143175	13.35	78	50 - 200	-0.0010	+/-0.50	
Perylene-d12	31805	25.1	59366	25.1	54	50 - 200	0.0000	+/-0.50	
Matrix Spike (0E08014-MS1)			Lab File ID: 0424401M.D			Analyzed: 06/05/10 04:15			
Phenanthrene-d10	119228	13.35	143175	13.35	83	50 - 200	0.0000	+/-0.50	
Perylene-d12	35180	25.1	59366	25.1	59	50 - 200	0.0000	+/-0.50	
Matrix Spike Dup (0E08014-MSD1)			Lab File ID: 0424401S.D			Analyzed: 06/05/10 04:49			
Phenanthrene-d10	112338	13.35	143175	13.35	78	50 - 200	0.0000	+/-0.50	
Perylene-d12	33583	25.1	59366	25.1	57	50 - 200	0.0000	+/-0.50	

Empirical Laboratories, LLC

Data file : \\ELABNSH05\TARGET\chem\bna3.i\060310b3.b\SEQ-CAL1.D
Lab Smp Id: SEQ-CAL1 Client Smp ID: cal0.05ppm
Inj Date : 03-JUN-2010 10:34 MS Autotune Date: 28-JUL-1998 06:19
Operator : ADM Inst ID: bna3.i
Smp Info : cal0.05ppm;;;;;;10E0487
Misc Info : ;;;;;;;all.sub;
Comment :
Method : \\ELABNSH05\TARGET\chem\bna3.i\060310b3.b\IXBN3LOW.m
Meth Date : 04-Jun-2010 05:53 amonteiro Quant Type: ISTD
Cal Date : 03-JUN-2010 10:34 Cal File: SEQ-CAL1.D
Als bottle: 2 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: pahsurmis.sub
Target Version: 4.04
Processing Host: TARGET02_VM

M 6/4/10
DQ 6/7/10

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ng/ul)	AMOUNTS ON-COL (ng/ul)
* 101 Phenanthrene-d10	188	12.767	12.767	(1.000)	97686	1.00000	
20 N-Nitroso-di-n-propylamine	70	5.015	5.015	(0.393)	699	0.05000	0.05139
38 Isophorone	82	5.424	5.424	(0.425)	2540	0.05000	0.04535
50 Naphthalene	128	5.990	5.990	(0.469)	5216	0.05000	0.05735
52 Hexachlorobutadiene	225	6.148	6.148	(0.482)	1027	0.05000	0.05068
54 2-Methylnaphthalene	142	6.992	6.992	(0.548)	3141	0.05000	0.05103
55 1-Methylnaphthalene	142	7.150	7.150	(0.560)	3230	0.05000	0.05678
$ 73 2-Fluorobiphenyl	172	7.652	7.652	(0.599)	3369	0.05000	0.04966
76 Acenaphthylene	152	8.691	8.691	(0.681)	3849	0.05000	0.04302
79 Acenaphthene	153	9.072	9.072	(0.711)	3364	0.05000	0.05728
87 Fluorene	166	10.316	10.316	(0.808)	2790	0.05000	0.04425
$ 106 2,4,6-Tribromophenol	330	10.929	10.929	(0.856)	369	0.10000	0.1668
110 Phenanthrene	178	12.832	12.832	(1.005)	4459	0.05000	0.04725
108 Hexachlorobenzene	284	11.718	11.718	(0.918)	1091	0.05000	0.04756
111 Anthracene	178	12.980	12.980	(1.017)	3267	0.05000	0.03842
115 Fluoranthene	202	16.239	16.239	(1.272)	3707	0.05000	0.04063
133 Pyrene	202	16.870	16.870	(1.321)	4301	0.05000	0.04493
* 153 Perylene-d12 Int. Std.	264	24.677	24.677	(1.000)	68875	1.00000	
$ 134 Terphenyl-d14	244	17.566	17.566	(1.376)	2680	0.05000	0.04169
137 Benzo(a)anthracene	228	20.463	20.463	(1.603)	3322	0.05000	0.04345
138 Chrysene	228	20.565	20.565	(1.611)	4322	0.05000	0.05327
~~139 Bis(2-ethylhexyl)phthalate~~	149	21.094	21.094	(0.855)	1620	0.05000	0.1292
~~154 Di-n-octylphthalate~~	149	23.090	23.090	(0.936)	2398	0.05000	0.2700
155 Benzo(b)fluoranthene	252	23.721	23.721	(0.961)	2866	0.05000	0.03500
156 Benzo(k)fluoranthene	252	23.823	23.823	(0.965)	2751	0.05000	0.03767
157 Benzo(a)pyrene	252	24.547	24.547	(0.995)	2901	0.05000	0.09442

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ng/ul)	AMOUNTS ON-COL (ng/ul)
158 Indeno(1,2,3-cd)pyrene	276	26.469	26.469	(1.073)	2488	0.05000	0.03941
159 Dibenz(a,h)anthracene	278	26.534	26.534	(1.075)	2390	0.05000	0.04057
~~160 Benzo(g,h,i)perylene~~	276	26.905	26.905	(1.090)	3360	0.05000	0.05030

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15602	Instrument:	MS-BNA3
		Calibration:	0156001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15602-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 06/04/10 18:09			
Phenanthrene-d10	112034	12.731	114187	12.766	98	50 - 200	-0.0350	+/-0.50	
Perylene-d12	66010	24.632	78489	24.667	84	50 - 200	-0.0350	+/-0.50	
LCS (0E09003-BS1)			Lab File ID: E09003L1.D			Analyzed: 06/04/10 18:45			
Phenanthrene-d10	99803	12.729	112034	12.731	89	50 - 200	-0.0020	+/-0.50	
Perylene-d12	69689	24.63	66010	24.632	106	50 - 200	-0.0020	+/-0.50	
Blank (0E09003-BLK1)			Lab File ID: E09003B1.D			Analyzed: 06/04/10 19:21			
Phenanthrene-d10	92962	12.729	112034	12.731	83	50 - 200	-0.0020	+/-0.50	
Perylene-d12	60427	24.631	66010	24.632	92	50 - 200	-0.0010	+/-0.50	
32SS-14-0002 (1004244-21)			Lab File ID: 0424421.D			Analyzed: 06/04/10 19:58			
Phenanthrene-d10	99284	12.729	112034	12.731	89	50 - 200	-0.0020	+/-0.50	
Perylene-d12	66002	24.63	66010	24.632	100	50 - 200	-0.0020	+/-0.50	
32SB-14-0910 (1004244-22)			Lab File ID: 0424422.D			Analyzed: 06/04/10 20:34			
Phenanthrene-d10	94811	12.728	112034	12.731	85	50 - 200	-0.0030	+/-0.50	
Perylene-d12	58238	24.639	66010	24.632	88	50 - 200	0.0070	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15603	Instrument:	MS-BNA4
		Calibration:	0098001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15603-CCV1)			Lab File ID: SEQ-CCV2.D			Analyzed: 06/05/10 06:14			
Phenanthrene-d10	122154	13.35	196258	13.55	62	50 - 200	-0.2000	+/-0.50	
Perylene-d12	44022	25.1	108221	25.217	41	50 - 200	-0.1170	+/-0.50	
32SB-10-0506 (1004244-20)			Lab File ID: 0424420.D			Analyzed: 06/05/10 06:48			
Phenanthrene-d10	112462	13.349	122154	13.35	92	50 - 200	-0.0010	+/-0.50	
Perylene-d12	32860	25.1	44022	25.1	75	50 - 200	0.0000	+/-0.50	
32SS-06-0002 (1004244-13)			Lab File ID: 0424413.D			Analyzed: 06/05/10 07:22			
Phenanthrene-d10	109264	13.452	122154	13.35	89	50 - 200	0.1020	+/-0.50	
Perylene-d12	42086	25.1	44022	25.1	96	50 - 200	0.0000	+/-0.50	
32SS-05-0002 (1004244-11)			Lab File ID: 0424411.D			Analyzed: 06/05/10 07:56			
Phenanthrene-d10	115705	13.359	122154	13.35	95	50 - 200	0.0090	+/-0.50	
Perylene-d12	60469	25.1	44022	25.1	137	50 - 200	0.0000	+/-0.50	
32SB-02-0607 (1004244-06)			Lab File ID: 424406D2.D			Analyzed: 06/05/10 09:38			
Phenanthrene-d10	106988	13.368	122154	13.35	88	50 - 200	0.0180	+/-0.50	
Perylene-d12	35976	25.1	44022	25.1	82	50 - 200	0.0000	+/-0.50	
32SB-06-0405 (1004244-14)			Lab File ID: 424414D2.D			Analyzed: 06/05/10 12:21			
Phenanthrene-d10	100309	13.377	122154	13.35	82	50 - 200	0.0270	+/-0.50	
Perylene-d12	34272	25.109	44022	25.1	78	50 - 200	0.0090	+/-0.50	

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE 1 OF 1

CLIENT NSWC Crane	JOB NUMBER 02111
SUBJECT Calculation Check	SDG CTOF273-001
BASED ON	DRAWING NUMBER
BY J. Kalinyak / CHECKED BY	APPROVED BY / DATE 07/23/18

VOC - benzene Sample - 325B-06-0405

$$\frac{345088}{559061} \times \frac{30\,\mu g/kg \times 100\,df}{1.07207 \times 0.844} \times \frac{5\,ml}{5.66\,g} \times \frac{1\,g}{1\,ml} \simeq 1808\,\mu g/kg$$

PAH - benzo(a) anthracene Sample - 325B-09-0607

$$\frac{78869 \times 1\,ng/\mu l \times 1000\,\mu l \times 1\,ml}{116159 \times 0.758 \times 1\,\mu l \times 15.1\,g \times 0.849} \simeq 69.9\,\mu g/kg \text{ or } mg/g$$

Data File: \\BC\TARGET\chem\voa4.i\050810V4E.b\0424414D.D
Report Date: 13-May-2010 17:37

Empirical Laboratories, LLC

Data file : \\BC\TARGET\chem\voa4.i\050810V4E.b\0424414D.D
Lab Smp Id: 1004244-14 Client Smp ID: 32SB-06-0405
Inj Date : 09-MAY-2010 09:44 MS Autotune Date: 07-MAY-2010 17:53
Operator : ADM Inst ID: voa4.i
Smp Info : 1004244-14;100X;;;;
Misc Info : ;;;;;gm-all.sub;
Comment :
Method : \\BC\TARGET\chem\voa4.i\050810V4E.b\VSOIL4.m
Meth Date : 13-May-2010 17:06 jeh Quant Type: ISTD
Cal Date : 07-MAY-2010 22:52 Cal File: SEQ-CAL8.D
Als bottle: 40
Dil Factor: 100.00000
Integrator: HP RTE Compound Sublist: gm-all.sub
Target Version: 4.04
Processing Host: NSH-LAPTOP2

RDW 5-14-10

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/Kg)	FINAL (ug/Kg)
* 59 Fluorobenzene	96	14.032	14.046	(1.000)	559061	30.0000	
20 Methylene chloride	84	8.453	8.474	(0.602)	204130	19.5217	1952
43 Chloroform	83	12.094	12.105	(0.862)	6112	0.62126	62.13
$ 46 Dibromofluoromethane	111	12.271	12.282	(0.874)	177813	31.0371	31.04(R)
54 Cyclohexane	56	13.639	13.640	(0.972)	95518	7.79209	779.2
$ 50 1,2-Dichloroethane-d4	102	12.960	12.971	(0.924)	34706	27.8827	27.88(QR)
56 Benzene	78	13.747	13.758	(0.980)	345088	17.2731	1727
$ 77 Toluene-d8	98	16.020	16.031	(0.926)	523514	31.4820	31.48(R)
78 Toluene	92	16.089	16.100	(0.930)	12325	1.06689	106.7
69 Methyl cyclohexane	83	15.154	15.165	(1.080)	88423	9.80293	980.3
* 87 Chlorobenzene-d5	82	17.299	17.313	(1.000)	243626	30.0000	
89 Ethylbenzene	91	17.476	17.478	(1.010)	18516	0.78316	78.32
90 m,p-Xylene	91	17.624	17.635	(1.019)	47456	3.74887	374.9
M 96 Xylene(total)	91				69343	5.02883	502.9
94 o-Xylene	91	17.948	17.960	(1.038)	21887	1.27995	128.0
100 Isopropylbenzene	105	18.234	18.245	(1.054)	42465	2.28576	228.6
$ 101 Bromofluorobenzene	95	18.283	18.285	(1.057)	230930	33.8649	33.86(R)
103 n-Propylbenzene	91	18.578	18.590	(0.960)	90093	3.03606	303.6
109 1,2,4-Trimethylbenzene	105	19.119	19.131	(0.988)	20814	1.07229	107.2
110 sec-Butylbenzene	105	19.228	19.229	(0.993)	88851	3.33443	333.4
* 112 1,4-Dichlorobenzene-d4	152	19.356	19.369	(1.000)	214835	30.0000	
116 n-Butylbenzene	91	19.710	19.711	(1.018)	141066	6.90454	690.4
119 Naphthalene	128	21.914	21.916	(1.132)	237493	17.1867	1719

5/17/10

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-CCV3.D	Calibration Date:	05/07/10 09:01
Sequence:	0E13717	Injection Date:	05/09/10
Lab Sample ID:	0E13717-CCV1	Injection Time:	00:35

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	96.70	1.072069	1.036658		-3.3	20
Ethylbenzene	A	100.0	86.23	2.911353	2.510407		-13.8	20
Naphthalene	A	100.0	99.80	1.929638	1.925803		-0.2	20
Methyl t-Butyl Ether	A	100.0	94.11	0.7656045	0.7205409		-5.9	20
Toluene	A	100.0	89.26	1.422543	1.269721		-10.7	20
m,p-Xylene	Q	200.0	194.9	2.139192	1.704976		-2.6	20
o-Xylene	A	100.0	85.13	2.105664	1.792548		-14.9	20
Xylenes (total)	Q	300.0	280.0	2.150116	1.734167		-6.7	20
Bromofluorobenzene	A	30.00	31.08	0.8397075	0.8699476		3.6	20
Dibromofluoromethane	A	30.00	29.92	0.3074291	0.3066275		-0.3	20
1,2-Dichloroethane-d4	A	30.00	29.56	6.679317E-02	6.581605E-02		-1.5	20
Toluene-d8	A	30.00	30.62	2.047687	2.090068		2.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BENCH SHEET

0E08008

Empirical Laboratories, LLC

Printed: 6/9/2010 7:04:16AM

497

Matrix: Solid **Prepared using: MS - 5035** **Surrogate used: 10D1141**

Lab Number	Test Code	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Extraction Comments
0E08008-BLK1	QC	05/08/2010 15:37	5	5				1	
0E08008-BLK2	QC	05/08/2010 15:37	5	5				1	
0E08008-BS1	QC	05/08/2010 15:37	5	5	10E0118		2.5	1	
0E08008-BS2	QC	05/08/2010 15:37	5	5	10E0215		2.5	1	
0E08008-BSD1	QC	05/08/2010 15:37	5	5	10E0118		2.5	1	
0E08008-BSD2	QC	05/08/2010 15:37	5	5	10E0215		2.5	1	
1004244-06	VOC_8260B_BTEXMN	05/08/2010 15:37	4.51	5				1	d50x based on screen ENCORES
1004244-12	VOC_8260B_BTEXMN	05/08/2010 15:37	5.99	5				1	ENCORES
1004244-14	VOC_8260B_BTEXMN	05/08/2010 15:37	5.66	5				1	d 100x based on screen ENCORES
1004244-20	VOC_8260B_BTEXMN	05/08/2010 15:37	5.91	5				1	ENCORES
1004245-04	VOC_8260B_AP9	05/08/2010 15:37	5.95	5				1	AP VIALS
1004245-05	VOC_8260B_AP9	05/08/2010 15:37	5.47	5				1	AP VIALS
1004245-09	VOC_8260B_AP9	05/08/2010 15:37	4.86	5				1	AP VIALS
1004245-10	VOC_8260B_AP9	05/08/2010 15:37	4.65	5				1	AP VIALS
1004245-11	VOC_8260B_AP9	05/08/2010 15:37	3.79	5				1	Some vials broken. Insufficient sample for MS
1004245-12	VOC_8260B_AP9	05/08/2010 15:37	5.4	5				1	AP VIALS
1004245-13	VOC_8260B_AP9	05/08/2010 15:37	5.64	5				1	AP VIALS
1004245-14	VOC_8260B_AP9	05/08/2010 15:37	4.89	5				1	AP VIALS

Spiking Witnessed By Date

Preparation Reviewed By Date

Extracts Received By Date

CTOF273_001

Data File: \\ELABNSH05\TARGET\chem\bna4.i\060410B4.b\0424418.D
Report Date: 05-Jun-2010 06:40

Empirical Laboratories, LLC

Data file : \\ELABNSH05\TARGET\chem\bna4.i\060410B4.b\0424418.D
Lab Smp Id: 1004244-18 Client Smp ID: 32SB-09-0607
Inj Date : 05-JUN-2010 03:07 MS Autotune Date: 08-MAY-2010 13:24
Operator : ADM Inst ID: bna4.i
Smp Info : 1004244-18;1;15;1000;1;UG/KG;10-MAY-2010
Misc Info : ;0;;;;0E08014;pahsurmis.sub;
Comment :
Method : \\ELABNSH05\TARGET\chem\bna4.i\060410B4.b\IXBN4LOW.m
Meth Date : 05-Jun-2010 06:37 amonteiro Quant Type: ISTD
Cal Date : 12-NOV-2009 21:22 Cal File: cal12.D
Als bottle: 19
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: pahsurmis.sub
Target Version: 4.04
Processing Host: TARGET02_VM

Concentration Formula: Amt * DF * Uf * Vt*Vi/(Amt * Vi * (Solids/100))

Name	Value	Description
DF	1.000	Dilution Factor
Uf	1.000	ng unit correction factor
Vt	1000.000	Volume of final extract (uL)(1000 low, 2
Amt	15.1g ~~15.000~~	Mass of initial extraction
Vi	1.000	Volume injected (uL)
Solids	100.000	Percent Solids

7/23/10

6/17/10

DQ 6/8/10

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng/ul)	FINAL (UG/KG)
* 101 Phenanthrene-d10	188	13.359	13.350	(1.000)	116159	1.00000	
50 Naphthalene	128	6.387	6.396	(0.478)	21205	0.14914	9.943
54 2-Methylnaphthalene	142	7.446	7.446	(0.557)	39555	0.42515	28.34
55 1-Methylnaphthalene	142	7.614	7.623	(0.570)	31891	0.37062	24.71
$ 73 2-Fluorobiphenyl	172	8.134	8.125	(0.609)	3610762	35.9112	2394
79 Acenaphthene	153	9.612	9.612	(0.720)	20767	0.23972	15.98
87 Fluorene	166	10.867	10.867	(0.814)	26464	0.30550	20.37
$ 106 2,4,6-Tribromophenol	330	11.518	11.500	(0.862)	1425629	82.5682	5504
110 Phenanthrene	178	13.424	13.415	(1.005)	266163	2.15285	143.5
111 Anthracene	178	13.563	13.563	(1.015)	74182	0.64193	42.80
115 Fluoranthene	202	16.836	16.826	(1.260)	297353	2.48461	165.6
133 Pyrene	202	17.468	17.459	(1.308)	227769	1.88901	125.9
* 153 Perylene-d12	264	25.128	25.100	(1.000)	47672	1.00000	

Data File: \\ELABNSH05\TARGET\chem\bna4.i\060410B4.b\0424418.D
Report Date: 05-Jun-2010 06:40

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng/ul)	FINAL (UG/KG)
$ 134 Terphenyl-d14	244	18.146	18.119	(1.358)	3146764	34.8676	2324
137 Benzo(a)anthracene	228	21.056	21.047	(1.576)	78869	0.89557	59.70
138 Chrysene	228	21.158	21.140	(1.584)	82373	0.96822	64.55

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_001
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0098001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	11/12/09 11:02
Sequence:	0F15601	Injection Date:	06/04/10
Lab Sample ID:	0F15601-CCV1	Injection Time:	17:26

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.445	0.7457972	0.8121753		8.9	20
Acenaphthylene	A	5.000	6.124	0.9996575	1.224386		22.5	20 *
Anthracene	A	5.000	5.440	0.9948455	1.082338		8.8	20
Benzo(a)anthracene	A	5.000	4.738	0.7581512	0.7183908		-5.2	20
Benzo(a)pyrene	A	5.000	5.864	0.9592349	1.124937		17.3	20
Benzo(b)fluoranthene	A	5.000	6.014	1.176864	1.41543		20.3	20 *
Benzo(g,h,i)perylene	A	5.000	4.999	0.8650452	0.8649362		-0.01	20
Benzo(k)fluoranthene	A	5.000	5.753	1.169451	1.345619		15.1	20
Chrysene	A	5.000	4.750	0.7324149	0.6957961		-5.0	20
Dibenz(a,h)anthracene	A	5.000	5.859	0.7647294	0.8961594		17.2	20
Fluoranthene	A	5.000	5.281	1.030294	1.088214		5.6	20
Fluorene	A	5.000	5.293	0.7457374	0.7894618		5.9	20
Indeno(1,2,3-cd)pyrene	A	5.000	5.870	0.7715006	0.9056766		17.4	20
1-Methylnaphthalene	A	5.000	5.084	0.7407783	0.7532125		1.7	20
2-Methylnaphthalene	A	5.000	5.366	0.8009425	0.8596654		7.3	20
Naphthalene	A	5.000	5.320	1.224033	1.302278		6.4	20
Phenanthrene	A	5.000	5.169	1.064344	1.100276		3.4	20
Pyrene	A	5.000	5.368	1.038027	1.114472		7.4	20
2-Fluorobiphenyl	A	5.000	5.031	0.8655987	0.8709663		0.6	20
Terphenyl-d14	A	5.000	4.985	0.776943	0.7745849		-0.3	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BENCH SHEET

0E08014

Empirical Laboratories, LLC

Printed: 6/9/2010 10:45:52AM

Matrix: Solid **Prepared using: EXT - EXT_3546** **Surrogate used: 10E0467**

Lab Number	Test Code	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Extraction Comments
1004244-18	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15.1	1				500	weigh in pans,extract 5/9
1004244-08	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15	1				500	weigh in pans,extract 5/9
1004244-12	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15.1	1				500	weigh in pans,extract 5/9
1004244-14	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15.5	1				500	weigh in pans,extract 5/9
1004244-16	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15.4	1				500	weigh in pans,extract 5/9
1004244-03	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15.1	1				500	weigh in pans,extract 5/9
1004244-04	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15.1	1				500	weigh in pans,extract 5/9
1004244-15	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15.4	1				500	weigh in pans,extract 5/9
1004244-02	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15	1				500	weigh in pans,extract 5/9
1004244-06	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15.1	1				500	weigh in pans,extract 5/9
1004244-07	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15.1	1				500	weigh in pans,extract 5/9
1004244-11	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15.1	1				500	weigh in pans,extract 5/9
1004244-17	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15.3	1				500	weigh in pans,extract 5/9
1004244-19	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15	1				500	weigh in pans,extract 5/9
1004244-20	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15.4	1				500	weigh in pans,extract 5/9
1004244-13	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15.3	1				500	weigh in pans,extract 5/9
1004244-01	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15	1				500	weigh in pans,extract 5/9
1004244-05	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15	1				500	weigh in pans,extract 5/9
0E08014-BLK1	QC	05/10/2010 10:30	15	1				500	
0E08014-BS1	QC	05/10/2010 10:30	15	1	10E0230		1000	500	
0E08014-MS1	QC	05/10/2010 10:30	15.1	1	10E0230	1004244-01	1000	500	Source cont. A.
0E08014-MSD1	QC	05/10/2010 10:30	15.1	1	10E0230	1004244-01	1000	500	Source cont. A.
1004244-09	SMS_PAH_8270C_3546_LOW	05/10/2010 10:30	15	1				500	weigh in pans,extract 5/9

Spiking Witnessed By Date

Preparation Reviewed By Date

Extracts Received By Date

883

CTOF273_001

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**TONY KLIMEK**	**DATE:**	**AUGUST 11, 2010**
FROM:	**CHERYLE LU**	**COPIES:**	**DV FILE**

SUBJECT: **DATA VALIDATION – VOLATILE ORGANIC AND POLYCYCLIC AROMATIC HYDROCARBON**

CTOF273, NAVAL AIR STATION CRANE, INDIANA

SAMPLE DELIVERY GROUP (SDG) – CTOF273_002

SAMPLES: 39/Solids

32SS-08-0002 32SB-08-0607 32SS-11-0002 32SB-11-0607 32SS-12-0002
32SB-12-0607 32SS-13-0002 32SB-13-0607 32SS-15-0002 32SB-15-0506
32SS-16-0002 32SB-16-0607 32SS-17-0002 32SB-17-0607 32SB-17-1112
32SS-18-0002 32SB-18-0506 32SS-19-0002 32SB-19-0506 32SS-20-0002
32SB-20-0506 32SS-21-0002 32SB-21-0506 32SS-22-0002 32SB-22-0506
32SS-23-0002 32SS-FD042710-02 32SS-FD042710-03 32SB-FD042710-03
32SB-FD042710-02 32SB-FD042710-03 32SB-08-0607 32SB-11-0506
32SB-13-0607 32SB-15-0506 32SB-16-0607 32SB-17-0607 32SB-17-1112
32SB-18-0506

Overview

The sample set for SDG CTOF273_002, consists of 39 soil samples. Thirteen (13) soil samples were analyzed for benzene, ethylbenzene, toluene and total xylenes by Method 8260B and 26 soil samples were analyzed for polycyclic aromatic hydrocarbon (PAH) by Method 8270C. The samples were collected by Tetra Tech NUS on April 27, 2010, and analyzed by Empirical Laboratories under USEPA approved methods and instrumentation in all analytical work and met DoD QSM 4.1 laboratory requirements (2009).

These data were evaluated based on the following parameters:

* • Data Completeness
• Holding Times
* • Instrument performance and tuning
* • Internal Standard
• Initial and Continuing Calibrations
* • Laboratory Method and Field Quality Control Blank Analyses
* • Surrogate Recoveries
* • Laboratory Control Sample Results
• Matrix Spike/ Matrix Spike Duplicate Results
* • Detection Limits

* - Quality control criteria were met for this parameter.

Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

Volatile Organic Compound (VOC):

The data results from method blank, laboratory control sample and laboratory control sample duplicate (LCS/LCSD), were within the quality control (QC) limits.

Sample 32SB-11-0607 was re-analyzed outside of the 14 day holding time. Nondetected results were qualified as estimated, "UJ".

The surrogate percent recoveries (%Rs) of bromofluorobenzene and toluene-d8 were greater than the quality control limits for sample 32SB-17-1112. The surrogate percent recovery (%R) of bromofluorobenzene was greater than the quality control limit for sample 32SB-20-0506. However, re-analysis results indicated that the surrogate %Rs were within the QC limits for all soil samples. The original analysis were used for validation and positive results in the affected samples were qualified as estimated, "J". No action was required for nondetected results.

The percent difference (%D) values of benzene, ethylbenzene, xylenes and toluene in the continuing calibration verification (CCV) 0E14109-CCV1 (on 5/15/2010 at 19:55 on instrument MS-VOA4) and 0F15210-CCV1 (on 5/21/2010 at 16:29 on instrument MS-VOA1) were below 25%, therefore, no qualification was required.

The internal standards associated with all the reported analytes failed criteria in samples, 32SB-11-0607 (<20%), 32SB-12-0607(<40%), 32SB-18-0506(50>x>40%), and 32SB-20-0506(<30%). The samples were re-analyzed and internal standard recoveries improved however, the re-analyses were analyzed outside of holding time. Therefore, the original analysis was used for validation for all samples except for sample32SB-11-0607 because the internal standard recoveries in the initial analysis were considered poor. Positive and nondetected results for in the samples affected by low internal standard recoveries were qualified as estimated, "J" and "UJ", respectively.

Polycyclic Aromatic Hydrocarbon (PAH):

The data results from method blank, surrogates, laboratory control sample and laboratory control sample duplicate (LCS/LCSD), were within the quality control (QC) limits.

The %Rs of indeno(1,2,3-cd)pyrene in matrix spike (MS) and MS duplicate (MSD) were within the QC limits, but the relative percent difference (RPD) value (35.1%) was greater than the QC limit (30%). No qualification was required.

The %Rs of naphthalene in MS/MSD were greater than the QC limits, but the RPD value (26.1%) was within the QC limit (30%). No qualification was required for nondetected result in sample 32SB-20-0506.

The internal standard area for phenanthrene-d10 was below 50% for sample 32SB-20-0506. Nondetected results for benzo(a)anthracene, chrysene, and naphthalene were qualified as estimated, "UJ".

The percent difference (%D) value of benzo(a)anthracene (27.1%) in the continuing calibration verification (0F15604-CCV1) on 6/3/2010 at 18:45 on instrument MS-BNA3 was greater than 25%. The nondetected results of benzo(a)anthracene were qualified as estimated nondetect "UJ" for samples 32SB-22-0002 and 32SB-22-0506.

The %D values of Dibenzo(a,h)anthracene (30.9%) and indeno(1,2,3-cd)pyrene (33.2%) in the CCV (0F16111-CCV1) on 6/7/2010 at 14:31 on instrument MS-BNA4 were greater than 25%. An estimated "J"

qualifier was applied to the positive results, and an estimated nondetect "UJ" qualifier was applied to the nondetected results of several affected samples.

The %D values of dibenzo(a,h)anthracene (50.8%) and indeno(1,2,3-cd)pyrene (57.2%) in the CCV (0F16721-CCV1) on 6/16/2010 at 01:55 on instrument MS-BNA4 were greater than 25%. An estimated "J" qualifier was applied to the positive results, and an estimated nondetect "UJ" qualifier was applied to the nondetected results of the affected sample 32SB-15-0002.

Notes:

The positive results reported below the reporting limit (RL) were qualified as estimated "J", due to uncertainty near the detection limit.

Executive Summary

Laboratory Performance: One volatile sample, 32SB-11-0607, was analyzed beyond holding time. Two samples contained high surrogate recoveries. Several volatile fraction samples were qualified for low internal standard recoveries. One semivolatile sample was qualified due to a low internal standard recovery. Several semivolatile continuing calibrations contained compounds that fell outside of acceptance criteria.

Other Factors Affecting Data Quality: High MS/MSD recoveries were noted in the semivolatile fraction but did not result in any data qualification.

The data for the analysis were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999), and the Department of Defense document entitled "Quality Systems Manual (QSM) for Environmental Laboratories January 2006". The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech NUS
Cheryle C. Lu
Senior Toxicologist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 02111	NSAMPLE	32SB-08-0607			32SB-11-0607RE			32SB-12-0607			32SB-13-0607		
SDG: CTOF273_002	LAB_ID	1004264-02			1004264-04RE1			1004264-06			1004264-08		
FRACTION: OV	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	86.0			84.5			82.5			85.1		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.467	U		0.463	UJ	H	0.483	UJ	N	0.471	U	
ETHYLBENZENE		0.745	U		0.738	UJ	H	0.77	UJ	N	0.751	U	
TOLUENE		0.854	U		0.847	UJ	H	0.883	UJ	N	0.861	U	
TOTAL XYLENES		0.695	U		0.689	UJ	H	0.719	UJ	N	0.701	U	

PROJ_NO: 02111	NSAMPLE	32SB-15-0506			32SB-16-0607			32SB-17-0607			32SB-17-1112		
SDG: CTOF273_002	LAB_ID	1004264-10			1004264-12RE1			1004264-14			1004264-15		
FRACTION: OV	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	84.4			85.2			82.6			86.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.556	U		0.487	U		27.4	U		0.535	U	
ETHYLBENZENE		0.887	U		0.777	U		43.7	U		0.853	U	
TOLUENE		1.02	U		0.89	U		50.1	U		0.978	U	
TOTAL XYLENES		0.828	U		0.725	U		40.7	U		0.796	U	

PROJ_NO: 02111	NSAMPLE	32SB-18-0506			32SB-19-0506			32SB-20-0506			32SB-21-0506		
SDG: CTOF273_002	LAB_ID	1004264-17			1004264-19			1004264-21			1004264-23		
FRACTION: OV	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	84.5			81.9			85.3			84.8		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.471	UJ	N	0.488	U		0.457	UJ	N	0.466	U	
ETHYLBENZENE		0.752	UJ	N	0.778	U		1.02	J	NPR	0.743	U	
TOLUENE		0.862	UJ	N	0.892	U		0.836	UJ	N	0.852	U	
TOTAL XYLENES		0.702	UJ	N	0.726	U		1.41	J	NPR	0.694	U	

PROJ_NO: 02111	NSAMPLE	32SB-22-0506		
SDG: CTOF273_002	LAB_ID	1004264-25		
FRACTION: OV	SAMP_DATE	4/27/2010		
MEDIA: SOIL	QC_TYPE	NM		
	UNITS	UG/KG		
	PCT_SOLIDS	84.8		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
BENZENE		0.548	U	
ETHYLBENZENE		0.874	U	
TOLUENE		1	U	
TOTAL XYLENES		0.816	U	

PROJ_NO: 02111	NSAMPLE	32SB-08-0607			32SB-11-0607			32SB-12-0607			32SB-13-0607		
SDG: CTOF273_002	LAB_ID	1004264-02			1004264-04			1004264-06			1004264-08		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	86.0			84.5			82.5			85.1		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.55	U		1.57	U		1.61	U		1.56	U	
BENZO(A)PYRENE		1.55	U		1.57	U		1.61	U		1.56	U	
BENZO(B)FLUORANTHENE		1.55	U		1.57	U		1.61	U		1.56	U	
BENZO(K)FLUORANTHENE		1.55	U		1.57	U		1.61	U		1.56	U	
CHRYSENE		1.55	U		1.57	U		1.61	U		1.56	U	
DIBENZO(A,H)ANTHRACENE		1.55	U		1.57	U		1.61	U		1.56	U	
INDENO(1,2,3-CD)PYRENE		1.55	U		1.57	U		1.61	U		1.56	U	
NAPHTHALENE		1.55	U		1.57	U		1.61	U		1.56	U	

PROJ_NO: 02111	NSAMPLE	32SB-15-0506			32SB-16-0607			32SB-17-0607			32SB-17-1112		
SDG: CTOF273_002	LAB_ID	1004264-10			1004264-12			1004264-14			1004264-15		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	84.4			85.2			82.6			86.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		46.3			1.56	U		213			1.55	U	
BENZO(A)PYRENE		56.6			1.56	U		112			1.55	U	
BENZO(B)FLUORANTHENE		74.4			1.56	U		104			1.55	U	
BENZO(K)FLUORANTHENE		34.5			1.56	U		16.1	U		1.55	U	
CHRYSENE		48.4			1.56	U		289			1.55	U	
DIBENZO(A,H)ANTHRACENE		1.58	U		1.56	UJ	C	16.1	UJ	C	1.55	UJ	C
INDENO(1,2,3-CD)PYRENE		35.3			1.56	UJ	C	16.1	UJ	C	1.55	UJ	C
NAPHTHALENE		35.5			1.56	U		2470			1.55	U	

PROJ_NO: 02111	NSAMPLE	32SB-18-0506			32SB-19-0506			32SB-20-0506			32SB-21-0506		
SDG: CTOF273_002	LAB_ID	1004264-17			1004264-19			1004264-21			1004264-23		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	84.5			81.9			85.3			84.8		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.57	U		1.62	U		1.56	UJ	N	1.57	U	
BENZO(A)PYRENE		1.57	U		1.62	U		1.56	U		1.57	U	
BENZO(B)FLUORANTHENE		1.57	U		1.62	U		1.56	U		1.57	U	
BENZO(K)FLUORANTHENE		1.57	U		1.62	U		1.56	U		1.57	U	
CHRYSENE		1.57	U		1.62	U		1.56	UJ	N	1.57	U	
DIBENZO(A,H)ANTHRACENE		1.57	UJ	C	1.62	UJ	C	1.56	U		1.57	U	
INDENO(1,2,3-CD)PYRENE		1.57	UJ	C	1.62	UJ	C	1.56	U		1.57	U	
NAPHTHALENE		1.57	U		1.62	U		1.56	UJ	N	1.57	U	

PROJ_NO: 02111	NSAMPLE	32SB-22-0506			32SS-08-0002			32SS-11-0002			32SS-12-0002		
SDG: CTOF273_002	LAB_ID	1004264-25			1004264-01			1004264-03			1004264-05		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	84.8			80.8			87.7			84.6		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.57	UJ	C	1.65	U		15.2	U		1.57	U	
BENZO(A)PYRENE		10.4			1.65	U		15.2	U		10.9		
BENZO(B)FLUORANTHENE		6.9	J	P	1.65	U		15.2	U		1.57	U	
BENZO(K)FLUORANTHENE		1.57	U		1.65	U		15.2	U		1.57	U	
CHRYSENE		1.57	U		1.65	U		15.2	U		1.57	U	
DIBENZO(A,H)ANTHRACENE		1.57	U		1.65	U		15.2	UJ	C	1.57	U	
INDENO(1,2,3-CD)PYRENE		1.57	U		1.65	U		15.2	UJ	C	1.57	U	
NAPHTHALENE		1.57	U		1.65	U		19	J	P	1.57	U	

PROJ_NO: 02111	NSAMPLE	32SS-13-0002			32SS-15-0002			32SS-16-0002			32SS-17-0002		
SDG: CTOF273_002	LAB_ID	1004264-07			1004264-09			1004264-11			1004264-13		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	82.1			83.8			86.6			89.8		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.62	U		15.9	U		15.4	U		3670		
BENZO(A)PYRENE		1.62	U		15.9	U		15.4	U		2900		
BENZO(B)FLUORANTHENE		1.62	U		15.9	U		15.4	U		4140		
BENZO(K)FLUORANTHENE		1.62	U		15.9	U		15.4	U		1440		
CHRYSENE		1.62	U		15.9	U		15.4	U		3980		
DIBENZO(A,H)ANTHRACENE		1.62	U		15.9	UJ	C	15.4	UJ	C	595	J	PC
INDENO(1,2,3-CD)PYRENE		1.62	U		15.9	UJ	C	15.4	UJ	C	2530	J	C
NAPHTHALENE		1.62	U		15.9	U		94.5			238		

PROJ_NO: 02111	NSAMPLE	32SS-18-0002			32SS-19-0002			32SS-20-0002			32SS-21-0002		
SDG: CTOF273_002	LAB_ID	1004264-16			1004264-18			1004264-20			1004264-22		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	84.4			84.9			78.2			85.7		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		689			15.7	U		1.7	U		16.8	J	G
BENZO(A)PYRENE		521			15.7	U		1.7	U		57.4	J	G
BENZO(B)FLUORANTHENE		688			15.7	U		1.7	U		97.1	J	G
BENZO(K)FLUORANTHENE		239			15.7	U		1.7	U		33.6	J	G
CHRYSENE		637			15.7	U		1.7	U		21.9	J	G
DIBENZO(A,H)ANTHRACENE		87.2	J	C	15.7	UJ	C	1.7	UJ	C	10.7		
INDENO(1,2,3-CD)PYRENE		435	J	C	15.7	UJ	C	1.7	UJ	C	50.6	J	G
NAPHTHALENE		9.93			15.7	U		1.7	U		5.83	J	P

PROJ_NO: 02111	NSAMPLE	32SS-22-0002			32SS-23-0002		
SDG: CTOF273_002	LAB_ID	1004264-24			1004264-26		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	83.4			85.4		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.59	UJ	C	4.57	J	P
BENZO(A)PYRENE		1.59	U		31.8		
BENZO(B)FLUORANTHENE		1.59	U		44.1		
BENZO(K)FLUORANTHENE		1.59	U		16.2		
CHRYSENE		1.59	U		8.07		
DIBENZO(A,H)ANTHRACENE		1.59	U		6.41		
INDENO(1,2,3-CD)PYRENE		1.59	U		32.1		
NAPHTHALENE		5.76	J	P	5.46	J	P

APPENDIX B
RESULTS AS REPORTED BY THE LABORATORY

Data for SW8260B Forms

ANALYSIS DATA SHEET

32SB-08-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-02	File ID:	0426402.D
Sampled:	04/27/10 08:10	Prepared:	05/09/10 13:37	Analyzed:	05/09/10 22:14
Solids:	85.95	Preparation:	5035	Dilution:	1

Batch: 0E09005 Sequence: 0E13508 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.467	5.00	U
100-41-4	Ethylbenzene		0.745	9.93	U
108-88-3	Toluene		0.854	9.93	U
1330-20-7	Xylenes (total)		0.695	9.93	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.78	30.14	101	85 - 120	
Dibromofluoromethane	29.78	28.83	96.8	80 - 125	
1,2-Dichloroethane-d4	29.78	27.08	90.9	75 - 140	
Toluene-d8	29.78	29.93	101	85 - 115	

ANALYSIS DATA SHEET

32SB-11-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-04	File ID:	0426404.D
Sampled:	04/27/10 08:25	Prepared:	05/09/10 13:00	Analyzed:	05/09/10 21:13
Solids:	84.50	Preparation:	5035	Dilution:	1

Batch: 0E15003 Sequence: 0E13508 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.463	5.00	S, U
100-41-4	Ethylbenzene		0.738	9.85	S, U
108-88-3	Toluene		0.847	9.85	S, U
1330-20-7	Xylenes (total)		0.689	9.85	S, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.54	31.84	108	85 - 120	
Dibromofluoromethane	29.54	31.21	106	80 - 125	
1,2-Dichloroethane-d4	29.54	33.89	115	75 - 140	
Toluene-d8	29.54	28.42	96.2	85 - 115	

ANALYSIS DATA SHEET

32SB-11-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-04RE1	File ID:	0426404.D
Sampled:	04/27/10 08:25	Prepared:	05/09/10 13:00	Analyzed:	05/15/10 23:30
Solids:	84.50	Preparation:	5035	Dilution:	1

Batch: 0E15003 Sequence: 0E14109 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.463	5.00	H1, U
100-41-4	Ethylbenzene		0.738	9.85	H1, Y, U
108-88-3	Toluene		0.847	9.85	H1, U
1330-20-7	Xylenes (total)		0.689	9.85	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.54	32.42	110	85 - 120	
Dibromofluoromethane	29.54	29.92	101	80 - 125	
1,2-Dichloroethane-d4	29.54	26.78	90.7	75 - 140	
Toluene-d8	29.54	31.82	108	85 - 115	

ANALYSIS DATA SHEET

32SB-12-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-06	File ID:	0426406.D
Sampled:	04/27/10 08:35	Prepared:	05/09/10 13:37	Analyzed:	05/09/10 21:43
Solids:	82.50	Preparation:	5035	Dilution:	1

Batch: 0E09005 Sequence: 0E13508 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.483	5.00	S, U
100-41-4	Ethylbenzene		0.770	10.3	S, U
108-88-3	Toluene		0.883	10.3	S, U
1330-20-7	Xylenes (total)		0.719	10.3	S, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.82	33.45	109	85 - 120	
Dibromofluoromethane	30.82	31.75	103	80 - 125	
1,2-Dichloroethane-d4	30.82	33.40	108	75 - 140	
Toluene-d8	30.82	33.71	109	85 - 115	

ANALYSIS DATA SHEET

32SB-12-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-06RE2	File ID:	0426406D.D
Sampled:	04/27/10 08:35	Prepared:	05/21/10 00:00	Analyzed:	05/21/10 22:25
Solids:	82.50	Preparation:	5035	Dilution:	50

Batch: 0E21026 Sequence: 0F15210 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		25.5	217	H1, U
100-41-4	Ethylbenzene		40.7	542	H1, U
108-88-3	Toluene		46.6	542	H1, U
1330-20-7	Xylenes (total)		37.9	542	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	32.52	34.09	105	85 - 120	
Dibromofluoromethane	32.52	31.48	96.8	80 - 125	
1,2-Dichloroethane-d4	32.52	27.71	85.2	75 - 140	
Toluene-d8	32.52	33.41	103	85 - 115	

ANALYSIS DATA SHEET

32SB-13-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-08	File ID:	0426408.D
Sampled:	04/27/10 08:55	Prepared:	05/09/10 15:46	Analyzed:	05/10/10 02:48
Solids:	85.07	Preparation:	5035	Dilution:	1

Batch: 0E09008 Sequence: 0E13510 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.471	5.00	U
100-41-4	Ethylbenzene		0.751	10.0	U
108-88-3	Toluene		0.861	10.0	U
1330-20-7	Xylenes (total)		0.701	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.04	33.68	112	85 - 120	
Dibromofluoromethane	30.04	29.09	96.9	80 - 125	
1,2-Dichloroethane-d4	30.04	27.52	91.6	75 - 140	
Toluene-d8	30.04	32.24	107	85 - 115	

ANALYSIS DATA SHEET

32SB-15-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-10	File ID:	0426410.D
Sampled:	04/27/10 09:10	Prepared:	05/09/10 15:46	Analyzed:	05/10/10 03:19
Solids:	84.41	Preparation:	5035	Dilution:	1

Batch: 0E09008 Sequence: 0E13510 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.556	5.00	U
100-41-4	Ethylbenzene		0.887	11.8	U
108-88-3	Toluene		1.02	11.8	U
1330-20-7	Xylenes (total)		0.828	11.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	35.47	39.25	111	85 - 120	
Dibromofluoromethane	35.47	35.51	100	80 - 125	
1,2-Dichloroethane-d4	35.47	33.70	95.0	75 - 140	
Toluene-d8	35.47	38.44	108	85 - 115	

ANALYSIS DATA SHEET

32SB-16-0607

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_002	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1004264-12RE1	File ID:	0426412.D
Sampled:	04/27/10 10:15	Prepared:	05/09/10 15:46	Analyzed:	05/16/10 00:01
Solids:	85.17	Preparation:	5035	Dilution:	1

Batch: 0E15003 Sequence: 0E14109 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.487	5.00	H1, U
100-41-4	Ethylbenzene		0.777	10.4	H1, Y, U
108-88-3	Toluene		0.890	10.4	H1, U
1330-20-7	Xylenes (total)		0.725	10.4	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	31.06	33.20	107	85 - 120	
Dibromofluoromethane	31.06	30.77	99.1	80 - 125	
1,2-Dichloroethane-d4	31.06	29.42	94.7	75 - 140	
Toluene-d8	31.06	32.86	106	85 - 115	

ANALYSIS DATA SHEET

32SB-17-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-14	File ID:	0426414D.D
Sampled:	04/27/10 10:20	Prepared:	05/10/10 16:01	Analyzed:	05/11/10 21:18
Solids:	82.60	Preparation:	5035	Dilution:	50

Batch: 0E10027 Sequence: 0E13511 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		27.4	233	U
100-41-4	Ethylbenzene		43.7	582	U
108-88-3	Toluene		50.1	582	U
1330-20-7	Xylenes (total)		40.7	582	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	34.92	39.59	113	85 - 120	
Dibromofluoromethane	34.92	37.27	107	80 - 125	
1,2-Dichloroethane-d4	34.92	33.50	95.9	75 - 140	
Toluene-d8	34.92	37.03	106	85 - 115	

ANALYSIS DATA SHEET

32SB-17-1112

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_002	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1004264-15	File ID:	0426415.D
Sampled:	04/27/10 10:20	Prepared:	05/09/10 15:46	Analyzed:	05/10/10 04:20
Solids:	86.04	Preparation:	5035	Dilution:	1

Batch: 0E15003 Sequence: 0E13510 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.535	5.00	U
100-41-4	Ethylbenzene		0.853	11.4	U
108-88-3	Toluene		0.978	11.4	U
1330-20-7	Xylenes (total)		0.796	11.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	34.12	51.25	150	85 - 120	*
Dibromofluoromethane	34.12	34.96	102	80 - 125	
1,2-Dichloroethane-d4	34.12	33.83	99.2	75 - 140	
Toluene-d8	34.12	47.38	139	85 - 115	*

ANALYSIS DATA SHEET

32SB-17-1112

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_002	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1004264-15RE1	File ID:	0426415.D
Sampled:	04/27/10 10:20	Prepared:	05/09/10 15:46	Analyzed:	05/16/10 00:32
Solids:	86.04	Preparation:	5035	Dilution:	1

Batch: 0E15003 Sequence: 0E14109 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.535	5.00	H1, U
100-41-4	Ethylbenzene		0.853	11.4	H1, Y, U
108-88-3	Toluene		0.978	11.4	H1, U
1330-20-7	Xylenes (total)		0.796	11.4	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	34.12	40.53	119	85 - 120	
Dibromofluoromethane	34.12	36.52	107	80 - 125	
1,2-Dichloroethane-d4	34.12	32.20	94.4	75 - 140	
Toluene-d8	34.12	37.62	110	85 - 115	

ANALYSIS DATA SHEET

32SB-18-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-17	File ID:	0426417.D
Sampled:	04/27/10 10:55	Prepared:	05/09/10 15:46	Analyzed:	05/10/10 04:50
Solids:	84.50	Preparation:	5035	Dilution:	1

Batch: 0E09008 Sequence: 0E13510 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.471	5.00	S, U
100-41-4	Ethylbenzene		0.752	10.0	S, U
108-88-3	Toluene		0.862	10.0	S, U
1330-20-7	Xylenes (total)		0.702	10.0	S, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.09	33.69	112	85 - 120	
Dibromofluoromethane	30.09	30.19	100	80 - 125	
1,2-Dichloroethane-d4	30.09	28.83	95.8	75 - 140	
Toluene-d8	30.09	30.43	101	85 - 115	

ANALYSIS DATA SHEET

32SB-18-0506

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_002	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1004264-17RE1	File ID:	0426417.D
Sampled:	04/27/10 10:55	Prepared:	05/20/10 11:09	Analyzed:	05/20/10 20:03
Solids:	84.50	Preparation:	5035	Dilution:	1

Batch: 0E20008 Sequence: 0E14105 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.460	5.00	H1, U
100-41-4	Ethylbenzene		0.734	9.78	H1, U
108-88-3	Toluene		0.841	9.78	H1, U
1330-20-7	Xylenes (total)		0.685	9.78	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.34	29.80	102	85 - 120	
Dibromofluoromethane	29.34	27.91	95.1	80 - 125	
1,2-Dichloroethane-d4	29.34	25.88	88.2	75 - 140	
Toluene-d8	29.34	31.27	107	85 - 115	

ANALYSIS DATA SHEET

32SB-19-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-19	File ID:	0426419.D
Sampled:	04/27/10 11:10	Prepared:	05/09/10 15:46	Analyzed:	05/10/10 05:21
Solids:	81.94	Preparation:	5035	Dilution:	1

Batch: 0E09008 Sequence: 0E13510 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.488	5.00	U
100-41-4	Ethylbenzene		0.778	10.4	U
108-88-3	Toluene		0.892	10.4	U
1330-20-7	Xylenes (total)		0.726	10.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	31.13	34.81	112	85 - 120	
Dibromofluoromethane	31.13	31.80	102	80 - 125	
1,2-Dichloroethane-d4	31.13	30.31	97.3	75 - 140	
Toluene-d8	31.13	32.58	105	85 - 115	

ANALYSIS DATA SHEET

32SB-20-0506

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_002	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1004264-21	File ID:	0426421.D
Sampled:	04/27/10 11:25	Prepared:	05/09/10 15:46	Analyzed:	05/10/10 09:25
Solids:	85.33	Preparation:	5035	Dilution:	1

Batch: 0E15003 Sequence: 0E13510 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.457	5.00	S, U
100-41-4	Ethylbenzene	1.02	0.729	9.72	S, J
108-88-3	Toluene		0.836	9.72	S, U
1330-20-7	Xylenes (total)	1.41	0.680	9.72	S, J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.15	40.53	139	85 - 120	*
Dibromofluoromethane	29.15	32.03	110	80 - 125	
1,2-Dichloroethane-d4	29.15	32.36	111	75 - 140	
Toluene-d8	29.15	30.39	104	85 - 115	

ANALYSIS DATA SHEET

32SB-20-0506

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_002	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1004264-21RE1	File ID:	0426421.D
Sampled:	04/27/10 11:25	Prepared:	05/09/10 15:46	Analyzed:	05/16/10 01:02
Solids:	85.33	Preparation:	5035	Dilution:	1

Batch: 0E15003 Sequence: 0E14109 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.457	5.00	H1, U
100-41-4	Ethylbenzene		0.729	9.72	Y, H1, U
108-88-3	Toluene		0.836	9.72	H1, U
1330-20-7	Xylenes (total)		0.680	9.72	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.15	34.08	117	85 - 120	
Dibromofluoromethane	29.15	28.25	96.9	80 - 125	
1,2-Dichloroethane-d4	29.15	26.51	90.9	75 - 140	
Toluene-d8	29.15	31.30	107	85 - 115	

ANALYSIS DATA SHEET

32SB-21-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-23	File ID:	0426423.D
Sampled:	04/27/10 11:45	Prepared:	05/09/10 15:46	Analyzed:	05/10/10 05:52
Solids:	84.78	Preparation:	5035	Dilution:	1

Batch: 0E09008 Sequence: 0E13510 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.466	5.00	U
100-41-4	Ethylbenzene		0.743	9.91	U
108-88-3	Toluene		0.852	9.91	U
1330-20-7	Xylenes (total)		0.694	9.91	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.74	32.75	110	85 - 120	
Dibromofluoromethane	29.74	30.46	102	80 - 125	
1,2-Dichloroethane-d4	29.74	28.97	97.4	75 - 140	
Toluene-d8	29.74	30.98	104	85 - 115	

ANALYSIS DATA SHEET

32SB-22-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-25	File ID:	0426425.D
Sampled:	04/27/10 12:55	Prepared:	05/09/10 15:46	Analyzed:	05/10/10 06:22
Solids:	84.79	Preparation:	5035	Dilution:	1

Batch: 0E09008 Sequence: 0E13510 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.548	5.00	U
100-41-4	Ethylbenzene		0.874	11.7	U
108-88-3	Toluene		1.00	11.7	U
1330-20-7	Xylenes (total)		0.816	11.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	34.96	38.65	111	85 - 120	
Dibromofluoromethane	34.96	36.23	104	80 - 125	
1,2-Dichloroethane-d4	34.96	31.07	88.9	75 - 140	
Toluene-d8	34.96	38.90	111	85 - 115	

Data for SW8270C (PAH) Forms

ANALYSIS DATA SHEET

32SS-08-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004264-01	File ID:	0426401.D
Sampled:	04/27/10 08:10	Prepared:	05/11/10 13:45	Analyzed:	06/06/10 09:58
Solids:	80.80	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11008 Sequence: 0F16003 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.65	8.26	U
50-32-8	Benzo(a)pyrene		1.65	6.19	U
205-99-2	Benzo(b)fluoranthene		1.65	8.26	U
207-08-9	Benzo(k)fluoranthene		1.65	8.26	U
218-01-9	Chrysene		1.65	8.26	U
53-70-3	Dibenz(a,h)anthracene		1.65	6.19	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.65	8.26	U
91-20-3	Naphthalene		1.65	6.19	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4126	3412	82.7	14 - 129	
Terphenyl-d14	4126	3006	72.8	14 - 129	

ANALYSIS DATA SHEET

32SB-08-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-02	File ID:	0426402.D
Sampled:	04/27/10 08:10	Prepared:	05/11/10 13:45	Analyzed:	06/06/10 10:32
Solids:	85.95	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11008 Sequence: 0F16003 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.76	U
50-32-8	Benzo(a)pyrene		1.55	5.82	U
205-99-2	Benzo(b)fluoranthene		1.55	7.76	U
207-08-9	Benzo(k)fluoranthene		1.55	7.76	U
218-01-9	Chrysene		1.55	7.76	U
53-70-3	Dibenz(a,h)anthracene		1.55	5.82	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.76	U
91-20-3	Naphthalene		1.55	5.82	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3878	3372	86.9	14 - 129	
Terphenyl-d14	3878	3037	78.3	14 - 129	

ANALYSIS DATA SHEET

32SS-11-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004264-03	File ID:	0426403D.D
Sampled:	04/27/10 08:20	Prepared:	05/11/10 13:45	Analyzed:	06/07/10 23:03
Solids:	87.75	Preparation:	EXT_3546	Dilution:	10

Batch: 0E11008 Sequence: 0F16111 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		15.2	76.0	U
50-32-8	Benzo(a)pyrene		15.2	57.0	U
205-99-2	Benzo(b)fluoranthene		15.2	76.0	U
207-08-9	Benzo(k)fluoranthene		15.2	76.0	U
218-01-9	Chrysene		15.2	76.0	U
53-70-3	Dibenz(a,h)anthracene		15.2	57.0	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		15.2	76.0	X, U
91-20-3	Naphthalene	19.0	15.2	57.0	J, D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3799	2369	62.4	14 - 129	
Terphenyl-d14	3799	2369	62.4	14 - 129	

ANALYSIS DATA SHEET

32SB-11-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-04	File ID:	0426404.D
Sampled:	04/27/10 08:25	Prepared:	05/11/10 13:45	Analyzed:	06/06/10 11:06
Solids:	84.50	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11008 Sequence: 0F16003 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.57	7.89	U
50-32-8	Benzo(a)pyrene		1.57	5.92	U
205-99-2	Benzo(b)fluoranthene		1.57	7.89	U
207-08-9	Benzo(k)fluoranthene		1.57	7.89	U
218-01-9	Chrysene		1.57	7.89	U
53-70-3	Dibenz(a,h)anthracene		1.57	5.92	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.57	7.89	U
91-20-3	Naphthalene		1.57	5.92	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3945	3055	77.4	14 - 129	
Terphenyl-d14	3945	2735	69.3	14 - 129	

ANALYSIS DATA SHEET

32SS-12-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004264-05	File ID:	0426405.D
Sampled:	04/27/10 08:35	Prepared:	05/11/10 13:45	Analyzed:	06/06/10 11:40
Solids:	84.57	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11008 Sequence: 0F16003 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.57	7.89	U
50-32-8	Benzo(a)pyrene	10.9	1.57	5.91	
205-99-2	Benzo(b)fluoranthene		1.57	7.89	U
207-08-9	Benzo(k)fluoranthene		1.57	7.89	U
218-01-9	Chrysene		1.57	7.89	U
53-70-3	Dibenz(a,h)anthracene		1.57	5.91	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.57	7.89	U
91-20-3	Naphthalene		1.57	5.91	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3941	2449	62.1	14 - 129	
Terphenyl-d14	3941	2677	67.9	14 - 129	

ANALYSIS DATA SHEET

32SB-12-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-06	File ID:	0426406.D
Sampled:	04/27/10 08:35	Prepared:	05/11/10 13:45	Analyzed:	06/06/10 12:14
Solids:	82.50	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11008 Sequence: 0F16003 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.61	8.08	U
50-32-8	Benzo(a)pyrene		1.61	6.06	U
205-99-2	Benzo(b)fluoranthene		1.61	8.08	U
207-08-9	Benzo(k)fluoranthene		1.61	8.08	U
218-01-9	Chrysene		1.61	8.08	U
53-70-3	Dibenz(a,h)anthracene		1.61	6.06	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.61	8.08	U
91-20-3	Naphthalene		1.61	6.06	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4040	3195	79.1	14 - 129	
Terphenyl-d14	4040	3022	74.8	14 - 129	

ANALYSIS DATA SHEET

32SS-13-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004264-07	File ID:	0426407.D
Sampled:	04/27/10 08:50	Prepared:	05/11/10 13:45	Analyzed:	06/06/10 12:49
Solids:	82.15	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11008 Sequence: 0F16003 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.62	8.12	U
50-32-8	Benzo(a)pyrene		1.62	6.09	U
205-99-2	Benzo(b)fluoranthene		1.62	8.12	U
207-08-9	Benzo(k)fluoranthene		1.62	8.12	U
218-01-9	Chrysene		1.62	8.12	U
53-70-3	Dibenz(a,h)anthracene		1.62	6.09	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.62	8.12	U
91-20-3	Naphthalene		1.62	6.09	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4058	3169	78.1	14 - 129	
Terphenyl-d14	4058	2874	70.8	14 - 129	

ANALYSIS DATA SHEET

32SB-13-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-08	File ID:	0426408.D
Sampled:	04/27/10 08:55	Prepared:	05/11/10 13:45	Analyzed:	06/06/10 13:23
Solids:	85.07	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11008 Sequence: 0F16003 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.56	7.84	U
50-32-8	Benzo(a)pyrene		1.56	5.88	U
205-99-2	Benzo(b)fluoranthene		1.56	7.84	U
207-08-9	Benzo(k)fluoranthene		1.56	7.84	U
218-01-9	Chrysene		1.56	7.84	U
53-70-3	Dibenz(a,h)anthracene		1.56	5.88	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.56	7.84	U
91-20-3	Naphthalene		1.56	5.88	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3918	3023	77.1	14 - 129	
Terphenyl-d14	3918	2817	71.9	14 - 129	

ANALYSIS DATA SHEET

32SS-15-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004264-09	File ID:	0426409D.D
Sampled:	04/27/10 09:10	Prepared:	05/11/10 13:45	Analyzed:	06/16/10 09:19
Solids:	83.79	Preparation:	EXT_3546	Dilution:	10

Batch: 0E11008 Sequence: 0F16721 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		15.9	79.6	X, U
50-32-8	Benzo(a)pyrene		15.9	59.7	X, U
205-99-2	Benzo(b)fluoranthene		15.9	79.6	X, U
207-08-9	Benzo(k)fluoranthene		15.9	79.6	U
218-01-9	Chrysene		15.9	79.6	X, U
53-70-3	Dibenz(a,h)anthracene		15.9	59.7	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		15.9	79.6	X, U
91-20-3	Naphthalene		15.9	59.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3978	2329	58.6	14 - 129	
Terphenyl-d14	3978	2559	64.3	14 - 129	

ANALYSIS DATA SHEET

32SB-15-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-10	File ID:	0426410.D
Sampled:	04/27/10 09:10	Prepared:	05/11/10 13:45	Analyzed:	06/06/10 13:57
Solids:	84.41	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11008 Sequence: 0F16003 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	46.3	1.58	7.90	
50-32-8	Benzo(a)pyrene	56.6	1.58	5.92	
205-99-2	Benzo(b)fluoranthene	74.4	1.58	7.90	
207-08-9	Benzo(k)fluoranthene	34.5	1.58	7.90	
218-01-9	Chrysene	48.4	1.58	7.90	
53-70-3	Dibenz(a,h)anthracene		1.58	5.92	U
193-39-5	Indeno(1,2,3-cd)pyrene	35.3	1.58	7.90	
91-20-3	Naphthalene	35.5	1.58	5.92	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3949	2918	73.9	14 - 129	
Terphenyl-d14	3949	2814	71.3	14 - 129	

ANALYSIS DATA SHEET

32SS-16-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004264-11	File ID:	0426411D.D
Sampled:	04/27/10 10:15	Prepared:	05/11/10 13:45	Analyzed:	06/08/10 00:11
Solids:	86.61	Preparation:	EXT_3546	Dilution:	10

Batch: 0E11008 Sequence: 0F16111 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		15.4	77.0	U
50-32-8	Benzo(a)pyrene		15.4	57.7	U
205-99-2	Benzo(b)fluoranthene		15.4	77.0	U
207-08-9	Benzo(k)fluoranthene		15.4	77.0	U
218-01-9	Chrysene		15.4	77.0	U
53-70-3	Dibenz(a,h)anthracene		15.4	57.7	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		15.4	77.0	X, U
91-20-3	Naphthalene	94.5	15.4	57.7	D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3849	3094	80.4	14 - 129	
Terphenyl-d14	3849	3175	82.5	14 - 129	

ANALYSIS DATA SHEET

32SB-16-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-12	File ID:	0426412.D
Sampled:	04/27/10 10:15	Prepared:	05/11/10 13:45	Analyzed:	06/07/10 16:14
Solids:	85.17	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11008 Sequence: 0F16111 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.56	7.83	U
50-32-8	Benzo(a)pyrene		1.56	5.87	U
205-99-2	Benzo(b)fluoranthene		1.56	7.83	U
207-08-9	Benzo(k)fluoranthene		1.56	7.83	U
218-01-9	Chrysene		1.56	7.83	U
53-70-3	Dibenz(a,h)anthracene		1.56	5.87	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.56	7.83	X, U
91-20-3	Naphthalene		1.56	5.87	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3914	2839	72.5	14 - 129	
Terphenyl-d14	3914	2952	75.4	14 - 129	

ANALYSIS DATA SHEET

32SS-17-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-13	File ID:	0426413D.D
Sampled:	04/27/10 10:20	Prepared:	05/11/10 13:45	Analyzed:	06/08/10 00:45
Solids:	89.82	Preparation:	EXT_3546	Dilution:	10

Batch: 0E11008 Sequence: 0F16111 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	3670	14.8	74.3	D
50-32-8	Benzo(a)pyrene	2900	14.8	55.7	D
205-99-2	Benzo(b)fluoranthene	4140	14.8	74.3	D
207-08-9	Benzo(k)fluoranthene	1440	14.8	74.3	D
218-01-9	Chrysene	3980	14.8	74.3	D
53-70-3	Dibenz(a,h)anthracene	595	14.8	55.7	X, D
193-39-5	Indeno(1,2,3-cd)pyrene	2530	14.8	74.3	X, D
91-20-3	Naphthalene	238	14.8	55.7	D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3711	3147	84.8	14 - 129	
Terphenyl-d14	3711	3205	86.4	14 - 129	

ANALYSIS DATA SHEET

32SB-17-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-14	File ID:	0426414D.D
Sampled:	04/27/10 10:20	Prepared:	05/11/10 13:45	Analyzed:	06/08/10 01:19
Solids:	82.60	Preparation:	EXT_3546	Dilution:	10

Batch: 0E11008 Sequence: 0F16111 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	213	16.1	80.8	D
50-32-8	Benzo(a)pyrene	112	16.1	60.5	D
205-99-2	Benzo(b)fluoranthene	104	16.1	80.8	D
207-08-9	Benzo(k)fluoranthene		16.1	80.8	U
218-01-9	Chrysene	289	16.1	80.8	D
53-70-3	Dibenz(a,h)anthracene		16.1	60.5	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		16.1	80.8	X, U
91-20-3	Naphthalene	2470	16.1	60.5	D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4036	3168	78.5	14 - 129	
Terphenyl-d14	4036	3493	86.6	14 - 129	

ANALYSIS DATA SHEET

32SB-17-1112

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-15	File ID:	0426415.D
Sampled:	04/27/10 10:20	Prepared:	05/11/10 13:45	Analyzed:	06/07/10 16:48
Solids:	86.04	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11008 Sequence: 0F16111 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.75	U
50-32-8	Benzo(a)pyrene		1.55	5.81	U
205-99-2	Benzo(b)fluoranthene		1.55	7.75	U
207-08-9	Benzo(k)fluoranthene		1.55	7.75	U
218-01-9	Chrysene		1.55	7.75	U
53-70-3	Dibenz(a,h)anthracene		1.55	5.81	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.75	X, U
91-20-3	Naphthalene		1.55	5.81	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3874	2742	70.8	14 - 129	
Terphenyl-d14	3874	3120	80.5	14 - 129	

ANALYSIS DATA SHEET

32SB-18-0506

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_002	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1004264-17	File ID:	0426417.D
Sampled:	04/27/10 10:55	Prepared:	05/11/10 13:45	Analyzed:	06/07/10 17:22
Solids:	84.50	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11008 Sequence: 0F16111 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.57	7.89	U
50-32-8	Benzo(a)pyrene		1.57	5.92	U
205-99-2	Benzo(b)fluoranthene		1.57	7.89	U
207-08-9	Benzo(k)fluoranthene		1.57	7.89	U
218-01-9	Chrysene		1.57	7.89	U
53-70-3	Dibenz(a,h)anthracene		1.57	5.92	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.57	7.89	X, U
91-20-3	Naphthalene		1.57	5.92	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3945	2564	65.0	14 - 129	
Terphenyl-d14	3945	2765	70.1	14 - 129	

ANALYSIS DATA SHEET

32SS-19-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-18	File ID:	0426418D.D
Sampled:	04/27/10 11:10	Prepared:	05/11/10 13:45	Analyzed:	06/08/10 01:54
Solids:	84.91	Preparation:	EXT_3546	Dilution:	10

Batch: 0E11008 Sequence: 0F16111 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		15.7	78.6	U
50-32-8	Benzo(a)pyrene		15.7	58.9	U
205-99-2	Benzo(b)fluoranthene		15.7	78.6	U
207-08-9	Benzo(k)fluoranthene		15.7	78.6	U
218-01-9	Chrysene		15.7	78.6	U
53-70-3	Dibenz(a,h)anthracene		15.7	58.9	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		15.7	78.6	X, U
91-20-3	Naphthalene		15.7	58.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3926	3223	82.1	14 - 129	
Terphenyl-d14	3926	3096	78.9	14 - 129	

ANALYSIS DATA SHEET

32SB-19-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-19	File ID:	0426419.D
Sampled:	04/27/10 11:10	Prepared:	05/11/10 13:45	Analyzed:	06/07/10 17:57
Solids:	81.94	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11008 Sequence: 0F16111 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.62	8.14	U
50-32-8	Benzo(a)pyrene		1.62	6.10	U
205-99-2	Benzo(b)fluoranthene		1.62	8.14	U
207-08-9	Benzo(k)fluoranthene		1.62	8.14	U
218-01-9	Chrysene		1.62	8.14	U
53-70-3	Dibenz(a,h)anthracene		1.62	6.10	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.62	8.14	X, U
91-20-3	Naphthalene		1.62	6.10	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4068	2524	62.0	14 - 129	
Terphenyl-d14	4068	2669	65.6	14 - 129	

ANALYSIS DATA SHEET

32SS-20-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-20	File ID:	0426420.D
Sampled:	04/27/10 11:25	Prepared:	05/11/10 13:45	Analyzed:	06/07/10 18:31
Solids:	78.18	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11008 Sequence: 0F16111 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.70	8.53	U
50-32-8	Benzo(a)pyrene		1.70	6.40	U
205-99-2	Benzo(b)fluoranthene		1.70	8.53	U
207-08-9	Benzo(k)fluoranthene		1.70	8.53	U
218-01-9	Chrysene		1.70	8.53	U
53-70-3	Dibenz(a,h)anthracene		1.70	6.40	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.70	8.53	X, U
91-20-3	Naphthalene		1.70	6.40	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4264	2780	65.2	14 - 129	
Terphenyl-d14	4264	2806	65.8	14 - 129	

ANALYSIS DATA SHEET

32SB-20-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-21	File ID:	0426421.D
Sampled:	04/27/10 11:25	Prepared:	05/11/10 16:35	Analyzed:	06/06/10 16:24
Solids:	85.33	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16103 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.56	7.82	S, U
50-32-8	Benzo(a)pyrene		1.56	5.86	U
205-99-2	Benzo(b)fluoranthene		1.56	7.82	U
207-08-9	Benzo(k)fluoranthene		1.56	7.82	U
218-01-9	Chrysene		1.56	7.82	S, U
53-70-3	Dibenz(a,h)anthracene		1.56	5.86	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.56	7.82	N, U
91-20-3	Naphthalene		1.56	5.86	N, S, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3907	4566	117	14 - 129	
Terphenyl-d14	3907	2665	68.2	14 - 129	

ANALYSIS DATA SHEET

32SS-21-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-22	File ID:	0426422.D
Sampled:	04/27/10 11:45	Prepared:	05/11/10 16:35	Analyzed:	06/06/10 17:00
Solids:	85.73	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16103 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	16.8	1.55	7.78	
50-32-8	Benzo(a)pyrene	57.4	1.55	5.83	
205-99-2	Benzo(b)fluoranthene	97.1	1.55	7.78	
207-08-9	Benzo(k)fluoranthene	33.6	1.55	7.78	
218-01-9	Chrysene	21.9	1.55	7.78	
53-70-3	Dibenz(a,h)anthracene	10.7	1.55	5.83	
193-39-5	Indeno(1,2,3-cd)pyrene	50.6	1.55	7.78	
91-20-3	Naphthalene	5.83	1.55	5.83	J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3888	3173	81.6	14 - 129	
Terphenyl-d14	3888	1755	45.1	14 - 129	

ANALYSIS DATA SHEET

32SB-21-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-23	File ID:	0426423.D
Sampled:	04/27/10 11:45	Prepared:	05/11/10 16:35	Analyzed:	06/06/10 20:19
Solids:	84.78	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.57	7.87	U
50-32-8	Benzo(a)pyrene		1.57	5.90	U
205-99-2	Benzo(b)fluoranthene		1.57	7.87	U
207-08-9	Benzo(k)fluoranthene		1.57	7.87	U
218-01-9	Chrysene		1.57	7.87	U
53-70-3	Dibenz(a,h)anthracene		1.57	5.90	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.57	7.87	U
91-20-3	Naphthalene		1.57	5.90	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3932	3013	76.6	14 - 129	
Terphenyl-d14	3932	1790	45.5	14 - 129	

ANALYSIS DATA SHEET

32SS-22-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-24	File ID:	0426424.D
Sampled:	04/27/10 12:55	Prepared:	05/07/10 17:00	Analyzed:	06/04/10 05:36
Solids:	83.39	Preparation:	EXT_3546	Dilution:	1

Batch: 0E06038 Sequence: 0F15604 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.59	8.00	X, U
50-32-8	Benzo(a)pyrene		1.59	6.00	U
205-99-2	Benzo(b)fluoranthene		1.59	8.00	U
207-08-9	Benzo(k)fluoranthene		1.59	8.00	U
218-01-9	Chrysene		1.59	8.00	U
53-70-3	Dibenz(a,h)anthracene		1.59	6.00	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.59	8.00	X, U
91-20-3	Naphthalene	5.76	1.59	6.00	J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3997	4134	103	14 - 129	
Terphenyl-d14	3997	3329	83.3	14 - 129	

ANALYSIS DATA SHEET

32SB-22-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-25	File ID:	0426425.D
Sampled:	04/27/10 12:55	Prepared:	05/07/10 17:00	Analyzed:	06/04/10 06:12
Solids:	84.79	Preparation:	EXT_3546	Dilution:	1

Batch: 0E06038 Sequence: 0F15604 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.57	7.87	X, U
50-32-8	Benzo(a)pyrene	10.4	1.57	5.90	
205-99-2	Benzo(b)fluoranthene	6.90	1.57	7.87	J
207-08-9	Benzo(k)fluoranthene		1.57	7.87	U
218-01-9	Chrysene		1.57	7.87	U
53-70-3	Dibenz(a,h)anthracene		1.57	5.90	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.57	7.87	X, U
91-20-3	Naphthalene		1.57	5.90	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3931	4184	106	14 - 129	
Terphenyl-d14	3931	4215	107	14 - 129	

ANALYSIS DATA SHEET

32SS-23-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004264-26	File ID:	0426426.D
Sampled:	04/27/10 13:05	Prepared:	05/11/10 16:35	Analyzed:	06/06/10 20:55
Solids:	85.40	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	4.57	1.56	7.81	J
50-32-8	Benzo(a)pyrene	31.8	1.56	5.85	
205-99-2	Benzo(b)fluoranthene	44.1	1.56	7.81	
207-08-9	Benzo(k)fluoranthene	16.2	1.56	7.81	
218-01-9	Chrysene	8.07	1.56	7.81	
53-70-3	Dibenz(a,h)anthracene	6.41	1.56	5.85	
193-39-5	Indeno(1,2,3-cd)pyrene	32.1	1.56	7.81	
91-20-3	Naphthalene	5.46	1.56	5.85	J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3903	2859	73.3	14 - 129	
Terphenyl-d14	3903	1719	44.1	14 - 129	

APPENDIX C
SUPPORT DOCUMENTATION

Sample Delivery Group Case Narrative

Receipt Information

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

A sample, 32SB-12-0607 (LabID 1004264-06), was received for volatiles analysis and was not listed on COC for analysis; however, the lab proceeded with analysis based upon the client's approval. The encore samples received with ID 32SB-11-0506 was not listed on the COC; however, the COC had an ID as 32SB-11-0607. Per the feedback from the client, this sample ID was 32SB-11-0607 (LabID 1004264-04).

Changes to the Revision

This is an original submittal of the final report package.

Analytical Information

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. The following information is provided specific to individual methods:

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.
B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.
C: The peak was manually integrated to correct the baseline from the original chromatogram.
D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

SW8260B:

The continuing calibration standards failed criteria in 0E14109-CCV1 for Ethylbenzene.

Sample 1004264-12 was analyzed and reported outside of holding time. The original analysis was performed within holding time; however, the run could not be reported.

The internal standards associated with all the reported analytes failed criteria in sample 1004264-04, 1004264-06, 1004264-17; however, all samples (1004264-04RE1, 1004264-06RE2, 1004264-17RE1) was re-analyzed outside of method holding time and both sets of data are reported.

The surrogate failed criteria in sample 1004264-15 for Bromofluorobenzene and Toluene-d8. The sample was reanalyzed outside of holding time and both runs are reported. The surrogate failed criteria in sample 1004264-21 for Bromofluorobenzene. The sample was reanalyzed outside of holding time and both runs are reported.

No additional anomalies or deviations are noted and the data is properly qualified.

SW8270C PAHs:
The continuing calibration standard 0F16111-CCV1 failed criteria for Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, in 0F16721-CCV1 for multiple parameters, and in 0F15604-CCV1 for Benzo(a)anthracene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene.

The matrix spikes associated with sample 1004264-21 failed criteria for accuracy and/or precision on specific parameters that are qualified on the parent sample. The internal standard failed criteria for this sample and the affected analytes are qualified.

No additional anomalies or deviations are noted and the data is properly qualified.

Data Qualifiers

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL), also known as Reporting Limit **(RL),** is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

*****: A failing quality control criteria is associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the EQL. One should feel confident that the result is greater than zero and less than the EQL.

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In metals, the qualifier indicates that the parameters MDL/RL

has been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The RPD and/or percent recovery failed in the associated Blank Spike and/or Blank Spike Duplicate.

S: The Internal Standard failed criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

LIMS Definitions / Naming Conventions:
The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

BLK: LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

BS: LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "**RE"** implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:
I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, Ms. Marcia K. McGinnity is authorized to sign this Statement of Data Authenticity.

Mr. Rick D. Davis
Laboratory Technical Director / VP Operations

Method 8260 Supporting Data

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13002	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13002-TUN1	SEQ-TUN1.D	05/07/10 18:43
Cal Standard	0E13002-CAL1	SEQ-CAL1.D	05/07/10 19:17
Cal Standard	0E13002-CAL2	SEQ-CAL2.D	05/07/10 19:47
Cal Standard	0E13002-CAL3	SEQ-CAL3.D	05/07/10 20:18
Cal Standard	0E13002-CAL4	SEQ-CAL4.D	05/07/10 20:49
Cal Standard	0E13002-CAL5	SEQ-CAL5.D	05/07/10 21:20
Cal Standard	0E13002-CAL6	SEQ-CAL6.D	05/07/10 21:51
Cal Standard	0E13002-CAL7	SEQ-CAL7.D	05/07/10 22:21
Cal Standard	0E13002-CAL8	SEQ-CAL8.D	05/07/10 22:52
Initial Cal Check	0E13002-ICV1	SEQ-ICV1.D	05/07/10 23:22
Cal Standard	0E13002-CAL9	SEQ-CAL9.D	05/07/10 23:53
Cal Standard	0E13002-CALA	SEQ-CALA.D	05/08/10 00:24
Cal Standard	0E13002-CALB	SEQ-CALB.D	05/08/10 00:55
Cal Standard	0E13002-CALC	SEQ-CALC.D	05/08/10 01:25
Cal Standard	0E13002-CALD	SEQ-CALD.D	05/08/10 01:56
Cal Standard	0E13002-CALE	SEQ-CALE.D	05/08/10 02:27
Cal Standard	0E13002-CALF	SEQ-CALF.D	05/08/10 02:57
Cal Standard	0E13002-CALG	SEQ-CALG.D	05/08/10 03:28
MS Tune	0E13002-TUN2	SEQ-TUN2.D	05/08/10 04:29
Cal Standard	0E13002-CALH	SEQ-CALH.D	05/08/10 04:59
Cal Standard	0E13002-CALI	SEQ-CALI.D	05/08/10 05:30
Cal Standard	0E13002-CALJ	SEQ-CALJ.D	05/08/10 06:01
Cal Standard	0E13002-CALK	SEQ-CALK.D	05/08/10 06:31
Cal Standard	0E13002-CALL	SEQ-CALL.D	05/08/10 07:02
Cal Standard	0E13002-CALM	SEQ-CALM.D	05/08/10 07:32
Cal Standard	0E13002-CALN	SEQ-CALN.D	05/08/10 08:03
Cal Standard	0E13002-CALO	SEQ-CALO.D	05/08/10 08:34

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13508	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13508-TUN1	SEQ-TUN1.D	05/09/10 11:30
Calibration Check	0E13508-CCV1	SEQ-CCV1.D	05/09/10 12:00
LCS	0E09005-BS1	V4LCS01.D	05/09/10 13:02
Blank	0E09005-BLK1	V4BLK01.D	05/09/10 14:34
32SB-11-0607	1004264-04	0426404.D	05/09/10 21:13
32SB-12-0607	1004264-06	0426406.D	05/09/10 21:43
32SB-08-0607	1004264-02	0426402.D	05/09/10 22:14
LCS Dup	0E09005-BSD1	V4LCSD01.D	05/09/10 22:44

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13510	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13510-TUN1	SEQ-TUN2.D	05/09/10 23:45
Calibration Check	0E13510-CCV1	SEQ-CCV3.D	05/10/10 00:16
LCS	0E09008-BS1	V4LCS03.D	05/10/10 00:46
Blank	0E09008-BLK1	V4BLK02.D	05/10/10 02:18
32SB-13-0607	1004264-08	0426408.D	05/10/10 02:48
32SB-15-0506	1004264-10	0426410.D	05/10/10 03:19
32SB-17-1112	1004264-15	0426415.D	05/10/10 04:20
32SB-18-0506	1004264-17	0426417.D	05/10/10 04:50
32SB-19-0506	1004264-19	0426419.D	05/10/10 05:21
32SB-21-0506	1004264-23	0426423.D	05/10/10 05:52
32SB-22-0506	1004264-25	0426425.D	05/10/10 06:22
32SB-20-0506	1004264-21	0426421.D	05/10/10 09:25
LCS Dup	0E09008-BSD1	V4LCSD03.D	05/10/10 09:56

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13511	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13511-TUN1	SEQ-TUN1.D	05/11/10 08:43
Calibration Check	0E13511-CCV1	SEQ-CCV1.D	05/11/10 09:13
LCS	0E10027-BS1	V4LCS01.D	05/11/10 10:19
Blank	0E10027-BLK1	V4BLK01.D	05/11/10 11:51
32SB-17-0607	1004264-14	0426414D.D	05/11/10 21:18
LCS Dup	0E10027-BSD1	V4LCSD1.D	05/11/10 21:49

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13909	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13909-TUN1	SEQ-TUN1.D	05/16/10 13:42
Cal Standard	0E13909-CAL1	SEQ-CAL1.D	05/16/10 14:17
Cal Standard	0E13909-CAL2	SEQ-CAL2.D	05/16/10 14:57
Cal Standard	0E13909-CAL3	SEQ-CAL3.D	05/16/10 15:36
Cal Standard	0E13909-CAL4	SEQ-CAL4.D	05/16/10 16:15
Cal Standard	0E13909-CAL5	SEQ-CAL5.D	05/16/10 16:54
Cal Standard	0E13909-CAL6	SEQ-CAL6.D	05/16/10 17:34
Cal Standard	0E13909-CAL7	SEQ-CAL7.D	05/16/10 18:13
Cal Standard	0E13909-CAL8	SEQ-CAL8.D	05/16/10 18:52
Initial Cal Check	0E13909-ICV1	SEQ-ICV1.D	05/16/10 19:31

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14024	Instrument:	MS-VOA4
Calibration:	0144005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14024-TUN1	SEQ-TUN1.D	05/13/10 13:56
Cal Standard	0E14024-CAL1	SEQ-CAL1.D	05/13/10 14:27
Cal Standard	0E14024-CAL2	SEQ-CAL2.D	05/13/10 14:58
Cal Standard	0E14024-CAL3	SEQ-CAL3.D	05/13/10 15:29
Cal Standard	0E14024-CAL4	SEQ-CAL4.D	05/13/10 16:00
Cal Standard	0E14024-CAL5	SEQ-CAL5.D	05/13/10 16:31
Cal Standard	0E14024-CAL6	SEQ-CAL6.D	05/13/10 17:02
Cal Standard	0E14024-CAL7	SEQ-CAL7.D	05/13/10 17:33
Cal Standard	0E14024-CAL8	SEQ-CAL8.D	05/13/10 18:03
Cal Standard	0E14024-CAL9	SEQ-CAL9.D	05/13/10 19:05
Cal Standard	0E14024-CALA	SEQ-CALA.D	05/13/10 19:36
Cal Standard	0E14024-CALB	SEQ-CALB.D	05/13/10 20:07
Cal Standard	0E14024-CALC	SEQ-CALC.D	05/13/10 20:38
Cal Standard	0E14024-CALD	SEQ-CALD.D	05/13/10 21:09
Cal Standard	0E14024-CALE	SEQ-CALE.D	05/13/10 21:39
Cal Standard	0E14024-CALF	SEQ-CALF.D	05/13/10 22:10
Cal Standard	0E14024-CALG	SEQ-CALG.D	05/13/10 22:41
MS Tune	0E14024-TUN2	SEQ-TUN2.D	05/13/10 23:42
Cal Standard	0E14024-CALH	SEQ-CALH.D	05/14/10 00:13
Cal Standard	0E14024-CALI	SEQ-CALI.D	05/14/10 00:44
Cal Standard	0E14024-CALJ	SEQ-CALJ.D	05/14/10 01:14
Cal Standard	0E14024-CALK	SEQ-CALK.D	05/14/10 01:45
Cal Standard	0E14024-CALL	SEQ-CALL.D	05/14/10 02:16
Cal Standard	0E14024-CALM	SEQ-CALM.D	05/14/10 02:46
Cal Standard	0E14024-CALN	SEQ-CALN.D	05/14/10 03:17
Cal Standard	0E14024-CALO	SEQ-CALO.D	05/14/10 03:48
MS Tune	0E14024-TUN3	SEQ-TUN1A.D	05/14/10 11:07
Initial Cal Check	0E14024-ICV4	SEQ-ICV4.D	05/14/10 11:37

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14109	Instrument:	MS-VOA4
Calibration:	0144005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14109-TUN1	SEQ-TUN3.D	05/15/10 19:25
Calibration Check	0E14109-CCV1	SEQ-CCV1.D	05/15/10 19:55
LCS	0E15003-BS1	V4LCS01.D	05/15/10 20:57
Blank	0E15003-BLK1	V4BLK01.D	05/15/10 22:29
32SB-11-0607	1004264-04RE1	0426404.D	05/15/10 23:30
32SB-16-0607	1004264-12RE1	0426412.D	05/16/10 00:01
32SB-17-1112	1004264-15RE1	0426415.D	05/16/10 00:32
32SB-20-0506	1004264-21RE1	0426421.D	05/16/10 01:02
LCS Dup	0E15003-BSD1	V4LCSD01.D	05/16/10 07:41

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14105	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14105-TUN1	SEQ-TUN1.D	05/20/10 13:38
Calibration Check	0E14105-CCV1	SEQ-CCV1.D	05/20/10 14:10
LCS	0E20008-BS1	V1LCS1.D	05/20/10 15:29
Blank	0E20008-BLK1	V1BLK01.D	05/20/10 17:26
32SB-18-0506	1004264-17RE1	0426417.D	05/20/10 20:03
LCS Dup	0E20008-BSD1	V1LCSD1.D	05/20/10 23:18

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15210	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15210-TUN1	SEQ-TUN1.D	05/21/10 15:57
Calibration Check	0F15210-CCV1	SEQ-CCV1.D	05/21/10 16:29
LCS	0E21026-BS1	V1LCS1.D	05/21/10 17:08
Blank	0E21026-BLK2	V1MBLK1.D	05/21/10 19:08
32SB-12-0607	1004264-06RE2	0426406D.D	05/21/10 22:25

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13510

SDG: CTOF273_002
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E13510-CCV1) ug/L				Lab File ID: SEQ-CCV3.D		Analyzed: 05/10/10 00:16		
Bromofluorobenzene	30.00	96.9	80 - 120	18.288	18.288	0.0000	+/-1.000	
Dibromofluoromethane	30.00	106	80 - 120	12.286	12.286	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	105	80 - 120	12.975	12.975	0.0000	+/-1.000	
Toluene-d8	30.00	98.2	80 - 120	16.025	16.025	0.0000	+/-1.000	
LCS (0E09008-BS1) ug/Kg wet				Lab File ID: V4LCS03.D		Analyzed: 05/10/10 00:46		
Bromofluorobenzene	30.00	100	85 - 120	18.29	18.288	0.0020	+/-1.000	
Dibromofluoromethane	30.00	100	80 - 125	12.288	12.286	0.0020	+/-1.000	
1,2-Dichloroethane-d4	30.00	88.7	75 - 140	12.977	12.975	0.0020	+/-1.000	
Toluene-d8	30.00	103	85 - 115	16.027	16.025	0.0020	+/-1.000	
Blank (0E09008-BLK1) ug/Kg wet				Lab File ID: V4BLK02.D		Analyzed: 05/10/10 02:18		
Bromofluorobenzene	30.00	106	85 - 120	18.293	18.288	0.0050	+/-1.000	
Dibromofluoromethane	30.00	103	80 - 125	12.281	12.286	-0.0050	+/-1.000	
1,2-Dichloroethane-d4	30.00	99.5	75 - 140	12.96	12.975	-0.0150	+/-1.000	
Toluene-d8	30.00	118	85 - 115	16.03	16.025	0.0050	+/-1.000	*
32SB-13-0607 (1004264-08) ug/Kg dry				Lab File ID: 0426408.D		Analyzed: 05/10/10 02:48		
Bromofluorobenzene	30.04	112	85 - 120	18.285	18.288	-0.0030	+/-1.000	
Dibromofluoromethane	30.04	96.9	80 - 125	12.292	12.286	0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.04	91.6	75 - 140	12.981	12.975	0.0060	+/-1.000	
Toluene-d8	30.04	107	85 - 115	16.031	16.025	0.0060	+/-1.000	
32SB-15-0506 (1004264-10) ug/Kg dry				Lab File ID: 0426410.D		Analyzed: 05/10/10 03:19		
Bromofluorobenzene	35.47	111	85 - 120	18.294	18.288	0.0060	+/-1.000	
Dibromofluoromethane	35.47	100	80 - 125	12.292	12.286	0.0060	+/-1.000	
1,2-Dichloroethane-d4	35.47	95.0	75 - 140	12.97	12.975	-0.0050	+/-1.000	
Toluene-d8	35.47	108	85 - 115	16.031	16.025	0.0060	+/-1.000	
32SB-17-1112 (1004264-15) ug/Kg dry				Lab File ID: 0426415.D		Analyzed: 05/10/10 04:20		
Bromofluorobenzene	34.12	150	85 - 120	18.26	18.288	-0.0280	+/-1.000	*
Dibromofluoromethane	34.12	102	80 - 125	12.287	12.286	0.0010	+/-1.000	
1,2-Dichloroethane-d4	34.12	99.2	75 - 140	12.976	12.975	0.0010	+/-1.000	
Toluene-d8	34.12	139	85 - 115	16.026	16.025	0.0010	+/-1.000	*
32SB-18-0506 (1004264-17) ug/Kg dry				Lab File ID: 0426417.D		Analyzed: 05/10/10 04:50		
Bromofluorobenzene	30.09	112	85 - 120	18.289	18.288	0.0010	+/-1.000	
Dibromofluoromethane	30.09	100	80 - 125	12.297	12.286	0.0110	+/-1.000	
1,2-Dichloroethane-d4	30.09	95.8	75 - 140	12.985	12.975	0.0100	+/-1.000	
Toluene-d8	30.09	101	85 - 115	16.026	16.025	0.0010	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13510	Instrument:	MS-VOA4
		Calibration:	0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
32SB-19-0506 (1004264-19) ug/Kg dry				Lab File ID: 0426419.D		Analyzed: 05/10/10 05:21		
Bromofluorobenzene	31.13	112	85 - 120	18.289	18.288	0.0010	+/-1.000	
Dibromofluoromethane	31.13	102	80 - 125	12.287	12.286	0.0010	+/-1.000	
1,2-Dichloroethane-d4	31.13	97.3	75 - 140	12.976	12.975	0.0010	+/-1.000	
Toluene-d8	31.13	105	85 - 115	16.026	16.025	0.0010	+/-1.000	
32SB-21-0506 (1004264-23) ug/Kg dry				Lab File ID: 0426423.D		Analyzed: 05/10/10 05:52		
Bromofluorobenzene	29.74	110	85 - 120	18.294	18.288	0.0060	+/-1.000	
Dibromofluoromethane	29.74	102	80 - 125	12.291	12.286	0.0050	+/-1.000	
1,2-Dichloroethane-d4	29.74	97.4	75 - 140	12.98	12.975	0.0050	+/-1.000	
Toluene-d8	29.74	104	85 - 115	16.031	16.025	0.0060	+/-1.000	
32SB-22-0506 (1004264-25) ug/Kg dry				Lab File ID: 0426425.D		Analyzed: 05/10/10 06:22		
Bromofluorobenzene	34.96	111	85 - 120	18.285	18.288	-0.0030	+/-1.000	
Dibromofluoromethane	34.96	104	80 - 125	12.283	12.286	-0.0030	+/-1.000	
1,2-Dichloroethane-d4	34.96	88.9	75 - 140	12.982	12.975	0.0070	+/-1.000	
Toluene-d8	34.96	111	85 - 115	16.032	16.025	0.0070	+/-1.000	
32SB-20-0506 (1004264-21) ug/Kg dry				Lab File ID: 0426421.D		Analyzed: 05/10/10 09:25		
Bromofluorobenzene	29.15	139	85 - 120	18.289	18.288	0.0010	+/-1.000	*
Dibromofluoromethane	29.15	110	80 - 125	12.287	12.286	0.0010	+/-1.000	
1,2-Dichloroethane-d4	29.15	111	75 - 140	12.976	12.975	0.0010	+/-1.000	
Toluene-d8	29.15	104	85 - 115	16.026	16.025	0.0010	+/-1.000	
LCS Dup (0E09008-BSD1) ug/Kg wet				Lab File ID: V4LCSD03.D		Analyzed: 05/10/10 09:56		
Bromofluorobenzene	30.00	107	85 - 120	18.283	18.288	-0.0050	+/-1.000	
Dibromofluoromethane	30.00	93.6	80 - 125	12.291	12.286	0.0050	+/-1.000	
1,2-Dichloroethane-d4	30.00	90.4	75 - 140	12.97	12.975	-0.0050	+/-1.000	
Toluene-d8	30.00	106	85 - 115	16.03	16.025	0.0050	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E14109

SDG: CTOF273_002
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0144005

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E14109-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/15/10 19:55		
Bromofluorobenzene	30.00	101	80 - 120	18.291	18.291	0.0000	+/-1.000	
Dibromofluoromethane	30.00	112	80 - 120	12.319	12.319	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	102	80 - 120	13.007	13.007	0.0000	+/-1.000	
Toluene-d8	30.00	98.0	80 - 120	16.038	16.038	0.0000	+/-1.000	
LCS (0E15003-BS1) ug/Kg wet				Lab File ID: V4LCS01.D		Analyzed: 05/15/10 20:57		
Bromofluorobenzene	30.00	102	85 - 120	18.289	18.291	-0.0020	+/-1.000	
Dibromofluoromethane	30.00	110	80 - 125	12.317	12.319	-0.0020	+/-1.000	
1,2-Dichloroethane-d4	30.00	102	75 - 140	13.006	13.007	-0.0010	+/-1.000	
Toluene-d8	30.00	105	85 - 115	16.036	16.038	-0.0020	+/-1.000	
Blank (0E15003-BLK1) ug/Kg wet				Lab File ID: V4BLK01.D		Analyzed: 05/15/10 22:29		
Bromofluorobenzene	30.00	103	85 - 120	18.29	18.291	-0.0010	+/-1.000	
Dibromofluoromethane	30.00	102	80 - 125	12.317	12.319	-0.0020	+/-1.000	
1,2-Dichloroethane-d4	30.00	94.9	75 - 140	13.006	13.007	-0.0010	+/-1.000	
Toluene-d8	30.00	103	85 - 115	16.037	16.038	-0.0010	+/-1.000	
32SB-11-0607 (1004264-04RE1) ug/Kg dry				Lab File ID: 0426404.D		Analyzed: 05/15/10 23:30		
Bromofluorobenzene	29.54	110	85 - 120	18.296	18.291	0.0050	+/-1.000	
Dibromofluoromethane	29.54	101	80 - 125	12.324	12.319	0.0050	+/-1.000	
1,2-Dichloroethane-d4	29.54	90.7	75 - 140	13.003	13.007	-0.0040	+/-1.000	
Toluene-d8	29.54	108	85 - 115	16.043	16.038	0.0050	+/-1.000	
32SB-16-0607 (1004264-12RE1) ug/Kg dry				Lab File ID: 0426412.D		Analyzed: 05/16/10 00:01		
Bromofluorobenzene	31.06	107	85 - 120	18.3	18.291	0.0090	+/-1.000	
Dibromofluoromethane	31.06	99.1	80 - 125	12.327	12.319	0.0080	+/-1.000	
1,2-Dichloroethane-d4	31.06	94.7	75 - 140	13.006	13.007	-0.0010	+/-1.000	
Toluene-d8	31.06	106	85 - 115	16.047	16.038	0.0090	+/-1.000	
32SB-17-1112 (1004264-15RE1) ug/Kg dry				Lab File ID: 0426415.D		Analyzed: 05/16/10 00:32		
Bromofluorobenzene	34.12	119	85 - 120	18.299	18.291	0.0080	+/-1.000	
Dibromofluoromethane	34.12	107	80 - 125	12.326	12.319	0.0070	+/-1.000	
1,2-Dichloroethane-d4	34.12	94.4	75 - 140	13.005	13.007	-0.0020	+/-1.000	
Toluene-d8	34.12	110	85 - 115	16.046	16.038	0.0080	+/-1.000	
32SB-20-0506 (1004264-21RE1) ug/Kg dry				Lab File ID: 0426421.D		Analyzed: 05/16/10 01:02		
Bromofluorobenzene	29.15	117	85 - 120	18.295	18.291	0.0040	+/-1.000	
Dibromofluoromethane	29.15	96.9	80 - 125	12.323	12.319	0.0040	+/-1.000	
1,2-Dichloroethane-d4	29.15	90.9	75 - 140	13.011	13.007	0.0040	+/-1.000	
Toluene-d8	29.15	107	85 - 115	16.042	16.038	0.0040	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14105	Instrument:	MS-VOA1
		Calibration:	0141001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E14105-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/20/10 14:10		
Bromofluorobenzene	30.00	98.4	80 - 120	22.473	22.473	0.0000	+/-1.000	
Dibromofluoromethane	30.00	94.5	80 - 120	12.412	12.412	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	90.0	80 - 120	13.211	13.211	0.0000	+/-1.000	
Toluene-d8	30.00	98.4	80 - 120	17.751	17.751	0.0000	+/-1.000	
LCS (0E20008-BS1) ug/Kg wet				Lab File ID: V1LCS1.D		Analyzed: 05/20/10 15:29		
Bromofluorobenzene	30.00	99.5	85 - 120	22.462	22.473	-0.0110	+/-1.000	
Dibromofluoromethane	30.00	96.6	80 - 125	12.412	12.412	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	89.3	75 - 140	13.211	13.211	0.0000	+/-1.000	
Toluene-d8	30.00	99.6	85 - 115	17.754	17.751	0.0030	+/-1.000	
Blank (0E20008-BLK1) ug/Kg wet				Lab File ID: V1BLK01.D		Analyzed: 05/20/10 17:26		
Bromofluorobenzene	30.00	105	85 - 120	22.471	22.473	-0.0020	+/-1.000	
Dibromofluoromethane	30.00	102	80 - 125	12.416	12.412	0.0040	+/-1.000	
1,2-Dichloroethane-d4	30.00	105	75 - 140	13.198	13.211	-0.0130	+/-1.000	
Toluene-d8	30.00	101	85 - 115	17.752	17.751	0.0010	+/-1.000	
✓ **32SB-18-0506 (1004264-17RE1) ug/Kg dry**				Lab File ID: 0426417.D		Analyzed: 05/20/10 20:03		
Bromofluorobenzene	29.34	102	85 - 120	22.467	22.473	-0.0060	+/-1.000	
Dibromofluoromethane	29.34	95.1	80 - 125	12.416	12.412	0.0040	+/-1.000	
1,2-Dichloroethane-d4	29.34	88.2	75 - 140	13.198	13.211	-0.0130	+/-1.000	
Toluene-d8	29.34	107	85 - 115	17.751	17.751	0.0000	+/-1.000	
LCS Dup (0E20008-BSD1) ug/Kg wet				Lab File ID: V1LCSD1.D		Analyzed: 05/20/10 23:18		
Bromofluorobenzene	30.00	99.4	85 - 120	22.46	22.473	-0.0130	+/-1.000	
Dibromofluoromethane	30.00	98.8	80 - 125	12.404	12.412	-0.0080	+/-1.000	
1,2-Dichloroethane-d4	30.00	88.2	75 - 140	13.201	13.211	-0.0100	+/-1.000	
Toluene-d8	30.00	104	85 - 115	17.744	17.751	-0.0070	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13508

SDG: CTOF273_002
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E13508-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/09/10 12:00		
Bromofluorobenzene	30.00	98.8	80 - 120	18.284	18.284	0.0000	+/-1.000	
Dibromofluoromethane	30.00	104	80 - 120	12.281	12.281	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	106	80 - 120	12.97	12.97	0.0000	+/-1.000	
Toluene-d8	30.00	98.9	80 - 120	16.03	16.03	0.0000	+/-1.000	
LCS (0E09005-BS1) ug/Kg wet				Lab File ID: V4LCS01.D		Analyzed: 05/09/10 13:02		
Bromofluorobenzene	30.00	108	85 - 120	18.284	18.284	0.0000	+/-1.000	
Dibromofluoromethane	30.00	103	80 - 125	12.282	12.281	0.0010	+/-1.000	
1,2-Dichloroethane-d4	30.00	95.2	75 - 140	12.971	12.97	0.0010	+/-1.000	
Toluene-d8	30.00	112	85 - 115	16.031	16.03	0.0010	+/-1.000	
Blank (0E09005-BLK1) ug/Kg wet				Lab File ID: V4BLK01.D		Analyzed: 05/09/10 14:34		
Bromofluorobenzene	30.00	113	85 - 120	18.283	18.284	-0.0010	+/-1.000	
Dibromofluoromethane	30.00	102	80 - 125	12.281	12.281	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	107	75 - 140	12.97	12.97	0.0000	+/-1.000	
Toluene-d8	30.00	108	85 - 115	16.02	16.03	-0.0100	+/-1.000	
32SB-11-0607 (1004264-04) ug/Kg dry				Lab File ID: 0426404.D		Analyzed: 05/09/10 21:13		
Bromofluorobenzene	29.54	108	85 - 120	18.285	18.284	0.0010	+/-1.000	
Dibromofluoromethane	29.54	106	80 - 125	12.283	12.281	0.0020	+/-1.000	
1,2-Dichloroethane-d4	29.54	115	75 - 140	12.971	12.97	0.0010	+/-1.000	
Toluene-d8	29.54	96.2	85 - 115	16.032	16.03	0.0020	+/-1.000	
32SB-12-0607 (1004264-06) ug/Kg dry				Lab File ID: 0426406.D		Analyzed: 05/09/10 21:43		
Bromofluorobenzene	30.82	109	85 - 120	18.286	18.284	0.0020	+/-1.000	
Dibromofluoromethane	30.82	103	80 - 125	12.283	12.281	0.0020	+/-1.000	
1,2-Dichloroethane-d4	30.82	108	75 - 140	12.972	12.97	0.0020	+/-1.000	
Toluene-d8	30.82	109	85 - 115	16.032	16.03	0.0020	+/-1.000	
32SB-08-0607 (1004264-02) ug/Kg dry				Lab File ID: 0426402.D		Analyzed: 05/09/10 22:14		
Bromofluorobenzene	29.78	101	85 - 120	18.284	18.284	0.0000	+/-1.000	
Dibromofluoromethane	29.78	96.8	80 - 125	12.282	12.281	0.0010	+/-1.000	
1,2-Dichloroethane-d4	29.78	90.9	75 - 140	12.971	12.97	0.0010	+/-1.000	
Toluene-d8	29.78	101	85 - 115	16.031	16.03	0.0010	+/-1.000	
LCS Dup (0E09005-BSD1) ug/Kg wet				Lab File ID: V4LCSD01.D		Analyzed: 05/09/10 22:44		
Bromofluorobenzene	30.00	97.2	85 - 120	18.288	18.284	0.0040	+/-1.000	
Dibromofluoromethane	30.00	94.9	80 - 125	12.285	12.281	0.0040	+/-1.000	
1,2-Dichloroethane-d4	30.00	99.2	75 - 140	12.974	12.97	0.0040	+/-1.000	
Toluene-d8	30.00	102	85 - 115	16.025	16.03	-0.0050	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13511

SDG: CTOF273_002
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E13511-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/11/10 09:13		
Bromofluorobenzene	30.00	94.9	80 - 120	18.296	18.296	0.0000	+/-1.000	
Dibromofluoromethane	30.00	102	80 - 120	12.304	12.304	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	102	80 - 120	12.983	12.983	0.0000	+/-1.000	
Toluene-d8	30.00	105	80 - 120	16.043	16.043	0.0000	+/-1.000	
LCS (0E10027-BS1) ug/Kg wet				Lab File ID: V4LCS01.D		Analyzed: 05/11/10 10:19		
Bromofluorobenzene	30.00	105	85 - 120	18.293	18.296	-0.0030	+/-1.000	
Dibromofluoromethane	30.00	108	80 - 125	12.301	12.304	-0.0030	+/-1.000	
1,2-Dichloroethane-d4	30.00	95.2	75 - 140	12.989	12.983	0.0060	+/-1.000	
Toluene-d8	30.00	105	85 - 115	16.04	16.043	-0.0030	+/-1.000	
Blank (0E10027-BLK1) ug/Kg wet				Lab File ID: V4BLK01.D		Analyzed: 05/11/10 11:51		
Bromofluorobenzene	30.00	119	85 - 120	18.29	18.296	-0.0060	+/-1.000	
Dibromofluoromethane	30.00	110	80 - 125	12.298	12.304	-0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	109	75 - 140	12.986	12.983	0.0030	+/-1.000	
Toluene-d8	30.00	109	85 - 115	16.037	16.043	-0.0060	+/-1.000	
32SB-17-0607 (1004264-14) ug/Kg dry				Lab File ID: 0426414D.D		Analyzed: 05/11/10 21:18		
Bromofluorobenzene	34.92	113	85 - 120	18.291	18.296	-0.0050	+/-1.000	
Dibromofluoromethane	34.92	107	80 - 125	12.288	12.304	-0.0160	+/-1.000	
1,2-Dichloroethane-d4	34.92	95.9	75 - 140	12.967	12.983	-0.0160	+/-1.000	
Toluene-d8	34.92	106	85 - 115	16.027	16.043	-0.0160	+/-1.000	
LCS Dup (0E10027-BSD1) ug/Kg wet				Lab File ID: V4LCSD1.D		Analyzed: 05/11/10 21:49		
Bromofluorobenzene	30.00	95.9	85 - 120	18.294	18.296	-0.0020	+/-1.000	
Dibromofluoromethane	30.00	111	80 - 125	12.291	12.304	-0.0130	+/-1.000	
1,2-Dichloroethane-d4	30.00	111	75 - 140	12.98	12.983	-0.0030	+/-1.000	
Toluene-d8	30.00	94.2	85 - 115	16.03	16.043	-0.0130	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14109	Instrument:	MS-VOA4
		Calibration:	0144005

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
LCS Dup (0E15003-BSD1) ug/Kg wet				Lab File ID: V4LCSD01.D		Analyzed: 05/16/10 07:41		
Bromofluorobenzene	30.00	96.7	85 - 120	18.294	18.291	0.0030	+/-1.000	
Dibromofluoromethane	30.00	103	80 - 125	12.332	12.319	0.0130	+/-1.000	
1,2-Dichloroethane-d4	30.00	98.1	75 - 140	13.011	13.007	0.0040	+/-1.000	
Toluene-d8	30.00	102	85 - 115	16.041	16.038	0.0030	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15210	Instrument:	MS-VOA1
		Calibration:	0141001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15210-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/21/10 16:29		
Bromofluorobenzene	30.00	95.6	80 - 120	22.476	22.476	0.0000	+/-1.000	
Dibromofluoromethane	30.00	94.2	80 - 120	12.43	12.43	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	79.1	80 - 120	13.213	13.213	0.0000	+/-1.000	*
Toluene-d8	30.00	99.0	80 - 120	17.755	17.755	0.0000	+/-1.000	
LCS (0E21026-BS1) ug/Kg wet				Lab File ID: V1LCS1.D		Analyzed: 05/21/10 17:08		
Bromofluorobenzene	30.00	94.5	85 - 120	22.467	22.476	-0.0090	+/-1.000	
Dibromofluoromethane	30.00	94.0	80 - 125	12.419	12.43	-0.0110	+/-1.000	
1,2-Dichloroethane-d4	30.00	81.6	75 - 140	13.218	13.213	0.0050	+/-1.000	
Toluene-d8	30.00	101	85 - 115	17.76	17.755	0.0050	+/-1.000	
Blank (0E21026-BLK2) ug/Kg wet				Lab File ID: V1MBLK1.D		Analyzed: 05/21/10 19:08		
Bromofluorobenzene	30.00	104	85 - 120	22.47	22.476	-0.0060	+/-1.000	
Dibromofluoromethane	30.00	90.3	80 - 125	12.407	12.43	-0.0230	+/-1.000	
1,2-Dichloroethane-d4	30.00	105	75 - 140	13.189	13.213	-0.0240	+/-1.000	
Toluene-d8	30.00	101	85 - 115	17.748	17.755	-0.0070	+/-1.000	
32SB-12-0607 (1004264-06RE2) ug/Kg dry				Lab File ID: 0426406D.D		Analyzed: 05/21/10 22:25		
Bromofluorobenzene	32.52	105	85 - 120	22.47	22.476	-0.0060	+/-1.000	
Dibromofluoromethane	32.52	96.8	80 - 125	12.415	12.43	-0.0150	+/-1.000	
1,2-Dichloroethane-d4	32.52	85.2	75 - 140	13.199	13.213	-0.0140	+/-1.000	
Toluene-d8	32.52	103	85 - 115	17.741	17.755	-0.0140	+/-1.000	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13508

SDG: CTOF273_002
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E13508-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/09/10 12:00			
Fluorobenzene	547849	14.043	672772	14.056	81	50 - 200	-0.0130	+/-0.50	
Chlorobenzene-d5	273315	17.309	278531	17.313	98	50 - 200	-0.0040	+/-0.50	
1,4-Dichlorobenzene-d4	203124	19.366	217185	19.369	94	50 - 200	-0.0030	+/-0.50	
LCS (0E09005-BS1)			Lab File ID: V4LCS01.D			Analyzed: 05/09/10 13:02			
Fluorobenzene	554823	14.043	547849	14.043	101	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	247823	17.31	273315	17.309	91	50 - 200	0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	197839	19.367	203124	19.366	97	50 - 200	0.0010	+/-0.50	
Blank (0E09005-BLK1)			Lab File ID: V4BLK01.D			Analyzed: 05/09/10 14:34			
Fluorobenzene	592397	14.033	547849	14.043	108	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	260914	17.309	273315	17.309	95	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	222696	19.366	203124	19.366	110	50 - 200	0.0000	+/-0.50	
32SB-11-0607 (1004264-04)			Lab File ID: 0426404.D			Analyzed: 05/09/10 21:13			
Fluorobenzene	88069	14.044	547849	14.043	16	50 - 200	0.0010	+/-0.50	*
Chlorobenzene-d5	42727	17.311	273315	17.309	16	50 - 200	0.0020	+/-0.50	*
1,4-Dichlorobenzene-d4	30635	19.367	203124	19.366	15	50 - 200	0.0010	+/-0.50	*
32SB-12-0607 (1004264-06)			Lab File ID: 0426406.D			Analyzed: 05/09/10 21:43			
Fluorobenzene	191875	14.045	547849	14.043	35	50 - 200	0.0020	+/-0.50	*
Chlorobenzene-d5	88254	17.312	273315	17.309	32	50 - 200	0.0030	+/-0.50	*
1,4-Dichlorobenzene-d4	66870	19.368	203124	19.366	33	50 - 200	0.0020	+/-0.50	*
32SB-08-0607 (1004264-02)			Lab File ID: 0426402.D			Analyzed: 05/09/10 22:14			
Fluorobenzene	475438	14.043	547849	14.043	87	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	224187	17.31	273315	17.309	82	50 - 200	0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	164230	19.367	203124	19.366	81	50 - 200	0.0010	+/-0.50	
LCS Dup (0E09005-BSD1)			Lab File ID: V4LCSD01.D			Analyzed: 05/09/10 22:44			
Fluorobenzene	586543	14.047	547849	14.043	107	50 - 200	0.0040	+/-0.50	
Chlorobenzene-d5	271830	17.314	273315	17.309	99	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	191319	19.37	203124	19.366	94	50 - 200	0.0040	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13510	Instrument:	MS-VOA4
		Calibration:	0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
32SB-22-0506 (1004264-25)			Lab File ID: 0426425.D			Analyzed: 05/10/10 06:22			
Fluorobenzene	525377	14.044	506526	14.038	104	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	221806	17.311	261388	17.304	85	50 - 200	0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	206107	19.368	170791	19.371	121	50 - 200	-0.0030	+/-0.50	
32SB-20-0506 (1004264-21)			Lab File ID: 0426421.D			Analyzed: 05/10/10 09:25			
Fluorobenzene	116640	14.038	506526	14.038	23	50 - 200	0.0000	+/-0.50	*
Chlorobenzene-d5	53097	17.305	261388	17.304	20	50 - 200	0.0010	+/-0.50	*
1,4-Dichlorobenzene-d4	44837	19.361	170791	19.371	26	50 - 200	-0.0100	+/-0.50	*
LCS Dup (0E09008-BSD1)			Lab File ID: V4LCSD03.D			Analyzed: 05/10/10 09:56			
Fluorobenzene	497406	14.042	506526	14.038	98	50 - 200	0.0040	+/-0.50	
Chlorobenzene-d5	223689	17.309	261388	17.304	86	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	192865	19.365	170791	19.371	113	50 - 200	-0.0060	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_002
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Sequence: 0E13510
Instrument: MS-VOA4
Calibration: 0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E13510-CCV1)			Lab File ID: SEQ-CCV3.D			Analyzed: 05/10/10 00:16			
Fluorobenzene	506526	14.038	672772	14.056	75	50 - 200	-0.0180	+/-0.50	
Chlorobenzene-d5	261388	17.304	278531	17.313	94	50 - 200	-0.0090	+/-0.50	
1,4-Dichlorobenzene-d4	170791	19.371	217185	19.369	79	50 - 200	0.0020	+/-0.50	
LCS (0E09008-BS1)			Lab File ID: V4LCS03.D			Analyzed: 05/10/10 00:46			
Fluorobenzene	552387	14.04	506526	14.038	109	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	256815	17.306	261388	17.304	98	50 - 200	0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	194250	19.363	170791	19.371	114	50 - 200	-0.0080	+/-0.50	
Blank (0E09008-BLK1)			Lab File ID: V4BLK02.D			Analyzed: 05/10/10 02:18			
Fluorobenzene	627749	14.032	506526	14.038	124	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	228191	17.319	261388	17.304	87	50 - 200	0.0150	+/-0.50	
1,4-Dichlorobenzene-d4	178169	19.365	170791	19.371	104	50 - 200	-0.0060	+/-0.50	
32SB-13-0607 (1004264-08)			Lab File ID: 0426408.D			Analyzed: 05/10/10 02:48			
Fluorobenzene	615533	14.044	506526	14.038	122	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	262325	17.31	261388	17.304	100	50 - 200	0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	218157	19.367	170791	19.371	128	50 - 200	-0.0040	+/-0.50	
32SB-15-0506 (1004264-10)			Lab File ID: 0426410.D			Analyzed: 05/10/10 03:19			
Fluorobenzene	522186	14.043	506526	14.038	103	50 - 200	0.0050	+/-0.50	
Chlorobenzene-d5	224761	17.31	261388	17.304	86	50 - 200	0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	179598	19.366	170791	19.371	105	50 - 200	-0.0050	+/-0.50	
32SB-17-1112 (1004264-15)			Lab File ID: 0426415.D			Analyzed: 05/10/10 04:20			
Fluorobenzene	577359	14.049	506526	14.038	114	50 - 200	0.0110	+/-0.50	
Chlorobenzene-d5	191744	17.315	261388	17.304	73	50 - 200	0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	35768	19.372	170791	19.371	21	50 - 200	0.0010	+/-0.50	*
32SB-18-0506 (1004264-17)			Lab File ID: 0426417.D			Analyzed: 05/10/10 04:50			
Fluorobenzene	245264	14.048	506526	14.038	48	50 - 200	0.0100	+/-0.50	*
Chlorobenzene-d5	113580	17.315	261388	17.304	43	50 - 200	0.0110	+/-0.50	*
1,4-Dichlorobenzene-d4	102522	19.371	170791	19.371	60	50 - 200	0.0000	+/-0.50	
32SB-19-0506 (1004264-19)			Lab File ID: 0426419.D			Analyzed: 05/10/10 05:21			
Fluorobenzene	453142	14.048	506526	14.038	89	50 - 200	0.0100	+/-0.50	
Chlorobenzene-d5	194252	17.315	261388	17.304	74	50 - 200	0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	195626	19.362	170791	19.371	115	50 - 200	-0.0090	+/-0.50	
32SB-21-0506 (1004264-23)			Lab File ID: 0426423.D			Analyzed: 05/10/10 05:52			
Fluorobenzene	549224	14.043	506526	14.038	108	50 - 200	0.0050	+/-0.50	
Chlorobenzene-d5	242590	17.31	261388	17.304	93	50 - 200	0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	226762	19.366	170791	19.371	133	50 - 200	-0.0050	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13511	Instrument:	MS-VOA4
		Calibration:	0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E13511-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/11/10 09:13			
Fluorobenzene	515277	14.055	672772	14.056	77	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	255857	17.322	278531	17.313	92	50 - 200	0.0090	+/-0.50	
1,4-Dichlorobenzene-d4	180335	19.379	217185	19.369	83	50 - 200	0.0100	+/-0.50	
LCS (0E10027-BS1)			Lab File ID: V4LCS01.D			Analyzed: 05/11/10 10:19			
Fluorobenzene	543300	14.052	515277	14.055	105	50 - 200	-0.0030	+/-0.50	
Chlorobenzene-d5	256372	17.319	255857	17.322	100	50 - 200	-0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	223693	19.375	180335	19.379	124	50 - 200	-0.0040	+/-0.50	
Blank (0E10027-BLK1)			Lab File ID: V4BLK01.D			Analyzed: 05/11/10 11:51			
Fluorobenzene	560332	14.049	515277	14.055	109	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	251198	17.316	255857	17.322	98	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	237103	19.372	180335	19.379	131	50 - 200	-0.0070	+/-0.50	
32SB-17-0607 (1004264-14)			Lab File ID: 0426414D.D			Analyzed: 05/11/10 21:18			
Fluorobenzene	463720	14.04	515277	14.055	90	50 - 200	-0.0150	+/-0.50	
Chlorobenzene-d5	209600	17.316	255857	17.322	82	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	173103	19.373	180335	19.379	96	50 - 200	-0.0060	+/-0.50	
LCS Dup (0E10027-BSD1)			Lab File ID: V4LCSD1.D			Analyzed: 05/11/10 21:49			
Fluorobenzene	424014	14.053	515277	14.055	82	50 - 200	-0.0020	+/-0.50	
Chlorobenzene-d5	221518	17.31	255857	17.322	87	50 - 200	-0.0120	+/-0.50	
1,4-Dichlorobenzene-d4	183607	19.376	180335	19.379	102	50 - 200	-0.0030	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14105	Instrument:	MS-VOA1
		Calibration:	0141001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E14105-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/20/10 14:10			
Fluorobenzene	2441510	14.573	2403751	14.57	102	50 - 200	0.0030	+/-0.50	
Chlorobenzene-d5	1066089	20.324	960429	20.321	111	50 - 200	0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	819746	24.828	805672	24.823	102	50 - 200	0.0050	+/-0.50	
LCS (0E20008-BS1)			Lab File ID: V1LCS1.D			Analyzed: 05/20/10 15:29			
Fluorobenzene	2650496	14.572	2441510	14.573	109	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	1148925	20.324	1066089	20.324	108	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	906986	24.82	819746	24.828	111	50 - 200	-0.0080	+/-0.50	
Blank (0E20008-BLK1)			Lab File ID: V1BLK01.D			Analyzed: 05/20/10 17:26			
Fluorobenzene	2472993	14.575	2441510	14.573	101	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	1034994	20.323	1066089	20.324	97	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	854031	24.822	819746	24.828	104	50 - 200	-0.0060	+/-0.50	
32SB-18-0506 (1004264-17RE1)			Lab File ID: 0426417.D			Analyzed: 05/20/10 20:03			
Fluorobenzene	1641713	14.574	2441510	14.573	67	50 - 200	0.0010	+/-0.50	
Chlorobenzene-d5	652677	20.32	1066089	20.324	61	50 - 200	-0.0040	+/-0.50	
1,4-Dichlorobenzene-d4	514044	24.819	819746	24.828	63	50 - 200	-0.0090	+/-0.50	
LCS Dup (0E20008-BSD1)			Lab File ID: V1LCSD1.D			Analyzed: 05/20/10 23:18			
Fluorobenzene	2825815	14.575	2441510	14.573	116	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	1107707	20.319	1066089	20.324	104	50 - 200	-0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	862673	24.814	819746	24.828	105	50 - 200	-0.0140	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E14109

SDG: CTOF273_002
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0144005

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E14109-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/15/10 19:55			
Fluorobenzene	843423	14.06	822611	14.04	103	50 - 200	0.0200	+/-0.50	
Chlorobenzene-d5	404132	17.317	341417	17.297	118	50 - 200	0.0200	+/-0.50	
1,4-Dichlorobenzene-d4	278121	19.374	297455	19.354	94	50 - 200	0.0200	+/-0.50	
LCS (0E15003-BS1)			Lab File ID: V4LCS01.D			Analyzed: 05/15/10 20:57			
Fluorobenzene	843029	14.058	843423	14.06	100	50 - 200	-0.0020	+/-0.50	
Chlorobenzene-d5	378372	17.315	404132	17.317	94	50 - 200	-0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	283789	19.372	278121	19.374	102	50 - 200	-0.0020	+/-0.50	
Blank (0E15003-BLK1)			Lab File ID: V4BLK01.D			Analyzed: 05/15/10 22:29			
Fluorobenzene	922615	14.059	843423	14.06	109	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	387301	17.316	404132	17.317	96	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	325105	19.373	278121	19.374	117	50 - 200	-0.0010	+/-0.50	
32SB-11-0607 (1004264-04RE1)			Lab File ID: 0426404.D			Analyzed: 05/15/10 23:30			
Fluorobenzene	843363	14.065	843423	14.06	100	50 - 200	0.0050	+/-0.50	
Chlorobenzene-d5	340736	17.322	404132	17.317	84	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	295857	19.369	278121	19.374	106	50 - 200	-0.0050	+/-0.50	
32SB-16-0607 (1004264-12RE1)			Lab File ID: 0426412.D			Analyzed: 05/16/10 00:01			
Fluorobenzene	615300	14.069	843423	14.06	73	50 - 200	0.0090	+/-0.50	
Chlorobenzene-d5	257351	17.316	404132	17.317	64	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	216271	19.373	278121	19.374	78	50 - 200	-0.0010	+/-0.50	
32SB-17-1112 (1004264-15RE1)			Lab File ID: 0426415.D			Analyzed: 05/16/10 00:32			
Fluorobenzene	934387	14.068	843423	14.06	111	50 - 200	0.0080	+/-0.50	
Chlorobenzene-d5	387734	17.325	404132	17.317	96	50 - 200	0.0080	+/-0.50	
1,4-Dichlorobenzene-d4	275928	19.372	278121	19.374	99	50 - 200	-0.0020	+/-0.50	
32SB-20-0506 (1004264-21RE1)			Lab File ID: 0426421.D			Analyzed: 05/16/10 01:02			
Fluorobenzene	1015101	14.064	843423	14.06	120	50 - 200	0.0040	+/-0.50	
Chlorobenzene-d5	403809	17.321	404132	17.317	100	50 - 200	0.0040	+/-0.50	
1,4-Dichlorobenzene-d4	296628	19.378	278121	19.374	107	50 - 200	0.0040	+/-0.50	
LCS Dup (0E15003-BSD1)			Lab File ID: V4LCSD01.D			Analyzed: 05/16/10 07:41			
Fluorobenzene	905421	14.073	843423	14.06	107	50 - 200	0.0130	+/-0.50	
Chlorobenzene-d5	410430	17.32	404132	17.317	102	50 - 200	0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	276738	19.377	278121	19.374	100	50 - 200	0.0030	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15210	Instrument:	MS-VOA1
		Calibration:	0141001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15210-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/21/10 16:29			
Fluorobenzene	2662943	14.59	2403751	14.57	111	50 - 200	0.0200	+/-0.50	
Chlorobenzene-d5	1157308	20.342	960429	20.321	120	50 - 200	0.0210	+/-0.50	
1,4-Dichlorobenzene-d4	837707	24.832	805672	24.823	104	50 - 200	0.0090	+/-0.50	
LCS (0E21026-BS1)			Lab File ID: V1LCS1.D			Analyzed: 05/21/10 17:08			
Fluorobenzene	2759485	14.58	2662943	14.59	104	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	1150251	20.335	1157308	20.342	99	50 - 200	-0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	841774	24.822	837707	24.832	100	50 - 200	-0.0100	+/-0.50	
Blank (0E21026-BLK2)			Lab File ID: V1MBLK1.D			Analyzed: 05/21/10 19:08			
Fluorobenzene	2551659	14.551	2662943	14.59	96	50 - 200	-0.0390	+/-0.50	
Chlorobenzene-d5	1070031	20.321	1157308	20.342	92	50 - 200	-0.0210	+/-0.50	
1,4-Dichlorobenzene-d4	852037	24.824	837707	24.832	102	50 - 200	-0.0080	+/-0.50	
32SB-12-0607 (1004264-06RE2)			Lab File ID: 0426406D.D			Analyzed: 05/21/10 22:25			
Fluorobenzene	2944231	14.576	2662943	14.59	111	50 - 200	-0.0140	+/-0.50	
Chlorobenzene-d5	1199637	20.317	1157308	20.342	104	50 - 200	-0.0250	+/-0.50	
1,4-Dichlorobenzene-d4	976972	24.819	837707	24.832	117	50 - 200	-0.0130	+/-0.50	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E09005	Laboratory ID:	0E09005-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	50.82	102	75 - 125
Ethylbenzene	50.00	49.95	99.9	75 - 125
Toluene	50.00	52.96	106	70 - 125
Xylenes (total)	150.0	153.3	102	75 - 125

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS	
					RPD	REC.
Benzene	50.00	44.98	90.0	12.2	30	75 - 125
Ethylbenzene	50.00	44.10	88.2	12.4	30	75 - 125
Toluene	50.00	46.60	93.2	12.8	30	70 - 125
Xylenes (total)	150.0	133.0	88.6	14.2	30	75 - 125

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E09008	Laboratory ID:	0E09008-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	50.54	101	75 - 125
Ethylbenzene	50.00	49.10	98.2	75 - 125
Toluene	50.00	48.89	97.8	70 - 125
Xylenes (total)	150.0	146.6	97.7	75 - 125

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS	
					RPD	REC.
Benzene	50.00	50.83	102	0.567	30	75 - 125
Ethylbenzene	50.00	50.32	101	2.47	30	75 - 125
Toluene	50.00	51.54	103	5.30	30	70 - 125
Xylenes (total)	150.0	154.9	103	5.49	30	75 - 125

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E10027	Laboratory ID:	0E10027-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	41.28	82.6	75 - 125
Ethylbenzene	50.00	41.07	82.1	75 - 125
Toluene	50.00	40.05	80.1	70 - 125
Xylenes (total)	150.0	119.9	79.9	75 - 125

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzene	50.00	50.75	101	20.6	30	75 - 125
Ethylbenzene	50.00	43.72	87.4	6.23	30	75 - 125
Toluene	50.00	42.00	84.0	4.77	30	70 - 125
Xylenes (total)	150.0	129.6	86.4	7.73	30	75 - 125

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E15003	Laboratory ID:	0E15003-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	59.69	119	75 - 125
Ethylbenzene	50.00	56.32	113	75 - 125
Toluene	50.00	58.68	117	70 - 125
Xylenes (total)	150.0	180.2	120	75 - 125

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS	
					RPD	REC.
Benzene	50.00	53.54	107	10.9	30	75 - 125
Ethylbenzene	50.00	50.08	100	11.7	30	75 - 125
Toluene	50.00	50.89	102	14.2	30	70 - 125
Xylenes (total)	150.0	150.9	101	17.7	30	75 - 125

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E20008	Laboratory ID:	0E20008-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	54.00	108	75 - 125
Ethylbenzene	50.00	53.23	106	75 - 125
Toluene	50.00	52.95	106	70 - 125
Xylenes (total)	150.0	156.6	104	75 - 125

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS	
					RPD	REC.
Benzene	50.00	44.68	89.4	18.9	30	75 - 125
Ethylbenzene	50.00	45.71	91.4	15.2	30	75 - 125
Toluene	50.00	46.44	92.9	13.1	30	70 - 125
Xylenes (total)	150.0	136.3	90.9	13.9	30	75 - 125

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E21026	Laboratory ID:	0E21026-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	48.79	97.6	75 - 125
Ethylbenzene	50.00	49.68	99.4	75 - 125
Toluene	50.00	49.63	99.3	70 - 125
Xylenes (total)	150.0	145.0	96.6	75 - 125

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/07/10
Instrument ID:	MS-VOA4	Injection Time:	18:43
Sequence:	0E13002	Lab Sample ID:	0E13002-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	32.2	PASS
75	30 - 60% of 95	50.5	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.01	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	70.3	PASS
175	5 - 9% of 174	7.68	PASS
176	95 - 101% of 174	95.1	PASS
177	5 - 9% of 176	5.92	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/08/10
Instrument ID:	MS-VOA4	Injection Time:	04:29
Sequence:	0E13002	Lab Sample ID:	0E13002-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	25.2	PASS
75	30 - 60% of 95	44.3	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.93	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	72	PASS
175	5 - 9% of 174	8.06	PASS
176	95 - 101% of 174	95.2	PASS
177	5 - 9% of 176	6.4	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/09/10
Instrument ID:	MS-VOA4	Injection Time:	11:30
Sequence:	0E13508	Lab Sample ID:	0E13508-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	26.9	PASS
75	30 - 60% of 95	46.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.81	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	78.4	PASS
175	5 - 9% of 174	8.65	PASS
176	95 - 101% of 174	98.3	PASS
177	5 - 9% of 176	6.62	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/09/10
Instrument ID:	MS-VOA4	Injection Time:	23:45
Sequence:	0E13510	Lab Sample ID:	0E13510-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	28	PASS
75	30 - 60% of 95	45.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.88	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	60.8	PASS
175	5 - 9% of 174	8.43	PASS
176	95 - 101% of 174	96.2	PASS
177	5 - 9% of 176	6.87	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/11/10
Instrument ID:	MS-VOA4	Injection Time:	08:43
Sequence:	0E13511	Lab Sample ID:	0E13511-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	26.5	PASS
75	30 - 60% of 95	47	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.66	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	80.1	PASS
175	5 - 9% of 174	8.62	PASS
176	95 - 101% of 174	98.2	PASS
177	5 - 9% of 176	6.59	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/16/10
Instrument ID:	MS-VOA1	Injection Time:	13:42
Sequence:	0E13909	Lab Sample ID:	0E13909-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	21.1	PASS
75	30 - 60% of 95	47.2	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.37	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	67.1	PASS
175	5 - 9% of 174	7.31	PASS
176	95 - 101% of 174	95.7	PASS
177	5 - 9% of 176	6.29	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/13/10
Instrument ID:	MS-VOA4	Injection Time:	13:56
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	24.2	PASS
75	30 - 60% of 95	46.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.6	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	72.9	PASS
175	5 - 9% of 174	8.01	PASS
176	95 - 101% of 174	97.4	PASS
177	5 - 9% of 176	6.63	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/13/10
Instrument ID:	MS-VOA4	Injection Time:	23:42
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	27.6	PASS
75	30 - 60% of 95	49	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.84	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	50.2	PASS
175	5 - 9% of 174	7.16	PASS
176	95 - 101% of 174	95.8	PASS
177	5 - 9% of 176	7.75	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1A.D	Injection Date:	05/14/10
Instrument ID:	MS-VOA4	Injection Time:	11:07
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN3

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	25.5	PASS
75	30 - 60% of 95	48.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.2	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	62.6	PASS
175	5 - 9% of 174	8.21	PASS
176	95 - 101% of 174	95.7	PASS
177	5 - 9% of 176	6.95	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/20/10
Instrument ID:	MS-VOA1	Injection Time:	13:38
Sequence:	0E14105	Lab Sample ID:	0E14105-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	21.7	PASS
75	30 - 60% of 95	45.6	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.35	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	67.6	PASS
175	5 - 9% of 174	6.92	PASS
176	95 - 101% of 174	95.4	PASS
177	5 - 9% of 176	6.29	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN3.D	Injection Date:	05/15/10
Instrument ID:	MS-VOA4	Injection Time:	19:25
Sequence:	0E14109	Lab Sample ID:	0E14109-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	23.2	PASS
75	30 - 60% of 95	45.9	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.71	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	79.2	PASS
175	5 - 9% of 174	8.16	PASS
176	95 - 101% of 174	97.5	PASS
177	5 - 9% of 176	6.59	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/21/10
Instrument ID:	MS-VOA1	Injection Time:	15:57
Sequence:	0F15210	Lab Sample ID:	0F15210-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	23.5	PASS
75	30 - 60% of 95	46.8	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.56	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	55.5	PASS
175	5 - 9% of 174	7.52	PASS
176	95 - 101% of 174	96	PASS
177	5 - 9% of 176	6.52	PASS

INITIAL CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-ICV1.D	Calibration Date:	05/07/10 09:01
Sequence:	0E13002	Injection Date:	05/07/10
Lab Sample ID:	0E13002-ICV1	Injection Time:	23:22

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzene	A	100.0	99.09	1.072069	1.062337		-0.9	20
Ethylbenzene	A	100.0	86.70	2.911353	2.524206		-13.3	20
Toluene	A	100.0	89.48	1.422543	1.27282		-10.5	20
Xylenes (total)	Q	300.0	284.2	2.150116	1.761576		-5.3	20
Bromofluorobenzene	A	30.00	29.24	0.8397075	0.8183789		-2.5	20
Dibromofluoromethane	A	30.00	30.33	0.3074291	0.3108571		1.1	20
1,2-Dichloroethane-d4	A	30.00	30.54	6.679317E-02	6.799794E-02		1.8	20
Toluene-d8	A	30.00	29.08	2.047687	1.984594		-3.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA1	Calibration:	0141001
Lab File ID:	SEQ-ICV1.D	Calibration Date:	05/16/10 05:53
Sequence:	0E13909	Injection Date:	05/16/10
Lab Sample ID:	0E13909-ICV1	Injection Time:	19:31

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzene	A	100.0	96.63	0.9538096	0.921635		-3.4	20
Ethylbenzene	A	100.0	96.92	2.625901	2.54502		-3.1	20
Naphthalene	A	100.0	113.1	1.42045	1.606474		13.1	20
Methyl t-Butyl Ether	A	100.0	102.9	0.4789501	0.4929269		2.9	20
Toluene	A	100.0	97.59	1.306087	1.274644		-2.4	20
m,p-Xylene	A	200.0	186.8	1.994748	1.862811		-6.6	20
o-Xylene	A	100.0	96.98	1.962043	1.90286		-3.0	20
Xylenes (total)	A	300.0	283.8	1.983846	1.876161		-5.4	20
Bromofluorobenzene	A	30.00	29.29	0.806614	0.7875346		-2.4	20
Dibromofluoromethane	A	30.00	29.65	0.2558456	0.2528796		-1.2	20
1,2-Dichloroethane-d4	A	30.00	29.22	6.111453E-02	5.952883E-02		-2.6	20
Toluene-d8	A	30.00	30.17	2.151044	2.163585		0.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0144005
Lab File ID:	SEQ-ICV4.D	Calibration Date:	05/13/10 12:58
Sequence:	0E14024	Injection Date:	05/14/10
Lab Sample ID:	0E14024-ICV4	Injection Time:	11:37

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzene	A	100.0	99.51	1.044291	1.039213		-0.5	20
Ethylbenzene	A	100.0	94.40	2.698668	2.547461		-5.6	20
Toluene	A	100.0	95.86	1.328513	1.27348		-4.1	20
Xylenes (total)	Q	300.0	298.4	2.00992	1.719716		-0.5	20
Bromofluorobenzene	A	30.00	30.32	0.8537608	0.8627737		1.1	20
Dibromofluoromethane	A	30.00	31.96	0.2871282	0.3058803		6.5	20
1,2-Dichloroethane-d4	A	30.00	27.56	6.763165E-02	6.213989E-02		-8.1	20
Toluene-d8	A	30.00	31.03	1.971808	2.039809		3.4	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/07/10 09:01
Sequence:	0E13508	Injection Date:	05/09/10
Lab Sample ID:	0E13508-CCV1	Injection Time:	12:00

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	97.32	1.072069	1.043307		-2.7	20
Ethylbenzene	A	100.0	83.84	2.911353	2.440878		-16.2	20
Naphthalene	A	100.0	87.34	1.929638	1.685266		-12.7	20
Methyl t-Butyl Ether	A	100.0	94.41	0.7656045	0.7227809		-5.6	20
Toluene	A	100.0	87.74	1.422543	1.248157		-12.3	20
m,p-Xylene	Q	200.0	184.8	2.139192	1.640006		-7.6	20
o-Xylene	A	100.0	85.04	2.105664	1.79071		-15.0	20
Xylenes (total)	Q	300.0	269.8	2.150116	1.690241		-10.1	20
Bromofluorobenzene	A	30.00	29.63	0.8397075	0.8294751		-1.2	20
Dibromofluoromethane	A	30.00	31.15	0.3074291	0.3192029		3.8	20
1,2-Dichloroethane-d4	A	30.00	31.88	6.679317E-02	7.098124E-02		6.3	20
Toluene-d8	A	30.00	29.66	2.047687	2.024232		-1.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-CCV3.D	Calibration Date:	05/07/10 09:01
Sequence:	0E13510	Injection Date:	05/10/10
Lab Sample ID:	0E13510-CCV1	Injection Time:	00:16

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	94.71	1.072069	1.015384		-5.3	20
Ethylbenzene	A	100.0	84.38	2.911353	2.456576		-15.6	20
Naphthalene	A	100.0	94.03	1.929638	1.814421		-6.0	20
Methyl t-Butyl Ether	A	100.0	84.34	0.7656045	0.6457327		-15.7	20
Toluene	A	100.0	89.46	1.422543	1.272551		-10.5	20
m,p-Xylene	Q	200.0	183.8	2.139192	1.633718		-8.1	20
o-Xylene	A	100.0	83.63	2.105664	1.760967		-16.4	20
Xylenes (total)	Q	300.0	267.4	2.150116	1.676135		-10.9	20
Bromofluorobenzene	A	30.00	29.06	0.8397075	0.8133464		-3.1	20
Dibromofluoromethane	A	30.00	31.80	0.3074291	0.325851		6.0	20
1,2-Dichloroethane-d4	A	30.00	31.61	6.679317E-02	7.037151E-02		5.4	20
Toluene-d8	A	30.00	29.46	2.047687	2.010505		-1.8	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/07/10 09:01
Sequence:	0E13511	Injection Date:	05/11/10
Lab Sample ID:	0E13511-CCV1	Injection Time:	09:13

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	96.00	1.072069	1.029219		-4.0	20
Ethylbenzene	A	100.0	86.23	2.911353	2.510586		-13.8	20
Naphthalene	A	100.0	92.57	1.929638	1.786339		-7.4	20
Methyl t-Butyl Ether	A	100.0	88.35	0.7656045	0.6763855		-11.7	20
Toluene	A	100.0	86.98	1.422543	1.237272		-13.0	20
m,p-Xylene	Q	200.0	186.6	2.139192	1.651453		-6.7	20
o-Xylene	A	100.0	85.39	2.105664	1.798075		-14.6	20
Xylenes (total)	Q	300.0	271.9	2.150116	1.700327		-9.4	20
Bromofluorobenzene	A	30.00	28.48	0.8397075	0.797121		-5.1	20
Dibromofluoromethane	A	30.00	30.62	0.3074291	0.3138273		2.1	20
1,2-Dichloroethane-d4	A	30.00	30.52	6.679317E-02	6.794598E-02		1.7	20
Toluene-d8	A	30.00	31.62	2.047687	2.158503		5.4	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA1	Calibration:	0141001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/16/10 05:53
Sequence:	0E14105	Injection Date:	05/20/10
Lab Sample ID:	0E14105-CCV1	Injection Time:	14:10

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	89.38	0.9538096	0.852482		-10.6	20
Ethylbenzene	A	100.0	85.50	2.625901	2.245226		-14.5	20
Naphthalene	A	100.0	83.43	1.42045	1.185048		-16.6	20
Methyl t-Butyl Ether	A	100.0	77.28	0.4789501	0.370126		-22.7	20 *
Toluene	A	100.0	87.09	1.306087	1.137517		-12.9	20
m,p-Xylene	A	200.0	165.1	1.994748	1.646864		-17.4	20
o-Xylene	A	100.0	83.92	1.962043	1.646635		-16.1	20
Xylenes (total)	A	300.0	249.0	1.983846	1.646787		-17.0	20
Bromofluorobenzene	A	30.00	29.53	0.806614	0.7940735		-1.6	20
Dibromofluoromethane	A	30.00	28.34	0.2558456	0.2417086		-5.5	20
1,2-Dichloroethane-d4	A	30.00	27.00	6.111453E-02	5.500776E-02		-10.0	20
Toluene-d8	A	30.00	29.52	2.151044	2.116707		-1.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0144005
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/13/10 12:58
Sequence:	0E14109	Injection Date:	05/15/10
Lab Sample ID:	0E14109-CCV1	Injection Time:	19:55

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
✓ Benzene	A	100.0	94.85	1.044291	0.9905176		-5.1	20
✓ Ethylbenzene	A	100.0	79.76	2.698668	2.152489		-20.2	20 *
✓ Toluene	A	100.0	83.07	1.328513	1.103647		-16.9	20
✓ Xylenes (total)	Q	300.0	258.5	2.00992	1.52534		-13.8	20
Bromofluorobenzene	A	30.00	30.23	0.8537608	0.8602882		0.8	20
Dibromofluoromethane	A	30.00	33.56	0.2871282	0.3211603		11.9	20
1,2-Dichloroethane-d4	A	30.00	30.64	6.763165E-02	0.0690804		2.1	20
Toluene-d8	A	30.00	29.41	1.971808	1.932812		-2.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA1	Calibration:	0141001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/16/10 05:53
Sequence:	0F15210	Injection Date:	05/21/10
Lab Sample ID:	0F15210-CCV1	Injection Time:	16:29

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	96.53	0.9538096	0.9207242		-3.5	20
Ethylbenzene	A	100.0	92.24	2.625901	2.422007		-7.8	20
Naphthalene	A	100.0	78.18	1.42045	1.110565		-21.8	20 *
Methyl t-Butyl Ether	A	100.0	154.2	0.4789501	0.7384538		54.2	20 *
Toluene	A	100.0	94.46	1.306087	1.233704		-5.5	20
m,p-Xylene	A	200.0	178.8	1.994748	1.783541		-10.6	20
o-Xylene	A	100.0	90.52	1.962043	1.775968		-9.5	20
Xylenes (total)	A	300.0	269.3	1.983846	1.781017		-10.2	20
Bromofluorobenzene	A	30.00	28.69	0.806614	0.7713755		-4.4	20
Dibromofluoromethane	A	30.00	28.25	0.2558456	0.2409428		-5.8	20
1,2-Dichloroethane-d4	A	30.00	23.73	6.111453E-02	4.833412E-02		-20.9	20 *
Toluene-d8	A	30.00	29.70	2.151044	2.129762		-1.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_002
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Matrix:
Laboratory ID: 0E09008-BLK1
File ID: V4BLK02.D
Sampled:
Prepared:
Analyzed: 05/10/10 02:18
Solids:
Preparation: 5035
Dilution:
Batch: 0E09008
Sequence: 0E13510
Calibration: 0130002
Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.88	106	85 - 120	
Dibromofluoromethane	30.00	30.81	103	80 - 125	
1,2-Dichloroethane-d4	30.00	29.85	99.5	75 - 140	
Toluene-d8	30.00	35.50	118	85 - 115	

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_002
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Matrix:
Laboratory ID: 0E10027-BLK1
File ID: V4BLK01.D
Sampled:
Prepared:
Analyzed: 05/11/10 11:51
Solids:
Preparation: 5035
Dilution:
Batch: 0E10027
Sequence: 0E13511
Calibration: 0130002
Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	35.56	119	85 - 120	
Dibromofluoromethane	30.00	32.86	110	80 - 125	
1,2-Dichloroethane-d4	30.00	32.62	109	75 - 140	
Toluene-d8	30.00	32.83	109	85 - 115	

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E15003-BLK1	File ID:	V4BLK01.D
Sampled:		Prepared:		Analyzed:	05/15/10 22:29
Solids:		Preparation:	5035	Dilution:	

Batch:	0E15003	Sequence:	0E14109	Calibration:	0144005	Instrument:	MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	Y, U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.91	103	85 - 120	
Dibromofluoromethane	30.00	30.57	102	80 - 125	
1,2-Dichloroethane-d4	30.00	28.47	94.9	75 - 140	
Toluene-d8	30.00	30.82	103	85 - 115	

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_002
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Matrix:
Laboratory ID: 0E20008-BLK1
File ID: V1BLK01.D
Sampled:
Prepared:
Analyzed: 05/20/10 17:26
Solids:
Preparation: 5035
Dilution:
Batch: 0E20008
Sequence: 0E14105
Calibration: 0141001
Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.63	105	85 - 120	
Dibromofluoromethane	30.00	30.62	102	80 - 125	
1,2-Dichloroethane-d4	30.00	31.37	105	75 - 140	
Toluene-d8	30.00	30.27	101	85 - 115	

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_002	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E21026-BLK2	File ID:	V1MBLK1.D
Sampled:		Prepared:		Analyzed:	05/21/10 19:08
Solids:		Preparation:	5035	Dilution:	

Batch: 0E21026 Sequence: 0F15210 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		23.5	200	U
100-41-4	Ethylbenzene		37.5	500	U
108-88-3	Toluene		43.0	500	U
1330-20-7	Xylenes (total)		35.0	500	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.19	104	85 - 120	
Dibromofluoromethane	30.00	27.08	90.3	80 - 125	
1,2-Dichloroethane-d4	30.00	31.55	105	75 - 140	
Toluene-d8	30.00	30.36	101	85 - 115	

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E09005-BLK1	File ID:	V4BLK01.D
Sampled:		Prepared:		Analyzed:	05/09/10 14:34
Solids:		Preparation:	5035	Dilution:	

Batch: 0E09005 Sequence: 0E13508 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	33.99	113	85 - 120	
Dibromofluoromethane	30.00	30.70	102	80 - 125	
1,2-Dichloroethane-d4	30.00	31.98	107	75 - 140	
Toluene-d8	30.00	32.44	108	85 - 115	

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_002

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E09005 Batch Matrix: Solid

Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E09005-BLK1	05/09/10 13:00	5.00	5.00
LCS	0E09005-BS1	05/09/10 13:00	5.00	5.00
LCS Dup	0E09005-BSD1	05/09/10 13:00	5.00	5.00
32SB-08-0607	1004264-02	05/09/10 13:37	5.86	5.00
32SB-12-0607	1004264-06	05/09/10 13:37	5.90	5.00

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_002

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E09008 Batch Matrix: Solid

Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E09008-BLK1	05/09/10 15:46	5.00	5.00
LCS	0E09008-BS1	05/09/10 15:46	5.00	5.00
LCS Dup	0E09008-BSD1	05/09/10 15:46	5.00	5.00
32SB-13-0607	1004264-08	05/09/10 15:46	5.87	5.00
32SB-15-0506	1004264-10	05/09/10 15:46	5.01	5.00
32SB-18-0506	1004264-17	05/09/10 15:46	5.90	5.00
32SB-19-0506	1004264-19	05/09/10 15:46	5.88	5.00
32SB-21-0506	1004264-23	05/09/10 15:46	5.95	5.00
32SB-22-0506	1004264-25	05/09/10 15:46	5.06	5.00

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_002

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E10027 Batch Matrix: Solid

Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E10027-BLK1	05/10/10 14:11	5.00	5.00
LCS	0E10027-BS1	05/10/10 14:11	5.00	5.00
LCS Dup	0E10027-BSD1	05/10/10 14:11	5.00	5.00
32SB-17-0607	1004264-14	05/10/10 16:01	5.20	5.00

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_002

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E15003 Batch Matrix: Solid

Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E15003-BLK1	05/15/10 14:56	5.00	5.00
LCS	0E15003-BS1	05/15/10 14:56	5.00	5.00
LCS Dup	0E15003-BSD1	05/15/10 14:56	5.00	5.00
32SB-11-0607	1004264-04	05/09/10 13:00	6.01	5.00
32SB-11-0607	1004264-04RE1	05/09/10 13:00	6.01	5.00
32SB-16-0607	1004264-12RE1	05/09/10 15:46	5.67	5.00
32SB-17-1112	1004264-15	05/09/10 15:46	5.11	5.00
32SB-17-1112	1004264-15RE1	05/09/10 15:46	5.11	5.00
32SB-20-0506	1004264-21	05/09/10 15:46	6.03	5.00
32SB-20-0506	1004264-21RE1	05/09/10 15:46	6.03	5.00

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_002

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E20008 Batch Matrix: Solid

Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E20008-BLK1	05/20/10 11:09	5.00	5.00
LCS	0E20008-BS1	05/20/10 11:09	5.00	5.00
LCS Dup	0E20008-BSD1	05/20/10 11:09	5.00	5.00
32SB-18-0506	1004264-17RE1	05/20/10 11:09	6.05	5.00

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_002

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E21026 Batch Matrix: Solid

Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E21026-BLK2	05/21/10 00:00	5.00	5.00
LCS	0E21026-BS1	05/21/10 00:00	5.00	5.00
32SB-12-0607	1004264-06RE2	05/21/10 00:00	5.59	5.00

HOLDING TIME SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_002

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SB-08-0607	04/27/10 08:10	04/28/10 08:30	05/09/10 13:37	N/A	14.00	05/09/10 22:14	12.59	14.00	
32SB-11-0607	04/27/10 08:25	04/28/10 08:30	05/09/10 13:00	N/A	14.00	05/09/10 21:13	12.53	14.00	
32SB-11-0607	04/27/10 08:25	04/28/10 08:30	05/09/10 13:00	N/A	14.00	05/15/10 23:30	18.63	14.00	*
32SB-12-0607	04/27/10 08:35	04/28/10 08:30	05/09/10 13:37	N/A	14.00	05/09/10 21:43	12.55	14.00	
32SB-12-0607	04/27/10 08:35	04/28/10 08:30	05/21/10 00:00	N/A	14.00	05/21/10 22:25	24.58	14.00	*
32SB-13-0607	04/27/10 08:55	04/28/10 08:30	05/09/10 15:46	N/A	14.00	05/10/10 02:48	12.75	14.00	
32SB-15-0506	04/27/10 09:10	04/28/10 08:30	05/09/10 15:46	N/A	14.00	05/10/10 03:19	12.76	14.00	
32SB-16-0607	04/27/10 10:15	04/28/10 08:30	05/09/10 15:46	N/A	14.00	05/16/10 00:01	18.57	14.00	*
32SB-17-0607	04/27/10 10:20	04/28/10 08:30	05/10/10 16:01	N/A	14.00	05/11/10 21:18	14.46	14.00	
32SB-17-1112	04/27/10 10:20	04/28/10 08:30	05/09/10 15:46	N/A	14.00	05/10/10 04:20	12.75	14.00	
32SB-17-1112	04/27/10 10:20	04/28/10 08:30	05/09/10 15:46	N/A	14.00	05/16/10 00:32	18.59	14.00	*
32SB-18-0506	04/27/10 10:55	04/28/10 08:30	05/09/10 15:46	N/A	14.00	05/10/10 04:50	12.75	14.00	
32SB-18-0506	04/27/10 10:55	04/28/10 08:30	05/20/10 11:09	N/A	14.00	05/20/10 20:03	23.38	14.00	*
32SB-19-0506	04/27/10 11:10	04/28/10 08:30	05/09/10 15:46	N/A	14.00	05/10/10 05:21	12.76	14.00	
32SB-20-0506	04/27/10 11:25	04/28/10 08:30	05/09/10 15:46	N/A	14.00	05/10/10 09:25	12.92	14.00	
32SB-20-0506	04/27/10 11:25	04/28/10 08:30	05/09/10 15:46	N/A	14.00	05/16/10 01:02	18.57	14.00	*
32SB-21-0506	04/27/10 11:45	04/28/10 08:30	05/09/10 15:46	N/A	14.00	05/10/10 05:52	12.75	14.00	
32SB-22-0506	04/27/10 12:55	04/28/10 08:30	05/09/10 15:46	N/A	14.00	05/10/10 06:22	12.73	14.00	

Method 8270 Supporting Data

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15501	Instrument:	MS-BNA3
Calibration:	0156001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15501-TUN1	SEQ-TUN1.D	06/03/10 10:13
Cal Standard	0F15501-CAL1	SEQ-CAL1.D	06/03/10 10:34
Cal Standard	0F15501-CAL2	SEQ-CAL2.D	06/03/10 11:11
Cal Standard	0F15501-CAL3	SEQ-CAL3.D	06/03/10 11:47
Cal Standard	0F15501-CAL4	SEQ-CAL4.D	06/03/10 12:23
Cal Standard	0F15501-CAL5	SEQ-CAL5.D	06/03/10 13:00
Cal Standard	0F15501-CAL6	SEQ-CAL6.D	06/03/10 13:36
Cal Standard	0F15501-CAL7	SEQ-CAL7.D	06/03/10 14:13
Cal Standard	0F15501-CAL8	SEQ-CAL8.D	06/03/10 14:49
Cal Standard	0F15501-CAL9	SEQ-CAL9.D	06/03/10 15:26
Cal Standard	0F15501-CALA	SEQ-CALA.D	06/03/10 16:03
Cal Standard	0F15501-CALB	SEQ-CALB.D	06/03/10 16:39
Initial Cal Check	0F15501-ICV1	SEQ-ICV1.D	06/03/10 17:16

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15604	Instrument:	MS-BNA3
Calibration:	0156001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15604-TUN1	SEQ-TUN2.D	06/03/10 18:24
Calibration Check	0F15604-CCV1	SEQ-CCV1.D	06/03/10 18:45
LCS	0E06038-BS1	E06038L1.D	06/03/10 19:21
Blank	0E06038-BLK1	E06038B1.D	06/03/10 19:57
32SS-22-0002	1004264-24	0426424.D	06/04/10 05:36
32SB-22-0506	1004264-25	0426425.D	06/04/10 06:12

ANALYSIS SEQUENCE SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16003	Instrument:	MS-BNA4
Calibration:	0098001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16003-TUN1	SEQ-TUN2.D	06/06/10 04:34
Calibration Check	0F16003-CCV1	SEQ-CCV2.D	06/06/10 04:51
LCS	0E11008-BS1	E11008L1.D	06/06/10 08:50
Blank	0E11008-BLK1	E11008B1.D	06/06/10 09:24
32SS-08-0002	1004264-01	0426401.D	06/06/10 09:58
32SB-08-0607	1004264-02	0426402.D	06/06/10 10:32
32SB-11-0607	1004264-04	0426404.D	06/06/10 11:06
32SS-12-0002	1004264-05	0426405.D	06/06/10 11:40
32SB-12-0607	1004264-06	0426406.D	06/06/10 12:14
32SS-13-0002	1004264-07	0426407.D	06/06/10 12:49
32SB-13-0607	1004264-08	0426408.D	06/06/10 13:23
32SB-15-0506	1004264-10	0426410.D	06/06/10 13:57
32SS-08-0002	0E11008-MS1	0426401M.D	06/06/10 14:31
32SS-08-0002	0E11008-MSD1	0426401S.D	06/06/10 15:05

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16103	Instrument:	MS-BNA3
Calibration:	0156001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16103-TUN1	SEQ-TUN1.D	06/06/10 06:22
Calibration Check	0F16103-CCV1	SEQ-CCV1.D	06/06/10 06:44
LCS	0E11010-BS1	E11010L1.D	06/06/10 15:12
Blank	0E11010-BLK1	E11010B1.D	06/06/10 15:48
32SB-20-0506	1004264-21	0426421.D	06/06/10 16:24
32SS-21-0002	1004264-22	0426422.D	06/06/10 17:00
32SB-20-0506	0E11010-MS1	0426421M.D	06/06/10 17:37
32SB-20-0506	0E11010-MSD1	0426421S.D	06/06/10 18:13

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16104	Instrument:	MS-BNA3
Calibration:	0156001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16104-TUN1	SEQ-TUN2.D	06/06/10 19:21
Calibration Check	0F16104-CCV1	SEQ-CCV2.D	06/06/10 19:42
32SB-21-0506	1004264-23	0426423.D	06/06/10 20:19
32SS-23-0002	1004264-26	0426426.D	06/06/10 20:55

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16111	Instrument:	MS-BNA4
Calibration:	0098001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16111-TUN1	SEQ-TUN1.D	06/07/10 14:13
Calibration Check	0F16111-CCV1	SEQ-CCV1.D	06/07/10 14:31
32SB-16-0607	1004264-12	0426412.D	06/07/10 16:14
32SB-17-1112	1004264-15	0426415.D	06/07/10 16:48
32SB-18-0506	1004264-17	0426417.D	06/07/10 17:22
32SB-19-0506	1004264-19	0426419.D	06/07/10 17:57
32SS-20-0002	1004264-20	0426420.D	06/07/10 18:31
32SS-18-0002	1004264-16	0426416.D	06/07/10 22:29
32SS-11-0002	1004264-03	0426403D.D	06/07/10 23:03
32SS-16-0002	1004264-11	0426411D.D	06/08/10 00:11
32SS-17-0002	1004264-13	0426413D.D	06/08/10 00:45
32SB-17-0607	1004264-14	0426414D.D	06/08/10 01:19
32SS-19-0002	1004264-18	0426418D.D	06/08/10 01:54

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16721	Instrument:	MS-BNA4
Calibration:	0098001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16721-TUN1	SEQ-TUN1.D	06/16/10 01:37
Calibration Check	0F16721-CCV1	SEQ-CCV1.D	06/16/10 01:55
32SS-15-0002	1004264-09	0426409D.D	06/16/10 09:19

ANALYSIS SEQUENCE SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	9L35713	Instrument:	MS-BNA4
Calibration:	0098001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	9L35713-TUN1	DF1112B1.D	11/12/09 15:24
Cal Standard	9L35713-CAL2	cal2.D	11/12/09 15:43
Cal Standard	9L35713-CAL3	cal3.D	11/12/09 16:16
Cal Standard	9L35713-CAL4	cal4.D	11/12/09 16:50
Cal Standard	9L35713-CAL5	cal5.D	11/12/09 17:24
Cal Standard	9L35713-CAL6	cal6.D	11/12/09 17:58
Cal Standard	9L35713-CAL7	cal7.D	11/12/09 18:32
Cal Standard	9L35713-CAL8	cal8.D	11/12/09 19:06
Cal Standard	9L35713-CAL9	cal9.D	11/12/09 19:40
Cal Standard	9L35713-CALA	cal10.D	11/12/09 20:14
Cal Standard	9L35713-CALB	cal11.D	11/12/09 20:48
Cal Standard	9L35713-CALC	cal12.D	11/12/09 21:22
Initial Cal Check	9L35713-ICV1	ICV1.D	11/12/09 21:55

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/03/10
Instrument ID:	MS-BNA3	Injection Time:	10:13
Sequence:	0F15501	Lab Sample ID:	0F15501-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	41.5	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	48.5	PASS
70	Less than 2% of 69	0.535	PASS
127	40 - 60% of 198	57.2	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.15	PASS
275	10 - 30% of 198	21.3	PASS
365	1 - 200% of 198	2.05	PASS
441	0.001 - 100% of 443	71.8	PASS
442	40 - 200% of 198	42.1	PASS
443	17 - 23% of 442	20.3	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	06/03/10
Instrument ID:	MS-BNA3	Injection Time:	18:24
Sequence:	0F15604	Lab Sample ID:	0F15604-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	31.3	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	37.5	PASS
70	Less than 2% of 69	0.454	PASS
127	40 - 60% of 198	48.7	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.68	PASS
275	10 - 30% of 198	24.7	PASS
365	1 - 200% of 198	2.7	PASS
441	0.001 - 100% of 443	77	PASS
442	40 - 200% of 198	58.4	PASS
443	17 - 23% of 442	19.6	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	06/06/10
Instrument ID:	MS-BNA4	Injection Time:	04:34
Sequence:	0F16003	Lab Sample ID:	0F16003-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	53.9	PASS
68	Less than 2% of 69	1.48	PASS
69	Less than 200% of 198	52.9	PASS
70	Less than 2% of 69	0.537	PASS
127	40 - 60% of 198	59.2	PASS
197	Less than 1% of 198	0.725	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.95	PASS
275	10 - 30% of 198	23.8	PASS
365	1 - 200% of 198	2.88	PASS
441	0.001 - 100% of 443	80.7	PASS
442	40 - 200% of 198	81.6	PASS
443	17 - 23% of 442	20.2	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/06/10
Instrument ID:	MS-BNA3	Injection Time:	06:22
Sequence:	0F16103	Lab Sample ID:	0F16103-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	40.3	PASS
68	Less than 2% of 69	0.891	PASS
69	Less than 200% of 198	46.7	PASS
70	Less than 2% of 69	0.554	PASS
127	40 - 60% of 198	53.6	PASS
197	Less than 1% of 198	0.0454	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.05	PASS
275	10 - 30% of 198	24.8	PASS
365	1 - 200% of 198	3.18	PASS
441	0.001 - 100% of 443	75.2	PASS
442	40 - 200% of 198	73.5	PASS
443	17 - 23% of 442	19.8	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	06/06/10
Instrument ID:	MS-BNA3	Injection Time:	19:21
Sequence:	0F16104	Lab Sample ID:	0F16104-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	36.3	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	41.8	PASS
70	Less than 2% of 69	0.627	PASS
127	40 - 60% of 198	51.9	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.06	PASS
275	10 - 30% of 198	23.5	PASS
365	1 - 200% of 198	2.82	PASS
441	0.001 - 100% of 443	74.8	PASS
442	40 - 200% of 198	50.7	PASS
443	17 - 23% of 442	20	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/07/10
Instrument ID:	MS-BNA4	Injection Time:	14:13
Sequence:	0F16111	Lab Sample ID:	0F16111-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	47.8	PASS
68	Less than 2% of 69	1.66	PASS
69	Less than 200% of 198	48.5	PASS
70	Less than 2% of 69	0.5	PASS
127	40 - 60% of 198	57.7	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.94	PASS
275	10 - 30% of 198	26.3	PASS
365	1 - 200% of 198	3.03	PASS
441	0.001 - 100% of 443	78.1	PASS
442	40 - 200% of 198	104	PASS
443	17 - 23% of 442	20.3	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/16/10
Instrument ID:	MS-BNA4	Injection Time:	01:37
Sequence:	0F16721	Lab Sample ID:	0F16721-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	36.1	PASS
68	Less than 2% of 69	1.57	PASS
69	Less than 200% of 198	36.3	PASS
70	Less than 2% of 69	0.49	PASS
127	40 - 60% of 198	47.2	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.66	PASS
275	10 - 30% of 198	29.3	PASS
365	1 - 200% of 198	4.45	PASS
441	0.001 - 100% of 443	82.5	PASS
442	40 - 200% of 198	153	PASS
443	17 - 23% of 442	20.1	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	DF1112B1.D	Injection Date:	11/12/09
Instrument ID:	MS-BNA4	Injection Time:	15:24
Sequence:	9L35713	Lab Sample ID:	9L35713-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	42.1	PASS
68	Less than 2% of 69	1.55	PASS
69	Less than 200% of 198	48.6	PASS
70	Less than 2% of 69	0.491	PASS
127	40 - 60% of 198	54.8	PASS
197	Less than 1% of 198	0.528	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.05	PASS
275	10 - 30% of 198	21.8	PASS
365	1 - 200% of 198	2.27	PASS
441	0.001 - 100% of 443	77.8	PASS
442	40 - 200% of 198	60.7	PASS
443	17 - 23% of 442	20.7	PASS

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0156001
Lab File ID:	SEQ-ICV1.D	Calibration Date:	06/03/10 10:00
Sequence:	0F15501	Injection Date:	06/03/10
Lab Sample ID:	0F15501-ICV1	Injection Time:	17:16

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Acenaphthene	A	5.000	4.847	0.6012431	0.5828774		-3.1	20
Acenaphthylene	A	5.000	5.192	0.9158405	0.9510355		3.8	20
Anthracene	A	5.000	5.523	0.8705871	0.9616306		10.5	20
Benzo(a)anthracene	A	5.000	5.465	0.7827159	0.8554742		9.3	20
Benzo(a)pyrene	Q	5.000	4.888	1.030906	1.147426		-2.2	20
Benzo(b)fluoranthene	L	5.000	4.779	1.129732	1.225146		-4.4	20
Benzo(g,h,i)perylene	A	5.000	4.885	0.9698277	0.9475424		-2.3	20
Benzo(k)fluoranthene	Q	5.000	4.634	1.107235	1.16417		-7.3	20
Chrysene	A	5.000	4.997	0.8305551	0.8300321		-0.06	20
Dibenz(a,h)anthracene	A	5.000	5.286	0.855389	0.904263		5.7	20
Fluoranthene	A	5.000	5.463	0.933897	1.020336		9.3	20
Fluorene	A	5.000	5.247	0.6453976	0.6773211		4.9	20
Indeno(1,2,3-cd)pyrene	A	5.000	5.218	0.9165747	0.9566115		4.4	20
1-Methylnaphthalene	A	5.000	4.592	0.582316	0.5348542		-8.2	20
2-Methylnaphthalene	A	5.000	4.798	0.6301093	0.6046013		-4.0	20
Naphthalene	A	5.000	4.505	0.9310503	0.8388271		-9.9	20
Phenanthrene	A	5.000	5.128	0.9661153	0.9909139		2.6	20
Pyrene	A	5.000	5.285	0.9799586	1.035874		5.7	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0098001
Lab File ID:	ICV1.D	Calibration Date:	11/12/09 11:02
Sequence:	9L35713	Injection Date:	11/12/09
Lab Sample ID:	9L35713-ICV1	Injection Time:	21:55

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Acenaphthene	A	5.000	5.088	0.7457972	0.7589529		1.8	20
Acenaphthylene	A	5.000	4.650	0.9996575	0.9296487		-7.0	20
Anthracene	A	5.000	5.306	0.9948455	1.055827		6.1	20
Benzo(a)anthracene	A	5.000	5.736	0.7581512	0.8697518		14.7	20
Benzo(a)pyrene	A	5.000	5.183	0.9592349	0.9943783		3.7	20
Benzo(b)fluoranthene	A	5.000	5.289	1.176864	1.244926		5.8	20
Benzo(g,h,i)perylene	A	5.000	4.944	0.8650452	0.8554135		-1.1	20
Benzo(k)fluoranthene	A	5.000	5.441	1.169451	1.272709		8.8	20
Chrysene	A	5.000	5.780	0.7324149	0.8467581		15.6	20
Dibenz(a,h)anthracene	A	5.000	5.176	0.7647294	0.7916294		3.5	20
Fluoranthene	A	5.000	5.472	1.030294	1.127536		9.4	20
Fluorene	A	5.000	5.185	0.7457374	0.7733265		3.7	20
Indeno(1,2,3-cd)pyrene	A	5.000	5.140	0.7715006	0.7930895		2.8	20
1-Methylnaphthalene	A	5.000	4.490	0.7407783	0.6652298		-10.2	20
2-Methylnaphthalene	A	5.000	4.750	0.8009425	0.7609113		-5.0	20
Naphthalene	A	5.000	4.862	1.224033	1.190144		-2.8	20
Phenanthrene	A	5.000	5.149	1.064344	1.096091		3.0	20
Pyrene	A	5.000	5.519	1.038027	1.145716		10.4	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0156001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	06/03/10 10:00
Sequence:	0F15604	Injection Date:	06/03/10
Lab Sample ID:	0F15604-CCV1	Injection Time:	18:45

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.396	0.6012431	0.6488751		7.9	20
Acenaphthylene	A	5.000	5.693	0.9158405	1.042769		13.9	20
Anthracene	A	5.000	6.212	0.8705871	1.08164		24.2	20 *
Benzo(a)anthracene	A	5.000	6.354	0.7827159	0.9946693		27.1	20 *
Benzo(a)pyrene	Q	5.000	5.541	1.030906	1.302097		10.8	20
Benzo(b)fluoranthene	L	5.000	5.667	1.129732	1.452866		13.3	20
Benzo(g,h,i)perylene	A	5.000	5.747	0.9698277	1.114659		14.9	20
Benzo(k)fluoranthene	Q	5.000	5.479	1.107235	1.370729		9.6	20
Chrysene	A	5.000	5.908	0.8305551	0.9813749		18.2	20
Dibenz(a,h)anthracene	A	5.000	6.139	0.855389	1.050205		22.8	20 *
Fluoranthene	A	5.000	6.358	0.933897	1.187565		27.2	20 *
Fluorene	A	5.000	5.846	0.6453976	0.7546572		16.9	20
Indeno(1,2,3-cd)pyrene	A	5.000	6.075	0.9165747	1.113622		21.5	20 *
1-Methylnaphthalene	A	5.000	5.169	0.582316	0.6019556		3.4	20
2-Methylnaphthalene	A	5.000	5.513	0.6301093	0.6947382		10.3	20
Naphthalene	A	5.000	5.236	0.9310503	0.9750807		4.7	20
Phenanthrene	A	5.000	5.791	0.9661153	1.119046		15.8	20
Pyrene	A	5.000	6.238	0.9799586	1.222656		24.8	20 *
2-Fluorobiphenyl	A	5.000	5.536	0.694446	0.7688973		10.7	20
Terphenyl-d14	A	5.000	6.422	0.6581084	0.8452588		28.4	20 *

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0098001
Lab File ID:	SEQ-CCV2.D	Calibration Date:	11/12/09 11:02
Sequence:	0F16003	Injection Date:	06/06/10
Lab Sample ID:	0F16003-CCV1	Injection Time:	04:51

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.488	0.7457972	0.8186367		9.8	20
Acenaphthylene	A	5.000	5.971	0.9996575	1.19374		19.4	20
Anthracene	A	5.000	5.332	0.9948455	1.060868		6.6	20
Benzo(a)anthracene	A	5.000	4.537	0.7581512	0.6878896		-9.3	20
Benzo(a)pyrene	A	5.000	5.573	0.9592349	1.069129		11.5	20
Benzo(b)fluoranthene	A	5.000	5.680	1.176864	1.336845		13.6	20
Benzo(g,h,i)perylene	A	5.000	4.765	0.8650452	0.8243393		-4.7	20
Benzo(k)fluoranthene	A	5.000	5.547	1.169451	1.297492		10.9	20
Chrysene	A	5.000	4.686	0.7324149	0.6864541		-6.3	20
Dibenz(a,h)anthracene	A	5.000	4.496	0.7647294	0.687729		-10.1	20
Fluoranthene	A	5.000	5.415	1.030294	1.115873		8.3	20
Fluorene	A	5.000	5.141	0.7457374	0.7667465		2.8	20
Indeno(1,2,3-cd)pyrene	A	5.000	4.820	0.7715006	0.7437389		-3.6	20
1-Methylnaphthalene	A	5.000	5.029	0.7407783	0.7451236		0.6	20
2-Methylnaphthalene	A	5.000	5.317	0.8009425	0.8517276		6.3	20
Naphthalene	A	5.000	5.340	1.224033	1.307262		6.8	20
Phenanthrene	A	5.000	5.089	1.064344	1.083253		1.8	20
Pyrene	A	5.000	5.521	1.038027	1.146187		10.4	20
2-Fluorobiphenyl	A	5.000	5.255	0.8655987	0.9097503		5.1	20
Terphenyl-d14	A	5.000	4.697	0.776943	0.729916		-6.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0156001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	06/03/10 10:00
Sequence:	0F16103	Injection Date:	06/06/10
Lab Sample ID:	0F16103-CCV1	Injection Time:	06:44

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.232	0.6012431	0.6291943		4.6	20
Acenaphthylene	A	5.000	5.562	0.9158405	1.018883		11.3	20
Anthracene	A	5.000	5.677	0.8705871	0.9885227		13.5	20
Benzo(a)anthracene	A	5.000	4.946	0.7827159	0.7742593		-1.1	20
Benzo(a)pyrene	Q	5.000	5.385	1.030906	1.264995		7.7	20
Benzo(b)fluoranthene	L	5.000	5.736	1.129732	1.470614		14.7	20
Benzo(g,h,i)perylene	A	5.000	4.687	0.9698277	0.9090827		-6.3	20
Benzo(k)fluoranthene	Q	5.000	5.690	1.107235	1.421977		13.8	20
Chrysene	A	5.000	4.346	0.8305551	0.7219164		-13.1	20
Dibenz(a,h)anthracene	A	5.000	5.035	0.855389	0.8613325		0.7	20
Fluoranthene	A	5.000	5.618	0.933897	1.049299		12.4	20
Fluorene	A	5.000	5.746	0.6453976	0.7417359		14.9	20
Indeno(1,2,3-cd)pyrene	A	5.000	5.024	0.9165747	0.9210273		0.5	20
1-Methylnaphthalene	A	5.000	5.045	0.582316	0.58758		0.9	20
2-Methylnaphthalene	A	5.000	5.349	0.6301093	0.6741203		7.0	20
Naphthalene	A	5.000	4.946	0.9310503	0.9209389		-1.1	20
Phenanthrene	A	5.000	5.539	0.9661153	1.070258		10.8	20
Pyrene	A	5.000	5.470	0.9799586	1.072178		9.4	20
2-Fluorobiphenyl	A	5.000	5.437	0.694446	0.7551623		8.7	20
Terphenyl-d14	A	5.000	5.401	0.6581084	0.710859		8.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0156001
Lab File ID:	SEQ-CCV2.D	Calibration Date:	06/03/10 10:00
Sequence:	0F16104	Injection Date:	06/06/10
Lab Sample ID:	0F16104-CCV1	Injection Time:	19:42

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.147	0.6012431	0.6189086		2.9	20
Acenaphthylene	A	5.000	5.497	0.9158405	1.006821		9.9	20
Anthracene	A	5.000	5.737	0.8705871	0.998944		14.7	20
Benzo(a)anthracene	A	5.000	5.310	0.7827159	0.8313305		6.2	20
Benzo(a)pyrene	Q	5.000	5.194	1.030906	1.219858		3.9	20
Benzo(b)fluoranthene	L	5.000	5.543	1.129732	1.421083		10.9	20
Benzo(g,h,i)perylene	A	5.000	3.791	0.9698277	0.7353982		-24.2	20 *
Benzo(k)fluoranthene	Q	5.000	5.670	1.107235	1.417173		13.4	20
Chrysene	A	5.000	4.753	0.8305551	0.789516		-4.9	20
Dibenz(a,h)anthracene	A	5.000	4.197	0.855389	0.7180157		-16.1	20
Fluoranthene	A	5.000	5.561	0.933897	1.038761		11.2	20
Fluorene	A	5.000	5.755	0.6453976	0.7428678		15.1	20
Indeno(1,2,3-cd)pyrene	A	5.000	4.074	0.9165747	0.7469131		-18.5	20
1-Methylnaphthalene	A	5.000	5.019	0.582316	0.5844826		0.4	20
2-Methylnaphthalene	A	5.000	5.335	0.6301093	0.6723375		6.7	20
Naphthalene	A	5.000	4.791	0.9310503	0.8921969		-4.2	20
Phenanthrene	A	5.000	5.509	0.9661153	1.064419		10.2	20
Pyrene	A	5.000	5.287	0.9799586	1.036228		5.7	20
2-Fluorobiphenyl	A	5.000	5.291	0.694446	0.7348623		5.8	20
Terphenyl-d14	A	5.000	5.554	0.6581084	0.7309775		11.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0098001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	11/12/09 11:02
Sequence:	0F16111	Injection Date:	06/07/10
Lab Sample ID:	0F16111-CCV1	Injection Time:	14:31

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.054	0.7457972	0.7537916		1.1	20
Acenaphthylene	A	5.000	5.764	0.9996575	1.152508		15.3	20
Anthracene	A	5.000	5.390	0.9948455	1.072362		7.8	20
Benzo(a)anthracene	A	5.000	5.368	0.7581512	0.8139588		7.4	20
Benzo(a)pyrene	A	5.000	5.715	0.9592349	1.09634		14.3	20
Benzo(b)fluoranthene	A	5.000	5.521	1.176864	1.299615		10.4	20
Benzo(g,h,i)perylene	A	5.000	6.142	0.8650452	1.062648		22.8	20 *
Benzo(k)fluoranthene	A	5.000	5.304	1.169451	1.240641		6.1	20
Chrysene	A	5.000	5.504	0.7324149	0.8061835		10.1	20
Dibenz(a,h)anthracene	A	5.000	6.546	0.7647294	1.001233		30.9	20 *
Fluoranthene	A	5.000	5.419	1.030294	1.116666		8.4	20
Fluorene	A	5.000	5.167	0.7457374	0.7706052		3.3	20
Indeno(1,2,3-cd)pyrene	A	5.000	6.659	0.7715006	1.027518		33.2	20 *
1-Methylnaphthalene	A	5.000	4.627	0.7407783	0.6854786		-7.5	20
2-Methylnaphthalene	A	5.000	4.874	0.8009425	0.7806936		-2.5	20
Naphthalene	A	5.000	4.908	1.224033	1.20156		-1.8	20
Phenanthrene	A	5.000	5.118	1.064344	1.089374		2.4	20
Pyrene	A	5.000	5.480	1.038027	1.137645		9.6	20
2-Fluorobiphenyl	A	5.000	4.893	0.8655987	0.847059		-2.1	20
Terphenyl-d14	A	5.000	5.308	0.776943	0.8248227		6.2	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0098001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	11/12/09 11:02
Sequence:	0F16721	Injection Date:	06/16/10
Lab Sample ID:	0F16721-CCV1	Injection Time:	01:55

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.439	0.7457972	0.8112861		8.8	20
Acenaphthylene	A	5.000	6.217	0.9996575	1.242978		24.3	20 *
Anthracene	A	5.000	5.764	0.9948455	1.146927		15.3	20
Benzo(a)anthracene	A	5.000	6.031	0.7581512	0.9144857		20.6	20 *
Benzo(a)pyrene	A	5.000	6.136	0.9592349	1.177098		22.7	20 *
Benzo(b)fluoranthene	A	5.000	6.182	1.176864	1.455066		23.6	20 *
Benzo(g,h,i)perylene	A	5.000	7.262	0.8650452	1.256403		45.2	20 *
Benzo(k)fluoranthene	A	5.000	5.096	1.169451	1.191966		1.9	20
Chrysene	A	5.000	6.241	0.7324149	0.9142081		24.8	20 *
Dibenz(a,h)anthracene	A	5.000	7.538	0.7647294	1.152947		50.8	20 *
Fluoranthene	A	5.000	5.550	1.030294	1.14358		11.0	20
Fluorene	A	5.000	5.199	0.7457374	0.7754302		4.0	20
Indeno(1,2,3-cd)pyrene	A	5.000	7.858	0.7715006	1.212482		57.2	20 *
1-Methylnaphthalene	A	5.000	4.798	0.7407783	0.7108443		-4.0	20
2-Methylnaphthalene	A	5.000	5.033	0.8009425	0.8062852		0.7	20
Naphthalene	A	5.000	4.942	1.224033	1.209961		-1.1	20
Phenanthrene	A	5.000	5.325	1.064344	1.133483		6.5	20
Pyrene	A	5.000	5.693	1.038027	1.181874		13.9	20
2-Fluorobiphenyl	A	5.000	5.003	0.8655987	0.8660647		0.05	20
Terphenyl-d14	A	5.000	5.308	0.776943	0.8247763		6.2	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15604	Instrument:	MS-BNA3
		Calibration:	0156001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15604-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 06/03/10 18:45			
Phenanthrene-d10	111881	12.776	114187	12.766	98	50 - 200	0.0100	+/-0.50	
Perylene-d12	73336	24.668	78489	24.667	93	50 - 200	0.0010	+/-0.50	
LCS (0E06038-BS1)			Lab File ID: E06038L1.D			Analyzed: 06/03/10 19:21			
Phenanthrene-d10	91070	12.765	111881	12.776	81	50 - 200	-0.0110	+/-0.50	
Perylene-d12	67483	24.667	73336	24.668	92	50 - 200	-0.0010	+/-0.50	
Blank (0E06038-BLK1)			Lab File ID: E06038B1.D			Analyzed: 06/03/10 19:57			
Phenanthrene-d10	101615	12.766	111881	12.776	91	50 - 200	-0.0100	+/-0.50	
Perylene-d12	74438	24.668	73336	24.668	102	50 - 200	0.0000	+/-0.50	
32SS-22-0002 (1004264-24)			Lab File ID: 0426424.D			Analyzed: 06/04/10 05:36			
Phenanthrene-d10	71500	12.769	111881	12.776	64	50 - 200	-0.0070	+/-0.50	
Perylene-d12	36307	24.67	73336	24.668	50	50 - 200	0.0020	+/-0.50	
32SB-22-0506 (1004264-25)			Lab File ID: 0426425.D			Analyzed: 06/04/10 06:12			
Phenanthrene-d10	57481	12.766	111881	12.776	51	50 - 200	-0.0100	+/-0.50	
Perylene-d12	38410	24.667	73336	24.668	52	50 - 200	-0.0010	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16003	Instrument:	MS-BNA4
		Calibration:	0098001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16003-CCV1)			Lab File ID: SEQ-CCV2.D			Analyzed: 06/06/10 04:51			
Phenanthrene-d10	164825	13.349	196258	13.55	84	50 - 200	-0.2010	+/-0.50	
Perylene-d12	74012	25.109	108221	25.217	68	50 - 200	-0.1080	+/-0.50	
LCS (0E11008-BS1)			Lab File ID: E11008L1.D			Analyzed: 06/06/10 08:50			
Phenanthrene-d10	173518	13.359	164825	13.349	105	50 - 200	0.0100	+/-0.50	
Perylene-d12	108994	25.11	74012	25.109	147	50 - 200	0.0010	+/-0.50	
Blank (0E11008-BLK1)			Lab File ID: E11008B1.D			Analyzed: 06/06/10 09:24			
Phenanthrene-d10	146949	13.368	164825	13.349	89	50 - 200	0.0190	+/-0.50	
Perylene-d12	67521	25.119	74012	25.109	91	50 - 200	0.0100	+/-0.50	
32SS-08-0002 (1004264-01)			Lab File ID: 0426401.D			Analyzed: 06/06/10 09:58			
Phenanthrene-d10	146199	13.359	164825	13.349	89	50 - 200	0.0100	+/-0.50	
Perylene-d12	51539	25.119	74012	25.109	70	50 - 200	0.0100	+/-0.50	
32SB-08-0607 (1004264-02)			Lab File ID: 0426402.D			Analyzed: 06/06/10 10:32			
Phenanthrene-d10	148064	13.359	164825	13.349	90	50 - 200	0.0100	+/-0.50	
Perylene-d12	57579	25.109	74012	25.109	78	50 - 200	0.0000	+/-0.50	
32SB-11-0607 (1004264-04)			Lab File ID: 0426404.D			Analyzed: 06/06/10 11:06			
Phenanthrene-d10	144763	13.359	164825	13.349	88	50 - 200	0.0100	+/-0.50	
Perylene-d12	40495	25.11	74012	25.109	55	50 - 200	0.0010	+/-0.50	
32SS-12-0002 (1004264-05)			Lab File ID: 0426405.D			Analyzed: 06/06/10 11:40			
Phenanthrene-d10	180329	13.461	164825	13.349	109	50 - 200	0.1120	+/-0.50	
Perylene-d12	55885	25.109	74012	25.109	76	50 - 200	0.0000	+/-0.50	
32SB-12-0607 (1004264-06)			Lab File ID: 0426406.D			Analyzed: 06/06/10 12:14			
Phenanthrene-d10	135876	13.359	164825	13.349	82	50 - 200	0.0100	+/-0.50	
Perylene-d12	67498	25.119	74012	25.109	91	50 - 200	0.0100	+/-0.50	
32SS-13-0002 (1004264-07)			Lab File ID: 0426407.D			Analyzed: 06/06/10 12:49			
Phenanthrene-d10	154014	13.359	164825	13.349	93	50 - 200	0.0100	+/-0.50	
Perylene-d12	75082	25.109	74012	25.109	101	50 - 200	0.0000	+/-0.50	
32SB-13-0607 (1004264-08)			Lab File ID: 0426408.D			Analyzed: 06/06/10 13:23			
Phenanthrene-d10	130192	13.359	164825	13.349	79	50 - 200	0.0100	+/-0.50	
Perylene-d12	49780	25.119	74012	25.109	67	50 - 200	0.0100	+/-0.50	
32SB-15-0506 (1004264-10)			Lab File ID: 0426410.D			Analyzed: 06/06/10 13:57			
Phenanthrene-d10	160753	13.35	164825	13.349	98	50 - 200	0.0010	+/-0.50	
Perylene-d12	60717	25.11	74012	25.109	82	50 - 200	0.0010	+/-0.50	
Matrix Spike (0E11008-MS1)			Lab File ID: 0426401M.D			Analyzed: 06/06/10 14:31			
Phenanthrene-d10	144781	13.359	164825	13.349	88	50 - 200	0.0100	+/-0.50	
Perylene-d12	62481	25.109	74012	25.109	84	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16003	Instrument:	MS-BNA4
		Calibration:	0098001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (0E11008-MSD1)			Lab File ID: 0426401S.D			Analyzed: 06/06/10 15:05			
Phenanthrene-d10	156221	13.359	164825	13.349	95	50 - 200	0.0100	+/-0.50	
Perylene-d12	92029	25.109	74012	25.109	124	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16103	Instrument:	MS-BNA3
		Calibration:	0156001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16103-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 06/06/10 06:44			
Phenanthrene-d10	138116	12.674	114187	12.766	121	50 - 200	-0.0920	+/-0.50	
Perylene-d12	70827	24.594	78489	24.667	90	50 - 200	-0.0730	+/-0.50	
LCS (0E11010-BS1)			Lab File ID: E11010L1.D			Analyzed: 06/06/10 15:12			
Phenanthrene-d10	104972	12.682	138116	12.674	76	50 - 200	0.0080	+/-0.50	
Perylene-d12	59555	24.593	70827	24.594	84	50 - 200	-0.0010	+/-0.50	
Blank (0E11010-BLK1)			Lab File ID: E11010B1.D			Analyzed: 06/06/10 15:48			
Phenanthrene-d10	80058	12.684	138116	12.674	58	50 - 200	0.0100	+/-0.50	
Perylene-d12	45379	24.594	70827	24.594	64	50 - 200	0.0000	+/-0.50	
32SB-20-0506 (1004264-21)			Lab File ID: 0426421.D			Analyzed: 06/06/10 16:24			
Phenanthrene-d10	46741	12.674	138116	12.674	34	50 - 200	0.0000	+/-0.50	*
Perylene-d12	36977	24.594	70827	24.594	52	50 - 200	0.0000	+/-0.50	
32SS-21-0002 (1004264-22)			Lab File ID: 0426422.D			Analyzed: 06/06/10 17:00			
Phenanthrene-d10	72180	12.673	138116	12.674	52	50 - 200	-0.0010	+/-0.50	
Perylene-d12	37775	24.593	70827	24.594	53	50 - 200	-0.0010	+/-0.50	
Matrix Spike (0E11010-MS1)			Lab File ID: 0426421M.D			Analyzed: 06/06/10 17:37			
Phenanthrene-d10	54294	12.676	138116	12.674	39	50 - 200	0.0020	+/-0.50	*
Perylene-d12	47791	24.587	70827	24.594	67	50 - 200	-0.0070	+/-0.50	
Matrix Spike Dup (0E11010-MSD1)			Lab File ID: 0426421S.D			Analyzed: 06/06/10 18:13			
Phenanthrene-d10	48303	12.684	138116	12.674	35	50 - 200	0.0100	+/-0.50	*
Perylene-d12	45865	24.595	70827	24.594	65	50 - 200	0.0010	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16104	Instrument:	MS-BNA3
		Calibration:	0156001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16104-CCV1)			Lab File ID: SEQ-CCV2.D			Analyzed: 06/06/10 19:42			
Phenanthrene-d10	110225	12.674	114187	12.766	97	50 - 200	-0.0920	+/-0.50	
Perylene-d12	52593	24.594	78489	24.667	67	50 - 200	-0.0730	+/-0.50	
32SB-21-0506 (1004264-23)			Lab File ID: 0426423.D			Analyzed: 06/06/10 20:19			
Phenanthrene-d10	88385	12.675	110225	12.674	80	50 - 200	0.0010	+/-0.50	
Perylene-d12	43635	24.586	52593	24.594	83	50 - 200	-0.0080	+/-0.50	
32SS-23-0002 (1004264-26)			Lab File ID: 0426426.D			Analyzed: 06/06/10 20:55			
Phenanthrene-d10	81721	12.668	110225	12.674	74	50 - 200	-0.0060	+/-0.50	
Perylene-d12	36172	24.588	52593	24.594	69	50 - 200	-0.0060	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0F16111

SDG: CTOF273_002
Project: CTOF273 NSA Crane SMU32
Instrument: MS-BNA4
Calibration: 0098001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16111-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 06/07/10 14:31			
Phenanthrene-d10	162464	13.238	196258	13.55	83	50 - 200	-0.3120	+/-0.50	
Perylene-d12	99732	24.979	108221	25.217	92	50 - 200	-0.2380	+/-0.50	
32SB-16-0607 (1004264-12)			Lab File ID: 0426412.D			Analyzed: 06/07/10 16:14			
Phenanthrene-d10	139433	13.229	162464	13.238	86	50 - 200	-0.0090	+/-0.50	
Perylene-d12	69454	24.979	99732	24.979	70	50 - 200	0.0000	+/-0.50	
32SB-17-1112 (1004264-15)			Lab File ID: 0426415.D			Analyzed: 06/07/10 16:48			
Phenanthrene-d10	147548	13.238	162464	13.238	91	50 - 200	0.0000	+/-0.50	
Perylene-d12	97320	24.979	99732	24.979	98	50 - 200	0.0000	+/-0.50	
32SB-18-0506 (1004264-17)			Lab File ID: 0426417.D			Analyzed: 06/07/10 17:22			
Phenanthrene-d10	153814	13.238	162464	13.238	95	50 - 200	0.0000	+/-0.50	
Perylene-d12	88326	24.979	99732	24.979	89	50 - 200	0.0000	+/-0.50	
32SB-19-0506 (1004264-19)			Lab File ID: 0426419.D			Analyzed: 06/07/10 17:57			
Phenanthrene-d10	148994	13.238	162464	13.238	92	50 - 200	0.0000	+/-0.50	
Perylene-d12	100468	24.979	99732	24.979	101	50 - 200	0.0000	+/-0.50	
32SS-20-0002 (1004264-20)			Lab File ID: 0426420.D			Analyzed: 06/07/10 18:31			
Phenanthrene-d10	141554	13.238	162464	13.238	87	50 - 200	0.0000	+/-0.50	
Perylene-d12	88587	24.979	99732	24.979	89	50 - 200	0.0000	+/-0.50	
32SS-18-0002 (1004264-16)			Lab File ID: 0426416.D			Analyzed: 06/07/10 22:29			
Phenanthrene-d10	144034	13.238	162464	13.238	89	50 - 200	0.0000	+/-0.50	
Perylene-d12	104540	24.989	99732	24.979	105	50 - 200	0.0100	+/-0.50	
32SS-11-0002 (1004264-03)			Lab File ID: 0426403D.D			Analyzed: 06/07/10 23:03			
Phenanthrene-d10	148212	13.238	162464	13.238	91	50 - 200	0.0000	+/-0.50	
Perylene-d12	101655	24.979	99732	24.979	102	50 - 200	0.0000	+/-0.50	
32SS-16-0002 (1004264-11)			Lab File ID: 0426411D.D			Analyzed: 06/08/10 00:11			
Phenanthrene-d10	153226	13.238	162464	13.238	94	50 - 200	0.0000	+/-0.50	
Perylene-d12	112348	24.989	99732	24.979	113	50 - 200	0.0100	+/-0.50	
32SS-17-0002 (1004264-13)			Lab File ID: 0426413D.D			Analyzed: 06/08/10 00:45			
Phenanthrene-d10	151251	13.238	162464	13.238	93	50 - 200	0.0000	+/-0.50	
Perylene-d12	113385	24.989	99732	24.979	114	50 - 200	0.0100	+/-0.50	
32SB-17-0607 (1004264-14)			Lab File ID: 0426414D.D			Analyzed: 06/08/10 01:19			
Phenanthrene-d10	149707	13.256	162464	13.238	92	50 - 200	0.0180	+/-0.50	
Perylene-d12	99325	24.998	99732	24.979	100	50 - 200	0.0190	+/-0.50	
32SS-19-0002 (1004264-18)			Lab File ID: 0426418D.D			Analyzed: 06/08/10 01:54			
Phenanthrene-d10	141126	13.247	162464	13.238	87	50 - 200	0.0090	+/-0.50	
Perylene-d12	89347	24.998	99732	24.979	90	50 - 200	0.0190	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16721	Instrument:	MS-BNA4
		Calibration:	0098001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16721-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 06/16/10 01:55			
Phenanthrene-d10	149175	12.866	196258	13.55	76	50 - 200	-0.6840	+/-0.50	
Perylene-d12	115415	24.673	108221	25.217	107	50 - 200	-0.5440	+/-0.50	
32SS-15-0002 (1004264-09)			Lab File ID: 0426409D.D			Analyzed: 06/16/10 09:19			
Phenanthrene-d10	129127	12.866	149175	12.866	87	50 - 200	0.0000	+/-0.50	
Perylene-d12	111252	24.682	115415	24.673	96	50 - 200	0.0090	+/-0.50	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15604	Instrument:	MS-BNA3
		Calibration:	0156001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15604-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 06/03/10 18:45		
2-Fluorobiphenyl	5.000	111	80 - 120	7.652	7.652	0.0000	+/-0.500	
Terphenyl-d14	5.000	128	80 - 120	17.566	17.566	0.0000	+/-0.500	*
LCS (0E06038-BS1) ug/Kg wet				Lab File ID: E06038L1.D		Analyzed: 06/03/10 19:21		
2-Fluorobiphenyl	3333	83.3	14 - 129	7.659	7.652	0.0070	+/-0.500	
Terphenyl-d14	3333	96.1	14 - 129	17.583	17.566	0.0170	+/-0.500	
Blank (0E06038-BLK1) ug/Kg wet				Lab File ID: E06038B1.D		Analyzed: 06/03/10 19:57		
2-Fluorobiphenyl	3333	81.1	14 - 129	7.651	7.652	-0.0010	+/-0.500	
Terphenyl-d14	3333	109	14 - 129	17.585	17.566	0.0190	+/-0.500	
32SS-22-0002 (1004264-24) ug/Kg dry				Lab File ID: 0426424.D		Analyzed: 06/04/10 05:36		
2-Fluorobiphenyl	3997	103	14 - 129	7.653	7.652	0.0010	+/-0.500	
Terphenyl-d14	3997	83.3	14 - 129	17.577	17.566	0.0110	+/-0.500	
32SB-22-0506 (1004264-25) ug/Kg dry				Lab File ID: 0426425.D		Analyzed: 06/04/10 06:12		
2-Fluorobiphenyl	3931	106	14 - 129	7.651	7.652	-0.0010	+/-0.500	
Terphenyl-d14	3931	107	14 - 129	17.575	17.566	0.0090	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16003	Instrument:	MS-BNA4
		Calibration:	0098001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16003-CCV1) ug/mL				Lab File ID: SEQ-CCV2.D		Analyzed: 06/06/10 04:51		
2-Fluorobiphenyl	5.000	105	80 - 120	8.125	8.125	0.0000	+/-0.500	
Terphenyl-d14	5.000	93.9	80 - 120	18.109	18.109	0.0000	+/-0.500	
LCS (0E11008-BS1) ug/Kg wet				Lab File ID: E11008L1.D		Analyzed: 06/06/10 08:50		
2-Fluorobiphenyl	3333	72.8	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3333	76.7	14 - 129	18.137	18.109	0.0280	+/-0.500	
Blank (0E11008-BLK1) ug/Kg wet				Lab File ID: E11008B1.D		Analyzed: 06/06/10 09:24		
2-Fluorobiphenyl	3333	80.3	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3333	77.3	14 - 129	18.137	18.109	0.0280	+/-0.500	
32SS-08-0002 (1004264-01) ug/Kg dry				Lab File ID: 0426401.D		Analyzed: 06/06/10 09:58		
2-Fluorobiphenyl	4126	82.7	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	4126	72.8	14 - 129	18.137	18.109	0.0280	+/-0.500	
32SB-08-0607 (1004264-02) ug/Kg dry				Lab File ID: 0426402.D		Analyzed: 06/06/10 10:32		
2-Fluorobiphenyl	3878	86.9	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3878	78.3	14 - 129	18.137	18.109	0.0280	+/-0.500	
32SB-11-0607 (1004264-04) ug/Kg dry				Lab File ID: 0426404.D		Analyzed: 06/06/10 11:06		
2-Fluorobiphenyl	3945	77.4	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3945	69.3	14 - 129	18.128	18.109	0.0190	+/-0.500	
32SS-12-0002 (1004264-05) ug/Kg dry				Lab File ID: 0426405.D		Analyzed: 06/06/10 11:40		
2-Fluorobiphenyl	3941	62.1	14 - 129	8.199	8.125	0.0740	+/-0.500	
Terphenyl-d14	3941	67.9	14 - 129	18.184	18.109	0.0750	+/-0.500	
32SB-12-0607 (1004264-06) ug/Kg dry				Lab File ID: 0426406.D		Analyzed: 06/06/10 12:14		
2-Fluorobiphenyl	4040	79.1	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	4040	74.8	14 - 129	18.137	18.109	0.0280	+/-0.500	
32SS-13-0002 (1004264-07) ug/Kg dry				Lab File ID: 0426407.D		Analyzed: 06/06/10 12:49		
2-Fluorobiphenyl	4058	78.1	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	4058	70.8	14 - 129	18.137	18.109	0.0280	+/-0.500	
32SB-13-0607 (1004264-08) ug/Kg dry				Lab File ID: 0426408.D		Analyzed: 06/06/10 13:23		
2-Fluorobiphenyl	3918	77.1	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3918	71.9	14 - 129	18.137	18.109	0.0280	+/-0.500	
32SB-15-0506 (1004264-10) ug/Kg dry				Lab File ID: 0426410.D		Analyzed: 06/06/10 13:57		
2-Fluorobiphenyl	3949	73.9	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	3949	71.3	14 - 129	18.137	18.109	0.0280	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16003	Instrument:	MS-BNA4
		Calibration:	0098001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Matrix Spike (0E11008-MS1) ug/Kg dry				Lab File ID: 0426401M.D		Analyzed: 06/06/10 14:31		
2-Fluorobiphenyl	4126	75.9	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	4126	73.1	14 - 129	18.128	18.109	0.0190	+/-0.500	
Matrix Spike Dup (0E11008-MSD1) ug/Kg dry				Lab File ID: 0426401S.D		Analyzed: 06/06/10 15:05		
2-Fluorobiphenyl	4126	69.5	14 - 129	8.134	8.125	0.0090	+/-0.500	
Terphenyl-d14	4126	70.0	14 - 129	18.137	18.109	0.0280	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16103	Instrument:	MS-BNA3
		Calibration:	0156001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16103-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 06/06/10 06:44		
2-Fluorobiphenyl	5.000	109	80 - 120	7.577	7.577	0.0000	+/-0.500	
Terphenyl-d14	5.000	108	80 - 120	17.464	17.464	0.0000	+/-0.500	
LCS (0E11010-BS1) ug/Kg wet				Lab File ID: E11010L1.D		Analyzed: 06/06/10 15:12		
2-Fluorobiphenyl	3333	80.0	14 - 129	7.586	7.577	0.0090	+/-0.500	
Terphenyl-d14	3333	86.1	14 - 129	17.491	17.464	0.0270	+/-0.500	
Blank (0E11010-BLK1) ug/Kg wet				Lab File ID: E11010B1.D		Analyzed: 06/06/10 15:48		
2-Fluorobiphenyl	3333	87.3	14 - 129	7.578	7.577	0.0010	+/-0.500	
Terphenyl-d14	3333	87.7	14 - 129	17.483	17.464	0.0190	+/-0.500	
32SB-20-0506 (1004264-21) ug/Kg dry				Lab File ID: 0426421.D		Analyzed: 06/06/10 16:24		
2-Fluorobiphenyl	3907	117	14 - 129	7.577	7.577	0.0000	+/-0.500	
Terphenyl-d14	3907	68.2	14 - 129	17.483	17.464	0.0190	+/-0.500	
32SS-21-0002 (1004264-22) ug/Kg dry				Lab File ID: 0426422.D		Analyzed: 06/06/10 17:00		
2-Fluorobiphenyl	3888	81.6	14 - 129	7.576	7.577	-0.0010	+/-0.500	
Terphenyl-d14	3888	45.1	14 - 129	17.482	17.464	0.0180	+/-0.500	
Matrix Spike (0E11010-MS1) ug/Kg dry				Lab File ID: 0426421M.D		Analyzed: 06/06/10 17:37		
2-Fluorobiphenyl	3907	97.0	14 - 129	7.58	7.577	0.0030	+/-0.500	
Terphenyl-d14	3907	64.4	14 - 129	17.485	17.464	0.0210	+/-0.500	
Matrix Spike Dup (0E11010-MSD1) ug/Kg dry				Lab File ID: 0426421S.D		Analyzed: 06/06/10 18:13		
2-Fluorobiphenyl	3907	111	14 - 129	7.578	7.577	0.0010	+/-0.500	
Terphenyl-d14	3907	83.3	14 - 129	17.493	17.464	0.0290	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16104	Instrument:	MS-BNA3
		Calibration:	0156001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16104-CCV1) ug/mL				Lab File ID: SEQ-CCV2.D		Analyzed: 06/06/10 19:42		
2-Fluorobiphenyl	5.000	106	80 - 120	7.568	7.568	0.0000	+/-0.500	
Terphenyl-d14	5.000	111	80 - 120	17.464	17.464	0.0000	+/-0.500	
32SB-21-0506 (1004264-23) ug/Kg dry				Lab File ID: 0426423.D		Analyzed: 06/06/10 20:19		
2-Fluorobiphenyl	3932	76.6	14 - 129	7.578	7.568	0.0100	+/-0.500	
Terphenyl-d14	3932	45.5	14 - 129	17.484	17.464	0.0200	+/-0.500	
32SS-23-0002 (1004264-26) ug/Kg dry				Lab File ID: 0426426.D		Analyzed: 06/06/10 20:55		
2-Fluorobiphenyl	3903	73.3	14 - 129	7.571	7.568	0.0030	+/-0.500	
Terphenyl-d14	3903	44.1	14 - 129	17.486	17.464	0.0220	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16111	Instrument:	MS-BNA4
		Calibration:	0098001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16111-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 06/07/10 14:31		
2-Fluorobiphenyl	5.000	97.9	80 - 120	8.041	8.041	0.0000	+/-0.500	
Terphenyl-d14	5.000	106	80 - 120	17.988	17.988	0.0000	+/-0.500	
32SB-16-0607 (1004264-12) ug/Kg dry				Lab File ID: 0426412.D		Analyzed: 06/07/10 16:14		
2-Fluorobiphenyl	3914	72.5	14 - 129	8.051	8.041	0.0100	+/-0.500	
Terphenyl-d14	3914	75.4	14 - 129	18.007	17.988	0.0190	+/-0.500	
32SB-17-1112 (1004264-15) ug/Kg dry				Lab File ID: 0426415.D		Analyzed: 06/07/10 16:48		
2-Fluorobiphenyl	3874	70.8	14 - 129	8.051	8.041	0.0100	+/-0.500	
Terphenyl-d14	3874	80.5	14 - 129	18.016	17.988	0.0280	+/-0.500	
32SB-18-0506 (1004264-17) ug/Kg dry				Lab File ID: 0426417.D		Analyzed: 06/07/10 17:22		
2-Fluorobiphenyl	3945	65.0	14 - 129	8.051	8.041	0.0100	+/-0.500	
Terphenyl-d14	3945	70.1	14 - 129	18.016	17.988	0.0280	+/-0.500	
32SB-19-0506 (1004264-19) ug/Kg dry				Lab File ID: 0426419.D		Analyzed: 06/07/10 17:57		
2-Fluorobiphenyl	4068	62.0	14 - 129	8.051	8.041	0.0100	+/-0.500	
Terphenyl-d14	4068	65.6	14 - 129	18.016	17.988	0.0280	+/-0.500	
32SS-20-0002 (1004264-20) ug/Kg dry				Lab File ID: 0426420.D		Analyzed: 06/07/10 18:31		
2-Fluorobiphenyl	4264	65.2	14 - 129	8.051	8.041	0.0100	+/-0.500	
Terphenyl-d14	4264	65.8	14 - 129	18.016	17.988	0.0280	+/-0.500	
32SS-18-0002 (1004264-16) ug/Kg dry				Lab File ID: 0426416.D		Analyzed: 06/07/10 22:29		
2-Fluorobiphenyl	3950	69.9	14 - 129	8.051	8.041	0.0100	+/-0.500	
Terphenyl-d14	3950	75.1	14 - 129	18.016	17.988	0.0280	+/-0.500	
32SS-11-0002 (1004264-03) ug/Kg dry				Lab File ID: 0426403D.D		Analyzed: 06/07/10 23:03		
2-Fluorobiphenyl	3799	62.4	14 - 129	8.041	8.041	0.0000	+/-0.500	
Terphenyl-d14	3799	62.4	14 - 129	17.988	17.988	0.0000	+/-0.500	
32SS-16-0002 (1004264-11) ug/Kg dry				Lab File ID: 0426411D.D		Analyzed: 06/08/10 00:11		
2-Fluorobiphenyl	3849	80.4	14 - 129	8.041	8.041	0.0000	+/-0.500	
Terphenyl-d14	3849	82.5	14 - 129	17.988	17.988	0.0000	+/-0.500	
32SS-17-0002 (1004264-13) ug/Kg dry				Lab File ID: 0426413D.D		Analyzed: 06/08/10 00:45		
2-Fluorobiphenyl	3711	84.8	14 - 129	8.041	8.041	0.0000	+/-0.500	
Terphenyl-d14	3711	86.4	14 - 129	17.998	17.988	0.0100	+/-0.500	
32SB-17-0607 (1004264-14) ug/Kg dry				Lab File ID: 0426414D.D		Analyzed: 06/08/10 01:19		
2-Fluorobiphenyl	4036	78.5	14 - 129	8.06	8.041	0.0190	+/-0.500	
Terphenyl-d14	4036	86.6	14 - 129	17.998	17.988	0.0100	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16111	Instrument:	MS-BNA4
		Calibration:	0098001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
32SS-19-0002 (1004264-18) ug/Kg dry				Lab File ID: 0426418D.D		Analyzed: 06/08/10 01:54		
2-Fluorobiphenyl	3926	82.1	14 - 129	8.051	8.041	0.0100	+/-0.500	
Terphenyl-d14	3926	78.9	14 - 129	17.998	17.988	0.0100	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16721	Instrument:	MS-BNA4
		Calibration:	0098001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16721-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 06/16/10 01:55		
2-Fluorobiphenyl	5.000	100	80 - 120	7.753	7.753	0.0000	+/-0.500	
Terphenyl-d14	5.000	106	80 - 120	17.607	17.607	0.0000	+/-0.500	
32SS-15-0002 (1004264-09) ug/Kg dry				Lab File ID: 0426409D.D		Analyzed: 06/16/10 09:19		
2-Fluorobiphenyl	3978	58.6	14 - 129	7.753	7.753	0.0000	+/-0.500	
Terphenyl-d14	3978	64.3	14 - 129	17.607	17.607	0.0000	+/-0.500	

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E06038	Laboratory ID:	0E06038-BS1
Preparation:	EXT_3546	Initial/Final:	15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.67	68.46	103	31 - 146
Benzo(a)pyrene	66.67	55.18	82.8	28 - 128
Benzo(b)fluoranthene	66.67	55.31	83.0	30 - 139
Benzo(k)fluoranthene	66.67	60.79	91.2	42 - 129
Chrysene	66.67	66.51	99.8	39 - 134
Dibenz(a,h)anthracene	66.67	58.67	88.0	30 - 138
Indeno(1,2,3-cd)pyrene	66.67	57.46	86.2	17 - 164
Naphthalene	66.67	61.06	91.6	29 - 106

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E11008	Laboratory ID:	0E11008-BS1
Preparation:	EXT_3546	Initial/Final:	15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.67	64.55	96.8	31 - 146
Benzo(a)pyrene	66.67	63.87	95.8	28 - 128
Benzo(b)fluoranthene	66.67	62.49	93.7	30 - 139
Benzo(k)fluoranthene	66.67	66.52	99.8	42 - 129
Chrysene	66.67	66.06	99.1	39 - 134
Dibenz(a,h)anthracene	66.67	76.55	115	30 - 138
Indeno(1,2,3-cd)pyrene	66.67	73.68	111	17 - 164
Naphthalene	66.67	51.09	76.6	29 - 106

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E11010	Laboratory ID:	0E11010-BS1
Preparation:	EXT_3546	Initial/Final:	15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.67	57.48	86.2	31 - 146
Benzo(a)pyrene	66.67	63.29	94.9	28 - 128
Benzo(b)fluoranthene	66.67	57.49	86.2	30 - 139
Benzo(k)fluoranthene	66.67	61.83	92.7	42 - 129
Chrysene	66.67	60.76	91.1	39 - 134
Dibenz(a,h)anthracene	66.67	49.54	74.3	30 - 138
Indeno(1,2,3-cd)pyrene	66.67	45.05	67.6	17 - 164
Naphthalene	66.67	52.56	78.8	29 - 106

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SS-08-0002

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_002

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E11008

% Solids: 80.80

Source Sample Name: **1004264-01**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	82.51	ND	63.56	77.0		31 - 146
Benzo(a)pyrene	82.51	ND	75.22	91.2		28 - 128
Benzo(b)fluoranthene	82.51	ND	80.57	97.7		30 - 139
Benzo(k)fluoranthene	82.51	ND	81.18	98.4		42 - 129
Chrysene	82.51	ND	65.19	79.0		39 - 134
Dibenz(a,h)anthracene	82.51	ND	80.49	97.5		30 - 138
Indeno(1,2,3-cd)pyrene	82.51	ND	83.61	101		17 - 164
Naphthalene	82.51	ND	68.25	82.7		29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS	
						RPD	REC.
Benzo(a)anthracene	82.51	68.62	83.2	7.66		30	31 - 146
Benzo(a)pyrene	82.51	68.10	82.5	9.94		30	28 - 128
Benzo(b)fluoranthene	82.51	71.09	86.2	12.5		30	30 - 139
Benzo(k)fluoranthene	82.51	71.10	86.2	13.2		30	42 - 129
Chrysene	82.51	70.50	85.4	7.82		30	39 - 134
Dibenz(a,h)anthracene	82.51	81.94	99.3	1.79		30	30 - 138
Indeno(1,2,3-cd)pyrene	82.51	86.67	105	3.59		30	17 - 164
Naphthalene	82.51	59.12	71.7	14.3		30	29 - 106

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SB-20-0506

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_002

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E11010

% Solids: 85.33

Source Sample Name: **1004264-21**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	78.13	ND	56.59	72.4		31 - 146
Benzo(a)pyrene	78.13	ND	48.89	62.6		28 - 128
Benzo(b)fluoranthene	78.13	ND	45.44	58.2		30 - 139
Benzo(k)fluoranthene	78.13	ND	51.53	65.9		42 - 129
Chrysene	78.13	ND	50.62	64.8		39 - 134
Dibenz(a,h)anthracene	78.13	ND	41.08	52.6		30 - 138
Indeno(1,2,3-cd)pyrene	78.13	ND	34.83	44.6		17 - 164
Naphthalene	78.13	ND	83.59	107	*	29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzo(a)anthracene	78.13	69.86	89.4	21.0		30	31 - 146
Benzo(a)pyrene	78.13	56.51	72.3	14.5		30	28 - 128
Benzo(b)fluoranthene	78.13	59.20	75.8	26.3		30	30 - 139
Benzo(k)fluoranthene	78.13	64.37	82.4	22.2		30	42 - 129
Chrysene	78.13	66.33	84.9	26.9		30	39 - 134
Dibenz(a,h)anthracene	78.13	53.62	68.6	26.5		30	30 - 138
Indeno(1,2,3-cd)pyrene	78.13	49.64	63.5	35.1	*	30	17 - 164
Naphthalene	78.13	108.6	139	26.1	*	30	29 - 106

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E06038-BLK1	File ID:	E06038B1.D
Sampled:		Prepared:		Analyzed:	06/03/10 19:57
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E06038 Sequence: 0F15604 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.33	6.67	X, U
50-32-8	Benzo(a)pyrene		1.33	5.00	U
205-99-2	Benzo(b)fluoranthene		1.33	6.67	U
207-08-9	Benzo(k)fluoranthene		1.33	6.67	U
218-01-9	Chrysene		1.33	6.67	U
53-70-3	Dibenz(a,h)anthracene		1.33	5.00	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.33	6.67	X, U
91-20-3	Naphthalene		1.33	5.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	2705	81.1	14 - 129	
Terphenyl-d14	3333	3624	109	14 - 129	

ANALYSIS DATA SHEET

LCS

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_002	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E06038-BS1	File ID:	E06038L1.D
Sampled:		Prepared:		Analyzed:	06/03/10 19:21
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E06038 Sequence: 0F15604 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	68.46	1.33	6.67	X
50-32-8	Benzo(a)pyrene	55.18	1.33	5.00	
205-99-2	Benzo(b)fluoranthene	55.31	1.33	6.67	
207-08-9	Benzo(k)fluoranthene	60.79	1.33	6.67	
218-01-9	Chrysene	66.51	1.33	6.67	
53-70-3	Dibenz(a,h)anthracene	58.67	1.33	5.00	X
193-39-5	Indeno(1,2,3-cd)pyrene	57.46	1.33	6.67	X
91-20-3	Naphthalene	61.06	1.33	5.00	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	2775	83.3	14 - 129	
Terphenyl-d14	3333	3202	96.1	14 - 129	

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E11008-BLK1	File ID:	E11008B1.D
Sampled:		Prepared:		Analyzed:	06/06/10 09:24
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E11008 Sequence: 0F16003 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.33	6.67	U
50-32-8	Benzo(a)pyrene		1.33	5.00	U
205-99-2	Benzo(b)fluoranthene		1.33	6.67	U
207-08-9	Benzo(k)fluoranthene		1.33	6.67	U
218-01-9	Chrysene		1.33	6.67	U
53-70-3	Dibenz(a,h)anthracene		1.33	5.00	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.33	6.67	U
91-20-3	Naphthalene		1.33	5.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	2676	80.3	14 - 129	
Terphenyl-d14	3333	2575	77.3	14 - 129	

ANALYSIS DATA SHEET

LCS

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_002	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E11008-BS1	File ID:	E11008L1.D
Sampled:		Prepared:		Analyzed:	06/06/10 08:50
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E11008 Sequence: 0F16003 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	64.55	1.33	6.67	
50-32-8	Benzo(a)pyrene	63.87	1.33	5.00	
205-99-2	Benzo(b)fluoranthene	62.49	1.33	6.67	
207-08-9	Benzo(k)fluoranthene	66.52	1.33	6.67	
218-01-9	Chrysene	66.06	1.33	6.67	
53-70-3	Dibenz(a,h)anthracene	76.55	1.33	5.00	
193-39-5	Indeno(1,2,3-cd)pyrene	73.68	1.33	6.67	
91-20-3	Naphthalene	51.09	1.33	5.00	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	2428	72.8	14 - 129	
Terphenyl-d14	3333	2557	76.7	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_002	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E11008-MS1	File ID:	0426401M.D
Sampled:		Prepared:		Analyzed:	06/06/10 14:31
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E11008 Sequence: 0F16003 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	63.56	1.65	8.26	
50-32-8	Benzo(a)pyrene	75.22	1.65	6.19	
205-99-2	Benzo(b)fluoranthene	80.57	1.65	8.26	
207-08-9	Benzo(k)fluoranthene	81.18	1.65	8.26	
218-01-9	Chrysene	65.19	1.65	8.26	
53-70-3	Dibenz(a,h)anthracene	80.49	1.65	6.19	
193-39-5	Indeno(1,2,3-cd)pyrene	83.61	1.65	8.26	
91-20-3	Naphthalene	68.25	1.65	6.19	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4126	3132	75.9	14 - 129	
Terphenyl-d14	4126	3014	73.1	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike Dup

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E11008-MSD1	File ID:	0426401S.D
Sampled:		Prepared:		Analyzed:	06/06/10 15:05
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E11008 Sequence: 0F16003 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	68.62	1.65	8.26	
50-32-8	Benzo(a)pyrene	68.10	1.65	6.19	
205-99-2	Benzo(b)fluoranthene	71.09	1.65	8.26	
207-08-9	Benzo(k)fluoranthene	71.10	1.65	8.26	
218-01-9	Chrysene	70.50	1.65	8.26	
53-70-3	Dibenz(a,h)anthracene	81.94	1.65	6.19	
193-39-5	Indeno(1,2,3-cd)pyrene	86.67	1.65	8.26	
91-20-3	Naphthalene	59.12	1.65	6.19	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4126	2869	69.5	14 - 129	
Terphenyl-d14	4126	2887	70.0	14 - 129	

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E11010-BLK1	File ID:	E11010B1.D
Sampled:		Prepared:		Analyzed:	06/06/10 15:48
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E11010 Sequence: 0F16103 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.33	6.67	U
50-32-8	Benzo(a)pyrene		1.33	5.00	U
205-99-2	Benzo(b)fluoranthene		1.33	6.67	U
207-08-9	Benzo(k)fluoranthene		1.33	6.67	U
218-01-9	Chrysene		1.33	6.67	U
53-70-3	Dibenz(a,h)anthracene		1.33	5.00	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.33	6.67	U
91-20-3	Naphthalene		1.33	5.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	2912	87.3	14 - 129	
Terphenyl-d14	3333	2922	87.7	14 - 129	

ANALYSIS DATA SHEET

LCS

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_002
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E11010-BS1	File ID:	E11010L1.D
Sampled:		Prepared:		Analyzed:	06/06/10 15:12
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E11010 Sequence: 0F16103 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	57.48	1.33	6.67	
50-32-8	Benzo(a)pyrene	63.29	1.33	5.00	
205-99-2	Benzo(b)fluoranthene	57.49	1.33	6.67	
207-08-9	Benzo(k)fluoranthene	61.83	1.33	6.67	
218-01-9	Chrysene	60.76	1.33	6.67	
53-70-3	Dibenz(a,h)anthracene	49.54	1.33	5.00	
193-39-5	Indeno(1,2,3-cd)pyrene	45.05	1.33	6.67	
91-20-3	Naphthalene	52.56	1.33	5.00	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	2666	80.0	14 - 129	
Terphenyl-d14	3333	2869	86.1	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_002

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E11010-MS1 File ID: 0426421M.D

Sampled: Prepared: Analyzed: 06/06/10 17:37

Solids: Preparation: EXT_3546 Dilution:

Batch: 0E11010 Sequence: 0F16103 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	56.59	1.56	7.82	S
50-32-8	Benzo(a)pyrene	48.89	1.56	5.86	
205-99-2	Benzo(b)fluoranthene	45.44	1.56	7.82	
207-08-9	Benzo(k)fluoranthene	51.53	1.56	7.82	
218-01-9	Chrysene	50.62	1.56	7.82	S
53-70-3	Dibenz(a,h)anthracene	41.08	1.56	5.86	
193-39-5	Indeno(1,2,3-cd)pyrene	34.83	1.56	7.82	
91-20-3	Naphthalene	83.59	1.56	5.86	S

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3907	3791	97.0	14 - 129	
Terphenyl-d14	3907	2517	64.4	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike Dup

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_002	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E11010-MSD1	File ID:	0426421S.D
Sampled:		Prepared:		Analyzed:	06/06/10 18:13
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E11010 Sequence: 0F16103 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	69.86	1.56	7.82	S
50-32-8	Benzo(a)pyrene	56.51	1.56	5.86	
205-99-2	Benzo(b)fluoranthene	59.20	1.56	7.82	
207-08-9	Benzo(k)fluoranthene	64.37	1.56	7.82	
218-01-9	Chrysene	66.33	1.56	7.82	S
53-70-3	Dibenz(a,h)anthracene	53.62	1.56	5.86	
193-39-5	Indeno(1,2,3-cd)pyrene	49.64	1.56	7.82	
91-20-3	Naphthalene	108.6	1.56	5.86	S

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3907	4340	111	14 - 129	
Terphenyl-d14	3907	3254	83.3	14 - 129	

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_002

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E06038 Batch Matrix: Solid

Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E06038-BLK1	05/07/10 17:00	15.00	1.00
LCS	0E06038-BS1	05/07/10 17:00	15.00	1.00
32SS-22-0002	1004264-24	05/07/10 17:00	15.00	1.00
32SB-22-0506	1004264-25	05/07/10 17:00	15.00	1.00

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_002

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E11008 Batch Matrix: Solid

Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E11008-BLK1	05/11/10 13:45	15.00	1.00
LCS	0E11008-BS1	05/11/10 13:45	15.00	1.00
32SS-08-0002	0E11008-MS1	05/11/10 13:45	15.00	1.00
32SS-08-0002	0E11008-MSD1	05/11/10 13:45	15.00	1.00
32SS-08-0002	1004264-01	05/11/10 13:45	15.00	1.00
32SB-08-0607	1004264-02	05/11/10 13:45	15.00	1.00
32SS-11-0002	1004264-03	05/11/10 13:45	15.00	1.00
32SB-11-0607	1004264-04	05/11/10 13:45	15.00	1.00
32SS-12-0002	1004264-05	05/11/10 13:45	15.00	1.00
32SB-12-0607	1004264-06	05/11/10 13:45	15.00	1.00
32SS-13-0002	1004264-07	05/11/10 13:45	15.00	1.00
32SB-13-0607	1004264-08	05/11/10 13:45	15.00	1.00
32SS-15-0002	1004264-09	05/11/10 13:45	15.00	1.00
32SB-15-0506	1004264-10	05/11/10 13:45	15.00	1.00
32SS-16-0002	1004264-11	05/11/10 13:45	15.00	1.00
32SB-16-0607	1004264-12	05/11/10 13:45	15.00	1.00
32SS-17-0002	1004264-13	05/11/10 13:45	15.00	1.00
32SB-17-0607	1004264-14	05/11/10 13:45	15.00	1.00
32SB-17-1112	1004264-15	05/11/10 13:45	15.00	1.00
32SS-18-0002	1004264-16	05/11/10 13:45	15.00	1.00
32SB-18-0506	1004264-17	05/11/10 13:45	15.00	1.00
32SS-19-0002	1004264-18	05/11/10 13:45	15.00	1.00
32SB-19-0506	1004264-19	05/11/10 13:45	15.00	1.00
32SS-20-0002	1004264-20	05/11/10 13:45	15.00	1.00

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_002

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E11010 Batch Matrix: Solid

Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E11010-BLK1	05/11/10 16:35	15.00	1.00
LCS	0E11010-BS1	05/11/10 16:35	15.00	1.00
32SB-20-0506	0E11010-MS1	05/11/10 16:35	15.00	1.00
32SB-20-0506	0E11010-MSD1	05/11/10 16:35	15.00	1.00
32SB-20-0506	1004264-21	05/11/10 16:35	15.00	1.00
32SS-21-0002	1004264-22	05/11/10 16:35	15.00	1.00
32SB-21-0506	1004264-23	05/11/10 16:35	15.00	1.00
32SS-23-0002	1004264-26	05/11/10 16:35	15.00	1.00

HOLDING TIME SUMMARY
SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_002

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SS-08-0002	04/27/10 08:10	04/28/10 08:30	05/11/10 13:45	14.23	14.00	06/06/10 09:58	25.84	40.00	
32SB-08-0607	04/27/10 08:10	04/28/10 08:30	05/11/10 13:45	14.23	14.00	06/06/10 10:32	25.87	40.00	
32SS-11-0002	04/27/10 08:20	04/28/10 08:30	05/11/10 13:45	14.23	14.00	06/07/10 23:03	27.39	40.00	
32SB-11-0607	04/27/10 08:25	04/28/10 08:30	05/11/10 13:45	14.22	14.00	06/06/10 11:06	25.89	40.00	
32SS-12-0002	04/27/10 08:35	04/28/10 08:30	05/11/10 13:45	14.22	14.00	06/06/10 11:40	25.91	40.00	
32SB-12-0607	04/27/10 08:35	04/28/10 08:30	05/11/10 13:45	14.22	14.00	06/06/10 12:14	25.94	40.00	
32SS-13-0002	04/27/10 08:50	04/28/10 08:30	05/11/10 13:45	14.20	14.00	06/06/10 12:49	25.96	40.00	
32SB-13-0607	04/27/10 08:55	04/28/10 08:30	05/11/10 13:45	14.20	14.00	06/06/10 13:23	25.98	40.00	
32SS-15-0002	04/27/10 09:10	04/28/10 08:30	05/11/10 13:45	14.19	14.00	06/16/10 09:19	35.82	40.00	
32SB-15-0506	04/27/10 09:10	04/28/10 08:30	05/11/10 13:45	14.19	14.00	06/06/10 13:57	26.01	40.00	
32SS-16-0002	04/27/10 10:15	04/28/10 08:30	05/11/10 13:45	14.15	14.00	06/08/10 00:11	27.43	40.00	
32SB-16-0607	04/27/10 10:15	04/28/10 08:30	05/11/10 13:45	14.15	14.00	06/07/10 16:14	27.10	40.00	
32SS-17-0002	04/27/10 10:20	04/28/10 08:30	05/11/10 13:45	14.14	14.00	06/08/10 00:45	27.46	40.00	
32SB-17-0607	04/27/10 10:20	04/28/10 08:30	05/11/10 13:45	14.14	14.00	06/08/10 01:19	27.48	40.00	
32SB-17-1112	04/27/10 10:20	04/28/10 08:30	05/11/10 13:45	14.14	14.00	06/07/10 16:48	27.13	40.00	
32SS-18-0002	04/27/10 10:55	04/28/10 08:30	05/11/10 13:45	14.12	14.00	06/07/10 22:29	27.36	40.00	
32SB-18-0506	04/27/10 10:55	04/28/10 08:30	05/11/10 13:45	14.12	14.00	06/07/10 17:22	27.15	40.00	
32SS-19-0002	04/27/10 11:10	04/28/10 08:30	05/11/10 13:45	14.11	14.00	06/08/10 01:54	27.51	40.00	
32SB-19-0506	04/27/10 11:10	04/28/10 08:30	05/11/10 13:45	14.11	14.00	06/07/10 17:57	27.18	40.00	
32SS-20-0002	04/27/10 11:25	04/28/10 08:30	05/11/10 13:45	14.10	14.00	06/07/10 18:31	27.20	40.00	
32SB-20-0506	04/27/10 11:25	04/28/10 08:30	05/11/10 16:35	14.22	14.00	06/06/10 16:24	25.99	40.00	
32SS-21-0002	04/27/10 11:45	04/28/10 08:30	05/11/10 16:35	14.20	14.00	06/06/10 17:00	26.02	40.00	
32SB-21-0506	04/27/10 11:45	04/28/10 08:30	05/11/10 16:35	14.20	14.00	06/06/10 20:19	26.16	40.00	
32SS-22-0002	04/27/10 12:55	04/28/10 08:30	05/07/10 17:00	10.17	14.00	06/04/10 05:36	27.53	40.00	

HOLDING TIME SUMMARY
SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_002

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SB-22-0506	04/27/10 12:55	04/28/10 08:30	05/07/10 17:00	10.17	14.00	06/04/10 06:12	27.55	40.00	
32SS-23-0002	04/27/10 13:05	04/28/10 08:30	05/11/10 16:35	14.15	14.00	06/06/10 20:55	26.18	40.00	

Sample Receipt Information

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 7

PROJECT NO: 112G02111	SITE NAME: CTO F273	PROJECT MANAGER AND PHONE NUMBER: Tony Klimek 513-251-2730	LABORATORY NAME AND CONTACT: Empirical Laboratories
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George Ten Eyck 513-251-2730	ADDRESS: 621 Mainstream Dr. Suite 270
		CARRIER/WAYBILL NUMBER: Fed Ex 8631 3888 3402	CITY, STATE: Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G

PRESERVATIVE USED:

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: PAHs								COMMENTS
4/27	0810	32SS-08-0002	SS	G	1	X								1004264-01
	0810	32SB-08-0607	SB		1	X								-02
	0820	32SS-11-0002	SS		1	X								-03
	0825	32SB-11-0607	SB		1	X								-04
	0835	32SS-12-0002	SS		1	X								-05
	0835	32SB-12-0607			1	X								-06
	0850	32SS-13-0002			1	X								-07
	0855	32SB-13-0607			1	X								-08
	0910	32SS-15-0002			1	X								-09
	0910	32SB-15-0506			1	X								-10
	1015	32SS-16-0002			1	X								-11
	1015	32SB-16-0607			1	X								-12
	1020	32SS-17-0002			1	X								-13

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/27/10		1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	4/28/10	08:30

COMMENTS: 0.6°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 2 OF 7

PROJECT NO: 112G02111
SITE NAME: CTO F273
PROJECT MANAGER AND PHONE NUMBER: Tony Klimek 513-251-2730
LABORATORY NAME AND CONTACT: Empirical
SAMPLERS (SIGNATURE):
FIELD OPERATIONS LEADER AND PHONE NUMBER: George TenEyck 513-251-2730
ADDRESS: (62) Mainstream Dr
CARRIER/WAYBILL NUMBER: FedEx 8631 3888 8402
CITY, STATE: Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED:

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: PAHs								COMMENTS
4/27	1020	32SB-17-0607		G	1	X								1004264 -14
	1020	32SB-17-1112			1	X								-15
	1055	32SS-18-0002			1	X								-16
	1055	32SB-18-0506			1	X								-17
	1110	32SS-19-0002			1	X								-18
	1110	32SB-19-0506			1	X								-19
	1125	32SS-20-0002			1	X								-20
	1125	32SB-20-0506			1	X								-21
	1145	32SS-21-0002			1	X								-22
	1145	32SB-21-0506			1	X								-23
	1255	32SS-22-0002			1	X								-24
	1255	32SB-22-0506			1	X								-25
	1305	32SS-23-0002			1	X								-26

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/27/10		1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	4/28/10	08:30

COMMENTS: 0.6°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 5 OF 7

PROJECT NO: 112G02111
SITE NAME: CTO F273
PROJECT MANAGER AND PHONE NUMBER: Tony Klimek 513-251-2730
LABORATORY NAME AND CONTACT: Empirical
SAMPLERS (SIGNATURE)
FIELD OPERATIONS LEADER AND PHONE NUMBER: George Tentyck 513-251-2730
ADDRESS: 621 Mainstream Dr.
CARRIER/WAYBILL NUMBER: FedEx 8631 3888 3402
CITY, STATE: Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G P
PRESERVATIVE USED

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	BTEX								COMMENTS
4/27	1145	32SS-FD042710-02		G	1	X									-53 WS 4/28/10
	1410	32SS-FD042710-03			1	X									-54
	1410	32SB-FD042710-03			1	X									-55
	1145	32SB-FD042710-02			3		X								-52
	1410	32SB-FD042710-03			3		X								-55
	0810	32SB-08-0607			3		X							1004264	-62
	0825	32SB-11-0506			3		X								-04
	0855	32SB-13-0607			3		X								-08
	0910	32SB-15-0506			3		X								-10
	1015	32SB-16-0607			3		X								-12
	1020	32SB-17-0607			3		X								-14
	1020	32SB-17-1112			3		X								-15
	1055	32SB-18-0506			3		X								-17

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/27/10		1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	4/28/10	08:50

COMMENTS 0.60C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004264 Number of Coolers: 1 of 3

Client: TTNUS Project: CTO F273

Date/Time Received: 4/28/10 09:00 Date cooler(s) opened: 4/28/10

Opened By (print): Will Schwab (signature): [illegible]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered
   EL Courier Other: _____

If applicable, enter airbill number here: 3413

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 1 Seal date: 4/27/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 0.6 °C

Dates samples were logged-in: 4/28/10

9. Initial this form to acknowledge login of sample(s): (Name): Will Schwab (Initial): WS
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

If Non-Conformance issues were present, list by sample ID: _____ CAR#: _____

Received encores for 325B-12-0607 & not listed on COC. Tagged for BTEX per volume received.

Rec'd encores labeled as 325B-11-0607 & this sample is not on COC. There was 325B-11-0607 collection dates/times ~~are~~ are the same! Tagged those as 325B-11-0607 thinking container labels were typos. Please verif

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004264 Number of Coolers: 2 of 3

Client: TDWUS Project: CTO F273

Date/Time Received: 4/28/10 09:00 Date cooler(s) opened: 4/28/10

Opened By (print): Will Schwab (signature): [illegible]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 3402

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 1 Seal date: 4/27/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 0.7 °C

Dates samples were logged-in: 4/28/10

9. Initial this form to acknowledge login of sample(s): (Name): _____ (Initial): _____
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

See page 1 of 3

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004264 Number of Coolers: 3 of 3

Client: TTNUS Project: CTO F273

Date/Time Received: **4/28/10** **09:00** Date cooler(s) opened: **4/28/10**

Opened By (print): Will Schwab (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 3424

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 1 Seal date: 4/27/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 3.0 °C

Dates samples were logged-in: **4/28/10**

9. Initial this form to acknowledge login of sample(s): (Name): _____ (Initial): _____
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

See page 1 of 3

WORK ORDER

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1004264

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32

Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Report To:
Tetra Tech NUS, Inc. (T010)
Tobrena Skeen
Foster Plaza 7, 661 Anderson Drive
Pittsburgh, PA 15220
Phone: (412) 921-8182
Fax: (412) 921-4040

Invoice To:
Tetra Tech NUS, Inc. (T010)
Accounts Payable
Foster Plaza 7, 661 Anderson Drive
Pittsburgh, PA 15220
Phone :(412) 921-8182
Fax: (412) 921-4040

Date Due: 05/19/2010 16:00 (15 day TAT)

Received By: William Schwab
Date Received: 04/28/2010 08:30

Logged In By: William Schwab
Date Logged In: 04/28/2010 14:08

Samples Received at: **0.7°C**

Custody Seals	Yes	Received On Ice	Yes
Containers Intact	Yes		
COC/Labels Agree	Yes		
Preservation Confir	Yes		

Analysis	Due	TAT	Expires	Comments
1004264-01 32SS-08-0002 [Solid] Sampled 04/27/2010 08:10 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 08:10	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 08:10	See version
1004264-02 32SB-08-0607 [Solid] Sampled 04/27/2010 08:10 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 08:10	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 08:10	See version
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 08:10	ENCORES
1004264-03 32SS-11-0002 [Solid] Sampled 04/27/2010 08:20 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 08:20	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 08:20	
1004264-04 32SB-11-0607 [Solid] Sampled 04/27/2010 08:25 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 08:25	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 08:25	See version
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 08:25	ENCORES
1004264-05 32SS-12-0002 [Solid] Sampled 04/27/2010 08:35 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 08:35	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 08:35	

WORK ORDER

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1004264

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32

Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Analysis	Due	TAT	Expires	Comments
1004264-06 32SB-12-0607 [Solid] Sampled 04/27/2010 08:35 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 08:35	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 08:35	
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 08:35	ENCORES
1004264-07 32SS-13-0002 [Solid] Sampled 04/27/2010 08:50 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 08:50	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 08:50	See version
1004264-08 32SB-13-0607 [Solid] Sampled 04/27/2010 08:55 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 08:55	
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 08:55	ENCORES
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 08:55	See version
1004264-09 32SS-15-0002 [Solid] Sampled 04/27/2010 09:10 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 09:10	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 09:10	See version
1004264-10 32SB-15-0506 [Solid] Sampled 04/27/2010 09:10 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 09:10	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 09:10	See version
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 09:10	ENCORES
1004264-11 32SS-16-0002 [Solid] Sampled 04/27/2010 10:15 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 10:15	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 10:15	See version
1004264-12 32SB-16-0607 [Solid] Sampled 04/27/2010 10:15 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 10:15	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 10:15	See version
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 10:15	ENCORES
1004264-13 32SS-17-0002 [Solid] Sampled 04/27/2010 10:20 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 10:20	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 10:20	
1004264-14 32SB-17-0607 [Solid] Sampled 04/27/2010 10:20 Central				**DoD QSM 4.1**
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 10:20	ENCORES
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 10:20	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 10:20	See version

1004264

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32

Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Analysis	Due	TAT	Expires	Comments
1004264-15 32SB-17-1112 [Solid] Sampled 04/27/2010 10:20 Central				**DoD QSM 4.1**
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 10:20	ENCORES
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 10:20	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 10:20	See version
1004264-16 32SS-18-0002 [Solid] Sampled 04/27/2010 10:55 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 10:55	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 10:55	
1004264-17 32SB-18-0506 [Solid] Sampled 04/27/2010 10:55 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 10:55	
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 10:55	ENCORES
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 10:55	See version
1004264-18 32SS-19-0002 [Solid] Sampled 04/27/2010 11:10 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 11:10	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 11:10	
1004264-19 32SB-19-0506 [Solid] Sampled 04/27/2010 11:10 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 11:10	See version
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 11:10	ENCORES
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 11:10	
1004264-20 32SS-20-0002 [Solid] Sampled 04/27/2010 11:25 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 11:25	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 11:25	
1004264-21 32SB-20-0506 [Solid] Sampled 04/27/2010 11:25 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 11:25	See version
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 11:25	ENCORES
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 11:25	
1004264-22 32SS-21-0002 [Solid] Sampled 04/27/2010 11:45 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 11:45	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 11:45	
1004264-23 32SB-21-0506 [Solid] Sampled 04/27/2010 11:45 Central				**DoD QSM 4.1**
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 11:45	ENCORES
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 11:45	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 11:45	

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1004264

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32

Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Analysis	Due	TAT	Expires	Comments
1004264-24 32SS-22-0002 [Solid] Sampled 04/27/2010 12:55 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 12:55	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 12:55	
1004264-25 32SB-22-0506 [Solid] Sampled 04/27/2010 12:55 Central				**DoD QSM 4.1**
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 12:55	ENCORES
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 12:55	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 12:55	
1004264-26 32SS-23-0002 [Solid] Sampled 04/27/2010 13:05 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 13:05	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 13:05	See version

Reviewed By

Date

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**T. KLIMEK**	**DATE:**	**AUGUST 6, 2010**
FROM:	**JOSEPH KALINYAK**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION: VOC / PAH**
NSWC CRANE, CTO F273
SDG CTOF273_003

SAMPLES: 14 / Soil / VOC (benzene, ethyl benzene, toluene, total xylenes)

32SB-23-0506	32SB-24-0506	32SB-25-0607
32SB-26-0405	32SB-27-0506	32SB-28-0506
32SB-29-0304	32SB-30-0506	32SB-32-0506
32SB-33-0506	32SB-34-0607	32SB-36-0506
32SB-37-0506	32SB-FD042710-02	

26 / Soil / PAH

32SB-23-0506	32SB-24-0506	32SB-25-0607
32SB-26-0405	32SB-27-0506	32SB-28-0506
32SB-29-0304	32SB-30-0506	32SB-32-0506
32SB-33-0506	32SB-34-0607	32SB-36-0506
32SB-37-0506	32SB-FD042710-02	32SS-24-0002
32SS-25-0002	32SS-26-0002	32SS-27-0002
32SS-28-0002	32SS-29-0002	32SS-30-0002
32SS-32-0002	32SS-33-0002	32SS-34-0002
32SS-36-0002	32SS-37-0002	

OVERVIEW

The sample set for NSWC Crane, CTO F273, SDG CTOF273_003 consisted of twenty-six (26) soil samples including one (1) field duplicate sample. Fourteen (14) of the samples were analyzed for a short list of four (4) volatile organic compounds (VOCs), benzene, ethyl benzene, toluene, and total xylenes, and all twenty-six (26) samples were analyzed for a list of eight (8) polynuclear aromatic hydrocarbons (PAH), benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene. The one (1) field duplicate pair included in this sample delivery group (SDG) was: 32SB-FD042710-02 / 32SB-21-0506 (from SDG CTOF273_002).

The samples were collected by TetraTech NUS on April 27, 2010 and analyzed by Empirical Laboratories, LLC. All analyses were conducted using USEPA SW-846 Methods 8260B and 8270C analytical and reporting protocols. The data contained in this SDG were fully validated with regard to the following parameters:

*	• Data Completeness
	• Holding Times
*	• GC/MS Tuning
	• Initial and Continuing Calibration
*	• Laboratory Blank Analyses
	• Surrogate Recoveries
*	• Blank Spike/Blank Spike Duplicate Results
	• Internal Standard Recoveries
*	• Field Duplicate Results
*	• Compound Quantitation

* • Compound Identification
* • Detection Limits

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

VOC

The initial analysis of sample 32SB-23-0506 had percent recoveries (%R) for internal standards fluorobenzene and chlorobenzene-d5 less than the quality control limit (and >40%). All surrogate recoveries were acceptable within the quality control limits in the initial analysis. A sample re-analysis was performed with internal standard %Rs within the quality control limits. However, the sample analysis was performed outside the sampling to analysis hold time of 14 days for the sample (23 days). The original analysis results were reported since they were within the hold times. The positive and non-detected results for the sample were qualified estimated, (J) and (UJ), respectively, due to the internal standard %R quality control limit exceedances.

The initial analysis of sample 32SB-28-0506 on 05/10/10 @ 15:52 had %Rs for all three internal standards less than the quality control limit and less than 10%. The sample was re-analyzed on 05/16/10 @ 01:33 and also had %Rs for all three internal standards less than the quality control limit (and >20%) while exceeding the sampling to analysis hold time of 14 days for the sample (18 days). All surrogate recoveries were acceptable within the quality control limits in the re-analysis. The sample was then re-analyzed at a 50X dilution on 05/21/10 @ 19:47 with all three internal standard %Rs within the quality control limits; however this analysis was performed 24 days after collection. The re-analysis results, analyzed 18 days after collection, were reported. The positive and non-detected results were qualified estimated, (J) and (UJ), respectively, due to the internal standard %R and hold time quality control limit exceedances.

The initial analysis of sample 32SB-36-0506 was analyzed beyond the sample to analysis hold time quality control limit of 14 days (18 days) and had %Rs for internal standards fluorobenzene and chlorobenzene-d5 less than the quality control limit (and >40%). All surrogate recoveries were acceptable within the quality control limits in the initial analysis. The sample was re-analyzed at a 50X dilution with internal standard %Rs within the quality control limits; however this analysis was performed 24 days after collection. The original analysis results were reported. The positive and non-detected results were qualified estimated, (J) and (UJ), respectively, due to the internal standard %R quality control limit exceedances.

The surrogate %R was greater than the quality control limit for toluene-d8 for the method blank 0E09008-BLK1. All VOCs were non-detected and no action was taken for this issue.

The surrogate %R was less than the quality control limit for 1,2-dichloroethane-d4 for the continuing calibration verification (CCV) check 0F15210-CCV1. All results for the CCV were within the quality control limits and no action was taken.

PAH

The sample to extraction hold time quality control limit of 14 days was exceeded for samples 32SB-32-0506, 32SB-33-0506, 32SB-34-0607, 32SB-36-0506, 32SB-37-0506, 32SB-FD042710-02, 32SS-33-0002, 32SS-34-0002, 32SS-36-0002, and 32SS-37-0002. These hold time exceedances were <2X the 14 day hold time quality control limit and the positive and non-detected results for these samples were qualified estimated, (J) and (UJ), respectively.

The CCV percent difference (%D) for chrysene was greater than the 25% quality control limit for instrument MS-BNA3 on 06/12/10 @ 11:37 affecting samples 32SB-32-0506, 32SB-33-0506, 32SB-34-0607, 32SB-36-0506, 32SB-FD042710-02, 32SS-34-0002, and 32SS-36-0002. The non-detected chrysene results for the aforementioned samples were qualified estimated, (UJ).

The CCV %D for dibenzo(a,h)anthracene was greater than the 25% quality control limit for instrument MS-BNA3 on 06/13/10 @ 13:34 affecting samples 32SB-37-0506, 32SS-33-0002, and 32SS-37-0002. The non-detected dibenzo(a,h)anthracene results for the aforementioned samples were qualified estimated, (UJ).

The %R for the internal standard phenanthrene-d10 was less than the quality control limit (and >40%) for sample 32SS-28-0002. No re-analysis of the sample was performed. PAH analytes associated with this internal standard were naphthalene, chrysene, and benzo(a)anthracene, and these non-detected analyte results were qualified estimated, (UJ), for sample 32SS-28-0002.

Samples 32SB-37-0507, 32SS-37-0002, and 32SS-33-0002 were analyzed at a 5X dilution and sample 32SS-25-002 was analyzed at a 10X, resulting in elevated reporting limits and minimum detection limits for the non-detected analytes. As a result of the elevated minimum detection limits, the sample 32SB-37-0507 non-detected naphthalene result, and the dibenzo(a,h)anthracene and benzo(a)pyrene results for samples 32SS-25-002, 32SS-37-0002, and 32SS-33-0002, were greater than the project quantitation limit goals (PQL) listed in the Statement of Work (SOW).

ADDITIONAL COMMENTS

Positive results less than the reporting limit (RL) were qualified as estimated, (J), due to uncertainty near the detection limit.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Sample VOC results were qualified due to exceeding the sample to hold time of 14 days. Samples PAH positive and non-detected results were qualified due to exceeding the 14 day sample to extraction hold time quality control limit (<2X the hold time). Sample chrysene and dibenzo(a,h)anthracene results were qualified due to continuing calibration verifications exceeding the quality control limit. Sample 32SS-28-0002 PAH results were qualified due to an internal standard %R that was less than the quality control limit. PAH non-detected results for some samples were greater than the SOW PQLs due to sample analysis dilutions.

Other factors affecting data quality: Positive results less than the reporting limit (RL) were qualified estimated, (J), due to uncertainty near the detection limit.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999) and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006). The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech NUS
Joseph Kalinyak
Chemist/Data Validator

TetraTech NUS
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Data Validation Quality Assurance Officer

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Value Qualifier Key (Val Qual)

J – The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

UJ – The result is an estimated non-detected quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

U - Value is a non-detect as reported by the laboratory.

UR – Non-detected result is considered rejected, (UR), as a result of technical non-compliances.

DATA QUALIFICATION CODE (QUAL CODE)

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's r < 0.995 / ICP PDS Recovery Noncompliance
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; e.g. chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient r < 0.995
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 02111	NSAMPLE	32SB-23-0506			32SB-24-0506			32SB-25-0607			32SB-26-0405		
SDG: CTOF273_003	LAB_ID	1004265-01			1004265-03			1004265-05			1004265-07		
FRACTION: OV	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	76.2			82.6			85.5			84.1		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.582	UJ	N	0.511	U		0.442	U		0.412	U	
ETHYLBENZENE		0.929	UJ	N	0.815	U		0.706	U		0.657	U	
TOLUENE		1.06	UJ	N	0.934	U		0.81	U		0.754	U	
TOTAL XYLENES		0.867	UJ	N	0.76	U		0.659	U		0.614	U	

PROJ_NO: 02111	NSAMPLE	32SB-27-0506			32SB-28-0506			32SB-29-0304			32SB-30-0506		
SDG: CTOF273_003	LAB_ID	1004265-09			1004265-11			1004265-13			1004265-15		
FRACTION: OV	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	86.1			84.4			84.5			85.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.426	U		0.449	UJ	HN	0.525	U		0.519	U	
ETHYLBENZENE		0.68	U		0.717	UJ	HN	0.837	U		0.827	U	
TOLUENE		0.78	U		0.822	UJ	HN	0.96	U		0.949	U	
TOTAL XYLENES		0.635	U		0.669	UJ	HN	0.781	U		0.772	U	

PROJ_NO: 02111	NSAMPLE	32SB-32-0506			32SB-33-0506			32SB-34-0607			32SB-36-0506		
SDG: CTOF273_003	LAB_ID	1004265-17			1004265-19			1004265-21			1004265-23		
FRACTION: OV	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	84.1			86.2			84.9			86.2		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.463	U		0.484	U		0.459	U		0.462	UJ	HN
ETHYLBENZENE		0.739	U		0.772	U		0.732	U		0.737	UJ	HN
TOLUENE		0.848	U		0.885	U		0.839	U		0.846	UJ	HN
TOTAL XYLENES		0.69	U		0.72	U		0.683	U		0.688	UJ	HN

PROJ_NO: 02111	NSAMPLE	32SB-37-0506			32SB-FD042710-02		
SDG: CTOF273_003	LAB_ID	1004265-25			1004265-26		
FRACTION: OV	SAMP_DATE	4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	79.6			84.5		
	DUP_OF				32SB-21-0506		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.575	U		0.478	U	
ETHYLBENZENE		0.918	U		0.762	U	
TOLUENE		1.05	U		0.874	U	
TOTAL XYLENES		0.857	U		0.711	U	

PROJ_NO: 02111	NSAMPLE	32SB-23-0506			32SB-24-0506			32SB-25-0607			32SB-26-0405		
SDG: CTOF273_003	LAB_ID	1004265-01			1004265-03			1004265-05			1004265-07		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	76.2			82.6			85.5			84.1		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.75	U		1.61	U		1.56	U		1.58	U	
BENZO(A)PYRENE		1.75	U		1.61	U		1.56	U		1.58	U	
BENZO(B)FLUORANTHENE		1.75	U		1.61	U		1.56	U		1.58	U	
BENZO(K)FLUORANTHENE		1.75	U		1.61	U		1.56	U		1.58	U	
CHRYSENE		1.75	U		1.61	U		1.56	U		3.2	J	P
DIBENZO(A,H)ANTHRACENE		1.75	U		1.61	U		1.56	U		1.58	U	
INDENO(1,2,3-CD)PYRENE		1.75	U		1.61	U		1.56	U		1.58	U	
NAPHTHALENE		1.75	U		1.61	U		1.56	U		1.58	U	

PROJ_NO: 02111	NSAMPLE	32SB-27-0506			32SB-28-0506			32SB-29-0304			32SB-30-0506		
SDG: CTOF273_003	LAB_ID	1004265-09			1004265-11			1004265-13			1004265-15		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	86.1			84.4			84.5			85.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.54	U		1.58	U		1.57	U		1.56	U	
BENZO(A)PYRENE		1.54	U		1.58	U		1.57	U		1.56	U	
BENZO(B)FLUORANTHENE		1.54	U		1.58	U		1.57	U		1.56	U	
BENZO(K)FLUORANTHENE		1.54	U		1.58	U		1.57	U		1.56	U	
CHRYSENE		1.54	U		1.58	U		1.57	U		1.56	U	
DIBENZO(A,H)ANTHRACENE		1.54	U		1.58	U		1.57	U		1.56	U	
INDENO(1,2,3-CD)PYRENE		1.54	U		1.58	U		1.57	U		1.56	U	
NAPHTHALENE		1.54	U		1.58	U		1.57	U		1.56	U	

PROJ_NO: 02111	NSAMPLE	32SB-32-0506			32SB-33-0506			32SB-34-0607			32SB-36-0506		
SDG: CTOF273_003	LAB_ID	1004265-17			1004265-19			1004265-21			1004265-23		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	84.1			86.2			84.9			86.2		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.58	UJ	H	1.54	UJ	H	1.57	UJ	H	1.54	UJ	H
BENZO(A)PYRENE		1.58	UJ	H	1.54	UJ	H	1.57	UJ	H	1.54	UJ	H
BENZO(B)FLUORANTHENE		1.58	UJ	H	1.54	UJ	H	1.57	UJ	H	1.54	UJ	H
BENZO(K)FLUORANTHENE		1.58	UJ	H	1.54	UJ	H	1.57	UJ	H	1.54	UJ	H
CHRYSENE		1.58	UJ	CH	1.54	UJ	CH	1.57	UJ	CH	1.54	UJ	CH
DIBENZO(A,H)ANTHRACENE		1.58	UJ	H	1.54	UJ	H	1.57	UJ	H	1.54	UJ	H
INDENO(1,2,3-CD)PYRENE		1.58	UJ	H	1.54	UJ	H	1.57	UJ	H	1.54	UJ	H
NAPHTHALENE		1.58	UJ	H	1.54	UJ	H	1.57	UJ	H	1.54	UJ	H

PROJ_NO: 02111	NSAMPLE	32SB-37-0506			32SB-FD042710-02			32SS-24-0002			32SS-25-0002		
SDG: CTOF273_003	LAB_ID	1004265-25			1004265-26			1004265-02			1004265-04		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	79.6			84.5			85.1			85.1		
	DUP_OF				32SB-21-0506								
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		394	J	H	1.57	UJ	H	1.56	U		15.6	U	
BENZO(A)PYRENE		121	J	H	1.57	UJ	H	1.56	U		15.6	U	
BENZO(B)FLUORANTHENE		8.35	UJ	H	1.57	UJ	H	1.56	U		15.6	U	
BENZO(K)FLUORANTHENE		8.35	UJ	H	1.57	UJ	H	1.56	U		15.6	U	
CHRYSENE		341	J	H	1.57	UJ	CH	1.56	U		15.6	U	
DIBENZO(A,H)ANTHRACENE		8.35	UJ	CH	1.57	UJ	H	1.56	U		15.6	U	
INDENO(1,2,3-CD)PYRENE		8.35	UJ	H	1.57	UJ	H	1.56	U		15.6	U	
NAPHTHALENE		8.35	UJ	H	1.57	UJ	H	1.56	U		15.6	U	

PROJ_NO: 02111	NSAMPLE	32SS-26-0002			32SS-27-0002			32SS-28-0002			32SS-29-0002		
SDG: CTOF273_003	LAB_ID	1004265-06			1004265-08			1004265-10			1004265-12		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	87.5			80.6			86.9			87.8		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		5.24	J	P	1.65	U		1.53	UJ	N	1.51	U	
BENZO(A)PYRENE		23.1			1.65	U		9.39			1.51	U	
BENZO(B)FLUORANTHENE		34.8			1.65	U		1.53	U		6.56	J	P
BENZO(K)FLUORANTHENE		11.4			1.65	U		1.53	U		1.51	U	
CHRYSENE		6.13	J	P	1.65	U		1.53	UJ	N	1.51	U	
DIBENZO(A,H)ANTHRACENE		1.52	U		1.65	U		1.53	U		1.51	U	
INDENO(1,2,3-CD)PYRENE		17.7			1.65	U		1.53	U		1.51	U	
NAPHTHALENE		3.02	J	P	1.65	U		1.53	UJ	N	1.51	U	

PROJ_NO: 02111 SDG: CTOF273_003 FRACTION: PAH MEDIA: SOIL	NSAMPLE	32SS-30-0002			32SS-32-0002			32SS-33-0002			32SS-34-0002		
	LAB_ID	1004265-14			1004265-16			1004265-18			1004265-20		
	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	83.5			84.3			87.6			86.9		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.59	U		1.58	U		7.59	UJ	H	1.53	UJ	H
BENZO(A)PYRENE		1.59	U		1.58	U		7.59	UJ	H	1.53	UJ	H
BENZO(B)FLUORANTHENE		1.59	U		1.58	U		7.59	UJ	H	1.53	UJ	H
BENZO(K)FLUORANTHENE		1.59	U		1.58	U		7.59	UJ	H	1.53	UJ	H
CHRYSENE		1.59	U		1.58	U		7.59	UJ	H	1.53	UJ	CH
DIBENZO(A,H)ANTHRACENE		1.59	U		1.58	U		7.59	UJ	CH	1.53	UJ	H
INDENO(1,2,3-CD)PYRENE		1.59	U		1.58	U		7.59	UJ	H	1.53	UJ	H
NAPHTHALENE		1.59	U		1.58	U		7.59	UJ	H	1.53	UJ	H

PROJ_NO: 02111 SDG: CTOF273_003 FRACTION: PAH MEDIA: SOIL	NSAMPLE	32SS-36-0002			32SS-37-0002		
	LAB_ID	1004265-22			1004265-24		
	SAMP_DATE	4/27/2010			4/27/2010		
	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	87.2			88.6		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.53	UJ	H	7.5	UJ	H
BENZO(A)PYRENE		1.53	UJ	H	7.5	UJ	H
BENZO(B)FLUORANTHENE		1.53	UJ	H	7.5	UJ	H
BENZO(K)FLUORANTHENE		1.53	UJ	H	7.5	UJ	H
CHRYSENE		1.53	UJ	CH	7.5	UJ	H
DIBENZO(A,H)ANTHRACENE		1.53	UJ	H	7.5	UJ	CH
INDENO(1,2,3-CD)PYRENE		1.53	UJ	H	7.5	UJ	H
NAPHTHALENE		1.53	UJ	H	7.5	UJ	H

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

ANALYSIS DATA SHEET

32SB-23-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004265-01	File ID:	0426501.D
Sampled:	04/27/10 13:05	Prepared:	05/09/10 15:46	Analyzed:	05/10/10 06:53
Solids:	76.18	Preparation:	5035	Dilution:	1

Batch: 0E09008 Sequence: 0E13510 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.582	5.00	U
100-41-4	Ethylbenzene		0.929	12.4	U
108-88-3	Toluene		1.06	12.4	U
1330-20-7	Xylenes (total)		0.867	12.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	37.15	42.18	114	85 - 120	
Dibromofluoromethane	37.15	40.46	109	80 - 125	
1,2-Dichloroethane-d4	37.15	40.23	108	75 - 140	
Toluene-d8	37.15	39.37	106	85 - 115	

ANALYSIS DATA SHEET

32SB-23-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004265-01RE1	File ID:	0426501.D
Sampled:	04/27/10 13:05	Prepared:	05/20/10 11:09	Analyzed:	05/20/10 20:42
Solids:	76.18	Preparation:	5035	Dilution:	1

Batch: 0E20008 Sequence: 0E14105 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.558	5.00	H1, U
100-41-4	Ethylbenzene		0.890	11.9	H1, U
108-88-3	Toluene		1.02	11.9	H1, U
1330-20-7	Xylenes (total)	2.46	0.831	11.9	H1, J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	35.61	36.49	102	85 - 120	
Dibromofluoromethane	35.61	34.61	97.2	80 - 125	
1,2-Dichloroethane-d4	35.61	34.95	98.2	75 - 140	
Toluene-d8	35.61	37.00	104	85 - 115	

ANALYSIS DATA SHEET

32SB-24-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004265-03	File ID:	0426503.D
Sampled:	04/27/10 13:15	Prepared:	05/09/10 15:46	Analyzed:	05/10/10 07:23
Solids:	82.64	Preparation:	5035	Dilution:	1

Batch: 0E09008 Sequence: 0E13510 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.511	5.00	U
100-41-4	Ethylbenzene		0.815	10.9	U
108-88-3	Toluene		0.934	10.9	U
1330-20-7	Xylenes (total)		0.760	10.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	32.59	36.46	112	85 - 120	
Dibromofluoromethane	32.59	32.01	98.2	80 - 125	
1,2-Dichloroethane-d4	32.59	28.23	86.6	75 - 140	
Toluene-d8	32.59	36.12	111	85 - 115	

ANALYSIS DATA SHEET

32SB-25-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004265-05	File ID:	0426505.D
Sampled:	04/27/10 13:30	Prepared:	05/09/10 15:46	Analyzed:	05/10/10 07:54
Solids:	85.52	Preparation:	5035	Dilution:	1

Batch: 0E09008 Sequence: 0E13510 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.442	5.00	U
100-41-4	Ethylbenzene		0.706	9.41	U
108-88-3	Toluene		0.810	9.41	U
1330-20-7	Xylenes (total)		0.659	9.41	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	28.24	32.17	114	85 - 120	
Dibromofluoromethane	28.24	29.33	104	80 - 125	
1,2-Dichloroethane-d4	28.24	27.87	98.7	75 - 140	
Toluene-d8	28.24	30.48	108	85 - 115	

ANALYSIS DATA SHEET

32SB-26-0405

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004265-07	File ID:	0426507.D
Sampled:	04/27/10 13:35	Prepared:	05/09/10 15:46	Analyzed:	05/10/10 08:24
Solids:	84.12	Preparation:	5035	Dilution:	1

Batch: 0E09008 Sequence: 0E13510 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.412	5.00	U
100-41-4	Ethylbenzene		0.657	8.77	U
108-88-3	Toluene		0.754	8.77	U
1330-20-7	Xylenes (total)		0.614	8.77	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	26.30	28.13	107	85 - 120	
Dibromofluoromethane	26.30	26.59	101	80 - 125	
1,2-Dichloroethane-d4	26.30	23.56	89.6	75 - 140	
Toluene-d8	26.30	28.85	110	85 - 115	

ANALYSIS DATA SHEET

32SB-27-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-09	File ID:	0426509.D
Sampled:	04/27/10 14:00	Prepared:	05/10/10 13:59	Analyzed:	05/10/10 15:22
Solids:	86.15	Preparation:	5035	Dilution:	1

Batch: 0E10025 Sequence: 0E13518 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.426	5.00	U
100-41-4	Ethylbenzene		0.680	9.07	U
108-88-3	Toluene		0.780	9.07	U
1330-20-7	Xylenes (total)		0.635	9.07	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	27.21	30.45	112	85 - 120	
Dibromofluoromethane	27.21	27.74	102	80 - 125	
1,2-Dichloroethane-d4	27.21	28.03	103	75 - 140	
Toluene-d8	27.21	28.66	105	85 - 115	

ANALYSIS DATA SHEET

32SB-28-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-11	File ID:	0426511.D
Sampled:	04/27/10 14:25	Prepared:	05/15/10 14:50	Analyzed:	05/16/10 01:33
Solids:	84.41	Preparation:	5035	Dilution:	1

Batch: 0E15003 Sequence: 0E14109 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.449	5.00	H1, S, U
100-41-4	Ethylbenzene		0.717	9.55	S, Y, H1, U
108-88-3	Toluene		0.822	9.55	H1, S, U
1330-20-7	Xylenes (total)		0.669	9.55	H1, S, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	28.66	30.98	108	85 - 120	
Dibromofluoromethane	28.66	30.35	106	80 - 125	
1,2-Dichloroethane-d4	28.66	30.81	107	75 - 140	
Toluene-d8	28.66	30.06	105	85 - 115	

ANALYSIS DATA SHEET

32SB-28-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-11RE1	File ID:	0426511D.D
Sampled:	04/27/10 14:25	Prepared:	05/21/10 00:00	Analyzed:	05/21/10 19:47
Solids:	84.41	Preparation:	5035	Dilution:	50

Batch: 0E21026 Sequence: 0F15210 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		23.0	196	H1, U
100-41-4	Ethylbenzene		36.7	490	H1, U
108-88-3	Toluene		42.1	490	H1, U
1330-20-7	Xylenes (total)	83.7	34.3	490	H1, J, D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.37	31.35	107	85 - 120	
Dibromofluoromethane	29.37	28.21	96.0	80 - 125	
1,2-Dichloroethane-d4	29.37	26.04	88.7	75 - 140	
Toluene-d8	29.37	30.23	103	85 - 115	

ANALYSIS DATA SHEET

32SB-29-0304

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_003	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1004265-13	File ID:	0426513.D
Sampled:	04/27/10 14:30	Prepared:	05/10/10 13:59	Analyzed:	05/10/10 16:23
Solids:	84.54	Preparation:	5035	Dilution:	1

Batch: 0E10025 Sequence: 0E13518 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.525	5.00	U
100-41-4	Ethylbenzene		0.837	11.2	U
108-88-3	Toluene		0.960	11.2	U
1330-20-7	Xylenes (total)		0.781	11.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	33.48	36.86	110	85 - 120	
Dibromofluoromethane	33.48	33.92	101	80 - 125	
1,2-Dichloroethane-d4	33.48	30.98	92.5	75 - 140	
Toluene-d8	33.48	36.03	108	85 - 115	

ANALYSIS DATA SHEET

32SB-30-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-15	File ID:	0426515.D
Sampled:	04/27/10 15:05	Prepared:	05/10/10 13:59	Analyzed:	05/10/10 16:54
Solids:	85.03	Preparation:	5035	Dilution:	1

Batch: 0E10025 Sequence: 0E13518 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.519	5.00	U
100-41-4	Ethylbenzene		0.827	11.0	U
108-88-3	Toluene		0.949	11.0	U
1330-20-7	Xylenes (total)		0.772	11.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	33.10	34.22	103	85 - 120	
Dibromofluoromethane	33.10	32.88	99.3	80 - 125	
1,2-Dichloroethane-d4	33.10	33.18	100	75 - 140	
Toluene-d8	33.10	34.41	104	85 - 115	

ANALYSIS DATA SHEET

32SB-32-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-17	File ID:	0426517.D
Sampled:	04/27/10 14:10	Prepared:	05/10/10 13:59	Analyzed:	05/10/10 17:24
Solids:	84.14	Preparation:	5035	Dilution:	1
Batch:	0E10025	Sequence:	0E13518	Calibration:	0130002
Instrument:	MS-VOA4				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.463	5.00	U
100-41-4	Ethylbenzene		0.739	9.85	U
108-88-3	Toluene		0.848	9.85	U
1330-20-7	Xylenes (total)		0.690	9.85	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.56	31.48	106	85 - 120	
Dibromofluoromethane	29.56	30.47	103	80 - 125	
1,2-Dichloroethane-d4	29.56	29.67	100	75 - 140	
Toluene-d8	29.56	31.48	106	85 - 115	

ANALYSIS DATA SHEET

32SB-33-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-19	File ID:	0426519.D
Sampled:	04/27/10 15:25	Prepared:	05/10/10 13:59	Analyzed:	05/10/10 17:55
Solids:	86.15	Preparation:	5035	Dilution:	1

Batch: 0E10025 Sequence: 0E13518 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.484	5.00	U
100-41-4	Ethylbenzene		0.772	10.3	U
108-88-3	Toluene		0.885	10.3	U
1330-20-7	Xylenes (total)		0.720	10.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.87	35.53	115	85 - 120	
Dibromofluoromethane	30.87	30.97	100	80 - 125	
1,2-Dichloroethane-d4	30.87	31.34	102	75 - 140	
Toluene-d8	30.87	33.13	107	85 - 115	

ANALYSIS DATA SHEET

32SB-34-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-21	File ID:	0426521.D
Sampled:	04/27/10 15:40	Prepared:	05/10/10 13:59	Analyzed:	05/10/10 18:26
Solids:	84.86	Preparation:	5035	Dilution:	1

Batch: 0E10025 Sequence: 0E13518 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.459	5.00	U
100-41-4	Ethylbenzene		0.732	9.76	U
108-88-3	Toluene		0.839	9.76	U
1330-20-7	Xylenes (total)		0.683	9.76	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.27	33.49	114	85 - 120	
Dibromofluoromethane	29.27	31.31	107	80 - 125	
1,2-Dichloroethane-d4	29.27	30.95	106	75 - 140	
Toluene-d8	29.27	32.80	112	85 - 115	

ANALYSIS DATA SHEET

32SB-36-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-23	File ID:	0426523.D
Sampled:	04/27/10 15:45	Prepared:	05/15/10 14:50	Analyzed:	05/16/10 02:04
Solids:	86.19	Preparation:	5035	Dilution:	1

Batch: 0E15003 Sequence: 0E14109 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.462	5.00	H1, S, U
100-41-4	Ethylbenzene		0.737	9.83	H1, S, Y, U
108-88-3	Toluene		0.846	9.83	H1, S, U
1330-20-7	Xylenes (total)		0.688	9.83	H1, S, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.50	31.50	107	85 - 120	
Dibromofluoromethane	29.50	31.43	107	80 - 125	
1,2-Dichloroethane-d4	29.50	29.33	99.4	75 - 140	
Toluene-d8	29.50	31.67	107	85 - 115	

ANALYSIS DATA SHEET

32SB-36-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-23RE1	File ID:	0426523D.D
Sampled:	04/27/10 15:45	Prepared:	05/21/10 00:00	Analyzed:	05/21/10 20:27
Solids:	86.19	Preparation:	5035	Dilution:	50

Batch: 0E21026 Sequence: 0F15210 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		22.2	189	H1, U
100-41-4	Ethylbenzene		35.4	472	H1, U
108-88-3	Toluene		40.6	472	H1, U
1330-20-7	Xylenes (total)		33.0	472	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	28.30	30.47	108	85 - 120	
Dibromofluoromethane	28.30	27.73	98.0	80 - 125	
1,2-Dichloroethane-d4	28.30	25.72	90.9	75 - 140	
Toluene-d8	28.30	29.24	103	85 - 115	

ANALYSIS DATA SHEET

32SB-37-0506

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_003	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1004265-25	File ID:	0426524.D
Sampled:	04/27/10 16:00	Prepared:	05/10/10 13:59	Analyzed:	05/10/10 19:27
Solids:	79.65	Preparation:	5035	Dilution:	1

Batch: 0E10025 Sequence: 0E13518 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.575	5.00	U
100-41-4	Ethylbenzene		0.918	12.2	U
108-88-3	Toluene		1.05	12.2	U
1330-20-7	Xylenes (total)		0.857	12.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	36.71	40.24	110	85 - 120	
Dibromofluoromethane	36.71	37.77	103	80 - 125	
1,2-Dichloroethane-d4	36.71	37.76	103	75 - 140	
Toluene-d8	36.71	39.18	107	85 - 115	

ANALYSIS DATA SHEET

32SB-FD042710-02

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-26	File ID:	0426525.D
Sampled:	04/27/10 11:45	Prepared:	05/10/10 13:59	Analyzed:	05/10/10 19:58
Solids:	84.53	Preparation:	5035	Dilution:	1

Batch: 0E10025 Sequence: 0E13518 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.478	5.00	U
100-41-4	Ethylbenzene		0.762	10.2	U
108-88-3	Toluene		0.874	10.2	U
1330-20-7	Xylenes (total)		0.711	10.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.49	34.65	114	85 - 120	
Dibromofluoromethane	30.49	31.61	104	80 - 125	
1,2-Dichloroethane-d4	30.49	29.11	95.5	75 - 140	
Toluene-d8	30.49	32.93	108	85 - 115	

ANALYSIS DATA SHEET

32SB-23-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004265-01	File ID:	0426501.D
Sampled:	04/27/10 13:05	Prepared:	05/11/10 16:35	Analyzed:	06/06/10 21:31
Solids:	76.18	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.75	8.76	U
50-32-8	Benzo(a)pyrene		1.75	6.56	U
205-99-2	Benzo(b)fluoranthene		1.75	8.76	U
207-08-9	Benzo(k)fluoranthene		1.75	8.76	U
218-01-9	Chrysene		1.75	8.76	U
53-70-3	Dibenz(a,h)anthracene		1.75	6.56	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.75	8.76	U
91-20-3	Naphthalene		1.75	6.56	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4375	3443	78.7	14 - 129	
Terphenyl-d14	4375	1818	41.6	14 - 129	

ANALYSIS DATA SHEET

32SB-24-0506

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_003	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Soil	Laboratory ID:	1004265-03	File ID:	0426503.D
Sampled:	04/27/10 13:15	Prepared:	05/11/10 16:35	Analyzed:	06/06/10 22:44
Solids:	82.64	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.61	8.07	U
50-32-8	Benzo(a)pyrene		1.61	6.05	U
205-99-2	Benzo(b)fluoranthene		1.61	8.07	U
207-08-9	Benzo(k)fluoranthene		1.61	8.07	U
218-01-9	Chrysene		1.61	8.07	U
53-70-3	Dibenz(a,h)anthracene		1.61	6.05	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.61	8.07	U
91-20-3	Naphthalene		1.61	6.05	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4034	3772	93.5	14 - 129	
Terphenyl-d14	4034	2187	54.2	14 - 129	

ANALYSIS DATA SHEET

32SB-25-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004265-05	File ID:	0426505.D
Sampled:	04/27/10 13:30	Prepared:	05/11/10 16:35	Analyzed:	06/06/10 23:20
Solids:	85.52	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.56	7.80	U
50-32-8	Benzo(a)pyrene		1.56	5.85	U
205-99-2	Benzo(b)fluoranthene		1.56	7.80	U
207-08-9	Benzo(k)fluoranthene		1.56	7.80	U
218-01-9	Chrysene		1.56	7.80	U
53-70-3	Dibenz(a,h)anthracene		1.56	5.85	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.56	7.80	U
91-20-3	Naphthalene		1.56	5.85	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3898	3489	89.5	14 - 129	
Terphenyl-d14	3898	1974	50.6	14 - 129	

ANALYSIS DATA SHEET

32SB-26-0405

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004265-07	File ID:	0426507.D
Sampled:	04/27/10 13:35	Prepared:	05/11/10 16:35	Analyzed:	06/07/10 00:33
Solids:	84.12	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.58	7.93	U
50-32-8	Benzo(a)pyrene		1.58	5.94	U
205-99-2	Benzo(b)fluoranthene		1.58	7.93	U
207-08-9	Benzo(k)fluoranthene		1.58	7.93	U
218-01-9	Chrysene	3.20	1.58	7.93	J
53-70-3	Dibenz(a,h)anthracene		1.58	5.94	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.58	7.93	U
91-20-3	Naphthalene		1.58	5.94	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3962	2703	68.2	14 - 129	
Terphenyl-d14	3962	1622	40.9	14 - 129	

ANALYSIS DATA SHEET

32SB-27-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-09	File ID:	0426509.D
Sampled:	04/27/10 14:00	Prepared:	05/11/10 16:35	Analyzed:	06/07/10 01:45
Solids:	86.15	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.54	7.74	U
50-32-8	Benzo(a)pyrene		1.54	5.80	U
205-99-2	Benzo(b)fluoranthene		1.54	7.74	U
207-08-9	Benzo(k)fluoranthene		1.54	7.74	U
218-01-9	Chrysene		1.54	7.74	U
53-70-3	Dibenz(a,h)anthracene		1.54	5.80	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.54	7.74	U
91-20-3	Naphthalene		1.54	5.80	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3869	3091	79.9	14 - 129	
Terphenyl-d14	3869	1761	45.5	14 - 129	

ANALYSIS DATA SHEET

32SB-28-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-11	File ID:	0426511.D
Sampled:	04/27/10 14:25	Prepared:	05/11/10 16:35	Analyzed:	06/07/10 02:22
Solids:	84.41	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.58	7.90	U
50-32-8	Benzo(a)pyrene		1.58	5.92	U
205-99-2	Benzo(b)fluoranthene		1.58	7.90	U
207-08-9	Benzo(k)fluoranthene		1.58	7.90	U
218-01-9	Chrysene		1.58	7.90	U
53-70-3	Dibenz(a,h)anthracene		1.58	5.92	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.58	7.90	U
91-20-3	Naphthalene		1.58	5.92	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3949	3543	89.7	14 - 129	
Terphenyl-d14	3949	1959	49.6	14 - 129	

ANALYSIS DATA SHEET

32SB-29-0304

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-13	File ID:	0426513.D
Sampled:	04/27/10 14:30	Prepared:	05/11/10 16:35	Analyzed:	06/07/10 03:34
Solids:	84.54	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.57	7.89	U
50-32-8	Benzo(a)pyrene		1.57	5.91	U
205-99-2	Benzo(b)fluoranthene		1.57	7.89	U
207-08-9	Benzo(k)fluoranthene		1.57	7.89	U
218-01-9	Chrysene		1.57	7.89	U
53-70-3	Dibenz(a,h)anthracene		1.57	5.91	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.57	7.89	U
91-20-3	Naphthalene		1.57	5.91	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3943	2852	72.3	14 - 129	
Terphenyl-d14	3943	2358	59.8	14 - 129	

ANALYSIS DATA SHEET

32SB-30-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-15	File ID:	0426515.D
Sampled:	04/27/10 15:05	Prepared:	05/11/10 16:35	Analyzed:	06/07/10 04:46
Solids:	85.03	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.56	7.84	U
50-32-8	Benzo(a)pyrene		1.56	5.88	U
205-99-2	Benzo(b)fluoranthene		1.56	7.84	U
207-08-9	Benzo(k)fluoranthene		1.56	7.84	U
218-01-9	Chrysene		1.56	7.84	U
53-70-3	Dibenz(a,h)anthracene		1.56	5.88	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.56	7.84	U
91-20-3	Naphthalene		1.56	5.88	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3920	3261	83.2	14 - 129	
Terphenyl-d14	3920	2727	69.6	14 - 129	

ANALYSIS DATA SHEET

32SB-32-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-17	File ID:	0426517.D
Sampled:	04/27/10 14:10	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 13:25
Solids:	84.14	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.58	7.93	H2, U
50-32-8	Benzo(a)pyrene		1.58	5.94	H2, U
205-99-2	Benzo(b)fluoranthene		1.58	7.93	H2, U
207-08-9	Benzo(k)fluoranthene		1.58	7.93	H2, U
218-01-9	Chrysene		1.58	7.93	H2, X, U
53-70-3	Dibenz(a,h)anthracene		1.58	5.94	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.58	7.93	H2, U
91-20-3	Naphthalene		1.58	5.94	H2, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3962	3384	85.4	14 - 129	
Terphenyl-d14	3962	1933	48.8	14 - 129	

ANALYSIS DATA SHEET

32SB-33-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-19	File ID:	0426519.D
Sampled:	04/27/10 15:25	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 14:02
Solids:	86.15	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.54	7.74	H2, U
50-32-8	Benzo(a)pyrene		1.54	5.80	H2, U
205-99-2	Benzo(b)fluoranthene		1.54	7.74	H2, U
207-08-9	Benzo(k)fluoranthene		1.54	7.74	H2, U
218-01-9	Chrysene		1.54	7.74	H2, X, U
53-70-3	Dibenz(a,h)anthracene		1.54	5.80	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.54	7.74	H2, U
91-20-3	Naphthalene		1.54	5.80	H2, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3869	3573	92.3	14 - 129	
Terphenyl-d14	3869	2035	52.6	14 - 129	

ANALYSIS DATA SHEET

32SB-34-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-21	File ID:	0426521.D
Sampled:	04/27/10 15:40	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 15:14
Solids:	84.86	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.57	7.86	H2, U
50-32-8	Benzo(a)pyrene		1.57	5.89	H2, U
205-99-2	Benzo(b)fluoranthene		1.57	7.86	H2, U
207-08-9	Benzo(k)fluoranthene		1.57	7.86	H2, U
218-01-9	Chrysene		1.57	7.86	H2, X, U
53-70-3	Dibenz(a,h)anthracene		1.57	5.89	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.57	7.86	H2, U
91-20-3	Naphthalene		1.57	5.89	H2, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3928	3177	80.9	14 - 129	
Terphenyl-d14	3928	1835	46.7	14 - 129	

ANALYSIS DATA SHEET

32SB-36-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-23	File ID:	0426523.D
Sampled:	04/27/10 15:45	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 16:26
Solids:	86.19	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.54	7.74	H2, U
50-32-8	Benzo(a)pyrene		1.54	5.80	H2, U
205-99-2	Benzo(b)fluoranthene		1.54	7.74	H2, U
207-08-9	Benzo(k)fluoranthene		1.54	7.74	H2, U
218-01-9	Chrysene		1.54	7.74	H2, X, U
53-70-3	Dibenz(a,h)anthracene		1.54	5.80	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.54	7.74	H2, U
91-20-3	Naphthalene		1.54	5.80	H2, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3867	3703	95.7	14 - 129	
Terphenyl-d14	3867	2112	54.6	14 - 129	

ANALYSIS DATA SHEET

32SB-37-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-25	File ID:	0426525D.D
Sampled:	04/27/10 16:00	Prepared:	05/20/10 13:40	Analyzed:	06/13/10 15:22
Solids:	79.65	Preparation:	EXT_3546	Dilution:	5

Batch: 0E11013 Sequence: 0F16739 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	394	8.35	41.9	H2, D
50-32-8	Benzo(a)pyrene	121	8.35	31.4	H2, D
205-99-2	Benzo(b)fluoranthene		8.35	41.9	H2, U
207-08-9	Benzo(k)fluoranthene		8.35	41.9	H2, U
218-01-9	Chrysene	341	8.35	41.9	H2, X, D
53-70-3	Dibenz(a,h)anthracene		8.35	31.4	H2, Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		8.35	41.9	H2, Y, U
91-20-3	Naphthalene		8.35	31.4	H2, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4185	2948	70.4	14 - 129	
Terphenyl-d14	4185	2608	62.3	14 - 129	

ANALYSIS DATA SHEET

32SB-FD042710-02

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-26	File ID:	0426526.D
Sampled:	04/27/10 11:45	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 17:02
Solids:	84.53	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.57	7.89	H2, U
50-32-8	Benzo(a)pyrene		1.57	5.91	H2, U
205-99-2	Benzo(b)fluoranthene		1.57	7.89	H2, U
207-08-9	Benzo(k)fluoranthene		1.57	7.89	H2, U
218-01-9	Chrysene		1.57	7.89	H2, X, U
53-70-3	Dibenz(a,h)anthracene		1.57	5.91	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.57	7.89	H2, U
91-20-3	Naphthalene		1.57	5.91	H2, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3943	3461	87.8	14 - 129	
Terphenyl-d14	3943	1857	47.1	14 - 129	

ANALYSIS DATA SHEET

32SS-24-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004265-02	File ID:	0426502.D
Sampled:	04/27/10 13:15	Prepared:	05/11/10 16:35	Analyzed:	06/06/10 22:07
Solids:	85.06	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.56	7.84	U
50-32-8	Benzo(a)pyrene		1.56	5.88	U
205-99-2	Benzo(b)fluoranthene		1.56	7.84	U
207-08-9	Benzo(k)fluoranthene		1.56	7.84	U
218-01-9	Chrysene		1.56	7.84	U
53-70-3	Dibenz(a,h)anthracene		1.56	5.88	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.56	7.84	U
91-20-3	Naphthalene		1.56	5.88	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3919	3221	82.2	14 - 129	
Terphenyl-d14	3919	1925	49.1	14 - 129	

ANALYSIS DATA SHEET

32SS-25-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-04	File ID:	0426504D.D
Sampled:	04/27/10 13:30	Prepared:	05/11/10 16:35	Analyzed:	06/07/10 06:35
Solids:	85.10	Preparation:	EXT_3546	Dilution:	10

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		15.6	78.4	U
50-32-8	Benzo(a)pyrene		15.6	58.8	U
205-99-2	Benzo(b)fluoranthene		15.6	78.4	U
207-08-9	Benzo(k)fluoranthene		15.6	78.4	U
218-01-9	Chrysene		15.6	78.4	U
53-70-3	Dibenz(a,h)anthracene		15.6	58.8	U
193-39-5	Indeno(1,2,3-cd)pyrene		15.6	78.4	U
91-20-3	Naphthalene		15.6	58.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3917	3831	97.8	14 - 129	
Terphenyl-d14	3917	2646	67.5	14 - 129	

ANALYSIS DATA SHEET

32SS-26-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-06	File ID:	0426506.D
Sampled:	04/27/10 13:35	Prepared:	05/11/10 16:35	Analyzed:	06/06/10 23:57
Solids:	87.48	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	5.24	1.52	7.62	J
50-32-8	Benzo(a)pyrene	23.1	1.52	5.72	
205-99-2	Benzo(b)fluoranthene	34.8	1.52	7.62	
207-08-9	Benzo(k)fluoranthene	11.4	1.52	7.62	
218-01-9	Chrysene	6.13	1.52	7.62	J
53-70-3	Dibenz(a,h)anthracene		1.52	5.72	U
193-39-5	Indeno(1,2,3-cd)pyrene	17.7	1.52	7.62	
91-20-3	Naphthalene	3.02	1.52	5.72	J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3810	3379	88.7	14 - 129	
Terphenyl-d14	3810	1765	46.3	14 - 129	

ANALYSIS DATA SHEET

32SS-27-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-08	File ID:	0426508.D
Sampled:	04/27/10 14:00	Prepared:	05/11/10 16:35	Analyzed:	06/07/10 01:09
Solids:	80.60	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.65	8.28	U
50-32-8	Benzo(a)pyrene		1.65	6.20	U
205-99-2	Benzo(b)fluoranthene		1.65	8.28	U
207-08-9	Benzo(k)fluoranthene		1.65	8.28	U
218-01-9	Chrysene		1.65	8.28	U
53-70-3	Dibenz(a,h)anthracene		1.65	6.20	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.65	8.28	U
91-20-3	Naphthalene		1.65	6.20	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4136	3757	90.8	14 - 129	
Terphenyl-d14	4136	2269	54.9	14 - 129	

ANALYSIS DATA SHEET

32SS-28-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-10	File ID:	0426510.D
Sampled:	04/27/10 14:25	Prepared:	05/11/10 16:35	Analyzed:	06/07/10 05:59
Solids:	86.94	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.53	7.67	S, U
50-32-8	Benzo(a)pyrene	9.39	1.53	5.75	
205-99-2	Benzo(b)fluoranthene		1.53	7.67	U
207-08-9	Benzo(k)fluoranthene		1.53	7.67	U
218-01-9	Chrysene		1.53	7.67	S, U
53-70-3	Dibenz(a,h)anthracene		1.53	5.75	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.53	7.67	U
91-20-3	Naphthalene		1.53	5.75	S, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3834	4926	128	14 - 129	
Terphenyl-d14	3834	2752	71.8	14 - 129	

ANALYSIS DATA SHEET

32SS-29-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-12	File ID:	0426512.D
Sampled:	04/27/10 14:30	Prepared:	05/11/10 16:35	Analyzed:	06/07/10 02:58
Solids:	87.83	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.51	7.59	U
50-32-8	Benzo(a)pyrene		1.51	5.69	U
205-99-2	Benzo(b)fluoranthene	6.56	1.51	7.59	J
207-08-9	Benzo(k)fluoranthene		1.51	7.59	U
218-01-9	Chrysene		1.51	7.59	U
53-70-3	Dibenz(a,h)anthracene		1.51	5.69	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.51	7.59	U
91-20-3	Naphthalene		1.51	5.69	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3795	3004	79.1	14 - 129	
Terphenyl-d14	3795	1755	46.2	14 - 129	

ANALYSIS DATA SHEET

32SS-30-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-14	File ID:	0426514.D
Sampled:	04/27/10 15:05	Prepared:	05/11/10 16:35	Analyzed:	06/07/10 04:10
Solids:	83.46	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.59	7.99	U
50-32-8	Benzo(a)pyrene		1.59	5.99	U
205-99-2	Benzo(b)fluoranthene		1.59	7.99	U
207-08-9	Benzo(k)fluoranthene		1.59	7.99	U
218-01-9	Chrysene		1.59	7.99	U
53-70-3	Dibenz(a,h)anthracene		1.59	5.99	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.59	7.99	U
91-20-3	Naphthalene		1.59	5.99	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3994	2978	74.6	14 - 129	
Terphenyl-d14	3994	3152	78.9	14 - 129	

ANALYSIS DATA SHEET

32SS-32-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-16	File ID:	0426516.D
Sampled:	04/27/10 14:10	Prepared:	05/11/10 16:35	Analyzed:	06/07/10 05:23
Solids:	84.28	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11010 Sequence: 0F16104 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.58	7.91	U
50-32-8	Benzo(a)pyrene		1.58	5.93	U
205-99-2	Benzo(b)fluoranthene		1.58	7.91	U
207-08-9	Benzo(k)fluoranthene		1.58	7.91	U
218-01-9	Chrysene		1.58	7.91	U
53-70-3	Dibenz(a,h)anthracene		1.58	5.93	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.58	7.91	U
91-20-3	Naphthalene		1.58	5.93	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3955	3595	90.9	14 - 129	
Terphenyl-d14	3955	3022	76.4	14 - 129	

ANALYSIS DATA SHEET

32SS-33-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-18	File ID:	0426518D.D
Sampled:	04/27/10 15:25	Prepared:	05/20/10 13:40	Analyzed:	06/13/10 14:10
Solids:	87.61	Preparation:	EXT_3546	Dilution:	5

Batch: 0E11013 Sequence: 0F16739 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		7.59	38.1	H2, U
50-32-8	Benzo(a)pyrene		7.59	28.5	H2, U
205-99-2	Benzo(b)fluoranthene		7.59	38.1	H2, U
207-08-9	Benzo(k)fluoranthene		7.59	38.1	H2, U
218-01-9	Chrysene		7.59	38.1	X, H2, U
53-70-3	Dibenz(a,h)anthracene		7.59	28.5	H2, Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		7.59	38.1	H2, Y, U
91-20-3	Naphthalene		7.59	28.5	H2, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3805	3182	83.6	14 - 129	
Terphenyl-d14	3805	2650	69.6	14 - 129	

ANALYSIS DATA SHEET

32SS-34-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-20	File ID:	0426520.D
Sampled:	04/27/10 15:40	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 14:38
Solids:	86.91	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.53	7.67	H2, U
50-32-8	Benzo(a)pyrene		1.53	5.75	H2, U
205-99-2	Benzo(b)fluoranthene		1.53	7.67	H2, U
207-08-9	Benzo(k)fluoranthene		1.53	7.67	H2, U
218-01-9	Chrysene		1.53	7.67	H2, X, U
53-70-3	Dibenz(a,h)anthracene		1.53	5.75	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.53	7.67	H2, U
91-20-3	Naphthalene		1.53	5.75	H2, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3835	3487	90.9	14 - 129	
Terphenyl-d14	3835	1841	48.0	14 - 129	

ANALYSIS DATA SHEET

32SS-36-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-22	File ID:	0426522.D
Sampled:	04/27/10 15:45	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 15:50
Solids:	87.19	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.53	7.65	H2, U
50-32-8	Benzo(a)pyrene		1.53	5.73	H2, U
205-99-2	Benzo(b)fluoranthene		1.53	7.65	H2, U
207-08-9	Benzo(k)fluoranthene		1.53	7.65	H2, U
218-01-9	Chrysene		1.53	7.65	H2, X, U
53-70-3	Dibenz(a,h)anthracene		1.53	5.73	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.53	7.65	H2, U
91-20-3	Naphthalene		1.53	5.73	H2, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3823	3678	96.2	14 - 129	
Terphenyl-d14	3823	1966	51.4	14 - 129	

ANALYSIS DATA SHEET

32SS-37-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004265-24	File ID:	0426524D.D
Sampled:	04/27/10 16:00	Prepared:	05/20/10 13:40	Analyzed:	06/13/10 14:46
Solids:	88.63	Preparation:	EXT_3546	Dilution:	5

Batch: 0E11013 Sequence: 0F16739 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		7.50	37.6	H2, U
50-32-8	Benzo(a)pyrene		7.50	28.2	H2, U
205-99-2	Benzo(b)fluoranthene		7.50	37.6	H2, U
207-08-9	Benzo(k)fluoranthene		7.50	37.6	H2, U
218-01-9	Chrysene		7.50	37.6	H2, X, U
53-70-3	Dibenz(a,h)anthracene		7.50	28.2	H2, Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		7.50	37.6	H2, Y, U
91-20-3	Naphthalene		7.50	28.2	H2, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3761	2408	64.0	14 - 129	
Terphenyl-d14	3761	2375	63.2	14 - 129	

APPENDIX C

SUPPORT DOCUMENTATION

HOLDTIME

SDG CTOF273_003

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV	UG/KG	32SB-30-0506	1004265-15	NM	04/27/2010	05/10/2010	05/10/2010	13	0	13
OV	UG/KG	32SB-FD042710-02	1004265-26	NM	04/27/2010	05/10/2010	05/10/2010	13	0	13
OV	UG/KG	32SB-37-0506	1004265-25	NM	04/27/2010	05/10/2010	05/10/2010	13	0	13
OV	UG/KG	32SB-36-0506	1004265-23RE1	NM	04/27/2010	05/21/2010	05/21/2010	24	0	24
OV	UG/KG	32SB-36-0506	1004265-23	NM	04/27/2010	05/15/2010	05/16/2010	18	1	19
OV	UG/KG	32SB-34-0607	1004265-21	NM	04/27/2010	05/10/2010	05/10/2010	13	0	13
OV	UG/KG	32SB-23-0506	1004265-01	NM	04/27/2010	05/09/2010	05/10/2010	12	1	13
OV	UG/KG	32SB-32-0506	1004265-17	NM	04/27/2010	05/10/2010	05/10/2010	13	0	13
OV	UG/KG	32SB-29-0304	1004265-13	NM	04/27/2010	05/10/2010	05/10/2010	13	0	13
OV	UG/KG	32SB-28-0506	1004265-11RE1	NM	04/27/2010	05/21/2010	05/21/2010	24	0	24
OV	UG/KG	32SB-28-0506	1004265-11	NM	04/27/2010	05/15/2010	05/16/2010	18	1	19
OV	UG/KG	32SB-27-0506	1004265-09	NM	04/27/2010	05/10/2010	05/10/2010	13	0	13
OV	UG/KG	32SB-26-0405	1004265-07	NM	04/27/2010	05/09/2010	05/10/2010	12	1	13
OV	UG/KG	32SB-25-0607	1004265-05	NM	04/27/2010	05/09/2010	05/10/2010	12	1	13
OV	UG/KG	32SB-24-0506	1004265-03	NM	04/27/2010	05/09/2010	05/10/2010	12	1	13

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV	UG/KG	32SB-23-0506	1004265-01RE1	NM	04/27/2010	05/20/2010	05/20/2010	23	0	23
OV	UG/KG	32SB-33-0506	1004265-19	NM	04/27/2010	05/10/2010	05/10/2010	13	0	13
SIM	UG/KG	32SB-28-0506	1004265-11	NM	04/27/2010	05/11/2010	06/07/2010	14	27	41
SIM	UG/KG	32SB-23-0506	1004265-01	NM	04/27/2010	05/11/2010	06/06/2010	14	26	40
SIM	UG/KG	32SB-24-0506	1004265-03	NM	04/27/2010	05/11/2010	06/06/2010	14	26	40
SIM	UG/KG	32SB-25-0607	1004265-05	NM	04/27/2010	05/11/2010	06/06/2010	14	26	40
SIM	UG/KG	32SS-24-0002	1004265-02	NM	04/27/2010	05/11/2010	06/06/2010	14	26	40
SIM	UG/KG	32SS-36-0002	1004265-22	NM	04/27/2010	05/20/2010	06/12/2010	23	23	46
SIM	UG/KG	32SS-34-0002	1004265-20	NM	04/27/2010	05/20/2010	06/12/2010	23	23	46
SIM	UG/KG	32SS-33-0002	1004265-18	NM	04/27/2010	05/20/2010	06/13/2010	23	24	47
SIM	UG/KG	32SS-32-0002	1004265-16	NM	04/27/2010	05/11/2010	06/07/2010	14	27	41
SIM	UG/KG	32SS-30-0002	1004265-14	NM	04/27/2010	05/11/2010	06/07/2010	14	27	41
SIM	UG/KG	32SS-29-0002	1004265-12	NM	04/27/2010	05/11/2010	06/07/2010	14	27	41
SIM	UG/KG	32SS-28-0002	1004265-10	NM	04/27/2010	05/11/2010	06/07/2010	14	27	41
SIM	UG/KG	32SS-27-0002	1004265-08	NM	04/27/2010	05/11/2010	06/07/2010	14	27	41
SIM	UG/KG	32SB-26-0405	1004265-07	NM	04/27/2010	05/11/2010	06/07/2010	14	27	41
SIM	UG/KG	32SS-25-0002	1004265-04	NM	04/27/2010	05/11/2010	06/07/2010	14	27	41
SIM	UG/KG	32SB-27-0506	1004265-09	NM	04/27/2010	05/11/2010	06/07/2010	14	27	41

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
SIM	UG/KG	32SB-FD042710-02	1004265-26	NM	04/27/2010	05/20/2010	06/12/2010	23	23	46
SIM	UG/KG	32SB-37-0506	1004265-25	NM	04/27/2010	05/20/2010	06/13/2010	23	24	47
SIM	UG/KG	32SB-36-0506	1004265-23	NM	04/27/2010	05/20/2010	06/12/2010	23	23	46
SIM	UG/KG	32SB-34-0607	1004265-21	NM	04/27/2010	05/20/2010	06/12/2010	23	23	46
SIM	UG/KG	32SB-33-0506	1004265-19	NM	04/27/2010	05/20/2010	06/12/2010	23	23	46
SIM	UG/KG	32SB-32-0506	1004265-17	NM	04/27/2010	05/20/2010	06/12/2010	23	23	46
SIM	UG/KG	32SB-30-0506	1004265-15	NM	04/27/2010	05/11/2010	06/07/2010	14	27	41
SIM	UG/KG	32SB-29-0304	1004265-13	NM	04/27/2010	05/11/2010	06/07/2010	14	27	41
SIM	UG/KG	32SS-37-0002	1004265-24	NM	04/27/2010	05/20/2010	06/13/2010	23	24	47
SIM	UG/KG	32SS-26-0002	1004265-06	NM	04/27/2010	05/11/2010	06/06/2010	14	26	40

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 3 OF 7

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
126022111	CTO F273	Tony Klimek 513-251-2730	Empirical
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George TenEyck 513-251-2730	ADDRESS: 12 Mainstream Dr.
		CARRIER/WAYBILL NUMBER: FedEx 8631 3888 3402	CITY, STATE: Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐ ☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED:
TYPE OF ANALYSIS: PAH

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAH							COMMENTS
4/27	1305	32SB-23-0506		G	1	X					1004265		-01 -27
	1315	32SS-24-0002			1	X							-02 -28
	1315	32SB-24-0506			1	X							-03 -29
	1330	32SS-25-0002			1	X							-04 -30
	1330	32SB-25-0607			1	X							-05 -31
	1335	32SS-26-0002			1	X							-06 -32
	1335	32SB-26-0405			1	X							-07 -33
	1400	32SS-27-0002			1	X							-08 -34
	1400	32SB-27-0506			1	X							-09 -35
	1425	32SS-28-0002			1	X							-10 -36
	1425	32SB-28-0506			1	X							-11 -37
	1430	32SS-29-0002			1	X							-12 -38
	1430	32SB-29-0304			1	X							-13 -39

WS 4/28/10

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/27/10		1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	4/28/10	08:30

COMMENTS: 0.6°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 4 OF 7

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G02111	CTO F273	Tony Klimek 513-251-2730	Empirical
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George TenEyck 513-251-2730	ADDRESS: 621 Mainstream Dr
		CARRIER/WAYBILL NUMBER: FedEX 8631 2885 3402	CITY, STATE: Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G

PRESERVATIVE USED:

TYPE OF ANALYSIS: PAHs

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs							COMMENTS
4/27	1505	32SS-30-0002		G	1	X					1004265		-14 -40
	1505	32SB-30-0506			1	X							-15 -41
	1410	32SS-32-0002			1	X							-16 -42
	1410	32SB-32-0506			1	X							-17 -43
	1525	32SS-33-0002			1	X							-18 -44
	1525	32SB-33-0506			1	X							-19 -45
	1540	32SS-31-0002			1	X							-20 -46
	1540	32SB-31-0607			1	X							-21 -47
	1545	32SS-36-0002			1	X							-22 -48
	1545	32SB-36-0506			1	X							-23 -49
	1600	32SS-37-0002			1	X							-24 -50
	1600	32SB-37-0506			1	X							-25 -51
	1145	32SB-ED042710-02			1	X							-26 -52

WS 4/28/10

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/27/10		1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	4/28/10	08:30

COMMENTS: 0.6 °C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 6 OF 7

PROJECT NO: 112G02111	SITE NAME: CTO F273	PROJECT MANAGER AND PHONE NUMBER: Tony Klimek 513-251-2730	LABORATORY NAME AND CONTACT: Empirical
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George TenEyck 513-251-2730	ADDRESS: 621 Mainstream Dr
		CARRIER/WAYBILL NUMBER: FedEx 863138883402	CITY, STATE: Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): P

PRESERVATIVE USED:

TYPE OF ANALYSIS: BTEX

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	BTEX							COMMENTS
4/27	1110	32SB-19-0506		G	3	X							1004264 -19
	1125	32SB-20-0506			3	X							-21
	1145	32SB-21-0506			3	X							-23
	1255	32SB-22-0506			3	X							-25
	1305	32SB-23-0506			3	X							1004265 -01 -27
	1815	32SB-24-0506			3	X							-03 -29
	1330	32SB-25-0607			3	X							-05 -31
	1335	32SB-26-0405			3	X							-07 -33
	1400	32SB-27-0506			3	X							-09 -35
	1425	32SB-28-0506			3	X							-11 4/28/10 -37
	1430	32SB-29-0304			3	X							-13 -39
	1505	32SB-30-0506			3	X							-15 -41
	1410	32SB-32-0506			3	X							-17 -43

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/27/10		1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	4/28/10	09:50

COMMENTS: 0.6°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 7 OF 7

PROJECT NO: 112602111	SITE NAME: CTOF273	PROJECT MANAGER AND PHONE NUMBER: Tony Klimek 513-251-2730	LABORATORY NAME AND CONTACT: Empirical Laboratories
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George TenEyck 513-251-2730	ADDRESS: 621 Mainstream Dr. Suite 270
		CARRIER/WAYBILL NUMBER: FedEX 8631 3888 3402	CITY, STATE: Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): P

PRESERVATIVE USED:

TYPE OF ANALYSIS: BTEX

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	BTEX								COMMENTS
4/27	1525	32SB-33-0506		G	3	X						1004265		-19 -45
	1540	32SB-34-0607			3	X								-21 -47
	1545	32SB-36-0506			3	X								-23 -49
	1600	32SB-37-0506			3	X								-25 -51
														WS 4/28/10

1. RELINQUISHED BY	DATE 4/27/10	TIME	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE 4/28/10	TIME 08:30

COMMENTS: 0.6°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

12

CTOF273_003 Summ Package

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004264, 1004265 Number of Coolers: 1 of 3

Client: TTNUS Project: CTO F273

Date/Time Received: 4/28/10 09:00 Date cooler(s) opened: 4/28/10

Opened By (print): Will Schwab (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 3413

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 1 Seal date: 4/27/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 0.6 °C

Dates samples were logged-in: 4/28/10

9. Initial this form to acknowledge login of sample(s): (Name): Will Schwab (Initial): WS
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

If Non-Conformance issues were present, list by sample ID: _____

Received encores for 323B-12-0607 & CAR#: _____

not listed on COC. Tagged for BTEX per volume received.

1004264

Rec'd encores labeled as 323B-11-0607 & this sample is not on COC. There was 323B-11-0607 collection dates/times ~~are~~ are the same! Tagged those as 323B-11-0607 thinking container labels were typos. Please verify!

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004264, 1004265 Number of Coolers: 2 of 3

Client: TTNUS Project: CTO F273

Date/Time Received: 4/28/10 09:00 Date cooler(s) opened: 4/28/10

Opened By (print): Will Schwab (signature): [illegible]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered
   EL Courier Other: _____

If applicable, enter airbill number here: 3402

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 1 Seal date: 4/27/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 0.7 °C

Dates samples were logged-in: 4/28/10

9. Initial this form to acknowledge login of sample(s): (Name): _____ (Initial): _____
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

See page 1 of 3

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004264, 1004265 Number of Coolers: 3 of 3

Client: TTNUS Project: CTO F273

Date/Time Received: **4/28/10** **09:00** Date cooler(s) opened: **4/28/10**

Opened By (print): Will Schwab (signature): [illegible]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 3424

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 1 Seal date: 4/27/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 3.0 °C

Dates samples were logged-in: **4/28/10**

9. Initial this form to acknowledge login of sample(s): (Name): _____ (Initial): _____
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

See page 1 of 3

WORK ORDER

Printed: 5/6/2010 4:43:40AM

1004265

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32

Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Report To:
Tetra Tech NUS, Inc. (T010)
Tobrena Skeen
Foster Plaza 7, 661 Anderson Drive
Pittsburgh, PA 15220
Phone: (412) 921-8182
Fax: (412) 921-4040

Invoice To:
Tetra Tech NUS, Inc. (T010)
Accounts Payable
Foster Plaza 7, 661 Anderson Drive
Pittsburgh, PA 15220
Phone :(412) 921-8182
Fax: (412) 921-4040

Date Due: 05/19/2010 16:00 (15 day TAT)
Received By: William Schwab
Date Received: 04/28/2010 08:30
Logged In By: William Schwab
Date Logged In: 04/28/2010 14:42

Samples Received at: **0.7°C**
Custody Seals Yes
Received On Ice Yes
Containers Intact Yes
COC/Labels Agree Yes
Preservation Confir Yes

Analysis	Due	TAT	Expires	Comments
1004265-01 32SB-23-0506 [Solid] Sampled 04/27/2010 13:05 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 13:05	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 13:05	
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 13:05	ENCORES
1004265-02 32SS-24-0002 [Solid] Sampled 04/27/2010 13:15 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 13:15	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 13:15	
1004265-03 32SB-24-0506 [Solid] Sampled 04/27/2010 13:15 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 13:15	See version
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 13:15	ENCORES
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 13:15	
1004265-04 32SS-25-0002 [Solid] Sampled 04/27/2010 13:30 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 13:30	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 13:30	
1004265-05 32SB-25-0607 [Solid] Sampled 04/27/2010 13:30 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 13:30	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 13:30	See version
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 13:30	ENCORES

WORK ORDER

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1004265

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32

Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Analysis	Due	TAT	Expires	Comments
1004265-06 32SS-26-0002 [Solid] Sampled 04/27/2010 13:35 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 13:35	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 13:35	
1004265-07 32SB-26-0405 [Solid] Sampled 04/27/2010 13:35 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 13:35	See version
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 13:35	ENCORES
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 13:35	
1004265-08 32SS-27-0002 [Solid] Sampled 04/27/2010 14:00 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 14:00	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 14:00	
1004265-09 32SB-27-0506 [Solid] Sampled 04/27/2010 14:00 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 14:00	See version
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 14:00	ENCORES
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 14:00	
1004265-10 32SS-28-0002 [Solid] Sampled 04/27/2010 14:25 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 14:25	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 14:25	See version
1004265-11 32SB-28-0506 [Solid] Sampled 04/27/2010 14:25 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 14:25	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 14:25	
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 14:25	ENCORES
1004265-12 32SS-29-0002 [Solid] Sampled 04/27/2010 14:30 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 14:30	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 14:30	See version
1004265-13 32SB-29-0304 [Solid] Sampled 04/27/2010 14:30 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 14:30	See version
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 14:30	ENCORES
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 14:30	
1004265-14 32SS-30-0002 [Solid] Sampled 04/27/2010 15:05 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 15:05	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 15:05	

1004265

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Analysis	Due	TAT	Expires	Comments
1004265-15 32SB-30-0506 [Solid] Sampled 04/27/2010 15:05 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 15:05	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 15:05	See version
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 15:05	ENCORES
1004265-16 32SS-32-0002 [Solid] Sampled 04/27/2010 14:10 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 14:10	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 14:10	
1004265-17 32SB-32-0506 [Solid] Sampled 04/27/2010 14:10 Central				**DoD QSM 4.1**
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 14:10	ENCORES
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 14:10	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 14:10	
1004265-18 32SS-33-0002 [Solid] Sampled 04/27/2010 15:25 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 15:25	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 15:25	See version
1004265-19 32SB-33-0506 [Solid] Sampled 04/27/2010 15:25 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 15:25	
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 15:25	ENCORES
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 15:25	See version
1004265-20 32SS-34-0002 [Solid] Sampled 04/27/2010 15:40 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 15:40	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 15:40	
1004265-21 32SB-34-0607 [Solid] Sampled 04/27/2010 15:40 Central				**DoD QSM 4.1**
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 15:40	ENCORES
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 15:40	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 15:40	See version
1004265-22 32SS-36-0002 [Solid] Sampled 04/27/2010 15:45 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 15:45	
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 15:45	See version
1004265-23 32SB-36-0506 [Solid] Sampled 04/27/2010 15:45 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 15:45	
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 15:45	ENCORES
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 15:45	See version

WORK ORDER

Printed: 5/6/2010 4:43:40AM

1004265

Empirical Laboratories, LLC

Client:	**Tetra Tech NUS, Inc. (T010)**	**Project Manager:**	**Kim Kostzer**
Project:	**CTOF273 NSA Crane SMU32**	**Project Number:**	**TET10CTOF273**

Analysis	Due	TAT	Expires	Comments
1004265-24 32SS-37-0002 [Solid] Sampled 04/27/2010 16:00 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 16:00	See version
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 16:00	
1004265-25 32SB-37-0506 [Solid] Sampled 04/27/2010 16:00 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 16:00	See version
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 16:00	ENCORES
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 16:00	
1004265-26 32SB-FD042710-02 [Solid] Sampled 04/27/2010 11:45 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/14/2010 14:00	15	05/04/2010 11:45	
VOC_8260B_BTEXMN	05/14/2010 14:00	15	05/11/2010 11:45	ENCORES
SMS_PAH_8270C_3546_LOW	05/14/2010 14:00	15	05/11/2010 11:45	See version

Reviewed By

Date

Sample Delivery Group Assignment Form

CLIENT: Tetra Tech NUS, Inc. (T010)
PROJECT NAME: CTOF273 NSA Crane SMU32
SDG #: CTOF273_003
MATRIX: Solid

QC LEVEL: EDD/IV
Report Due: 5/19/2010
Client Sample Count: 25

Sample Type	Sampled	Received	Lab ID	Client ID	SM2540B	SW8260B	SW8270C
Client Sample	4/27/2010	4/28/2010	1004265-01	32SB-23-0506	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-02	32SS-24-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-03	32SB-24-0506	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-04	32SS-25-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-05	32SB-25-0607	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-06	32SS-26-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-07	32SB-26-0405	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-08	32SS-27-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-09	32SB-27-0506	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-10	32SS-28-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-11	32SB-28-0506	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-12	32SS-29-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-13	32SB-29-0304	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-14	32SS-30-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-15	32SB-30-0506	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-16	32SS-32-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-17	32SB-32-0506	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-18	32SS-33-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-19	32SB-33-0506	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-20	32SS-34-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-21	32SB-34-0607	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-22	32SS-36-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-23	32SB-36-0506	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-24	32SS-37-0002	DoD QSM 4.1		DoD QSM 4.1
Client Sample	4/27/2010	4/28/2010	1004265-25	32SB-37-0506	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Field Duplicate	4/27/2010	4/28/2010	1004265-26	32SB-FD042710-02	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1

Sample Delivery Group Case Narrative

Receipt Information

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision

This is an original submittal of the final report package.

Analytical Information

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. The following information is provided specific to individual methods:

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.
B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.
C: The peak was manually integrated to correct the baseline from the original chromatogram.
D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

SW8260B:

The continuing calibration standards failed criteria in 0E14109-CCV1 for Ethylbenzene.

Samples 1004265-01RE1 (reanalysis), 1004265-11RE1 (reanalysis at 50 dilution) were analyzed and reported outside of holding time on the re-analysis. The original analyses were performed within holding time and are reported; however, the original failed criteria for internal standards and required re-analysis. Sample 1004265-23 was analyzed outside the method holding time; however, the sample was analyzed within a 2X of the holding time. The first run failed internal standard criteria and the re-analyses was performed at a 50 diltuion. Both analyses are reported.

No additional anomalies or deviations are noted and the data is properly qualified.

SW8270C PAHs:
Samples 1004265-17, 1004265-18, 1004265-19, 1004265-20, 1004265-21, 1004265-22, 1004265-23, 1004265-24, 1004265-25, and 1004265-26 were extracted outside the method holding time; however, the samples were prepped within a 2X of the holding time.

The continuing calibration standard failed criteria in 0F16723-CCV1 for Chrysene, and in 0F16739-CCV1 for Chrysene, Dibenz(a,h)anthracene, and Indeno(1,2,3-cd)pyrene.

The internal standard failed criteria for sample 1004265-10 and the affected analytes are qualified. No additional anomalies or deviations are noted and the data is properly qualified.

Data Qualifiers
As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL), also known as Reporting Limit **(RL),** is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

*****: A failing quality control criteria is associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the EQL. One should feel confident that the result is greater than zero and less than the EQL.

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In metals, the qualifier indicates that the parameters MDL/RL

has been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The RPD and/or percent recovery failed in the associated Blank Spike and/or Blank Spike Duplicate.

S: The Internal Standard failed criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

LIMS Definitions / Naming Conventions:
The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

BLK: LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

BS: LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "**RE**" implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:
I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, Ms. Marcia K. McGinnity is authorized to sign this Statement of Data Authenticity.

Mr. Rick D. Davis
Laboratory Technical Director / VP Operations

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Sequence: 0E13002

Calibration: 0130002

SDG: CTOF273_003

Project: CTOF273 NSA Crane SMU32

Instrument: MS-VOA4

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13002-TUN1	SEQ-TUN1.D	05/07/10 18:43
Cal Standard	0E13002-CAL1	SEQ-CAL1.D	05/07/10 19:17
Cal Standard	0E13002-CAL2	SEQ-CAL2.D	05/07/10 19:47
Cal Standard	0E13002-CAL3	SEQ-CAL3.D	05/07/10 20:18
Cal Standard	0E13002-CAL4	SEQ-CAL4.D	05/07/10 20:49
Cal Standard	0E13002-CAL5	SEQ-CAL5.D	05/07/10 21:20
Cal Standard	0E13002-CAL6	SEQ-CAL6.D	05/07/10 21:51
Cal Standard	0E13002-CAL7	SEQ-CAL7.D	05/07/10 22:21
Cal Standard	0E13002-CAL8	SEQ-CAL8.D	05/07/10 22:52
Initial Cal Check	0E13002-ICV1	SEQ-ICV1.D	05/07/10 23:22
Cal Standard	0E13002-CAL9	SEQ-CAL9.D	05/07/10 23:53
Cal Standard	0E13002-CALA	SEQ-CALA.D	05/08/10 00:24
Cal Standard	0E13002-CALB	SEQ-CALB.D	05/08/10 00:55
Cal Standard	0E13002-CALC	SEQ-CALC.D	05/08/10 01:25
Cal Standard	0E13002-CALD	SEQ-CALD.D	05/08/10 01:56
Cal Standard	0E13002-CALE	SEQ-CALE.D	05/08/10 02:27
Cal Standard	0E13002-CALF	SEQ-CALF.D	05/08/10 02:57
Cal Standard	0E13002-CALG	SEQ-CALG.D	05/08/10 03:28
MS Tune	0E13002-TUN2	SEQ-TUN2.D	05/08/10 04:29
Cal Standard	0E13002-CALH	SEQ-CALH.D	05/08/10 04:59
Cal Standard	0E13002-CALI	SEQ-CALI.D	05/08/10 05:30
Cal Standard	0E13002-CALJ	SEQ-CALJ.D	05/08/10 06:01
Cal Standard	0E13002-CALK	SEQ-CALK.D	05/08/10 06:31
Cal Standard	0E13002-CALL	SEQ-CALL.D	05/08/10 07:02
Cal Standard	0E13002-CALM	SEQ-CALM.D	05/08/10 07:32
Cal Standard	0E13002-CALN	SEQ-CALN.D	05/08/10 08:03
Cal Standard	0E13002-CALO	SEQ-CALO.D	05/08/10 08:34

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/07/10
Instrument ID:	MS-VOA4	Injection Time:	18:43
Sequence:	0E13002	Lab Sample ID:	0E13002-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	32.2	PASS
75	30 - 60% of 95	50.5	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.01	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	70.3	PASS
175	5 - 9% of 174	7.68	PASS
176	95 - 101% of 174	95.1	PASS
177	5 - 9% of 176	5.92	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/08/10
Instrument ID:	MS-VOA4	Injection Time:	04:29
Sequence:	0E13002	Lab Sample ID:	0E13002-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	25.2	PASS
75	30 - 60% of 95	44.3	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.93	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	72	PASS
175	5 - 9% of 174	8.06	PASS
176	95 - 101% of 174	95.2	PASS
177	5 - 9% of 176	6.4	PASS

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0130002	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/7/2010 9:01:33AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	1.072069	4.777662	13.77363	2.989758E-02			15	
Bromofluorobenzene	0.8397075	6.434109	18.2985	2.305661E-02			15	
Ethylbenzene	2.911353	12.32509	17.49371	7.889913E-03			CCC (20)	
Naphthalene	1.929638	13.77676	21.93187	8.914289E-03			15	
Methyl t-Butyl Ether	0.7656045	3.435099	10.40713	4.151465E-02			15	
Toluene	1.422543	12.62549	16.10688	1.093417E-02			CCC (20)	
m,p-Xylene	2.139192	17.90708	17.64143	1.326399E-02		0.9998704	0.99	
o-Xylene	2.105664	14.8487	17.96983	3.930673E-03			15	
Xylenes (total)	2.150116	17.06447	0	0		0.9998992	0.99	
Dibromofluoromethane	0.3074291	2.04296	12.30138	4.654776E-02			15	
1,2-Dichloroethane-d4	6.679317E-02	3.711545	12.98763	2.467597E-02			15	
Toluene-d8	2.047687	4.711146	16.03913	1.096841E-02			15	

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13510	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13510-TUN1	SEQ-TUN2.D	05/09/10 23:45
Calibration Check	0E13510-CCV1	SEQ-CCV3.D	05/10/10 00:16
LCS	0E09008-BS1	V4LCS03.D	05/10/10 00:46
Blank	0E09008-BLK1	V4BLK02.D	05/10/10 02:18
32SB-23-0506	1004265-01	0426501.D	05/10/10 06:53
32SB-24-0506	1004265-03	0426503.D	05/10/10 07:23
32SB-25-0607	1004265-05	0426505.D	05/10/10 07:54
32SB-26-0405	1004265-07	0426507.D	05/10/10 08:24
LCS Dup	0E09008-BSD1	V4LCSD03.D	05/10/10 09:56

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/09/10
Instrument ID:	MS-VOA4	Injection Time:	23:45
Sequence:	0E13510	Lab Sample ID:	0E13510-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	28	PASS
75	30 - 60% of 95	45.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.88	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	60.8	PASS
175	5 - 9% of 174	8.43	PASS
176	95 - 101% of 174	96.2	PASS
177	5 - 9% of 176	6.87	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-CCV3.D	Calibration Date:	05/07/10 09:01
Sequence:	0E13510	Injection Date:	05/10/10
Lab Sample ID:	0E13510-CCV1	Injection Time:	00:16

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	94.71	1.072069	1.015384		-5.3	20
Ethylbenzene	A	100.0	84.38	2.911353	2.456576		-15.6	20
Naphthalene	A	100.0	94.03	1.929638	1.814421		-6.0	20
Methyl t-Butyl Ether	A	100.0	84.34	0.7656045	0.6457327		-15.7	20
Toluene	A	100.0	89.46	1.422543	1.272551		-10.5	20
m,p-Xylene	Q	200.0	183.8	2.139192	1.633718		-8.1	20
o-Xylene	A	100.0	83.63	2.105664	1.760967		-16.4	20
Xylenes (total)	Q	300.0	267.4	2.150116	1.676135		-10.9	20
Bromofluorobenzene	A	30.00	29.06	0.8397075	0.8133464		-3.1	20
Dibromofluoromethane	A	30.00	31.80	0.3074291	0.325851		6.0	20
1,2-Dichloroethane-d4	A	30.00	31.61	6.679317E-02	7.037151E-02		5.4	20
Toluene-d8	A	30.00	29.46	2.047687	2.010505		-1.8	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13518	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13518-TUN1	SEQ-TUN1.D	05/10/10 10:46
Calibration Check	0E13518-CCV1	SEQ-CCV1.D	05/10/10 11:17
LCS	0E10025-BS1	V4LCS01.D	05/10/10 12:18
Blank	0E10025-BLK1	V4BLK01.D	05/10/10 14:21
32SB-27-0506	1004265-09	0426509.D	05/10/10 15:22
32SB-29-0304	1004265-13	0426513.D	05/10/10 16:23
32SB-30-0506	1004265-15	0426515.D	05/10/10 16:54
32SB-32-0506	1004265-17	0426517.D	05/10/10 17:24
32SB-33-0506	1004265-19	0426519.D	05/10/10 17:55
32SB-34-0607	1004265-21	0426521.D	05/10/10 18:26
32SB-37-0506	1004265-25	0426524.D	05/10/10 19:27
32SB-FD042710-02	1004265-26	0426525.D	05/10/10 19:58

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/10/10
Instrument ID:	MS-VOA4	Injection Time:	10:46
Sequence:	0E13518	Lab Sample ID:	0E13518-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	31.6	PASS
75	30 - 60% of 95	50.8	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.86	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	56.1	PASS
175	5 - 9% of 174	8.26	PASS
176	95 - 101% of 174	95.4	PASS
177	5 - 9% of 176	7.08	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/07/10 09:01
Sequence:	0E13518	Injection Date:	05/10/10
Lab Sample ID:	0E13518-CCV1	Injection Time:	11:17

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	106.8	1.072069	1.145476		6.8	20
Ethylbenzene	A	100.0	89.19	2.911353	2.596576		-10.8	20
Naphthalene	A	100.0	95.21	1.929638	1.837237		-4.8	20
Methyl t-Butyl Ether	A	100.0	98.68	0.7656045	0.755503		-1.3	20
Toluene	A	100.0	92.26	1.422543	1.312496		-7.7	20
m,p-Xylene	Q	200.0	207.2	2.139192	1.781679		3.6	20
o-Xylene	A	100.0	90.57	2.105664	1.907106		-9.4	20
Xylenes (total)	Q	300.0	297.8	2.150116	1.823488		-0.7	20
Bromofluorobenzene	A	30.00	29.84	0.8397075	0.8352643		-0.5	20
Dibromofluoromethane	A	30.00	32.13	0.3074291	0.3292726		7.1	20
1,2-Dichloroethane-d4	A	30.00	30.14	6.679317E-02	6.710867E-02		0.5	20
Toluene-d8	A	30.00	31.36	2.047687	2.140874		4.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14024	Instrument:	MS-VOA4
Calibration:	0144005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14024-TUN1	SEQ-TUN1.D	05/13/10 13:56
Cal Standard	0E14024-CAL1	SEQ-CAL1.D	05/13/10 14:27
Cal Standard	0E14024-CAL2	SEQ-CAL2.D	05/13/10 14:58
Cal Standard	0E14024-CAL3	SEQ-CAL3.D	05/13/10 15:29
Cal Standard	0E14024-CAL4	SEQ-CAL4.D	05/13/10 16:00
Cal Standard	0E14024-CAL5	SEQ-CAL5.D	05/13/10 16:31
Cal Standard	0E14024-CAL6	SEQ-CAL6.D	05/13/10 17:02
Cal Standard	0E14024-CAL7	SEQ-CAL7.D	05/13/10 17:33
Cal Standard	0E14024-CAL8	SEQ-CAL8.D	05/13/10 18:03
Cal Standard	0E14024-CAL9	SEQ-CAL9.D	05/13/10 19:05
Cal Standard	0E14024-CALA	SEQ-CALA.D	05/13/10 19:36
Cal Standard	0E14024-CALB	SEQ-CALB.D	05/13/10 20:07
Cal Standard	0E14024-CALC	SEQ-CALC.D	05/13/10 20:38
Cal Standard	0E14024-CALD	SEQ-CALD.D	05/13/10 21:09
Cal Standard	0E14024-CALE	SEQ-CALE.D	05/13/10 21:39
Cal Standard	0E14024-CALF	SEQ-CALF.D	05/13/10 22:10
Cal Standard	0E14024-CALG	SEQ-CALG.D	05/13/10 22:41
MS Tune	0E14024-TUN2	SEQ-TUN2.D	05/13/10 23:42
Cal Standard	0E14024-CALH	SEQ-CALH.D	05/14/10 00:13
Cal Standard	0E14024-CALI	SEQ-CALI.D	05/14/10 00:44
Cal Standard	0E14024-CALJ	SEQ-CALJ.D	05/14/10 01:14
Cal Standard	0E14024-CALK	SEQ-CALK.D	05/14/10 01:45
Cal Standard	0E14024-CALL	SEQ-CALL.D	05/14/10 02:16
Cal Standard	0E14024-CALM	SEQ-CALM.D	05/14/10 02:46
Cal Standard	0E14024-CALN	SEQ-CALN.D	05/14/10 03:17
Cal Standard	0E14024-CALO	SEQ-CALO.D	05/14/10 03:48
MS Tune	0E14024-TUN3	SEQ-TUN1A.D	05/14/10 11:07
Initial Cal Check	0E14024-ICV4	SEQ-ICV4.D	05/14/10 11:37

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/13/10
Instrument ID:	MS-VOA4	Injection Time:	13:56
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	24.2	PASS
75	30 - 60% of 95	46.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.6	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	72.9	PASS
175	5 - 9% of 174	8.01	PASS
176	95 - 101% of 174	97.4	PASS
177	5 - 9% of 176	6.63	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/13/10
Instrument ID:	MS-VOA4	Injection Time:	23:42
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	27.6	PASS
75	30 - 60% of 95	49	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.84	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	50.2	PASS
175	5 - 9% of 174	7.16	PASS
176	95 - 101% of 174	95.8	PASS
177	5 - 9% of 176	7.75	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1A.D	Injection Date:	05/14/10
Instrument ID:	MS-VOA4	Injection Time:	11:07
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN3

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	25.5	PASS
75	30 - 60% of 95	48.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.2	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	62.6	PASS
175	5 - 9% of 174	8.21	PASS
176	95 - 101% of 174	95.7	PASS
177	5 - 9% of 176	6.95	PASS

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0144005	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/13/2010 12:58:00PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	1.044291	4.652266	13.76237	3.391041E-02			15	
Bromofluorobenzene	0.8537608	7.34618	18.281	8.410647E-03			15	
Ethylbenzene	2.698668	13.33057	17.47429	6.927592E-03			CCC (20)	
Naphthalene	1.996388	5.075341	21.90313	1.378937E-02			15	
Methyl t-Butyl Ether	0.7267424	7.117503	10.3995	0.1372416			15	
Toluene	1.328513	13.22851	16.0955	5.342824E-03			CCC (20)	
m,p-Xylene	2.002384	18.89119	17.62343	2.237986E-02		0.9993129	0.99	
o-Xylene	1.977768	14.16671	17.947	1.172407E-02			15	
Xylenes (total)	2.00992	17.15348	0	0		0.9991333	0.99	
Dibromofluoromethane	0.2871282	2.648676	12.29125	3.601698E-02			15	
1,2-Dichloroethane-d4	6.763165E-02	4.751393	12.97875	3.193036E-02			15	
Toluene-d8	1.971808	5.830891	16.02787	1.491481E-02			15	

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	~~CTOF273~~ NSA Crane SMU32
Sequence:	0E14109	Instrument:	MS-VOA4
Calibration:	0144005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14109-TUN1	SEQ-TUN3.D	05/15/10 19:25
Calibration Check	0E14109-CCV1	SEQ-CCV1.D	05/15/10 19:55
LCS	0E15003-BS1	V4LCS01.D	05/15/10 20:57
Blank	0E15003-BLK1	V4BLK01.D	05/15/10 22:29
32SB-28-0506	1004265-11	0426511.D	05/16/10 01:33
32SB-36-0506	1004265-23	0426523.D	05/16/10 02:04
LCS Dup	0E15003-BSD1	V4LCSD01.D	05/16/10 07:41

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN3.D	Injection Date:	05/15/10
Instrument ID:	MS-VOA4	Injection Time:	19:25
Sequence:	0E14109	Lab Sample ID:	0E14109-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	23.2	PASS
75	30 - 60% of 95	45.9	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.71	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	79.2	PASS
175	5 - 9% of 174	8.16	PASS
176	95 - 101% of 174	97.5	PASS
177	5 - 9% of 176	6.59	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0144005
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/13/10 12:58
Sequence:	0E14109	Injection Date:	05/15/10
Lab Sample ID:	0E14109-CCV1	Injection Time:	19:55

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	94.85	1.044291	0.9905176		-5.1	20
Ethylbenzene	A	100.0	79.76	2.698668	2.152489		-20.2	20 *
Toluene	A	100.0	83.07	1.328513	1.103647		-16.9	20
Xylenes (total)	Q	300.0	258.5	2.00992	1.52534		-13.8	20
Bromofluorobenzene	A	30.00	30.23	0.8537608	0.8602882		0.8	20
Dibromofluoromethane	A	30.00	33.56	0.2871282	0.3211603		11.9	20
1,2-Dichloroethane-d4	A	30.00	30.64	6.763165E-02	0.0690804		2.1	20
Toluene-d8	A	30.00	29.41	1.971808	1.932812		-2.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13909	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13909-TUN1	SEQ-TUN1.D	05/16/10 13:42
Cal Standard	0E13909-CAL1	SEQ-CAL1.D	05/16/10 14:17
Cal Standard	0E13909-CAL2	SEQ-CAL2.D	05/16/10 14:57
Cal Standard	0E13909-CAL3	SEQ-CAL3.D	05/16/10 15:36
Cal Standard	0E13909-CAL4	SEQ-CAL4.D	05/16/10 16:15
Cal Standard	0E13909-CAL5	SEQ-CAL5.D	05/16/10 16:54
Cal Standard	0E13909-CAL6	SEQ-CAL6.D	05/16/10 17:34
Cal Standard	0E13909-CAL7	SEQ-CAL7.D	05/16/10 18:13
Cal Standard	0E13909-CAL8	SEQ-CAL8.D	05/16/10 18:52
Initial Cal Check	0E13909-ICV1	SEQ-ICV1.D	05/16/10 19:31

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/16/10
Instrument ID:	MS-VOA1	Injection Time:	13:42
Sequence:	0E13909	Lab Sample ID:	0E13909-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	21.1	PASS
75	30 - 60% of 95	47.2	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.37	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	67.1	PASS
175	5 - 9% of 174	7.31	PASS
176	95 - 101% of 174	95.7	PASS
177	5 - 9% of 176	6.29	PASS

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0141001	Instrument:	MS-VOA1
Matrix:	Water	Calibration Date:	5/16/2010 5:53:49AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	0.9538096	3.675415	14.21375	4.186609E-02			15	
Bromofluorobenzene	0.806614	6.33105	22.47137	1.987755E-02			15	
Ethylbenzene	2.625901	8.273184	20.69738	1.993286E-02			CCC (20)	
Naphthalene	1.42045	7.973596	29.36488	1.155791E-02			15	
Methyl t-Butyl Ether	0.4789501	5.76918	10.66088	8.608269E-02			15	
Toluene	1.306087	5.445475	17.8805	2.681495E-02			CCC (20)	
m,p-Xylene	1.994748	13.5635	21.01925	2.161043E-02			15	
o-Xylene	1.962043	8.658804	21.74325	2.516958E-02			15	
Xylenes (total)	1.983846	11.91374	0	0			15	
Dibromofluoromethane	0.2558456	1.002136	12.42088	3.528492E-02			15	
1,2-Dichloroethane-d4	6.111453E-02	2.620876	13.20788	4.616384E-02			15	
Toluene-d8	2.151044	5.303775	17.753	2.907062E-02			15	

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14105	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14105-TUN1	SEQ-TUN1.D	05/20/10 13:38
Calibration Check	0E14105-CCV1	SEQ-CCV1.D	05/20/10 14:10
LCS	0E20008-BS1	V1LCS1.D	05/20/10 15:29
Blank	0E20008-BLK1	V1BLK01.D	05/20/10 17:26
32SB-23-0506	1004265-01RE1	0426501.D	05/20/10 20:42
LCS Dup	0E20008-BSD1	V1LCSD1.D	05/20/10 23:18

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/20/10
Instrument ID:	MS-VOA1	Injection Time:	13:38
Sequence:	0E14105	Lab Sample ID:	0E14105-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	21.7	PASS
75	30 - 60% of 95	45.6	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.35	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	67.6	PASS
175	5 - 9% of 174	6.92	PASS
176	95 - 101% of 174	95.4	PASS
177	5 - 9% of 176	6.29	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA1	Calibration:	0141001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/16/10 05:53
Sequence:	0E14105	Injection Date:	05/20/10
Lab Sample ID:	0E14105-CCV1	Injection Time:	14:10

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	89.38	0.9538096	0.852482		-10.6	20
Ethylbenzene	A	100.0	85.50	2.625901	2.245226		-14.5	20
Naphthalene	A	100.0	83.43	1.42045	1.185048		-16.6	20
Methyl t-Butyl Ether	A	100.0	77.28	0.4789501	0.370126		-22.7	20 *
Toluene	A	100.0	87.09	1.306087	1.137517		-12.9	20
m,p-Xylene	A	200.0	165.1	1.994748	1.646864		-17.4	20
o-Xylene	A	100.0	83.92	1.962043	1.646635		-16.1	20
Xylenes (total)	A	300.0	249.0	1.983846	1.646787		-17.0	20
Bromofluorobenzene	A	30.00	29.53	0.806614	0.7940735		-1.6	20
Dibromofluoromethane	A	30.00	28.34	0.2558456	0.2417086		-5.5	20
1,2-Dichloroethane-d4	A	30.00	27.00	6.111453E-02	5.500776E-02		-10.0	20
Toluene-d8	A	30.00	29.52	2.151044	2.116707		-1.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15210	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15210-TUN1	SEQ-TUN1.D	05/21/10 15:57
Calibration Check	0F15210-CCV1	SEQ-CCV1.D	05/21/10 16:29
LCS	0E21026-BS1	V1LCS1.D	05/21/10 17:08
Blank	0E21026-BLK2	V1MBLK1.D	05/21/10 19:08
32SB-28-0506	1004265-11RE1	0426511D.D	05/21/10 19:47
32SB-36-0506	1004265-23RE1	0426523D.D	05/21/10 20:27

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/21/10
Instrument ID:	MS-VOA1	Injection Time:	15:57
Sequence:	0F15210	Lab Sample ID:	0F15210-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	23.5	PASS
75	30 - 60% of 95	46.8	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.56	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	55.5	PASS
175	5 - 9% of 174	7.52	PASS
176	95 - 101% of 174	96	PASS
177	5 - 9% of 176	6.52	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA1	Calibration:	0141001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/16/10 05:53
Sequence:	0F15210	Injection Date:	05/21/10
Lab Sample ID:	0F15210-CCV1	Injection Time:	16:29

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	96.53	0.9538096	0.9207242		-3.5	20
Ethylbenzene	A	100.0	92.24	2.625901	2.422007		-7.8	20
Naphthalene	A	100.0	78.18	1.42045	1.110565		-21.8	20 *
Methyl t-Butyl Ether	A	100.0	154.2	0.4789501	0.7384538		54.2	20 *
Toluene	A	100.0	94.46	1.306087	1.233704		-5.5	20
m,p-Xylene	A	200.0	178.8	1.994748	1.783541		-10.6	20
o-Xylene	A	100.0	90.52	1.962043	1.775968		-9.5	20
Xylenes (total)	A	300.0	269.3	1.983846	1.781017		-10.2	20
Bromofluorobenzene	A	30.00	28.69	0.806614	0.7713755		-4.4	20
Dibromofluoromethane	A	30.00	28.25	0.2558456	0.2409428		-5.8	20
1,2-Dichloroethane-d4	A	30.00	23.73	6.111453E-02	4.833412E-02		-20.9	20 *
Toluene-d8	A	30.00	29.70	2.151044	2.129762		-1.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_003

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E09008 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E09008-BLK1	05/09/10 15:46	5.00	5.00
LCS	0E09008-BS1	05/09/10 15:46	5.00	5.00
LCS Dup	0E09008-BSD1	05/09/10 15:46	5.00	5.00
32SB-23-0506	1004265-01	05/09/10 15:46	5.30	5.00
32SB-24-0506	1004265-03	05/09/10 15:46	5.57	5.00
32SB-25-0607	1004265-05	05/09/10 15:46	6.21	5.00
32SB-26-0405	1004265-07	05/09/10 15:46	6.78	5.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_003	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E09008-BLK1	File ID:	V4BLK02.D
Sampled:		Prepared:		Analyzed:	05/10/10 02:18
Solids:		Preparation:	5035	Dilution:	

Batch: 0E09008 Sequence: 0E13510 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.88	106	85 - 120	
Dibromofluoromethane	30.00	30.81	103	80 - 125	
1,2-Dichloroethane-d4	30.00	29.85	99.5	75 - 140	
Toluene-d8	30.00	35.50	118	85 - 115	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E09008	Laboratory ID:	0E09008-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	50.54	101	75 - 125
Ethylbenzene	50.00	49.10	98.2	75 - 125
Toluene	50.00	48.89	97.8	70 - 125
Xylenes (total)	150.0	146.6	97.7	75 - 125

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzene	50.00	50.83	102	0.567	30	75 - 125
Ethylbenzene	50.00	50.32	101	2.47	30	75 - 125
Toluene	50.00	51.54	103	5.30	30	70 - 125
Xylenes (total)	150.0	154.9	103	5.49	30	75 - 125

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_003

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E10025

Batch Matrix: Solid

Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E10025-BLK1	05/10/10 12:00	5.00	5.00
LCS	0E10025-BS1	05/10/10 12:00	5.00	5.00
32SB-27-0506	1004265-09	05/10/10 13:59	6.40	5.00
32SB-29-0304	1004265-13	05/10/10 13:59	5.30	5.00
32SB-30-0506	1004265-15	05/10/10 13:59	5.33	5.00
32SB-32-0506	1004265-17	05/10/10 13:59	6.03	5.00
32SB-33-0506	1004265-19	05/10/10 13:59	5.64	5.00
32SB-34-0607	1004265-21	05/10/10 13:59	6.04	5.00
32SB-37-0506	1004265-25	05/10/10 13:59	5.13	5.00
32SB-FD042710-02	1004265-26	05/10/10 13:59	5.82	5.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E10025-BLK1	File ID:	V4BLK01.D
Sampled:		Prepared:		Analyzed:	05/10/10 14:21
Solids:		Preparation:	5035	Dilution:	

Batch: 0E10025 Sequence: 0E13518 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	34.12	114	85 - 120	
Dibromofluoromethane	30.00	32.13	107	80 - 125	
1,2-Dichloroethane-d4	30.00	32.36	108	75 - 140	
Toluene-d8	30.00	31.89	106	85 - 115	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E10025	Laboratory ID:	0E10025-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	46.06	92.1	75 - 125
Ethylbenzene	50.00	45.42	90.8	75 - 125
Toluene	50.00	45.32	90.6	70 - 125
Xylenes (total)	150.0	131.8	87.9	75 - 125

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_003

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E15003

Batch Matrix: Solid

Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E15003-BLK1	05/15/10 14:56	5.00	5.00
LCS	0E15003-BS1	05/15/10 14:56	5.00	5.00
LCS Dup	0E15003-BSD1	05/15/10 14:56	5.00	5.00
32SB-28-0506	1004265-11	05/15/10 14:50	6.20	5.00
32SB-36-0506	1004265-23	05/15/10 14:50	5.90	5.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E15003-BLK1	File ID:	V4BLK01.D
Sampled:		Prepared:		Analyzed:	05/15/10 22:29
Solids:		Preparation:	5035	Dilution:	

Batch: 0E15003 Sequence: 0E14109 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	Y, U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.91	103	85 - 120	
Dibromofluoromethane	30.00	30.57	102	80 - 125	
1,2-Dichloroethane-d4	30.00	28.47	94.9	75 - 140	
Toluene-d8	30.00	30.82	103	85 - 115	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E15003	Laboratory ID:	0E15003-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	59.69	119	75 - 125
Ethylbenzene	50.00	56.32	113	75 - 125
Toluene	50.00	58.68	117	70 - 125
Xylenes (total)	150.0	180.2	120	75 - 125

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS	
					RPD	REC.
Benzene	50.00	53.54	107	10.9	30	75 - 125
Ethylbenzene	50.00	50.08	100	11.7	30	75 - 125
Toluene	50.00	50.89	102	14.2	30	70 - 125
Xylenes (total)	150.0	150.9	101	17.7	30	75 - 125

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_003

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E20008

Batch Matrix: Solid

Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E20008-BLK1	05/20/10 11:09	5.00	5.00
LCS	0E20008-BS1	05/20/10 11:09	5.00	5.00
LCS Dup	0E20008-BSD1	05/20/10 11:09	5.00	5.00
32SB-23-0506	1004265-01RE1	05/20/10 11:09	5.53	5.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_003	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E20008-BLK1	File ID:	V1BLK01.D
Sampled:		Prepared:		Analyzed:	05/20/10 17:26
Solids:		Preparation:	5035	Dilution:	

Batch: 0E20008 Sequence: 0E14105 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.63	105	85 - 120	
Dibromofluoromethane	30.00	30.62	102	80 - 125	
1,2-Dichloroethane-d4	30.00	31.37	105	75 - 140	
Toluene-d8	30.00	30.27	101	85 - 115	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E20008	Laboratory ID:	0E20008-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	54.00	108	75 - 125
Ethylbenzene	50.00	53.23	106	75 - 125
Toluene	50.00	52.95	106	70 - 125
Xylenes (total)	150.0	156.6	104	75 - 125

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzene	50.00	44.68	89.4	18.9	30	75 - 125
Ethylbenzene	50.00	45.71	91.4	15.2	30	75 - 125
Toluene	50.00	46.44	92.9	13.1	30	70 - 125
Xylenes (total)	150.0	136.3	90.9	13.9	30	75 - 125

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_003

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E21026 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E21026-BLK2	05/21/10 00:00	5.00	5.00
LCS	0E21026-BS1	05/21/10 00:00	5.00	5.00
32SB-28-0506	1004265-11RE1	05/21/10 00:00	6.05	5.00
32SB-36-0506	1004265-23RE1	05/21/10 00:00	6.15	5.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_003	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E21026-BLK2	File ID:	V1MBLK1.D
Sampled:		Prepared:		Analyzed:	05/21/10 19:08
Solids:		Preparation:	5035	Dilution:	

Batch: 0E21026 Sequence: 0F15210 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		23.5	200	U
100-41-4	Ethylbenzene		37.5	500	U
108-88-3	Toluene		43.0	500	U
1330-20-7	Xylenes (total)		35.0	500	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.19	104	85 - 120	
Dibromofluoromethane	30.00	27.08	90.3	80 - 125	
1,2-Dichloroethane-d4	30.00	31.55	105	75 - 140	
Toluene-d8	30.00	30.36	101	85 - 115	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E21026	Laboratory ID:	0E21026-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	48.79	97.6	75 - 125
Ethylbenzene	50.00	49.68	99.4	75 - 125
Toluene	50.00	49.63	99.3	70 - 125
Xylenes (total)	150.0	145.0	96.6	75 - 125

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13510	Instrument:	MS-VOA4
		Calibration:	0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E13510-CCV1) ug/L				Lab File ID: SEQ-CCV3.D		Analyzed: 05/10/10 00:16		
Bromofluorobenzene	30.00	96.9	80 - 120	18.288	18.288	0.0000	+/-1.000	
Dibromofluoromethane	30.00	106	80 - 120	12.286	12.286	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	105	80 - 120	12.975	12.975	0.0000	+/-1.000	
Toluene-d8	30.00	98.2	80 - 120	16.025	16.025	0.0000	+/-1.000	
LCS (0E09008-BS1) ug/Kg wet				Lab File ID: V4LCS03.D		Analyzed: 05/10/10 00:46		
Bromofluorobenzene	30.00	100	85 - 120	18.29	18.288	0.0020	+/-1.000	
Dibromofluoromethane	30.00	100	80 - 125	12.288	12.286	0.0020	+/-1.000	
1,2-Dichloroethane-d4	30.00	88.7	75 - 140	12.977	12.975	0.0020	+/-1.000	
Toluene-d8	30.00	103	85 - 115	16.027	16.025	0.0020	+/-1.000	
Blank (0E09008-BLK1) ug/Kg wet				Lab File ID: V4BLK02.D		Analyzed: 05/10/10 02:18		
Bromofluorobenzene	30.00	106	85 - 120	18.293	18.288	0.0050	+/-1.000	
Dibromofluoromethane	30.00	103	80 - 125	12.281	12.286	-0.0050	+/-1.000	
1,2-Dichloroethane-d4	30.00	99.5	75 - 140	12.96	12.975	-0.0150	+/-1.000	
Toluene-d8	30.00	118	85 - 115	16.03	16.025	0.0050	+/-1.000	*
32SB-23-0506 (1004265-01) ug/Kg dry				Lab File ID: 0426501.D		Analyzed: 05/10/10 06:53		
Bromofluorobenzene	37.15	114	85 - 120	18.284	18.288	-0.0040	+/-1.000	
Dibromofluoromethane	37.15	109	80 - 125	12.292	12.286	0.0060	+/-1.000	
1,2-Dichloroethane-d4	37.15	108	75 - 140	12.971	12.975	-0.0040	+/-1.000	
Toluene-d8	37.15	106	85 - 115	16.031	16.025	0.0060	+/-1.000	
32SB-24-0506 (1004265-03) ug/Kg dry				Lab File ID: 0426503.D		Analyzed: 05/10/10 07:23		
Bromofluorobenzene	32.59	112	85 - 120	18.285	18.288	-0.0030	+/-1.000	
Dibromofluoromethane	32.59	98.2	80 - 125	12.292	12.286	0.0060	+/-1.000	
1,2-Dichloroethane-d4	32.59	86.6	75 - 140	12.981	12.975	0.0060	+/-1.000	
Toluene-d8	32.59	111	85 - 115	16.032	16.025	0.0070	+/-1.000	
32SB-25-0607 (1004265-05) ug/Kg dry				Lab File ID: 0426505.D		Analyzed: 05/10/10 07:54		
Bromofluorobenzene	28.24	114	85 - 120	18.289	18.288	0.0010	+/-1.000	
Dibromofluoromethane	28.24	104	80 - 125	12.287	12.286	0.0010	+/-1.000	
1,2-Dichloroethane-d4	28.24	98.7	75 - 140	12.975	12.975	0.0000	+/-1.000	
Toluene-d8	28.24	108	85 - 115	16.026	16.025	0.0010	+/-1.000	
32SB-26-0405 (1004265-07) ug/Kg dry				Lab File ID: 0426507.D		Analyzed: 05/10/10 08:24		
Bromofluorobenzene	26.30	107	85 - 120	18.283	18.288	-0.0050	+/-1.000	
Dibromofluoromethane	26.30	101	80 - 125	12.291	12.286	0.0050	+/-1.000	
1,2-Dichloroethane-d4	26.30	89.6	75 - 140	12.98	12.975	0.0050	+/-1.000	
Toluene-d8	26.30	110	85 - 115	16.03	16.025	0.0050	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13510	Instrument:	MS-VOA4
		Calibration:	0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
LCS Dup (0E09008-BSD1) ug/Kg wet				Lab File ID: V4LCSD03.D		Analyzed: 05/10/10 09:56		
Bromofluorobenzene	30.00	107	85 - 120	18.283	18.288	-0.0050	+/-1.000	
Dibromofluoromethane	30.00	93.6	80 - 125	12.291	12.286	0.0050	+/-1.000	
1,2-Dichloroethane-d4	30.00	90.4	75 - 140	12.97	12.975	-0.0050	+/-1.000	
Toluene-d8	30.00	106	85 - 115	16.03	16.025	0.0050	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13518

SDG: CTOF273_003
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E13518-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/10/10 11:17		
Bromofluorobenzene	30.00	99.5	80 - 120	18.284	18.284	0.0000	+/-1.000	
Dibromofluoromethane	30.00	107	80 - 120	12.282	12.282	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	100	80 - 120	12.981	12.981	0.0000	+/-1.000	
Toluene-d8	30.00	105	80 - 120	16.031	16.031	0.0000	+/-1.000	
LCS (0E10025-BS1) ug/Kg wet				Lab File ID: V4LCS01.D		Analyzed: 05/10/10 12:18		
Bromofluorobenzene	30.00	100	85 - 120	18.283	18.284	-0.0010	+/-1.000	
Dibromofluoromethane	30.00	99.8	80 - 125	12.29	12.282	0.0080	+/-1.000	
1,2-Dichloroethane-d4	30.00	90.5	75 - 140	12.979	12.981	-0.0020	+/-1.000	
Toluene-d8	30.00	99.5	85 - 115	16.029	16.031	-0.0020	+/-1.000	
Blank (0E10025-BLK1) ug/Kg wet				Lab File ID: V4BLK01.D		Analyzed: 05/10/10 14:21		
Bromofluorobenzene	30.00	114	85 - 120	18.29	18.284	0.0060	+/-1.000	
Dibromofluoromethane	30.00	107	80 - 125	12.288	12.282	0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	108	75 - 140	12.977	12.981	-0.0040	+/-1.000	
Toluene-d8	30.00	106	85 - 115	16.027	16.031	-0.0040	+/-1.000	
32SB-27-0506 (1004265-09) ug/Kg dry				Lab File ID: 0426509.D		Analyzed: 05/10/10 15:22		
Bromofluorobenzene	27.21	112	85 - 120	18.29	18.284	0.0060	+/-1.000	
Dibromofluoromethane	27.21	102	80 - 125	12.288	12.282	0.0060	+/-1.000	
1,2-Dichloroethane-d4	27.21	103	75 - 140	12.976	12.981	-0.0050	+/-1.000	
Toluene-d8	27.21	105	85 - 115	16.027	16.031	-0.0040	+/-1.000	
32SB-29-0304 (1004265-13) ug/Kg dry				Lab File ID: 0426513.D		Analyzed: 05/10/10 16:23		
Bromofluorobenzene	33.48	110	85 - 120	18.29	18.284	0.0060	+/-1.000	
Dibromofluoromethane	33.48	101	80 - 125	12.287	12.282	0.0050	+/-1.000	
1,2-Dichloroethane-d4	33.48	92.5	75 - 140	12.976	12.981	-0.0050	+/-1.000	
Toluene-d8	33.48	108	85 - 115	16.027	16.031	-0.0040	+/-1.000	
32SB-30-0506 (1004265-15) ug/Kg dry				Lab File ID: 0426515.D		Analyzed: 05/10/10 16:54		
Bromofluorobenzene	33.10	103	85 - 120	18.293	18.284	0.0090	+/-1.000	
Dibromofluoromethane	33.10	99.3	80 - 125	12.291	12.282	0.0090	+/-1.000	
1,2-Dichloroethane-d4	33.10	100	75 - 140	12.98	12.981	-0.0010	+/-1.000	
Toluene-d8	33.10	104	85 - 115	16.03	16.031	-0.0010	+/-1.000	
32SB-32-0506 (1004265-17) ug/Kg dry				Lab File ID: 0426517.D		Analyzed: 05/10/10 17:24		
Bromofluorobenzene	29.56	106	85 - 120	18.294	18.284	0.0100	+/-1.000	
Dibromofluoromethane	29.56	103	80 - 125	12.291	12.282	0.0090	+/-1.000	
1,2-Dichloroethane-d4	29.56	100	75 - 140	12.98	12.981	-0.0010	+/-1.000	
Toluene-d8	29.56	106	85 - 115	16.031	16.031	0.0000	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13518	Instrument:	MS-VOA4
		Calibration:	0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
32SB-33-0506 (1004265-19) ug/Kg dry				Lab File ID: 0426519.D		Analyzed: 05/10/10 17:55		
Bromofluorobenzene	30.87	115	85 - 120	18.294	18.284	0.0100	+/-1.000	
Dibromofluoromethane	30.87	100	80 - 125	12.292	12.282	0.0100	+/-1.000	
1,2-Dichloroethane-d4	30.87	102	75 - 140	12.981	12.981	0.0000	+/-1.000	
Toluene-d8	30.87	107	85 - 115	16.031	16.031	0.0000	+/-1.000	
32SB-34-0607 (1004265-21) ug/Kg dry				Lab File ID: 0426521.D		Analyzed: 05/10/10 18:26		
Bromofluorobenzene	29.27	114	85 - 120	18.294	18.284	0.0100	+/-1.000	
Dibromofluoromethane	29.27	107	80 - 125	12.292	12.282	0.0100	+/-1.000	
1,2-Dichloroethane-d4	29.27	106	75 - 140	12.981	12.981	0.0000	+/-1.000	
Toluene-d8	29.27	112	85 - 115	16.031	16.031	0.0000	+/-1.000	
32SB-37-0506 (1004265-25) ug/Kg dry				Lab File ID: 0426524.D		Analyzed: 05/10/10 19:27		
Bromofluorobenzene	36.71	110	85 - 120	18.29	18.284	0.0060	+/-1.000	
Dibromofluoromethane	36.71	103	80 - 125	12.297	12.282	0.0150	+/-1.000	
1,2-Dichloroethane-d4	36.71	103	75 - 140	12.986	12.981	0.0050	+/-1.000	
Toluene-d8	36.71	107	85 - 115	16.036	16.031	0.0050	+/-1.000	
32SB-FD042710-02 (1004265-26) ug/Kg dry				Lab File ID: 0426525.D		Analyzed: 05/10/10 19:58		
Bromofluorobenzene	30.49	114	85 - 120	18.29	18.284	0.0060	+/-1.000	
Dibromofluoromethane	30.49	104	80 - 125	12.297	12.282	0.0150	+/-1.000	
1,2-Dichloroethane-d4	30.49	95.5	75 - 140	12.986	12.981	0.0050	+/-1.000	
Toluene-d8	30.49	108	85 - 115	16.037	16.031	0.0060	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E14105

SDG: CTOF273_003
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA1
Calibration: 0141001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E14105-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/20/10 14:10		
Bromofluorobenzene	30.00	98.4	80 - 120	22.473	22.473	0.0000	+/-1.000	
Dibromofluoromethane	30.00	94.5	80 - 120	12.412	12.412	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	90.0	80 - 120	13.211	13.211	0.0000	+/-1.000	
Toluene-d8	30.00	98.4	80 - 120	17.751	17.751	0.0000	+/-1.000	
LCS (0E20008-BS1) ug/Kg wet				Lab File ID: V1LCS1.D		Analyzed: 05/20/10 15:29		
Bromofluorobenzene	30.00	99.5	85 - 120	22.462	22.473	-0.0110	+/-1.000	
Dibromofluoromethane	30.00	96.6	80 - 125	12.412	12.412	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	89.3	75 - 140	13.211	13.211	0.0000	+/-1.000	
Toluene-d8	30.00	99.6	85 - 115	17.754	17.751	0.0030	+/-1.000	
Blank (0E20008-BLK1) ug/Kg wet				Lab File ID: V1BLK01.D		Analyzed: 05/20/10 17:26		
Bromofluorobenzene	30.00	105	85 - 120	22.471	22.473	-0.0020	+/-1.000	
Dibromofluoromethane	30.00	102	80 - 125	12.416	12.412	0.0040	+/-1.000	
1,2-Dichloroethane-d4	30.00	105	75 - 140	13.198	13.211	-0.0130	+/-1.000	
Toluene-d8	30.00	101	85 - 115	17.752	17.751	0.0010	+/-1.000	
32SB-23-0506 (1004265-01RE1) ug/Kg dry				Lab File ID: 0426501.D		Analyzed: 05/20/10 20:42		
Bromofluorobenzene	35.61	102	85 - 120	22.466	22.473	-0.0070	+/-1.000	
Dibromofluoromethane	35.61	97.2	80 - 125	12.415	12.412	0.0030	+/-1.000	
1,2-Dichloroethane-d4	35.61	98.2	75 - 140	13.213	13.211	0.0020	+/-1.000	
Toluene-d8	35.61	104	85 - 115	17.75	17.751	-0.0010	+/-1.000	
LCS Dup (0E20008-BSD1) ug/Kg wet				Lab File ID: V1LCSD1.D		Analyzed: 05/20/10 23:18		
Bromofluorobenzene	30.00	99.4	85 - 120	22.46	22.473	-0.0130	+/-1.000	
Dibromofluoromethane	30.00	98.8	80 - 125	12.404	12.412	-0.0080	+/-1.000	
1,2-Dichloroethane-d4	30.00	88.2	75 - 140	13.201	13.211	-0.0100	+/-1.000	
Toluene-d8	30.00	104	85 - 115	17.744	17.751	-0.0070	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14109	Instrument:	MS-VOA4
		Calibration:	0144005

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E14109-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/15/10 19:55		
Bromofluorobenzene	30.00	101	80 - 120	18.291	18.291	0.0000	+/-1.000	
Dibromofluoromethane	30.00	112	80 - 120	12.319	12.319	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	102	80 - 120	13.007	13.007	0.0000	+/-1.000	
Toluene-d8	30.00	98.0	80 - 120	16.038	16.038	0.0000	+/-1.000	
LCS (0E15003-BS1) ug/Kg wet				Lab File ID: V4LCS01.D		Analyzed: 05/15/10 20:57		
Bromofluorobenzene	30.00	102	85 - 120	18.289	18.291	-0.0020	+/-1.000	
Dibromofluoromethane	30.00	110	80 - 125	12.317	12.319	-0.0020	+/-1.000	
1,2-Dichloroethane-d4	30.00	102	75 - 140	13.006	13.007	-0.0010	+/-1.000	
Toluene-d8	30.00	105	85 - 115	16.036	16.038	-0.0020	+/-1.000	
Blank (0E15003-BLK1) ug/Kg wet				Lab File ID: V4BLK01.D		Analyzed: 05/15/10 22:29		
Bromofluorobenzene	30.00	103	85 - 120	18.29	18.291	-0.0010	+/-1.000	
Dibromofluoromethane	30.00	102	80 - 125	12.317	12.319	-0.0020	+/-1.000	
1,2-Dichloroethane-d4	30.00	94.9	75 - 140	13.006	13.007	-0.0010	+/-1.000	
Toluene-d8	30.00	103	85 - 115	16.037	16.038	-0.0010	+/-1.000	
32SB-28-0506 (1004265-11) ug/Kg dry				Lab File ID: 0426511.D		Analyzed: 05/16/10 01:33		
Bromofluorobenzene	28.66	108	85 - 120	18.304	18.291	0.0130	+/-1.000	
Dibromofluoromethane	28.66	106	80 - 125	12.321	12.319	0.0020	+/-1.000	
1,2-Dichloroethane-d4	28.66	107	75 - 140	13.01	13.007	0.0030	+/-1.000	
Toluene-d8	28.66	105	85 - 115	16.05	16.038	0.0120	+/-1.000	
32SB-36-0506 (1004265-23) ug/Kg dry				Lab File ID: 0426523.D		Analyzed: 05/16/10 02:04		
Bromofluorobenzene	29.50	107	85 - 120	18.298	18.291	0.0070	+/-1.000	
Dibromofluoromethane	29.50	107	80 - 125	12.325	12.319	0.0060	+/-1.000	
1,2-Dichloroethane-d4	29.50	99.4	75 - 140	13.014	13.007	0.0070	+/-1.000	
Toluene-d8	29.50	107	85 - 115	16.044	16.038	0.0060	+/-1.000	
LCS Dup (0E15003-BSD1) ug/Kg wet				Lab File ID: V4LCSD01.D		Analyzed: 05/16/10 07:41		
Bromofluorobenzene	30.00	96.7	85 - 120	18.294	18.291	0.0030	+/-1.000	
Dibromofluoromethane	30.00	103	80 - 125	12.332	12.319	0.0130	+/-1.000	
1,2-Dichloroethane-d4	30.00	98.1	75 - 140	13.011	13.007	0.0040	+/-1.000	
Toluene-d8	30.00	102	85 - 115	16.041	16.038	0.0030	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15210	Instrument:	MS-VOA1
		Calibration:	0141001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15210-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/21/10 16:29		
Bromofluorobenzene	30.00	95.6	80 - 120	22.476	22.476	0.0000	+/-1.000	
Dibromofluoromethane	30.00	94.2	80 - 120	12.43	12.43	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	79.1	80 - 120	13.213	13.213	0.0000	+/-1.000	*
Toluene-d8	30.00	99.0	80 - 120	17.755	17.755	0.0000	+/-1.000	
LCS (0E21026-BS1) ug/Kg wet				Lab File ID: V1LCS1.D		Analyzed: 05/21/10 17:08		
Bromofluorobenzene	30.00	94.5	85 - 120	22.467	22.476	-0.0090	+/-1.000	
Dibromofluoromethane	30.00	94.0	80 - 125	12.419	12.43	-0.0110	+/-1.000	
1,2-Dichloroethane-d4	30.00	81.6	75 - 140	13.218	13.213	0.0050	+/-1.000	
Toluene-d8	30.00	101	85 - 115	17.76	17.755	0.0050	+/-1.000	
Blank (0E21026-BLK2) ug/Kg wet				Lab File ID: V1MBLK1.D		Analyzed: 05/21/10 19:08		
Bromofluorobenzene	30.00	104	85 - 120	22.47	22.476	-0.0060	+/-1.000	
Dibromofluoromethane	30.00	90.3	80 - 125	12.407	12.43	-0.0230	+/-1.000	
1,2-Dichloroethane-d4	30.00	105	75 - 140	13.189	13.213	-0.0240	+/-1.000	
Toluene-d8	30.00	101	85 - 115	17.748	17.755	-0.0070	+/-1.000	
32SB-28-0506 (1004265-11RE1) ug/Kg dry				Lab File ID: 0426511D.D		Analyzed: 05/21/10 19:47		
Bromofluorobenzene	29.37	107	85 - 120	22.478	22.476	0.0020	+/-1.000	
Dibromofluoromethane	29.37	96.0	80 - 125	12.415	12.43	-0.0150	+/-1.000	
1,2-Dichloroethane-d4	29.37	88.7	75 - 140	13.198	13.213	-0.0150	+/-1.000	
Toluene-d8	29.37	103	85 - 115	17.755	17.755	0.0000	+/-1.000	
32SB-36-0506 (1004265-23RE1) ug/Kg dry				Lab File ID: 0426523D.D		Analyzed: 05/21/10 20:27		
Bromofluorobenzene	28.30	108	85 - 120	22.47	22.476	-0.0060	+/-1.000	
Dibromofluoromethane	28.30	98.0	80 - 125	12.415	12.43	-0.0150	+/-1.000	
1,2-Dichloroethane-d4	28.30	90.9	75 - 140	13.198	13.213	-0.0150	+/-1.000	
Toluene-d8	28.30	103	85 - 115	17.745	17.755	-0.0100	+/-1.000	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13510	Instrument:	MS-VOA4
		Calibration:	0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E13510-CCV1)			Lab File ID: SEQ-CCV3.D			Analyzed: 05/10/10 00:16			
Fluorobenzene	506526	14.038	672772	14.056	75	50 - 200	-0.0180	+/-0.50	
Chlorobenzene-d5	261388	17.304	278531	17.313	94	50 - 200	-0.0090	+/-0.50	
1,4-Dichlorobenzene-d4	170791	19.371	217185	19.369	79	50 - 200	0.0020	+/-0.50	
LCS (0E09008-BS1)			Lab File ID: V4LCS03.D			Analyzed: 05/10/10 00:46			
Fluorobenzene	552387	14.04	506526	14.038	109	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	256815	17.306	261388	17.304	98	50 - 200	0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	194250	19.363	170791	19.371	114	50 - 200	-0.0080	+/-0.50	
Blank (0E09008-BLK1)			Lab File ID: V4BLK02.D			Analyzed: 05/10/10 02:18			
Fluorobenzene	627749	14.032	506526	14.038	124	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	228191	17.319	261388	17.304	87	50 - 200	0.0150	+/-0.50	
1,4-Dichlorobenzene-d4	178169	19.365	170791	19.371	104	50 - 200	-0.0060	+/-0.50	
32SB-23-0506 (1004265-01)			Lab File ID: 0426501.D			Analyzed: 05/10/10 06:53			
Fluorobenzene	223432	14.043	506526	14.038	44	50 - 200	0.0050	+/-0.50	*
Chlorobenzene-d5	103565	17.31	261388	17.304	40	50 - 200	0.0060	+/-0.50	*
1,4-Dichlorobenzene-d4	92434	19.366	170791	19.371	54	50 - 200	-0.0050	+/-0.50	
32SB-24-0506 (1004265-03)			Lab File ID: 0426503.D			Analyzed: 05/10/10 07:23			
Fluorobenzene	549673	14.044	506526	14.038	109	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	235432	17.311	261388	17.304	90	50 - 200	0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	216680	19.367	170791	19.371	127	50 - 200	-0.0040	+/-0.50	
32SB-25-0607 (1004265-05)			Lab File ID: 0426505.D			Analyzed: 05/10/10 07:54			
Fluorobenzene	567456	14.048	506526	14.038	112	50 - 200	0.0100	+/-0.50	
Chlorobenzene-d5	242365	17.315	261388	17.304	93	50 - 200	0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	221332	19.371	170791	19.371	130	50 - 200	0.0000	+/-0.50	
32SB-26-0405 (1004265-07)			Lab File ID: 0426507.D			Analyzed: 05/10/10 08:24			
Fluorobenzene	567463	14.042	506526	14.038	112	50 - 200	0.0040	+/-0.50	
Chlorobenzene-d5	238883	17.309	261388	17.304	91	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	199055	19.366	170791	19.371	117	50 - 200	-0.0050	+/-0.50	
LCS Dup (0E09008-BSD1)			Lab File ID: V4LCSD03.D			Analyzed: 05/10/10 09:56			
Fluorobenzene	497406	14.042	506526	14.038	98	50 - 200	0.0040	+/-0.50	
Chlorobenzene-d5	223689	17.309	261388	17.304	86	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	192865	19.365	170791	19.371	113	50 - 200	-0.0060	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13518

SDG: CTOF273_003
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E13518-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/10/10 11:17			
Fluorobenzene	464858	14.043	672772	14.056	69	50 - 200	-0.0130	+/-0.50	
Chlorobenzene-d5	235025	17.31	278531	17.313	84	50 - 200	-0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	176657	19.367	217185	19.369	81	50 - 200	-0.0020	+/-0.50	
LCS (0E10025-BS1)			Lab File ID: V4LCS01.D			Analyzed: 05/10/10 12:18			
Fluorobenzene	512501	14.042	464858	14.043	110	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	236464	17.309	235025	17.31	101	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	192710	19.365	176657	19.367	109	50 - 200	-0.0020	+/-0.50	
Blank (0E10025-BLK1)			Lab File ID: V4BLK01.D			Analyzed: 05/10/10 14:21			
Fluorobenzene	535627	14.04	464858	14.043	115	50 - 200	-0.0030	+/-0.50	
Chlorobenzene-d5	243414	17.306	235025	17.31	104	50 - 200	-0.0040	+/-0.50	
1,4-Dichlorobenzene-d4	222520	19.363	176657	19.367	126	50 - 200	-0.0040	+/-0.50	
32SB-27-0506 (1004265-09)			Lab File ID: 0426509.D			Analyzed: 05/10/10 15:22			
Fluorobenzene	448730	14.039	464858	14.043	97	50 - 200	-0.0040	+/-0.50	
Chlorobenzene-d5	207148	17.306	235025	17.31	88	50 - 200	-0.0040	+/-0.50	
1,4-Dichlorobenzene-d4	182823	19.362	176657	19.367	103	50 - 200	-0.0050	+/-0.50	
32SB-29-0304 (1004265-13)			Lab File ID: 0426513.D			Analyzed: 05/10/10 16:23			
Fluorobenzene	539139	14.049	464858	14.043	116	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	230567	17.306	235025	17.31	98	50 - 200	-0.0040	+/-0.50	
1,4-Dichlorobenzene-d4	189597	19.362	176657	19.367	107	50 - 200	-0.0050	+/-0.50	
32SB-30-0506 (1004265-15)			Lab File ID: 0426515.D			Analyzed: 05/10/10 16:54			
Fluorobenzene	496482	14.042	464858	14.043	107	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	219398	17.309	235025	17.31	93	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	191617	19.366	176657	19.367	108	50 - 200	-0.0010	+/-0.50	
32SB-32-0506 (1004265-17)			Lab File ID: 0426517.D			Analyzed: 05/10/10 17:24			
Fluorobenzene	520785	14.043	464858	14.043	112	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	235087	17.31	235025	17.31	100	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	200523	19.366	176657	19.367	114	50 - 200	-0.0010	+/-0.50	
32SB-33-0506 (1004265-19)			Lab File ID: 0426519.D			Analyzed: 05/10/10 17:55			
Fluorobenzene	388867	14.043	464858	14.043	84	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	166418	17.31	235025	17.31	71	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	143340	19.367	176657	19.367	81	50 - 200	0.0000	+/-0.50	
32SB-34-0607 (1004265-21)			Lab File ID: 0426521.D			Analyzed: 05/10/10 18:26			
Fluorobenzene	512036	14.053	464858	14.043	110	50 - 200	0.0100	+/-0.50	
Chlorobenzene-d5	228408	17.31	235025	17.31	97	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	196242	19.367	176657	19.367	111	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13518	Instrument:	MS-VOA4
		Calibration:	0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
32SB-37-0506 (1004265-25)			Lab File ID: 0426524.D			Analyzed: 05/10/10 19:27			
Fluorobenzene	514632	14.049	464858	14.043	111	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	237459	17.316	235025	17.31	101	50 - 200	0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	195641	19.372	176657	19.367	111	50 - 200	0.0050	+/-0.50	
32SB-FD042710-02 (1004265-26)			Lab File ID: 0426525.D			Analyzed: 05/10/10 19:58			
Fluorobenzene	524129	14.049	464858	14.043	113	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	225009	17.316	235025	17.31	96	50 - 200	0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	200371	19.372	176657	19.367	113	50 - 200	0.0050	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14105	Instrument:	MS-VOA1
		Calibration:	0141001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E14105-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/20/10 14:10			
Fluorobenzene	2441510	14.573	2403751	14.57	102	50 - 200	0.0030	+/-0.50	
Chlorobenzene-d5	1066089	20.324	960429	20.321	111	50 - 200	0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	819746	24.828	805672	24.823	102	50 - 200	0.0050	+/-0.50	
LCS (0E20008-BS1)			Lab File ID: V1LCS1.D			Analyzed: 05/20/10 15:29			
Fluorobenzene	2650496	14.572	2441510	14.573	109	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	1148925	20.324	1066089	20.324	108	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	906986	24.82	819746	24.828	111	50 - 200	-0.0080	+/-0.50	
Blank (0E20008-BLK1)			Lab File ID: V1BLK01.D			Analyzed: 05/20/10 17:26			
Fluorobenzene	2472993	14.575	2441510	14.573	101	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	1034994	20.323	1066089	20.324	97	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	854031	24.822	819746	24.828	104	50 - 200	-0.0060	+/-0.50	
32SB-23-0506 (1004265-01RE1)			Lab File ID: 0426501.D			Analyzed: 05/20/10 20:42			
Fluorobenzene	1441950	14.574	2441510	14.573	59	50 - 200	0.0010	+/-0.50	
Chlorobenzene-d5	591129	20.319	1066089	20.324	55	50 - 200	-0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	462089	24.818	819746	24.828	56	50 - 200	-0.0100	+/-0.50	
LCS Dup (0E20008-BSD1)			Lab File ID: V1LCSD1.D			Analyzed: 05/20/10 23:18			
Fluorobenzene	2825815	14.575	2441510	14.573	116	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	1107707	20.319	1066089	20.324	104	50 - 200	-0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	862673	24.814	819746	24.828	105	50 - 200	-0.0140	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14109	Instrument:	MS-VOA4
		Calibration:	0144005

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E14109-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/15/10 19:55			
Fluorobenzene	843423	14.06	822611	14.04	103	50 - 200	0.0200	+/-0.50	
Chlorobenzene-d5	404132	17.317	341417	17.297	118	50 - 200	0.0200	+/-0.50	
1,4-Dichlorobenzene-d4	278121	19.374	297455	19.354	94	50 - 200	0.0200	+/-0.50	
LCS (0E15003-BS1)			Lab File ID: V4LCS01.D			Analyzed: 05/15/10 20:57			
Fluorobenzene	843029	14.058	843423	14.06	100	50 - 200	-0.0020	+/-0.50	
Chlorobenzene-d5	378372	17.315	404132	17.317	94	50 - 200	-0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	283789	19.372	278121	19.374	102	50 - 200	-0.0020	+/-0.50	
Blank (0E15003-BLK1)			Lab File ID: V4BLK01.D			Analyzed: 05/15/10 22:29			
Fluorobenzene	922615	14.059	843423	14.06	109	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	387301	17.316	404132	17.317	96	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	325105	19.373	278121	19.374	117	50 - 200	-0.0010	+/-0.50	
32SB-28-0506 (1004265-11)			Lab File ID: 0426511.D			Analyzed: 05/16/10 01:33			
Fluorobenzene	179985	14.073	843423	14.06	21	50 - 200	0.0130	+/-0.50	*
Chlorobenzene-d5	79739	17.32	404132	17.317	20	50 - 200	0.0030	+/-0.50	*
1,4-Dichlorobenzene-d4	71292	19.376	278121	19.374	26	50 - 200	0.0020	+/-0.50	*
32SB-36-0506 (1004265-23)			Lab File ID: 0426523.D			Analyzed: 05/16/10 02:04			
Fluorobenzene	406829	14.067	843423	14.06	48	50 - 200	0.0070	+/-0.50	*
Chlorobenzene-d5	174622	17.324	404132	17.317	43	50 - 200	0.0070	+/-0.50	*
1,4-Dichlorobenzene-d4	156026	19.38	278121	19.374	56	50 - 200	0.0060	+/-0.50	
LCS Dup (0E15003-BSD1)			Lab File ID: V4LCSD01.D			Analyzed: 05/16/10 07:41			
Fluorobenzene	905421	14.073	843423	14.06	107	50 - 200	0.0130	+/-0.50	
Chlorobenzene-d5	410430	17.32	404132	17.317	102	50 - 200	0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	276738	19.377	278121	19.374	100	50 - 200	0.0030	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0F15210

SDG: CTOF273_003
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA1
Calibration: 0141001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15210-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/21/10 16:29			
Fluorobenzene	2662943	14.59	2403751	14.57	111	50 - 200	0.0200	+/-0.50	
Chlorobenzene-d5	1157308	20.342	960429	20.321	120	50 - 200	0.0210	+/-0.50	
1,4-Dichlorobenzene-d4	837707	24.832	805672	24.823	104	50 - 200	0.0090	+/-0.50	
LCS (0E21026-BS1)			Lab File ID: V1LCS1.D			Analyzed: 05/21/10 17:08			
Fluorobenzene	2759485	14.58	2662943	14.59	104	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	1150251	20.335	1157308	20.342	99	50 - 200	-0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	841774	24.822	837707	24.832	100	50 - 200	-0.0100	+/-0.50	
Blank (0E21026-BLK2)			Lab File ID: V1MBLK1.D			Analyzed: 05/21/10 19:08			
Fluorobenzene	2551659	14.551	2662943	14.59	96	50 - 200	-0.0390	+/-0.50	
Chlorobenzene-d5	1070031	20.321	1157308	20.342	92	50 - 200	-0.0210	+/-0.50	
1,4-Dichlorobenzene-d4	852037	24.824	837707	24.832	102	50 - 200	-0.0080	+/-0.50	
32SB-28-0506 (1004265-11RE1)			Lab File ID: 0426511D.D			Analyzed: 05/21/10 19:47			
Fluorobenzene	2799189	14.576	2662943	14.59	105	50 - 200	-0.0140	+/-0.50	
Chlorobenzene-d5	1133681	20.329	1157308	20.342	98	50 - 200	-0.0130	+/-0.50	
1,4-Dichlorobenzene-d4	947089	24.818	837707	24.832	113	50 - 200	-0.0140	+/-0.50	
32SB-36-0506 (1004265-23RE1)			Lab File ID: 0426523D.D			Analyzed: 05/21/10 20:27			
Fluorobenzene	2823513	14.576	2662943	14.59	106	50 - 200	-0.0140	+/-0.50	
Chlorobenzene-d5	1157238	20.336	1157308	20.342	100	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	974839	24.821	837707	24.832	116	50 - 200	-0.0110	+/-0.50	

PREPARATION BENCH SHEET

0E15003

Empirical Laboratories, LLC

Printed: 6/4/2010 12:20:48PM

694

Matrix: Solid **Prepared using: MS - 5035** **Surrogate used: 10D1141**

Lab Number	Test Code	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Extraction Comments
0E15003-BLK1	QC	05/15/2010 14:56	5	5				1	
0E15003-BLK3	QC	05/15/2010 14:56	5	5				1	
0E15003-BS1	QC	05/15/2010 14:56	5	5	10E0572		2.5	1	
0E15003-BS2	QC	05/15/2010 14:56	5	5	10E0253		2.5	1	
0E15003-BSD1	QC	05/15/2010 14:56	5	5	10E0572		2.5	1	
0E15003-BSD2	QC	05/15/2010 14:56	5	5	10E0253		2.5	1	
1004170-64RE1	VOC_8260B_AP9	05/14/2010 16:00	5.06	5				1	AP VIALS
1004171-01RE1	VOC_8260B_TCL	05/15/2010 14:53	4.56	5				1	d50x. DOD QSM 4.1
1004171-03RE1	VOC_8260B_TCL	05/15/2010 14:53	3.97	5				1	d50x. DOD QSM 4.1
1004189-27	VOC_8260B_AP9	05/15/2010 14:52	6.75	5				1	AP VIALS
1004189-28	VOC_8260B_AP9	05/15/2010 14:52	5.17	5				1	AP VIALS
1004189-38	VOC_8260B_AP9	05/15/2010 14:52	4.74	5				1	AP VIALS
1004189-39	VOC_8260B_AP9	05/15/2010 14:52	5.75	5				1	AP VIALS
1004189-44	VOC_8260B_AP9	05/15/2010 14:52	5.18	5				1	AP VIALS
1004264-04	VOC_8260B_BTEXMN	05/15/2010 14:47	6.01	5				1	ENCORES
1004264-04RE1	VOC_8260B_BTEXMN	05/15/2010 14:47	6.01	5				1	ENCORES
1004264-12	VOC_8260B_BTEXMN	05/09/2010 15:46	5.67	5				1	ENCORES
1004264-12RE1	VOC_8260B_BTEXMN	05/09/2010 15:46	5.67	5				1	ENCORES
1004264-15	VOC_8260B_BTEXMN	05/09/2010 15:46	5.11	5				1	ENCORES
1004264-15RE1	VOC_8260B_BTEXMN	05/09/2010 15:46	5.11	5				1	ENCORES
1004264-21	VOC_8260B_BTEXMN	05/09/2010 15:46	6.03	5				1	ENCORES
1004264-21RE1	VOC_8260B_BTEXMN	05/09/2010 15:46	6.03	5				1	ENCORES
1004265-11	VOC_8260B_BTEXMN	05/15/2010 14:50	6.2	5				1	ENCORES

Spiking Witnessed By Date

Preparation Reviewed By Date

Extracts Received By Date

CTOF273_003

PREPARATION BENCH SHEET

0E15003

Empirical Laboratories, LLC

Printed: 6/4/2010 12:20:48PM

Matrix: Solid **Prepared using: MS - 5035** **Surrogate used: 10D1141**

Lab Number	Test Code	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Extraction Comments
1004265-23	VOC_8260B_BTEXMN	05/15/2010 14:50	5.9	5				1	ENCORES
1004270-17	VOC_8260B_AP9	05/15/2010 14:51	5.63	5				1	AP VIALS!
1004277-26	VOC_8260B_BTEXMN	05/15/2010 14:52	5.21	5				1	ENCORES!

Spiking Witnessed By Date

Preparation Reviewed By Date

Extracts Received By Date

695

CTOF273_003

PREPARATION BENCH SHEET

0E10025

Empirical Laboratories, LLC

Printed: 6/17/2010 9:28:02AM

696

Matrix: Solid **Prepared using: MS - 5035** **Surrogate used: 10D1141**

Lab Number	Test Code	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Extraction Comments
0E10025-BLK1	QC	05/10/2010 12:00	5	5				1	
0E10025-BLK2	QC	05/10/2010 12:00	5	5				1	
0E10025-BS1	QC	05/10/2010 12:00	5	5	10E0333		2.5	1	
0E10025-BS2	QC	05/10/2010 12:00	5	5	10E0253		2.5	1	
0E10025-BSD1	QC	05/10/2010 12:00	5	5	10E0333		2.5	1	
0E10025-BSD2	QC	05/10/2010 12:00	5	5	10E0253		2.5	1	
1004265-09	VOC_8260B_BTEXMN	05/10/2010 13:59	6.4	5				1	ENCORES
1004265-13	VOC_8260B_BTEXMN	05/10/2010 13:59	5.3	5				1	ENCORES
1004265-15	VOC_8260B_BTEXMN	05/10/2010 13:59	5.33	5				1	ENCORES
1004265-17	VOC_8260B_BTEXMN	05/10/2010 13:59	6.03	5				1	ENCORES
1004265-19	VOC_8260B_BTEXMN	05/10/2010 13:59	5.64	5				1	ENCORES
1004265-21	VOC_8260B_BTEXMN	05/10/2010 13:59	6.04	5				1	ENCORES
1004265-25	VOC_8260B_BTEXMN	05/10/2010 13:59	5.13	5				1	ENCORES
1004265-26	VOC_8260B_BTEXMN	05/10/2010 13:59	5.82	5				1	ENCORES
1004266-03	VOC_8260B_BTEXMN	05/10/2010 13:59	6.16	5				1	ENCORES
1004270-01	VOC_8260B_AP9	05/10/2010 13:59	3.51	5				1	50x dilution from MeOH (both water vials crac

Spiking Witnessed By Date

Preparation Reviewed By Date

Extracts Received By Date

CTOF273_003

PREPARATION BENCH SHEET

0E21026

Empirical Laboratories, LLC

Printed: 6/17/2010 10:27:58AM

697

Matrix: Solid **Prepared using: MS - 5035** **Surrogate used: 10D1141**

Lab Number	Test Code	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Extraction Comments
0E21026-BLK1	QC	05/21/2010 00:00	5	5				1	
0E21026-BLK2	QC	05/21/2010 00:00	5	5				1	Added 6/1/2010 by ADM
0E21026-BS1	QC	05/21/2010 00:00	5	5	10E1044		2.5	1	
1004264-06RE2	VOC_8260B_BTEXMN	05/21/2010 00:00	5.59	5				1	D 50x. Re-extract added 5/21/2010 by WAL
1004265-11RE1	VOC_8260B_BTEXMN	05/21/2010 00:00	6.05	5				1	D 50x. Re-extract added 5/21/2010 by WAL
1004265-23RE1	VOC_8260B_BTEXMN	05/21/2010 00:00	6.15	5				1	D 50x. Re-extract added 5/21/2010 by WAL
1004277-26RE1	VOC_8260B_BTEXMN	05/21/2010 00:00	5.26	5				1	D 50x. Re-extract added 5/21/2010 by WAL
1004294-20RE2	VOC_8260B_BTEXMN	05/21/2010 00:00	5.47	5				1	D 50x. Re-extract added 5/21/2010 by WAL
1004294-26RE1	VOC_8260B_BTEXMN	05/21/2010 00:00	5.68	5				1	D 50x. Re-extract added 5/21/2010 by WAL
1005021-04RE2	VOC_8260B_BTEXMN	05/21/2010 00:00	5.85	5				1	D50x. Re-extract added 5/21/2010 by WAL

Spiking Witnessed By Date

Preparation Reviewed By Date

Extracts Received By Date

CTOF273_003

PREPARATION BENCH SHEET

0E09008

Empirical Laboratories, LLC

Printed: 6/18/2010 8:39:47AM

692

Matrix: Solid **Prepared using: MS - 5035** **Surrogate used: 10D1141**

Lab Number	Test Code	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Extraction Comments
0E09008-BLK1	QC	05/09/2010 15:46	5	5				1	
0E09008-BLK2	QC	05/09/2010 15:46	5	5				1	
0E09008-BS1	QC	05/09/2010 15:46	5	5	10E0118		2.5	1	
0E09008-BSD1	QC	05/09/2010 15:46	5	5	10E0118		2.5	1	
1004264-08	VOC_8260B_BTEXMN	05/09/2010 15:46	5.87	5				1	ENCORES
1004264-10	VOC_8260B_BTEXMN	05/09/2010 15:46	5.01	5				1	ENCORES
1004264-17	VOC_8260B_BTEXMN	05/09/2010 15:46	5.9	5				1	ENCORES
1004264-19	VOC_8260B_BTEXMN	05/09/2010 15:46	5.88	5				1	ENCORES
1004264-23	VOC_8260B_BTEXMN	05/09/2010 15:46	5.95	5				1	ENCORES
1004264-25	VOC_8260B_BTEXMN	05/09/2010 15:46	5.06	5				1	ENCORES
1004265-01	VOC_8260B_BTEXMN	05/09/2010 15:46	5.3	5				1	ENCORES
1004265-03	VOC_8260B_BTEXMN	05/09/2010 15:46	5.57	5				1	ENCORES
1004265-05	VOC_8260B_BTEXMN	05/09/2010 15:46	6.21	5				1	ENCORES
1004265-07	VOC_8260B_BTEXMN	05/09/2010 15:46	6.78	5				1	ENCORES

Spiking Witnessed By Date

Preparation Reviewed By Date

Extracts Received By Date

CTOF273_003

PREPARATION BENCH SHEET

0E20008

Empirical Laboratories, LLC

Printed: 6/9/2010 7:04:43AM

693

Matrix: Solid

Prepared using: MS - 5035

Surrogate used: 10D1141

Lab Number	Test Code	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Extraction Comments
0E20008-BLK1	QC	05/20/2010 11:09	5	5				1	
0E20008-BLK2	QC	05/20/2010 11:09	5	5				1	
0E20008-BS1	QC	05/20/2010 11:09	5	5	10E0767		2.5	1	
0E20008-BS2	QC	05/20/2010 11:09	5	5	10E0947		2.5	1	
0E20008-BSD1	QC	05/20/2010 11:09	5	5	10E0767		2.5	1	
1004225-10RE1	VOC_8260B_TCL	05/20/2010 11:09	5.12	5				1	From 0E19022 by ADM on 05/20/2010-50x D
1004244-08RE1	VOC_8260B_BTEXMN	05/20/2010 11:09	5.56	5				1	Re-extract added 5/20/2010 by WAL
1004264-06RE1	VOC_8260B_BTEXMN	05/20/2010 11:09	5.95	5				1	Re-extract added 5/20/2010 by WAL
1004264-14RE1	VOC_8260B_BTEXMN	05/20/2010 11:09	5.2	5				1	D50X. Re-extract added 5/20/2010 by WAL.
1004264-17RE1	VOC_8260B_BTEXMN	05/20/2010 11:09	6.05	5				1	Re-extract added 5/20/2010 by WAL
1004265-01RE1	VOC_8260B_BTEXMN	05/20/2010 11:09	5.53	5				1	Re-extract added 5/20/2010 by WAL
1004277-20RE1	VOC_8260B_BTEXMN	05/20/2010 11:09	5.49	5				1	Re-extract added 5/20/2010 by WAL

From 0E19022 on 5/20/2010 by ADM

Spiking Witnessed By Date

Preparation Reviewed By Date

Extracts Received By Date

CTOF273_003

HOLDING TIME SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_003

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

32SB-28-0506 5/10/10 15:52

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SB-23-0506	04/27/10 13:05	04/28/10 08:30	05/09/10 15:46	N/A	14.00	05/10/10 06:53	12.74	14.00	
32SB-23-0506	04/27/10 13:05	04/28/10 08:30	05/20/10 11:09	N/A	14.00	05/20/10 20:42	23.32	14.00	*
32SB-24-0506	04/27/10 13:15	04/28/10 08:30	05/09/10 15:46	N/A	14.00	05/10/10 07:23	12.76	14.00	
32SB-25-0607	04/27/10 13:30	04/28/10 08:30	05/09/10 15:46	N/A	14.00	05/10/10 07:54	12.77	14.00	
32SB-26-0405	04/27/10 13:35	04/28/10 08:30	05/09/10 15:46	N/A	14.00	05/10/10 08:24	12.78	14.00	
32SB-27-0506	04/27/10 14:00	04/28/10 08:30	05/10/10 13:59	N/A	14.00	05/10/10 15:22	13.06	14.00	
32SB-28-0506	04/27/10 14:25	04/28/10 08:30	05/15/10 14:50	N/A	14.00	05/16/10 01:33	18.46	14.00	*
32SB-28-0506	04/27/10 14:25	04/28/10 08:30	05/21/10 00:00	N/A	14.00	05/21/10 19:47	24.22	14.00	*
32SB-29-0304	04/27/10 14:30	04/28/10 08:30	05/10/10 13:59	N/A	14.00	05/10/10 16:23	13.08	14.00	
32SB-30-0506	04/27/10 15:05	04/28/10 08:30	05/10/10 13:59	N/A	14.00	05/10/10 16:54	13.08	14.00	
32SB-32-0506	04/27/10 14:10	04/28/10 08:30	05/10/10 13:59	N/A	14.00	05/10/10 17:24	13.13	14.00	
32SB-33-0506	04/27/10 15:25	04/28/10 08:30	05/10/10 13:59	N/A	14.00	05/10/10 17:55	13.10	14.00	
32SB-34-0607	04/27/10 15:40	04/28/10 08:30	05/10/10 13:59	N/A	14.00	05/10/10 18:26	13.12	14.00	
32SB-36-0506	04/27/10 15:45	04/28/10 08:30	05/15/10 14:50	N/A	14.00	05/16/10 02:04	18.43	14.00	*
32SB-36-0506	04/27/10 15:45	04/28/10 08:30	05/21/10 00:00	N/A	14.00	05/21/10 20:27	24.20	14.00	*
32SB-37-0506	04/27/10 16:00	04/28/10 08:30	05/10/10 13:59	N/A	14.00	05/10/10 19:27	13.14	14.00	
32SB-FD042710-02	04/27/10 11:45	04/28/10 08:30	05/10/10 13:59	N/A	14.00	05/10/10 19:58	13.34	14.00	

Data File: \\ELABNSH05\TARGET\chem\voa4.i\051010V4.b\0426511.D
Report Date: 15-May-2010 06:25

Empirical Laboratories, LLC

Data file : \\ELABNSH05\TARGET\chem\voa4.i\051010V4.b\0426511.D
Lab Smp Id: 1004265-11 Client Smp ID: 32SB-28-0506
Inj Date : 10-MAY-2010 15:52 MS Autotune Date: 07-MAY-2010 17:53
Operator : ADM Inst ID: voa4.i
Smp Info : 1004265-11;;;;;
Misc Info : ;;;;;gm-all.sub;
Comment :
Method : \\ELABNSH05\TARGET\chem\voa4.i\051010V4.b\VSOIL4.m
Meth Date : 15-May-2010 06:23 ghallquist Quant Type: ISTD
Cal Date : 07-MAY-2010 22:52 Cal File: SEQ-CAL8.D
Als bottle: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: gm-all.sub
Target Version: 4.04
Processing Host: TARGET03_VM

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/Kg)	FINAL (ug/Kg)
* 59 Fluorobenzene	96	14.046	14.043	(1.000)	11185	30.0000	<10% 506526
20 Methylene chloride	84	8.506	8.464	(0.606)	4299	21.3608	21.36(M)
$ 46 Dibromofluoromethane	111	12.285	12.282	(0.875)	3841	33.5108	33.51(R)
$ 50 1,2-Dichloroethane-d4	102	12.983	12.981	(0.924)	1534	61.5997	61.60(QR)
$ 77 Toluene-d8	98	16.033	16.031	(0.927)	11715	28.6676	28.67(R)
* 87 Chlorobenzene-d5	82	17.303	17.310	(1.000)	5987	30.0000	<10% ~~103565~~ 261388
$ 101 Bromofluorobenzene	95	18.287	18.284	(1.057)	6283	37.4931	37.49(R)
* 112 1,4-Dichlorobenzene-d4	152	19.369	19.367	(1.000)	6094	30.0000	<10% (Q) 170791
119 Naphthalene	128	21.918	21.915	(1.132)	904	2.30628	2.306

QC Flag Legend

Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.
M - Compound response manually integrated.

5/11/10

Data File: \\BC\TARGET\chem\voa4.i\051510V4.b\0426511.D
Report Date: 21-May-2010 12:07

Empirical Laboratories, LLC

Data file : \\BC\TARGET\chem\voa4.i\051510V4.b\0426511.D
Lab Smp Id: 1004265-11 Client Smp ID: 32SB-28-0506
Inj Date : 16-MAY-2010 01:33 MS Autotune Date: 07-MAY-2010 17:53
Operator : ADM Inst ID: voa4.i
Smp Info : 1004265-11;;;;;
Misc Info : ;;;;;gm-all.sub;
Comment :
Method : \\BC\TARGET\chem\voa4.i\051510V4.b\VSOIL4.m
Meth Date : 21-May-2010 11:18 jeh Quant Type: ISTD
Cal Date : 07-MAY-2010 22:52 Cal File: SEQ-CAL8.D
Als bottle: 12
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: gm-all.sub
Target Version: 4.04
Processing Host: NSH-LAPTOP2

5-21-10

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/Kg)	FINAL (ug/Kg)
* 59 Fluorobenzene	96	14.073	14.064	(1.000)	179985	30.0000	
12 Acetone	43	7.382	7.379	(0.525)	8093	13.4922	13.49
20 Methylene chloride	84	8.543	8.530	(0.607)	20188	3.67711	3.677
$ 46 Dibromofluoromethane	111	12.321	12.319	(0.876)	54716	31.7631	31.76(R)
$ 50 1,2-Dichloroethane-d4	102	13.010	13.007	(0.924)	13083	32.2435	32.24(R)
$ 77 Toluene-d8	98	16.050	16.038	(0.927)	164883	31.4602	31.46(R)
* 87 Chlorobenzene-d5	82	17.320	17.312	(1.000)	79739	30.0000	(Q)
$ 101 Bromofluorobenzene	95	18.304	18.291	(1.057)	73590	32.4290	32.43(R)
106 1,3,5-Trimethylbenzene	105	18.796	18.803	(0.970)	2534	0.41277	0.4128(Q)
109 1,2,4-Trimethylbenzene	105	19.140	19.137	(0.988)	4798	0.77486	0.7748
* 112 1,4-Dichlorobenzene-d4	152	19.376	19.368	(1.000)	71292	30.0000	(Q)
118 1,2,4-Trichlorobenzene	180	21.620	21.597	(1.116)	1068	0.45921	0.4592
119 Naphthalene	128	21.925	21.922	(1.132)	4520	0.95274	0.9527

QC Flag Legend

Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

05/22/10

Data File: \\ELABNSH05\TARGET\chem\voa1.i\052110V1.b\0426511D.D
Report Date: 23-May-2010 07:05

Empirical Laboratories, LLC

Data file : \\ELABNSH05\TARGET\chem\voa1.i\052110V1.b\0426511D.D
Lab Smp Id: 1004265-11 Client Smp ID: 32SB-28-0506
Inj Date : 21-MAY-2010 19:47 MS Autotune Date: 13-MAY-2010 10:07
Operator : RDW Inst ID: voa1.i
Smp Info : 1004265-11;50X;;;;
Misc Info : ;;;;;gm-all.sub;
Comment :
Method : \\ELABNSH05\TARGET\chem\voa1.i\052110V1.b\VSOIL1.m
Meth Date : 23-May-2010 07:04 ghallquist Quant Type: ISTD
Cal Date : 17-MAY-2010 07:04 Cal File: SEQ-CALO.D
Als bottle: 11
Dil Factor: 50.00000
Integrator: HP RTE Compound Sublist: gm-all.sub
Target Version: 4.04
Processing Host: TARGET03_VM

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/Kg)	FINAL (ug/Kg)
* 59 Fluorobenzene	96	14.576	14.590	(1.000)	2799189	30.0000	
$ 46 Dibromofluoromethane	111	12.415	12.430	(0.852)	687690	28.8074	28.81(R)
$ 50 1,2-Dichloroethane-d4	102	13.198	13.213	(0.905)	151685	26.6003	26.60(R)
$ 77 Toluene-d8	98	17.755	17.755	(0.873)	2509628	30.8738	30.87(R)
* 87 Chlorobenzene-d5	82	20.329	20.342	(1.000)	1133681	30.0000	
90 m,p Xylene	91	21.019	21.032	(1.034)	128877	1.70969	85.48
M 96 Xylene(total)	91				128877	1.70969	85.48
$ 101 Bromofluorobenzene	95	22.478	22.476	(1.106)	976068	32.0217	32.02(R)
109 1,2,4-Trimethylbenzene	105	24.348	24.361	(0.981)	49929	0.65541	32.77
* 112 1,4-Dichlorobenzene-d4	152	24.818	24.832	(1.000)	947089	30.0000	(Q)

m 5/26/10

QC Flag Legend

Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

5/26

Data File: \\BC\TARGET\chem\voa4.i\051510V4.b\0426523.D
Report Date: 21-May-2010 12:07

Empirical Laboratories, LLC

Data file : \\BC\TARGET\chem\voa4.i\051510V4.b\0426523.D
Lab Smp Id: 1004265-23 Client Smp ID: 32SB-36-0506
Inj Date : 16-MAY-2010 02:04 MS Autotune Date: 07-MAY-2010 17:53
Operator : ADM Inst ID: voa4.i
Smp Info : 1004265-23;;;;;
Misc Info : ;;;;;gm-all.sub;
Comment :
Method : \\BC\TARGET\chem\voa4.i\051510V4.b\VSOIL4.m
Meth Date : 21-May-2010 11:18 jeh Quant Type: ISTD
Cal Date : 07-MAY-2010 22:52 Cal File: SEQ-CAL8.D
Als bottle: 13
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: gm-all.sub
Target Version: 4.04
Processing Host: NSH-LAPTOP2

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/Kg)	FINAL (ug/Kg)
* 59 Fluorobenzene	96	14.067	14.064	(1.000)	406829	30.0000	
12 Acetone	43	7.405	7.379	(0.526)	11653	8.59480	8.595
20 Methylene chloride	84	8.556	8.530	(0.608)	51439	5.11965	5.120
$ 46 Dibromofluoromethane	111	12.325	12.319	(0.876)	124453	31.9624	31.96(R)
$ 50 1,2-Dichloroethane-d4	102	13.014	13.007	(0.925)	27360	29.8315	29.83(R)
$ 77 Toluene-d8	98	16.044	16.038	(0.926)	369661	32.2078	32.21(R)
* 87 Chlorobenzene-d5	82	17.324	17.312	(1.000)	174622	30.0000	(Q)
$ 101 Bromofluorobenzene	95	18.298	18.291	(1.056)	159191	32.0335	32.03(R)
109 1,2,4-Trimethylbenzene	105	19.134	19.137	(0.987)	6378	0.47064	0.4706
* 112 1,4-Dichlorobenzene-d4	152	19.380	19.368	(1.000)	156026	30.0000	(Q)

QC Flag Legend

Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

Data File: \\ELABNSH05\TARGET\chem\voa1.i\052110V1.b\0426523D.D
Report Date: 23-May-2010 07:05

Empirical Laboratories, LLC

Data file : \\ELABNSH05\TARGET\chem\voa1.i\052110V1.b\0426523D.D
Lab Smp Id: 1004265-23 Client Smp ID: 32SB-36-0506
Inj Date : 21-MAY-2010 20:27 MS Autotune Date: 13-MAY-2010 10:07
Operator : RDW Inst ID: voa1.i
Smp Info : 1004265-23;50X;;;;
Misc Info : ;;;;;gm-all.sub;
Comment :
Method : \\ELABNSH05\TARGET\chem\voa1.i\052110V1.b\VSOIL1.m
Meth Date : 23-May-2010 07:04 ghallquist Quant Type: ISTD
Cal Date : 17-MAY-2010 07:04 Cal File: SEQ-CALO.D
Als bottle: 12
Dil Factor: 50.00000
Integrator: HP RTE Compound Sublist: gm-all.sub
Target Version: 4.04
Processing Host: TARGET03_VM

mm 5/10

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/Kg)	FINAL (ug/Kg)
* 59 Fluorobenzene	96	14.576	14.590	(1.000)	2823513	30.0000	
$ 46 Dibromofluoromethane	111	12.415	12.430	(0.852)	707903	29.3986	29.40(R)
$ 50 1,2-Dichloroethane-d4	102	13.198	13.213	(0.905)	156850	27.2691	27.27(R)
$ 77 Toluene-d8	98	17.745	17.755	(0.873)	2572347	31.0012	31.00(R)
* 87 Chlorobenzene-d5	82	20.336	20.342	(1.000)	1157238	30.0000	
$ 101 Bromofluorobenzene	95	22.470	22.476	(1.105)	1005218	32.3067	32.31(R)
109 1,2,4-Trimethylbenzene	105	24.368	24.361	(0.982)	50201	0.64022	32.01
* 112 1,4-Dichlorobenzene-d4	152	24.821	24.832	(1.000)	974839	30.0000	(Q)

QC Flag Legend

Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

C 05/14

Data for SW8270C (PAH) Forms

HOLDING TIME SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_003

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SB-23-0506	04/27/10 13:05	04/28/10 08:30	05/11/10 16:35	14.15	14.00	06/06/10 21:31	26.21	40.00	
32SS-24-0002	04/27/10 13:15	04/28/10 08:30	05/11/10 16:35	14.14	14.00	06/06/10 22:07	26.23	40.00	
32SB-24-0506	04/27/10 13:15	04/28/10 08:30	05/11/10 16:35	14.14	14.00	06/06/10 22:44	26.26	40.00	
32SS-25-0002	04/27/10 13:30	04/28/10 08:30	05/11/10 16:35	14.13	14.00	06/07/10 06:35	26.58	40.00	
32SB-25-0607	04/27/10 13:30	04/28/10 08:30	05/11/10 16:35	14.13	14.00	06/06/10 23:20	26.28	40.00	
32SS-26-0002	04/27/10 13:35	04/28/10 08:30	05/11/10 16:35	14.13	14.00	06/06/10 23:57	26.31	40.00	
32SB-26-0405	04/27/10 13:35	04/28/10 08:30	05/11/10 16:35	14.13	14.00	06/07/10 00:33	26.33	40.00	
32SS-27-0002	04/27/10 14:00	04/28/10 08:30	05/11/10 16:35	14.11	14.00	06/07/10 01:09	26.36	40.00	
32SB-27-0506	04/27/10 14:00	04/28/10 08:30	05/11/10 16:35	14.11	14.00	06/07/10 01:45	26.38	40.00	
32SS-28-0002	04/27/10 14:25	04/28/10 08:30	05/11/10 16:35	14.09	14.00	06/07/10 05:59	26.56	40.00	
32SB-28-0506	04/27/10 14:25	04/28/10 08:30	05/11/10 16:35	14.09	14.00	06/07/10 02:22	26.41	40.00	
32SS-29-0002	04/27/10 14:30	04/28/10 08:30	05/11/10 16:35	14.09	14.00	06/07/10 02:58	26.43	40.00	
32SB-29-0304	04/27/10 14:30	04/28/10 08:30	05/11/10 16:35	14.09	14.00	06/07/10 03:34	26.46	40.00	
32SS-30-0002	04/27/10 15:05	04/28/10 08:30	05/11/10 16:35	14.06	14.00	06/07/10 04:10	26.48	40.00	
32SB-30-0506	04/27/10 15:05	04/28/10 08:30	05/11/10 16:35	14.06	14.00	06/07/10 04:46	26.51	40.00	
32SS-32-0002	04/27/10 14:10	04/28/10 08:30	05/11/10 16:35	14.10	14.00	06/07/10 05:23	26.53	40.00	
32SB-32-0506	04/27/10 14:10	04/28/10 08:30	05/20/10 13:40	22.98	14.00	06/12/10 13:25	22.99	40.00	*
32SS-33-0002	04/27/10 15:25	04/28/10 08:30	05/20/10 13:40	22.93	14.00	06/13/10 14:10	24.02	40.00	*
32SB-33-0506	04/27/10 15:25	04/28/10 08:30	05/20/10 13:40	22.93	14.00	06/12/10 14:02	23.02	40.00	*
32SS-34-0002	04/27/10 15:40	04/28/10 08:30	05/20/10 13:40	22.92	14.00	06/12/10 14:38	23.04	40.00	*
32SB-34-0607	04/27/10 15:40	04/28/10 08:30	05/20/10 13:40	22.92	14.00	06/12/10 15:14	23.07	40.00	*
32SS-36-0002	04/27/10 15:45	04/28/10 08:30	05/20/10 13:40	22.91	14.00	06/12/10 15:50	23.09	40.00	*
32SB-36-0506	04/27/10 15:45	04/28/10 08:30	05/20/10 13:40	22.91	14.00	06/12/10 16:26	23.12	40.00	*
32SS-37-0002	04/27/10 16:00	04/28/10 08:30	05/20/10 13:40	22.90	14.00	06/13/10 14:46	24.05	40.00	*

HOLDING TIME SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_003

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SB-37-0506	04/27/10 16:00	04/28/10 08:30	05/20/10 13:40	22.90	14.00	06/13/10 15:22	24.07	40.00	*
32SB-FD042710-02	04/27/10 11:45	04/28/10 08:30	05/20/10 13:40	23.08	14.00	06/12/10 17:02	23.14	40.00	*

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Sequence: 0F15501

Calibration: 0156001

SDG: CTOF273_003

Project: CTOF273 NSA Crane SMU32

Instrument: MS-BNA3

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15501-TUN1	SEQ-TUN1.D	06/03/10 10:13
Cal Standard	0F15501-CAL1	SEQ-CAL1.D	06/03/10 10:34
Cal Standard	0F15501-CAL2	SEQ-CAL2.D	06/03/10 11:11
Cal Standard	0F15501-CAL3	SEQ-CAL3.D	06/03/10 11:47
Cal Standard	0F15501-CAL4	SEQ-CAL4.D	06/03/10 12:23
Cal Standard	0F15501-CAL5	SEQ-CAL5.D	06/03/10 13:00
Cal Standard	0F15501-CAL6	SEQ-CAL6.D	06/03/10 13:36
Cal Standard	0F15501-CAL7	SEQ-CAL7.D	06/03/10 14:13
Cal Standard	0F15501-CAL8	SEQ-CAL8.D	06/03/10 14:49
Cal Standard	0F15501-CAL9	SEQ-CAL9.D	06/03/10 15:26
Cal Standard	0F15501-CALA	SEQ-CALA.D	06/03/10 16:03
Cal Standard	0F15501-CALB	SEQ-CALB.D	06/03/10 16:39
Initial Cal Check	0F15501-ICV1	SEQ-ICV1.D	06/03/10 17:16

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/03/10
Instrument ID:	MS-BNA3	Injection Time:	10:13
Sequence:	0F15501	Lab Sample ID:	0F15501-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	41.5	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	48.5	PASS
70	Less than 2% of 69	0.535	PASS
127	40 - 60% of 198	57.2	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.15	PASS
275	10 - 30% of 198	21.3	PASS
365	1 - 200% of 198	2.05	PASS
441	0.001 - 100% of 443	71.8	PASS
442	40 - 200% of 198	42.1	PASS
443	17 - 23% of 442	20.3	PASS

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0156001

Matrix: Water

SDG: CTOF273_003

Project: CTOF273 NSA Crane SMU32

Instrument: MS-BNA3

Calibration Date: 6/3/2010 10:00:02AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.6012431	7.184963	9.083455	0.1514793			CCC (30)	
Acenaphthylene	0.9158405	9.534423	8.697545	0.1224601			15	
Anthracene	0.8705871	12.60701	12.99	0.1331843			15	
Benzo(a)anthracene	0.7827159	11.93588	20.47909	0.1037901			15	
Benzo(a)pyrene	1.030906	16.82034	24.56209	9.824416E-02		0.9996429	CCC (30)	
Benzo(b)fluoranthene	1.129732	17.94265	23.74682	0.1340174	0.9995021		0.995	
Benzo(g,h,i)perylene	0.9698277	5.644128	26.92336	0.1059566			15	
Benzo(k)fluoranthene	1.107235	15.53366	23.83891	0.1427109		0.9995849	0.99	
Chrysene	0.8305551	8.726862	20.58036	0.113825			15	
Dibenz(a,h)anthracene	0.855389	11.29456	26.542	7.745018E-02			15	
Fluoranthene	0.933897	12.06893	16.25082	0.108705			CCC (30)	
Fluorene	0.6453976	9.224112	10.32127	0.1362755			15	
2-Fluorobiphenyl	0.694446	6.728885	7.654455	0.1153448			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	0.9165747	14.56335	26.47864	8.292637E-02			15	
1-Methylnaphthalene	0.582316	8.672515	7.157364	0.1267128			15	
2-Methylnaphthalene	0.6301093	6.416041	6.996091	9.985584E-02			15	
Naphthalene	0.9310503	9.373293	5.993454	0.1135701			15	
Nitrobenzene-d5							15	
Phenanthrene	0.9661153	6.161989	12.843	0.1252231			15	
Phenol-d6							15	
Pyrene	0.9799586	10.54414	16.87882	0.1189006			15	
Terphenyl-d14	0.6581084	10.97145	17.571	8.350396E-02			15	
2,4,6-Tribromophenol	7.286756E-02	24.60508	10.93736	0.1598562	0.9994666		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0156001	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	6/3/2010 10:00:02AM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	5	0.6002718	10	0.5806503	20	0.5973085	40	0.5419444	50	0.5559183		
Acenaphthylene	5	0.996145	10	0.9522535	20	0.9740831	40	0.8437298	50	0.8521731		
Anthracene	5	0.979197	10	0.9469419	20	0.9395354	40	0.8610334	50	0.8639298		
Benzo(a)anthracene	5	0.8684765	10	0.8689523	20	0.9041125	40	0.8252984	50	0.8183905		
Benzo(a)pyrene	5	1.161679	10	1.190829	20	1.204541	40	1.139674	50	1.164882		
Benzo(b)fluoranthene	5	1.256836	10	1.303416	20	1.338558	40	1.256523	50	1.288767		
Benzo(g,h,i)perylene	5	1.033172	10	0.9653504	20	0.9758677	40	0.9357831	50	0.9449846		
Benzo(k)fluoranthene	5	1.247367	10	1.220529	20	1.199914	40	1.062619	50	1.055571		
Chrysene	5	0.8571933	10	0.8178722	20	0.8108023	40	0.7058679	50	0.6931645		
Dibenz(a,h)anthracene	5	0.9728076	10	0.8740959	20	0.9219851	40	0.8782113	50	0.9064931		
Fluoranthene	5	1.057894	10	1.030243	20	0.9916996	40	0.9091715	50	0.9093705		
Fluorene	5	0.6976308	10	0.6827717	20	0.6924626	40	0.6368748	50	0.6485439		
2-Fluorobiphenyl	5	0.6983717	10	0.6741065	20	0.7014284	40	0.6312498	50	0.6401928		
2-Fluorophenol	10		20		40		80		100			
Indeno(1,2,3-cd)pyrene	5	1.012459	10	0.989698	20	1.043266	40	1.037456	50	1.053229		
1-Methylnaphthalene	5	0.5732521	10	0.5494585	20	0.5301068	40	0.5110041	50	0.5193554		
2-Methylnaphthalene	5	0.6516727	10	0.6303897	20	0.6140409	40	0.5901664	50	0.6028238		
Naphthalene	5	0.8905291	10	0.8801026	20	0.897545	40	0.8002282	50	0.801229		
Nitrobenzene-d5	5		10		20		40		50			
Phenanthrene	5	1.014187	10	0.9957043	20	0.9686654	40	0.909254	50	0.9194809		
Phenol-d6	10		20		40		80		100			
Pyrene	5	1.077181	10	1.060542	20	1.026275	40	0.9179219	50	0.9248837		
Terphenyl-d14	5	0.7256615	10	0.7216351	20	0.7091201	40	0.6431398	50	0.6575362		
2,4,6-Tribromophenol	10	8.592749E-02	20	8.619644E-02	40	8.909966E-02	80	8.342171E-02	100	8.564323E-02		
Acenaphthene-d10	1		1		1		1		1			
Chrysene-d12	1		1		1		1		1			

INITIAL CALIBRATION DATA

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0156001	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	6/3/2010 10:00:02AM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	0.05	0.6887374	0.1	0.6102112	0.25	0.5761253	0.5	0.5776617	1	0.6553898	2	0.6294555
Acenaphthylene	0.05	0.7880351	0.1	0.8217325	0.25	0.8647101	0.5	0.9131058	1	1.037771	2	1.030506
Anthracene	0.05	0.6688778	0.1	0.7488617	0.25	0.7754771	0.5	0.8142023	1	1.021439	2	0.956963
Benzo(a)anthracene	0.05	0.6801384	0.1	0.6164626	0.25	0.6899172	0.5	0.7070394	1	0.8133413	2	0.817746
Benzo(a)pyrene	0.05	0.8423956	0.1	0.7159641	0.25	0.8221258	0.5	0.9278189	1	1.125508	2	1.044545
Benzo(b)fluoranthene	0.05	0.8322323	0.1	0.7969726	0.25	0.8997674	0.5	1.021327	1	1.235345	2	1.197305
Benzo(g,h,i)perylene	0.05	0.9756806	0.1	0.8810967	0.25	0.9167138	0.5	0.9668029	1	1.083948	2	0.9887047
Benzo(k)fluoranthene	0.05	0.7988385	0.1	0.8457854	0.25	1.026941	0.5	1.116021	1	1.344609	2	1.261387
Chrysene	0.05	0.884876	0.1	0.852523	0.25	0.839287	0.5	0.8622205	1	0.9274874	2	0.8848117
Dibenz(a,h)anthracene	0.05	0.6940109	0.1	0.7369952	0.25	0.7385505	0.5	0.8090594	1	0.9697665	2	0.9073038
Fluoranthene	0.05	0.7589624	0.1	0.7961671	0.25	0.7895931	0.5	0.9280486	1	1.055173	2	1.046544
Fluorene	0.05	0.571218	0.1	0.5629992	0.25	0.5755492	0.5	0.6067879	1	0.7388494	2	0.6856866
2-Fluorobiphenyl	0.05	0.6897611	0.1	0.645387	0.25	0.6959309	0.5	0.7248683	1	0.7704467	2	0.7671633
2-Fluorophenol	0.1		0.2		0.5		1		2		4	
Indeno(1,2,3-cd)pyrene	0.05	0.7224682	0.1	0.7250516	0.25	0.7677667	0.5	0.8152105	1	1.003223	2	0.9124935
1-Methylnaphthalene	0.05	0.6613025	0.1	0.6154363	0.25	0.57843	0.5	0.606636	1	0.634109	2	0.6263848
2-Methylnaphthalene	0.05	0.6430809	0.1	0.56048	0.25	0.6342816	0.5	0.6196611	1	0.7064815	2	0.6781234
Naphthalene	0.05	1.067911	0.1	0.957957	0.25	0.9674469	0.5	0.9957184	1	1.039278	2	0.9436075
Nitrobenzene-d5	0.05		0.1		0.25		0.5		1		2	
Phenanthrene	0.05	0.9129251	0.1	0.9264201	0.25	0.9274397	0.5	0.9330612	1	1.09318	2	1.026951
Phenol-d6	0.1		0.2		0.5		1		2		4	
Pyrene	0.05	0.8805765	0.1	0.8095096	0.25	0.9019806	0.5	0.9547064	1	1.132414	2	1.093554
Terphenyl-d14	0.05	0.5486968	0.1	0.5291297	0.25	0.6158804	0.5	0.6422557	1	0.7516004	2	0.6945365
2,4,6-Tribromophenol	0.1	3.777409E-02	0.2	4.744532E-02	0.5	6.116313E-02	1	6.110979E-02	2	8.439665E-02	4	7.936563E-02
Acenaphthene-d10	1		1		1		1		1		1	
Chrysene-d12	1		1		1		1		1		1	

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16103	Instrument:	MS-BNA3
Calibration:	0156001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16103-TUN1	SEQ-TUN1.D	06/06/10 06:22
Calibration Check	0F16103-CCV1	SEQ-CCV1.D	06/06/10 06:44
LCS	0E11010-BS1	E11010L1.D	06/06/10 15:12
Blank	0E11010-BLK1	E11010B1.D	06/06/10 15:48

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/06/10
Instrument ID:	MS-BNA3	Injection Time:	06:22
Sequence:	0F16103	Lab Sample ID:	0F16103-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	40.3	PASS
68	Less than 2% of 69	0.891	PASS
69	Less than 200% of 198	46.7	PASS
70	Less than 2% of 69	0.554	PASS
127	40 - 60% of 198	53.6	PASS
197	Less than 1% of 198	0.0454	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.05	PASS
275	10 - 30% of 198	24.8	PASS
365	1 - 200% of 198	3.18	PASS
441	0.001 - 100% of 443	75.2	PASS
442	40 - 200% of 198	73.5	PASS
443	17 - 23% of 442	19.8	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0156001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	06/03/10 10:00
Sequence:	0F16103	Injection Date:	06/06/10
Lab Sample ID:	0F16103-CCV1	Injection Time:	06:44

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.232	0.6012431	0.6291943		4.6	20
Acenaphthylene	A	5.000	5.562	0.9158405	1.018883		11.3	20
Anthracene	A	5.000	5.677	0.8705871	0.9885227		13.5	20
Benzo(a)anthracene	A	5.000	4.946	0.7827159	0.7742593		-1.1	20
Benzo(a)pyrene	Q	5.000	5.385	1.030906	1.264995		7.7	20
Benzo(b)fluoranthene	L	5.000	5.736	1.129732	1.470614		14.7	20
Benzo(g,h,i)perylene	A	5.000	4.687	0.9698277	0.9090827		-6.3	20
Benzo(k)fluoranthene	Q	5.000	5.690	1.107235	1.421977		13.8	20
Chrysene	A	5.000	4.346	0.8305551	0.7219164		-13.1	20
Dibenz(a,h)anthracene	A	5.000	5.035	0.855389	0.8613325		0.7	20
Fluoranthene	A	5.000	5.618	0.933897	1.049299		12.4	20
Fluorene	A	5.000	5.746	0.6453976	0.7417359		14.9	20
Indeno(1,2,3-cd)pyrene	A	5.000	5.024	0.9165747	0.9210273		0.5	20
1-Methylnaphthalene	A	5.000	5.045	0.582316	0.58758		0.9	20
2-Methylnaphthalene	A	5.000	5.349	0.6301093	0.6741203		7.0	20
Naphthalene	A	5.000	4.946	0.9310503	0.9209389		-1.1	20
Phenanthrene	A	5.000	5.539	0.9661153	1.070258		10.8	20
Pyrene	A	5.000	5.470	0.9799586	1.072178		9.4	20
2-Fluorobiphenyl	A	5.000	5.437	0.694446	0.7551623		8.7	20
Terphenyl-d14	A	5.000	5.401	0.6581084	0.710859		8.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16104	Instrument:	MS-BNA3
Calibration:	0156001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16104-TUN1	SEQ-TUN2.D	06/06/10 19:21
Calibration Check	0F16104-CCV1	SEQ-CCV2.D	06/06/10 19:42
32SB-23-0506	1004265-01	0426501.D	06/06/10 21:31
32SS-24-0002	1004265-02	0426502.D	06/06/10 22:07
32SB-24-0506	1004265-03	0426503.D	06/06/10 22:44
32SB-25-0607	1004265-05	0426505.D	06/06/10 23:20
32SS-26-0002	1004265-06	0426506.D	06/06/10 23:57
32SB-26-0405	1004265-07	0426507.D	06/07/10 00:33
32SS-27-0002	1004265-08	0426508.D	06/07/10 01:09
32SB-27-0506	1004265-09	0426509.D	06/07/10 01:45
32SB-28-0506	1004265-11	0426511.D	06/07/10 02:22
32SS-29-0002	1004265-12	0426512.D	06/07/10 02:58
32SB-29-0304	1004265-13	0426513.D	06/07/10 03:34
32SS-30-0002	1004265-14	0426514.D	06/07/10 04:10
32SB-30-0506	1004265-15	0426515.D	06/07/10 04:46
32SS-32-0002	1004265-16	0426516.D	06/07/10 05:23
32SS-28-0002	1004265-10	0426510.D	06/07/10 05:59
32SS-25-0002	1004265-04	0426504D.D	06/07/10 06:35

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	06/06/10
Instrument ID:	MS-BNA3	Injection Time:	19:21
Sequence:	0F16104	Lab Sample ID:	0F16104-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	36.3	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	41.8	PASS
70	Less than 2% of 69	0.627	PASS
127	40 - 60% of 198	51.9	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.06	PASS
275	10 - 30% of 198	23.5	PASS
365	1 - 200% of 198	2.82	PASS
441	0.001 - 100% of 443	74.8	PASS
442	40 - 200% of 198	50.7	PASS
443	17 - 23% of 442	20	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0156001
Lab File ID:	SEQ-CCV2.D	Calibration Date:	06/03/10 10:00
Sequence:	0F16104	Injection Date:	06/06/10
Lab Sample ID:	0F16104-CCV1	Injection Time:	19:42

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.147	0.6012431	0.6189086		2.9	20
Acenaphthylene	A	5.000	5.497	0.9158405	1.006821		9.9	20
Anthracene	A	5.000	5.737	0.8705871	0.998944		14.7	20
Benzo(a)anthracene	A	5.000	5.310	0.7827159	0.8313305		6.2	20
Benzo(a)pyrene	Q	5.000	5.194	1.030906	1.219858		3.9	20
Benzo(b)fluoranthene	L	5.000	5.543	1.129732	1.421083		10.9	20
Benzo(g,h,i)perylene	A	5.000	3.791	0.9698277	0.7353982		-24.2	20 *
Benzo(k)fluoranthene	Q	5.000	5.670	1.107235	1.417173		13.4	20
Chrysene	A	5.000	4.753	0.8305551	0.789516		-4.9	20
Dibenz(a,h)anthracene	A	5.000	4.197	0.855389	0.7180157		-16.1	20
Fluoranthene	A	5.000	5.561	0.933897	1.038761		11.2	20
Fluorene	A	5.000	5.755	0.6453976	0.7428678		15.1	20
Indeno(1,2,3-cd)pyrene	A	5.000	4.074	0.9165747	0.7469131		-18.5	20
1-Methylnaphthalene	A	5.000	5.019	0.582316	0.5844826		0.4	20
2-Methylnaphthalene	A	5.000	5.335	0.6301093	0.6723375		6.7	20
Naphthalene	A	5.000	4.791	0.9310503	0.8921969		-4.2	20
Phenanthrene	A	5.000	5.509	0.9661153	1.064419		10.2	20
Pyrene	A	5.000	5.287	0.9799586	1.036228		5.7	20
2-Fluorobiphenyl	A	5.000	5.291	0.694446	0.7348623		5.8	20
Terphenyl-d14	A	5.000	5.554	0.6581084	0.7309775		11.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16101	Instrument:	MS-BNA3
Calibration:	0161002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16101-TUN1	SEQ-TUN1.D	06/09/10 22:00
Cal Standard	0F16101-CAL1	SEQ-CAL1.D	06/09/10 22:21
Cal Standard	0F16101-CAL2	SEQ-CAL2.D	06/09/10 22:57
Cal Standard	0F16101-CAL3	SEQ-CAL3.D	06/09/10 23:33
Cal Standard	0F16101-CAL4	SEQ-CAL4.D	06/10/10 00:10
Cal Standard	0F16101-CAL5	SEQ-CAL5.D	06/10/10 00:46
Cal Standard	0F16101-CAL6	SEQ-CAL6.D	06/10/10 01:22
Cal Standard	0F16101-CAL7	SEQ-CAL7.D	06/10/10 01:58
Cal Standard	0F16101-CAL8	SEQ-CAL8.D	06/10/10 02:34
Cal Standard	0F16101-CAL9	SEQ-CAL9.D	06/10/10 03:10
Cal Standard	0F16101-CALA	SEQ-CALA.D	06/10/10 03:47
Cal Standard	0F16101-CALB	SEQ-CALB.D	06/10/10 04:23
Initial Cal Check	0F16101-ICV1	SEQ-ICV1.D	06/10/10 04:59

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/09/10
Instrument ID:	MS-BNA3	Injection Time:	22:00
Sequence:	0F16101	Lab Sample ID:	0F16101-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	41	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	46.6	PASS
70	Less than 2% of 69	0.373	PASS
127	40 - 60% of 198	52.1	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.88	PASS
275	10 - 30% of 198	25.8	PASS
365	1 - 200% of 198	3.06	PASS
441	0.001 - 100% of 443	73	PASS
442	40 - 200% of 198	76.4	PASS
443	17 - 23% of 442	19.9	PASS

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0161002

Matrix: Water

SDG: CTOF273_003

Project: CTOF273 NSA Crane SMU32

Instrument: MS-BNA3

Calibration Date: 6/9/2010 2:36:40PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.786274	9.577482	8.827818	8.701544E-02			CCC (30)	
Acenaphthylene	1.21382	13.93835	8.448273	8.020422E-02			15	
Anthracene	0.8565716	13.35312	12.68555	0.0437723		0.9965319	0.99	
Benzo(a)anthracene	0.5502005	25.35066	20.14791	3.724692E-02	0.9971164		0.995	
Benzo(a)pyrene	0.963022	29.14946	24.25627	0.0396758	0.9978688		CCC (30)	
Benzo(b)fluoranthene	1.109058	29.03611	23.311	5.698884E-02	0.9977015		0.995	
Benzo(g,h,i)perylene	1.144808	17.70931	26.6111	2.691288E-02	0.9940619		0.995	*
Benzo(k)fluoranthene	1.244685	13.47436	23.40864	6.974615E-02		0.9990568	0.99	
Chrysene	0.6385135	11.86689	20.24573	0.046851	0.999541		0.995	
Dibenz(a,h)anthracene	0.8922049	25.66608	26.25891	2.493493E-02		0.9956229	0.99	
Fluoranthene	0.7487376	20.49171	15.92809	5.045146E-02	0.9993594		CCC (30)	
Fluorene	0.7298324	15.00874	10.04655	8.243873E-02	0.9991819		0.995	
2-Fluorobiphenyl	0.9931515	15.39381	7.432	8.333368E-02		0.997918	0.99	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	0.899166	24.90014	26.19636	3.894349E-02		0.9952191	0.99	
1-Methylnaphthalene	0.8184576	14.6224	6.947636	5.542856E-02			15	
2-Methylnaphthalene	0.8899234	13.70893	6.790546	0.0599914			15	
Naphthalene	1.415819	14.97382	5.818455	9.857723E-02			15	
Nitrobenzene-d5							15	
Phenanthrene	0.9983893	7.84061	12.53873	6.340399E-02			15	
Phenol-d6							15	
Pyrene	0.8081301	15.14012	16.55264	5.656614E-02		0.9951965	0.99	
Terphenyl-d14	0.5588801	18.64392	17.26073	2.669893E-02	0.9989362		0.995	
2,4,6-Tribromophenol	6.258919E-02	34.34367	10.65255	8.128201E-02	0.9982302		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0161002	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	6/9/2010 2:36:40PM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	5	0.8218902	10	0.6612802	20	0.69928	40	0.7020702	50	0.7554387		
Acenaphthylene	5	1.429666	10	1.181993	20	1.201768	40	1.120576	50	1.039745		
Anthracene	5	0.9519616	10	1.004131	20	0.9280447	40	0.969482	50	0.8458382		
Benzo(a)anthracene	5	0.6169	10	0.5863312	20	0.6586795	40	0.7655029	50	0.7436028		
Benzo(a)pyrene	5	1.045056	10	1.241046	20	1.237051	40	1.28072	50	1.184513		
Benzo(b)fluoranthene	5	1.240976	10	1.302874	20	1.50057	40	1.461523	50	1.3659		
Benzo(g,h,i)perylene	5	1.141598	10	1.357898	20	1.432767	40	1.228286	50	~~1.014052~~		
Benzo(k)fluoranthene	5	1.408468	10	1.302771	20	1.417919	40	1.217167	50	1.203144		
Chrysene	5	0.740596	10	0.6022235	20	0.6501879	40	0.6572236	50	0.6652184		
Dibenz(a,h)anthracene	5	1.024504	10	1.027125	20	1.321258	40	1.022199	50	0.9502335		
Fluoranthene	5	0.8784363	10	0.8333759	20	0.9106519	40	0.8852303	50	0.8587487		
Fluorene	5	0.8172183	10	0.7368271	20	0.78762	40	0.8031852	50	0.7668709		
2-Fluorobiphenyl	5	1.095608	10	0.8674879	20	0.9012972	40	0.8825569	50	0.7905428		
2-Fluorophenol	10		20		40		80		100			
Indeno(1,2,3-cd)pyrene	5	0.9233905	10	0.9996862	20	1.357223	40	1.124935	50	1.0297		
1-Methylnaphthalene	5	0.8774699	10	0.6826278	20	0.7135754	40	0.7022219	50	0.6659749		
2-Methylnaphthalene	5	0.998341	10	0.7904317	20	0.8114878	40	0.8167446	50	0.7655517		
Naphthalene	5	1.458759	10	1.270788	20	1.197777	40	1.195748	50	1.052568		
Nitrobenzene-d5	5		10		20		40		50			
Phenanthrene	5	1.06686	10	1.052591	20	1.003882	40	0.9388948	50	0.9024793		
Phenol-d6	10		20		40		80		100			
Pyrene	5	0.892208	10	0.8527914	20	0.9247498	40	1.001447	50	0.8788489		
Terphenyl-d14	5	0.6031102	10	0.5647646	20	0.7066398	40	0.6781201	50	0.6793725		
2,4,6-Tribromophenol	10	7.378915E-02	20	7.615304E-02	40	8.139074E-02	80	8.789232E-02	100	9.134983E-02		
Acenaphthene-d10	1		1		1		1		1			
Chrysene-d12	1		1		1		1		1			

INITIAL CALIBRATION DATA

SW8270C

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0161002

Matrix: Water

SDG: CTOF273_003

Project: CTOF273 NSA Crane SMU32

Instrument: MS-BNA3

Calibration Date: 6/9/2010 2:36:40PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	0.05	0.8654875	0.1	0.8214918	0.25	0.7519391	0.5	0.839034	1	0.8745142	2	0.8565875
Acenaphthylene	0.05	1.034618	0.1	1.031552	0.25	1.096442	0.5	1.326876	1	1.419164	2	1.469624
Anthracene	0.05	0.680697	0.1	0.7153292	0.25	0.7733015	0.5	0.7301898	1	0.8790683	2	0.9442446
Benzo(a)anthracene	0.05	0.4316997	0.1	0.4035591	0.25	0.4153366	0.5	0.3520456	1	0.5428208	2	0.5357267
Benzo(a)pyrene	0.05	0.676786	0.1	0.5293241	0.25	0.6468518	0.5	0.6692812	1	0.9692824	2	1.113331
Benzo(b)fluoranthene	0.05	0.6220118	0.1	0.6520201	0.25	0.8172036	0.5	0.8162992	1	1.186124	2	1.234135
Benzo(g,h,i)perylene	0.05	1.22592	0.1	0.9558741	0.25	0.7550983	0.5	0.9882347	1	1.099643	2	1.262758
Benzo(k)fluoranthene	0.05	1.216636	0.1	0.9992553	0.25	0.9959753	0.5	1.075996	1	1.408421	2	1.445785
Chrysene	0.05	0.5658555	0.1	0.5897931	0.25	0.645127	0.5	0.48125	1	0.7345978	2	0.6915761
Dibenz(a,h)anthracene	0.05	0.7454858	0.1	0.5025135	0.25	0.6725157	0.5	0.6572289	1	0.9752571	2	0.9159335
Fluoranthene	0.05	0.4567561	0.1	0.5843248	0.25	0.6149218	0.5	0.6141016	1	0.821474	2	0.7780924
Fluorene	0.05	0.5914339	0.1	0.5390162	0.25	0.5947749	0.5	0.6976001	1	0.846476	2	0.8471346
2-Fluorobiphenyl	0.05	0.8393872	0.1	0.9851497	0.25	0.9862573	0.5	1.180222	1	1.236724	2	1.159433
2-Fluorophenol	0.1		0.2		0.5		1		2		4	
Indeno(1,2,3-cd)pyrene	0.05	0.7751938	0.1	0.7216533	0.25	0.6091979	0.5	0.6177244	1	0.8802468	2	0.8518748
1-Methylnaphthalene	0.05	0.8214649	0.1	0.8221168	0.25	0.7952109	0.5	0.9747798	1	0.9855237	2	0.9620677
2-Methylnaphthalene	0.05	0.8026727	0.1	0.7646999	0.25	0.9034513	0.5	1.008423	1	1.097658	2	1.029696
Naphthalene	0.05	1.511036	0.1	1.431752	0.25	1.488168	0.5	1.705438	1	1.692705	2	1.56927
Nitrobenzene-d5	0.05		0.1		0.25		0.5		1		2	
Phenanthrene	0.05	0.9422225	0.1	0.9110936	0.25	0.9637097	0.5	0.9823417	1	1.154557	2	1.063651
Phenol-d6	0.1		0.2		0.5		1		2		4	
Pyrene	0.05	0.7116695	0.1	0.6847068	0.25	0.6488039	0.5	0.6260801	1	0.8453146	2	0.8228112
Terphenyl-d14	0.05	0.4282197	0.1	0.4973791	0.25	0.4755039	0.5	0.3912771	1	0.5546543	2	0.5686396
2,4,6-Tribromophenol	0.1	3.497447E-02	0.2	3.925444E-02	0.5	3.565975E-02	1	4.183292E-02	2	5.944619E-02	4	6.673825E-02
Acenaphthene-d10	1		1		1		1		1		1	
Chrysene-d12	1		1		1		1		1		1	

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16723	Instrument:	MS-BNA3
Calibration:	0161002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16723-TUN1	SEQ-TUN1.D	06/12/10 11:15
Calibration Check	0F16723-CCV1	SEQ-CCV1.D	06/12/10 11:37
LCS	0E11013-BS1	E11013L1.D	06/12/10 12:13
Blank	0E11013-BLK1	E11013B1.D	06/12/10 12:49
32SB-32-0506	1004265-17	0426517.D	06/12/10 13:25
32SB-33-0506	1004265-19	0426519.D	06/12/10 14:02
32SS-34-0002	1004265-20	0426520.D	06/12/10 14:38
32SB-34-0607	1004265-21	0426521.D	06/12/10 15:14
32SS-36-0002	1004265-22	0426522.D	06/12/10 15:50
32SB-36-0506	1004265-23	0426523.D	06/12/10 16:26
32SB-FD042710-02	1004265-26	0426526.D	06/12/10 17:02

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/12/10
Instrument ID:	MS-BNA3	Injection Time:	11:15
Sequence:	0F16723	Lab Sample ID:	0F16723-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	38.9	PASS
68	Less than 2% of 69	0.00501	PASS
69	Less than 200% of 198	45	PASS
70	Less than 2% of 69	0.491	PASS
127	40 - 60% of 198	50.5	PASS
197	Less than 1% of 198	0.0149	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.05	PASS
275	10 - 30% of 198	25.9	PASS
365	1 - 200% of 198	2.95	PASS
441	0.001 - 100% of 443	76.4	PASS
442	40 - 200% of 198	80.3	PASS
443	17 - 23% of 442	19.4	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0161002
Lab File ID:	SEQ-CCV1.D	Calibration Date:	06/09/10 14:36
Sequence:	0F16723	Injection Date:	06/12/10
Lab Sample ID:	0F16723-CCV1	Injection Time:	11:37

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.131	0.786274	0.8068446		2.6	20
Acenaphthylene	A	5.000	5.766	1.21382	1.39973		15.3	20
Anthracene	Q	5.000	5.207	0.8565716	1.044179		4.1	20
Benzo(a)anthracene	L	5.000	5.525	0.5502005	0.7357773		10.5	20
Benzo(a)pyrene	L	5.000	5.366	0.963022	1.286212		7.3	20
Benzo(b)fluoranthene	L	5.000	5.696	1.109058	1.573732		13.9	20
Benzo(g,h,i)perylene	L	5.000	4.647	1.144808	1.353563		-7.1	20
Benzo(k)fluoranthene	Q	5.000	5.531	1.244685	1.590188		10.6	20
Chrysene	L	5.000	6.398	0.6385135	0.8396126		28.0	20 *
Dibenz(a,h)anthracene	Q	5.000	4.338	0.8922049	1.192917		-13.2	20
Fluoranthene	L	5.000	5.933	0.7487376	1.029877		18.7	20
Fluorene	L	5.000	5.275	0.7298324	0.8262417		5.5	20
Indeno(1,2,3-cd)pyrene	Q	5.000	4.386	0.899166	1.155885		-12.3	20
1-Methylnaphthalene	A	5.000	5.174	0.8184576	0.8470027		3.5	20
2-Methylnaphthalene	A	5.000	5.320	0.8899234	0.9469168		6.4	20
Naphthalene	A	5.000	4.926	1.415819	1.394951		-1.5	20
Phenanthrene	A	5.000	5.731	0.9983893	1.14429		14.6	20
Pyrene	Q	5.000	5.616	0.8081301	1.039421		12.3	20
2-Fluorobiphenyl	Q	5.000	5.359	0.9931515	1.068672		7.2	20
Terphenyl-d14	L	5.000	5.479	0.5588801	0.7089421		9.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16739	Instrument:	MS-BNA3
Calibration:	0161002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16739-TUN1	SEQ-TUN3.D	06/13/10 13:13
Calibration Check	0F16739-CCV1	SEQ-CCV3.D	06/13/10 13:34
32SS-33-0002	1004265-18	0426518D.D	06/13/10 14:10
32SS-37-0002	1004265-24	0426524D.D	06/13/10 14:46
32SB-37-0506	1004265-25	0426525D.D	06/13/10 15:22

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN3.D	Injection Date:	06/13/10
Instrument ID:	MS-BNA3	Injection Time:	13:13
Sequence:	0F16739	Lab Sample ID:	0F16739-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	39.5	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	44.9	PASS
70	Less than 2% of 69	0.488	PASS
127	40 - 60% of 198	51.8	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.18	PASS
275	10 - 30% of 198	27	PASS
365	1 - 200% of 198	3.11	PASS
441	0.001 - 100% of 443	76.6	PASS
442	40 - 200% of 198	79.1	PASS
443	17 - 23% of 442	19.2	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0161002
Lab File ID:	SEQ-CCV3.D	Calibration Date:	06/09/10 14:36
Sequence:	0F16739	Injection Date:	06/13/10
Lab Sample ID:	0F16739-CCV1	Injection Time:	13:34

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	4.763	0.786274	0.748976		-4.7	20
Acenaphthylene	A	5.000	4.971	1.21382	1.20678		-0.6	20
Anthracene	Q	5.000	5.422	0.8565716	1.087791		8.4	20
Benzo(a)anthracene	L	5.000	5.929	0.5502005	0.7967444		18.6	20
Benzo(a)pyrene	L	5.000	5.413	0.963022	1.297762		8.3	20
Benzo(b)fluoranthene	L	5.000	5.143	1.109058	1.417192		2.9	20
Benzo(g,h,i)perylene	L	5.000	3.792	1.144808	1.092656		-24.2	20 *
Benzo(k)fluoranthene	Q	5.000	5.148	1.244685	1.481171		3.0	20
Chrysene	L	5.000	6.192	0.6385135	0.8124695		23.8	20 *
Dibenz(a,h)anthracene	Q	5.000	3.687	0.8922049	0.9964661		-26.3	20 *
Fluoranthene	L	5.000	5.923	0.7487376	1.02817		18.5	20
Fluorene	L	5.000	5.360	0.7298324	0.8394757		7.2	20
Indeno(1,2,3-cd)pyrene	Q	5.000	3.935	0.899166	1.020001		-21.3	20 *
1-Methylnaphthalene	A	5.000	4.510	0.8184576	0.7382772		-9.8	20
2-Methylnaphthalene	A	5.000	4.665	0.8899234	0.8303672		-6.7	20
Naphthalene	A	5.000	4.144	1.415819	1.173544		-17.1	20
Phenanthrene	A	5.000	5.607	0.9983893	1.119545		12.1	20
Pyrene	Q	5.000	5.576	0.8081301	1.031791		11.5	20
2-Fluorobiphenyl	Q	5.000	4.625	0.9931515	0.9269473		-7.5	20
Terphenyl-d14	L	5.000	5.767	0.5588801	0.7483787		15.3	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_003

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E11010 Batch Matrix: Solid

Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E11010-BLK1	05/11/10 16:35	15.00	1.00
LCS	0E11010-BS1	05/11/10 16:35	15.00	1.00
32SB-23-0506	1004265-01	05/11/10 16:35	15.00	1.00
32SS-24-0002	1004265-02	05/11/10 16:35	15.00	1.00
32SB-24-0506	1004265-03	05/11/10 16:35	15.00	1.00
32SS-25-0002	1004265-04	05/11/10 16:35	15.00	1.00
32SB-25-0607	1004265-05	05/11/10 16:35	15.00	1.00
32SS-26-0002	1004265-06	05/11/10 16:35	15.00	1.00
32SB-26-0405	1004265-07	05/11/10 16:35	15.00	1.00
32SS-27-0002	1004265-08	05/11/10 16:35	15.00	1.00
32SB-27-0506	1004265-09	05/11/10 16:35	15.00	1.00
32SS-28-0002	1004265-10	05/11/10 16:35	15.00	1.00
32SB-28-0506	1004265-11	05/11/10 16:35	15.00	1.00
32SS-29-0002	1004265-12	05/11/10 16:35	15.00	1.00
32SB-29-0304	1004265-13	05/11/10 16:35	15.00	1.00
32SS-30-0002	1004265-14	05/11/10 16:35	15.00	1.00
32SB-30-0506	1004265-15	05/11/10 16:35	15.00	1.00
32SS-32-0002	1004265-16	05/11/10 16:35	15.00	1.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_003	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E11010-BLK1	File ID:	E11010B1.D
Sampled:		Prepared:		Analyzed:	06/06/10 15:48
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E11010 Sequence: 0F16103 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.33	6.67	U
50-32-8	Benzo(a)pyrene		1.33	5.00	U
205-99-2	Benzo(b)fluoranthene		1.33	6.67	U
207-08-9	Benzo(k)fluoranthene		1.33	6.67	U
218-01-9	Chrysene		1.33	6.67	U
53-70-3	Dibenz(a,h)anthracene		1.33	5.00	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.33	6.67	U
91-20-3	Naphthalene		1.33	5.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	2912	87.3	14 - 129	
Terphenyl-d14	3333	2922	87.7	14 - 129	

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E11010	Laboratory ID:	0E11010-BS1
Preparation:	EXT_3546	Initial/Final:	15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.67	57.48	86.2	31 - 146
Benzo(a)pyrene	66.67	63.29	94.9	28 - 128
Benzo(b)fluoranthene	66.67	57.49	86.2	30 - 139
Benzo(k)fluoranthene	66.67	61.83	92.7	42 - 129
Chrysene	66.67	60.76	91.1	39 - 134
Dibenz(a,h)anthracene	66.67	49.54	74.3	30 - 138
Indeno(1,2,3-cd)pyrene	66.67	45.05	67.6	17 - 164
Naphthalene	66.67	52.56	78.8	29 - 106

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_003

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E11013

Batch Matrix: Solid

Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E11013-BLK1	05/20/10 13:40	15.00	1.00
LCS	0E11013-BS1	05/20/10 13:40	15.00	1.00
32SB-32-0506	1004265-17	05/20/10 13:40	15.00	1.00
32SS-33-0002	1004265-18	05/20/10 13:40	15.00	1.00
32SB-33-0506	1004265-19	05/20/10 13:40	15.00	1.00
32SS-34-0002	1004265-20	05/20/10 13:40	15.00	1.00
32SB-34-0607	1004265-21	05/20/10 13:40	15.00	1.00
32SS-36-0002	1004265-22	05/20/10 13:40	15.00	1.00
32SB-36-0506	1004265-23	05/20/10 13:40	15.00	1.00
32SS-37-0002	1004265-24	05/20/10 13:40	15.00	1.00
32SB-37-0506	1004265-25	05/20/10 13:40	15.00	1.00
32SB-FD042710-02	1004265-26	05/20/10 13:40	15.00	1.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_003	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E11013-BLK1	File ID:	E11013B1.D
Sampled:		Prepared:		Analyzed:	06/12/10 12:49
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.33	6.67	U
50-32-8	Benzo(a)pyrene		1.33	5.00	U
205-99-2	Benzo(b)fluoranthene		1.33	6.67	U
207-08-9	Benzo(k)fluoranthene		1.33	6.67	U
218-01-9	Chrysene		1.33	6.67	X, U
53-70-3	Dibenz(a,h)anthracene		1.33	5.00	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.33	6.67	U
91-20-3	Naphthalene		1.33	5.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	4213	126	14 - 129	
Terphenyl-d14	3333	3454	104	14 - 129	

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E11013	Laboratory ID:	0E11013-BS1
Preparation:	EXT_3546	Initial/Final:	15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.67	86.89	130	31 - 146
Benzo(a)pyrene	66.67	53.72	80.6	28 - 128
Benzo(b)fluoranthene	66.67	63.69	95.5	30 - 139
Benzo(k)fluoranthene	66.67	68.37	103	42 - 129
Chrysene	66.67	73.56	110	39 - 134
Dibenz(a,h)anthracene	66.67	85.92	129	30 - 138
Indeno(1,2,3-cd)pyrene	66.67	88.70	133	17 - 164
Naphthalene	66.67	57.05	85.6	29 - 106

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16103	Instrument:	MS-BNA3
		Calibration:	0156001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16103-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 06/06/10 06:44		
2-Fluorobiphenyl	5.000	109	80 - 120	7.577	7.577	0.0000	+/-0.500	
Terphenyl-d14	5.000	108	80 - 120	17.464	17.464	0.0000	+/-0.500	
LCS (0E11010-BS1) ug/Kg wet				Lab File ID: E11010L1.D		Analyzed: 06/06/10 15:12		
2-Fluorobiphenyl	3333	80.0	14 - 129	7.586	7.577	0.0090	+/-0.500	
Terphenyl-d14	3333	86.1	14 - 129	17.491	17.464	0.0270	+/-0.500	
Blank (0E11010-BLK1) ug/Kg wet				Lab File ID: E11010B1.D		Analyzed: 06/06/10 15:48		
2-Fluorobiphenyl	3333	87.3	14 - 129	7.578	7.577	0.0010	+/-0.500	
Terphenyl-d14	3333	87.7	14 - 129	17.483	17.464	0.0190	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16104	Instrument:	MS-BNA3
		Calibration:	0156001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16104-CCV1) ug/mL				Lab File ID: SEQ-CCV2.D		Analyzed: 06/06/10 19:42		
2-Fluorobiphenyl	5.000	106	80 - 120	7.568	7.568	0.0000	+/-0.500	
Terphenyl-d14	5.000	111	80 - 120	17.464	17.464	0.0000	+/-0.500	
32SB-23-0506 (1004265-01) ug/Kg dry				Lab File ID: 0426501.D		Analyzed: 06/06/10 21:31		
2-Fluorobiphenyl	4375	78.7	14 - 129	7.577	7.568	0.0090	+/-0.500	
Terphenyl-d14	4375	41.6	14 - 129	17.473	17.464	0.0090	+/-0.500	
32SS-24-0002 (1004265-02) ug/Kg dry				Lab File ID: 0426502.D		Analyzed: 06/06/10 22:07		
2-Fluorobiphenyl	3919	82.2	14 - 129	7.577	7.568	0.0090	+/-0.500	
Terphenyl-d14	3919	49.1	14 - 129	17.473	17.464	0.0090	+/-0.500	
32SB-24-0506 (1004265-03) ug/Kg dry				Lab File ID: 0426503.D		Analyzed: 06/06/10 22:44		
2-Fluorobiphenyl	4034	93.5	14 - 129	7.577	7.568	0.0090	+/-0.500	
Terphenyl-d14	4034	54.2	14 - 129	17.482	17.464	0.0180	+/-0.500	
32SB-25-0607 (1004265-05) ug/Kg dry				Lab File ID: 0426505.D		Analyzed: 06/06/10 23:20		
2-Fluorobiphenyl	3898	89.5	14 - 129	7.577	7.568	0.0090	+/-0.500	
Terphenyl-d14	3898	50.6	14 - 129	17.483	17.464	0.0190	+/-0.500	
32SS-26-0002 (1004265-06) ug/Kg dry				Lab File ID: 0426506.D		Analyzed: 06/06/10 23:57		
2-Fluorobiphenyl	3810	88.7	14 - 129	7.576	7.568	0.0080	+/-0.500	
Terphenyl-d14	3810	46.3	14 - 129	17.481	17.464	0.0170	+/-0.500	
32SB-26-0405 (1004265-07) ug/Kg dry				Lab File ID: 0426507.D		Analyzed: 06/07/10 00:33		
2-Fluorobiphenyl	3962	68.2	14 - 129	7.576	7.568	0.0080	+/-0.500	
Terphenyl-d14	3962	40.9	14 - 129	17.481	17.464	0.0170	+/-0.500	
32SS-27-0002 (1004265-08) ug/Kg dry				Lab File ID: 0426508.D		Analyzed: 06/07/10 01:09		
2-Fluorobiphenyl	4136	90.8	14 - 129	7.577	7.568	0.0090	+/-0.500	
Terphenyl-d14	4136	54.9	14 - 129	17.483	17.464	0.0190	+/-0.500	
32SB-27-0506 (1004265-09) ug/Kg dry				Lab File ID: 0426509.D		Analyzed: 06/07/10 01:45		
2-Fluorobiphenyl	3869	79.9	14 - 129	7.577	7.568	0.0090	+/-0.500	
Terphenyl-d14	3869	45.5	14 - 129	17.483	17.464	0.0190	+/-0.500	
32SB-28-0506 (1004265-11) ug/Kg dry				Lab File ID: 0426511.D		Analyzed: 06/07/10 02:22		
2-Fluorobiphenyl	3949	89.7	14 - 129	7.579	7.568	0.0110	+/-0.500	
Terphenyl-d14	3949	49.6	14 - 129	17.475	17.464	0.0110	+/-0.500	
32SS-29-0002 (1004265-12) ug/Kg dry				Lab File ID: 0426512.D		Analyzed: 06/07/10 02:58		
2-Fluorobiphenyl	3795	79.1	14 - 129	7.576	7.568	0.0080	+/-0.500	
Terphenyl-d14	3795	46.2	14 - 129	17.482	17.464	0.0180	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16104	Instrument:	MS-BNA3
		Calibration:	0156001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
32SB-29-0304 (1004265-13) ug/Kg dry				Lab File ID: 0426513.D		Analyzed: 06/07/10 03:34		
2-Fluorobiphenyl	3943	72.3	14 - 129	7.578	7.568	0.0100	+/-0.500	
Terphenyl-d14	3943	59.8	14 - 129	17.474	17.464	0.0100	+/-0.500	
32SS-30-0002 (1004265-14) ug/Kg dry				Lab File ID: 0426514.D		Analyzed: 06/07/10 04:10		
2-Fluorobiphenyl	3994	74.6	14 - 129	7.579	7.568	0.0110	+/-0.500	
Terphenyl-d14	3994	78.9	14 - 129	17.484	17.464	0.0200	+/-0.500	
32SB-30-0506 (1004265-15) ug/Kg dry				Lab File ID: 0426515.D		Analyzed: 06/07/10 04:46		
2-Fluorobiphenyl	3920	83.2	14 - 129	7.576	7.568	0.0080	+/-0.500	
Terphenyl-d14	3920	69.6	14 - 129	17.482	17.464	0.0180	+/-0.500	
32SS-32-0002 (1004265-16) ug/Kg dry				Lab File ID: 0426516.D		Analyzed: 06/07/10 05:23		
2-Fluorobiphenyl	3955	90.9	14 - 129	7.577	7.568	0.0090	+/-0.500	
Terphenyl-d14	3955	76.4	14 - 129	17.482	17.464	0.0180	+/-0.500	
32SS-28-0002 (1004265-10) ug/Kg dry				Lab File ID: 0426510.D		Analyzed: 06/07/10 05:59		
2-Fluorobiphenyl	3834	128	14 - 129	7.577	7.568	0.0090	+/-0.500	
Terphenyl-d14	3834	71.8	14 - 129	17.482	17.464	0.0180	+/-0.500	
32SS-25-0002 (1004265-04) ug/Kg dry				Lab File ID: 0426504D.D		Analyzed: 06/07/10 06:35		
2-Fluorobiphenyl	3917	97.8	14 - 129	7.568	7.568	0.0000	+/-0.500	
Terphenyl-d14	3917	67.5	14 - 129	17.455	17.464	-0.0090	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16723	Instrument:	MS-BNA3
		Calibration:	0161002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16723-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 06/12/10 11:37		
2-Fluorobiphenyl	5.000	107	80 - 120	7.413	7.413	0.0000	+/-0.500	
Terphenyl-d14	5.000	110	80 - 120	17.235	17.235	0.0000	+/-0.500	
LCS (0E11013-BS1) ug/Kg wet				Lab File ID: E11013L1.D		Analyzed: 06/12/10 12:13		
2-Fluorobiphenyl	3333	97.1	14 - 129	7.42	7.413	0.0070	+/-0.500	
Terphenyl-d14	3333	86.4	14 - 129	17.242	17.235	0.0070	+/-0.500	
Blank (0E11013-BLK1) ug/Kg wet				Lab File ID: E11013B1.D		Analyzed: 06/12/10 12:49		
2-Fluorobiphenyl	3333	126	14 - 129	7.422	7.413	0.0090	+/-0.500	
Terphenyl-d14	3333	104	14 - 129	17.244	17.235	0.0090	+/-0.500	
32SB-32-0506 (1004265-17) ug/Kg dry				Lab File ID: 0426517.D		Analyzed: 06/12/10 13:25		
2-Fluorobiphenyl	3962	85.4	14 - 129	7.419	7.413	0.0060	+/-0.500	
Terphenyl-d14	3962	48.8	14 - 129	17.241	17.235	0.0060	+/-0.500	
32SB-33-0506 (1004265-19) ug/Kg dry				Lab File ID: 0426519.D		Analyzed: 06/12/10 14:02		
2-Fluorobiphenyl	3869	92.3	14 - 129	7.42	7.413	0.0070	+/-0.500	
Terphenyl-d14	3869	52.6	14 - 129	17.242	17.235	0.0070	+/-0.500	
32SS-34-0002 (1004265-20) ug/Kg dry				Lab File ID: 0426520.D		Analyzed: 06/12/10 14:38		
2-Fluorobiphenyl	3835	90.9	14 - 129	7.421	7.413	0.0080	+/-0.500	
Terphenyl-d14	3835	48.0	14 - 129	17.243	17.235	0.0080	+/-0.500	
32SB-34-0607 (1004265-21) ug/Kg dry				Lab File ID: 0426521.D		Analyzed: 06/12/10 15:14		
2-Fluorobiphenyl	3928	80.9	14 - 129	7.419	7.413	0.0060	+/-0.500	
Terphenyl-d14	3928	46.7	14 - 129	17.251	17.235	0.0160	+/-0.500	
32SS-36-0002 (1004265-22) ug/Kg dry				Lab File ID: 0426522.D		Analyzed: 06/12/10 15:50		
2-Fluorobiphenyl	3823	96.2	14 - 129	7.419	7.413	0.0060	+/-0.500	
Terphenyl-d14	3823	51.4	14 - 129	17.25	17.235	0.0150	+/-0.500	
32SB-36-0506 (1004265-23) ug/Kg dry				Lab File ID: 0426523.D		Analyzed: 06/12/10 16:26		
2-Fluorobiphenyl	3867	95.7	14 - 129	7.429	7.413	0.0160	+/-0.500	
Terphenyl-d14	3867	54.6	14 - 129	17.251	17.235	0.0160	+/-0.500	
32SB-FD042710-02 (1004265-26) ug/Kg dry				Lab File ID: 0426526.D		Analyzed: 06/12/10 17:02		
2-Fluorobiphenyl	3943	87.8	14 - 129	7.428	7.413	0.0150	+/-0.500	
Terphenyl-d14	3943	47.1	14 - 129	17.25	17.235	0.0150	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16739	Instrument:	MS-BNA3
		Calibration:	0161002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16739-CCV1) ug/mL				Lab File ID: SEQ-CCV3.D		Analyzed: 06/13/10 13:34		
2-Fluorobiphenyl	5.000	92.5	80 - 120	7.419	7.419	0.0000	+/-0.500	
Terphenyl-d14	5.000	115	80 - 120	17.241	17.241	0.0000	+/-0.500	
32SS-33-0002 (1004265-18) ug/Kg dry				Lab File ID: 0426518D.D		Analyzed: 06/13/10 14:10		
2-Fluorobiphenyl	3805	83.6	14 - 129	7.419	7.419	0.0000	+/-0.500	
Terphenyl-d14	3805	69.6	14 - 129	17.241	17.241	0.0000	+/-0.500	
32SS-37-0002 (1004265-24) ug/Kg dry				Lab File ID: 0426524D.D		Analyzed: 06/13/10 14:46		
2-Fluorobiphenyl	3761	64.0	14 - 129	7.419	7.419	0.0000	+/-0.500	
Terphenyl-d14	3761	63.2	14 - 129	17.25	17.241	0.0090	+/-0.500	
32SB-37-0506 (1004265-25) ug/Kg dry				Lab File ID: 0426525D.D		Analyzed: 06/13/10 15:22		
2-Fluorobiphenyl	4185	70.4	14 - 129	7.419	7.419	0.0000	+/-0.500	
Terphenyl-d14	4185	62.3	14 - 129	17.25	17.241	0.0090	+/-0.500	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16103	Instrument:	MS-BNA3
		Calibration:	0156001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16103-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 06/06/10 06:44			
Phenanthrene-d10	138116	12.674	114187	12.766	121	50 - 200	-0.0920	+/-0.50	
Perylene-d12	70827	24.594	78489	24.667	90	50 - 200	-0.0730	+/-0.50	
LCS (0E11010-BS1)			Lab File ID: E11010L1.D			Analyzed: 06/06/10 15:12			
Phenanthrene-d10	104972	12.682	138116	12.674	76	50 - 200	0.0080	+/-0.50	
Perylene-d12	59555	24.593	70827	24.594	84	50 - 200	-0.0010	+/-0.50	
Blank (0E11010-BLK1)			Lab File ID: E11010B1.D			Analyzed: 06/06/10 15:48			
Phenanthrene-d10	80058	12.684	138116	12.674	58	50 - 200	0.0100	+/-0.50	
Perylene-d12	45379	24.594	70827	24.594	64	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16104	Instrument:	MS-BNA3
		Calibration:	0156001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16104-CCV1)			Lab File ID: SEQ-CCV2.D			Analyzed: 06/06/10 19:42			
Phenanthrene-d10	110225	12.674	114187	12.766	97	50 - 200	-0.0920	+/-0.50	
Perylene-d12	52593	24.594	78489	24.667	67	50 - 200	-0.0730	+/-0.50	
32SB-23-0506 (1004265-01)			Lab File ID: 0426501.D			Analyzed: 06/06/10 21:31			
Phenanthrene-d10	80771	12.674	110225	12.674	73	50 - 200	0.0000	+/-0.50	
Perylene-d12	38323	24.585	52593	24.594	73	50 - 200	-0.0090	+/-0.50	
32SS-24-0002 (1004265-02)			Lab File ID: 0426502.D			Analyzed: 06/06/10 22:07			
Phenanthrene-d10	72374	12.674	110225	12.674	66	50 - 200	0.0000	+/-0.50	
Perylene-d12	35946	24.584	52593	24.594	68	50 - 200	-0.0100	+/-0.50	
32SB-24-0506 (1004265-03)			Lab File ID: 0426503.D			Analyzed: 06/06/10 22:44			
Phenanthrene-d10	76989	12.674	110225	12.674	70	50 - 200	0.0000	+/-0.50	
Perylene-d12	36850	24.584	52593	24.594	70	50 - 200	-0.0100	+/-0.50	
32SB-25-0607 (1004265-05)			Lab File ID: 0426505.D			Analyzed: 06/06/10 23:20			
Phenanthrene-d10	82532	12.674	110225	12.674	75	50 - 200	0.0000	+/-0.50	
Perylene-d12	37538	24.585	52593	24.594	71	50 - 200	-0.0090	+/-0.50	
32SS-26-0002 (1004265-06)			Lab File ID: 0426506.D			Analyzed: 06/06/10 23:57			
Phenanthrene-d10	80845	12.672	110225	12.674	73	50 - 200	-0.0020	+/-0.50	
Perylene-d12	35822	24.583	52593	24.594	68	50 - 200	-0.0110	+/-0.50	
32SB-26-0405 (1004265-07)			Lab File ID: 0426507.D			Analyzed: 06/07/10 00:33			
Phenanthrene-d10	92099	12.672	110225	12.674	84	50 - 200	-0.0020	+/-0.50	
Perylene-d12	32973	24.583	52593	24.594	63	50 - 200	-0.0110	+/-0.50	
32SS-27-0002 (1004265-08)			Lab File ID: 0426508.D			Analyzed: 06/07/10 01:09			
Phenanthrene-d10	81452	12.674	110225	12.674	74	50 - 200	0.0000	+/-0.50	
Perylene-d12	32650	24.585	52593	24.594	62	50 - 200	-0.0090	+/-0.50	
32SB-27-0506 (1004265-09)			Lab File ID: 0426509.D			Analyzed: 06/07/10 01:45			
Phenanthrene-d10	90095	12.674	110225	12.674	82	50 - 200	0.0000	+/-0.50	
Perylene-d12	39384	24.585	52593	24.594	75	50 - 200	-0.0090	+/-0.50	
32SB-28-0506 (1004265-11)			Lab File ID: 0426511.D			Analyzed: 06/07/10 02:22			
Phenanthrene-d10	78318	12.667	110225	12.674	71	50 - 200	-0.0070	+/-0.50	
Perylene-d12	35727	24.587	52593	24.594	68	50 - 200	-0.0070	+/-0.50	
32SS-29-0002 (1004265-12)			Lab File ID: 0426512.D			Analyzed: 06/07/10 02:58			
Phenanthrene-d10	81839	12.673	110225	12.674	74	50 - 200	-0.0010	+/-0.50	
Perylene-d12	35763	24.583	52593	24.594	68	50 - 200	-0.0110	+/-0.50	
32SB-29-0304 (1004265-13)			Lab File ID: 0426513.D			Analyzed: 06/07/10 03:34			
Phenanthrene-d10	80957	12.665	110225	12.674	73	50 - 200	-0.0090	+/-0.50	
Perylene-d12	34447	24.585	52593	24.594	65	50 - 200	-0.0090	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16104	Instrument:	MS-BNA3
		Calibration:	0156001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
32SS-30-0002 (1004265-14)			Lab File ID: 0426514.D			Analyzed: 06/07/10 04:10			
Phenanthrene-d10	98240	12.666	110225	12.674	89	50 - 200	-0.0080	+/-0.50	
Perylene-d12	43492	24.586	52593	24.594	83	50 - 200	-0.0080	+/-0.50	
32SB-30-0506 (1004265-15)			Lab File ID: 0426515.D			Analyzed: 06/07/10 04:46			
Phenanthrene-d10	87292	12.673	110225	12.674	79	50 - 200	-0.0010	+/-0.50	
Perylene-d12	43186	24.593	52593	24.594	82	50 - 200	-0.0010	+/-0.50	
32SS-32-0002 (1004265-16)			Lab File ID: 0426516.D			Analyzed: 06/07/10 05:23			
Phenanthrene-d10	83088	12.674	110225	12.674	75	50 - 200	0.0000	+/-0.50	
Perylene-d12	44270	24.584	52593	24.594	84	50 - 200	-0.0100	+/-0.50	
32SS-28-0002 (1004265-10)			Lab File ID: 0426510.D			Analyzed: 06/07/10 05:59			
Phenanthrene-d10	48696	12.673	110225	12.674	44	50 - 200	-0.0010	+/-0.50	*
Perylene-d12	27427	24.593	52593	24.594	52	50 - 200	-0.0010	+/-0.50	
32SS-25-0002 (1004265-04)			Lab File ID: 0426504D.D			Analyzed: 06/07/10 06:35			
Phenanthrene-d10	80340	12.674	110225	12.674	73	50 - 200	0.0000	+/-0.50	
Perylene-d12	39127	24.584	52593	24.594	74	50 - 200	-0.0100	+/-0.50	

Empirical Laboratories, LLC

Data file : \\ELABNSH05\TARGET\chem\bna3.i\060310b3.b\SEQ-CAL2.D
Lab Smp Id: SEQ-CAL2 Client Smp ID: CAL0.10PPM
Inj Date : 03-JUN-2010 11:11 MS Autotune Date: 28-JUL-1998 06:19
Operator : ADM Inst ID: bna3.i
Smp Info : CAL0.10PPM;;;;;;10E0488
Misc Info : ;;;;;;pahsurmis.sub;
Comment :
Method : \\ELABNSH05\TARGET\chem\bna3.i\060310b3.b\IXBN3LOW.m
Meth Date : 04-Jun-2010 05:53 amonteiro Quant Type: ISTD
Cal Date : 03-JUN-2010 10:34 Cal File: SEQ-CAL1.D
Als bottle: 3 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: pahsurmis.sub
Target Version: 4.04
Processing Host: TARGET02_VM

M 6/4/10
DQ
6/7/10

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ng/ul)	AMOUNTS ON-COL (ng/ul)
* 101 Phenanthrene-d10	188	12.775	12.775	(1.000)	107176	1.00000	
20 N-Nitroso-di-n-propylamine	70	5.014	5.014	(0.393)	1711	0.10000	0.1146
38 Isophorone	82	5.422	5.422	(0.424)	6040	0.10000	0.09829
50 Naphthalene	128	5.989	5.989	(0.469)	10267	0.10000	0.1029
52 Hexachlorobutadiene	225	6.146	6.146	(0.481)	2443	0.10000	0.1099
54 2-Methylnaphthalene	142	6.991	6.991	(0.547)	6007	0.10000	0.08895
55 1-Methylnaphthalene	142	7.149	7.149	(0.560)	6596	0.10000	0.1057
69 Hexachlorocyclopentadiene	237	7.260	7.260	(0.568)	218	0.10000	0.7571
$ 73 2-Fluorobiphenyl	172	7.650	7.650	(0.599)	6917	0.10000	0.09294
76 Acenaphthylene	152	8.690	8.690	(0.680)	8807	0.10000	0.08972
79 Acenaphthene	153	9.071	9.071	(0.710)	6540	0.10000	0.1015
87 Fluorene	166	10.315	10.315	(0.807)	6034	0.10000	0.08723
$ 106 2,4,6-Tribromophenol	330	10.927	10.927	(0.855)	1017	0.20000	0.2338
110 Phenanthrene	178	12.831	12.831	(1.004)	9929	0.10000	0.09589
108 Hexachlorobenzene	284	11.716	11.716	(0.917)	2757	0.10000	0.1095
111 Anthracene	178	12.979	12.979	(1.016)	8026	0.10000	0.08602
115 Fluoranthene	202	16.238	16.238	(1.271)	8533	0.10000	0.08525
123 Pyrene	202	16.860	16.860	(1.320)	8676	0.10000	0.08261
* 153 Perylene-d12	264	24.667	24.667	(1.000)	77029	1.00000	
$ ~~134 Terphenyl-d14~~	244	17.565	17.565	(1.375)	5671	0.10000	0.08040
137 Benzo(a)anthracene	228	20.462	20.462	(1.602)	6607	0.10000	0.07876
138 Chrysene	228	20.564	20.564	(1.610)	9137	0.10000	0.1026
139 Bis(2-ethylhexyl)phthalate	149	21.093	21.093	(0.855)	3645	0.10000	0.1530
154 Di-n-octylphthalate	149	23.089	23.089	(0.936)	4148	0.10000	0.2807(M)
155 Benzo(b)fluoranthene	252	23.720	23.720	(0.962)	6139	0.10000	0.06470
156 Benzo(k)fluoranthene	252	23.813	23.813	(0.965)	6515	0.10000	0.07228

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16723	Instrument:	MS-BNA3
		Calibration:	0161002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16723-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 06/12/10 11:37			
Phenanthrene-d10	158374	12.454	109351	12.47	145	50 - 200	-0.0160	+/-0.50	
Perylene-d12	72628	24.365	46195	24.39	157	50 - 200	-0.0250	+/-0.50	
LCS (0E11013-BS1)			Lab File ID: E11013L1.D			Analyzed: 06/12/10 12:13			
Phenanthrene-d10	142591	12.461	158374	12.454	90	50 - 200	0.0070	+/-0.50	
Perylene-d12	58185	24.372	72628	24.365	80	50 - 200	0.0070	+/-0.50	
Blank (0E11013-BLK1)			Lab File ID: E11013B1.D			Analyzed: 06/12/10 12:49			
Phenanthrene-d10	126307	12.463	158374	12.454	80	50 - 200	0.0090	+/-0.50	
Perylene-d12	49082	24.374	72628	24.365	68	50 - 200	0.0090	+/-0.50	
32SB-32-0506 (1004265-17)			Lab File ID: 0426517.D			Analyzed: 06/12/10 13:25			
Phenanthrene-d10	150670	12.46	158374	12.454	95	50 - 200	0.0060	+/-0.50	
Perylene-d12	67278	24.371	72628	24.365	93	50 - 200	0.0060	+/-0.50	
32SB-33-0506 (1004265-19)			Lab File ID: 0426519.D			Analyzed: 06/12/10 14:02			
Phenanthrene-d10	163258	12.461	158374	12.454	103	50 - 200	0.0070	+/-0.50	
Perylene-d12	74565	24.371	72628	24.365	103	50 - 200	0.0060	+/-0.50	
32SS-34-0002 (1004265-20)			Lab File ID: 0426520.D			Analyzed: 06/12/10 14:38			
Phenanthrene-d10	146546	12.462	158374	12.454	93	50 - 200	0.0080	+/-0.50	
Perylene-d12	72956	24.373	72628	24.365	100	50 - 200	0.0080	+/-0.50	
32SB-34-0607 (1004265-21)			Lab File ID: 0426521.D			Analyzed: 06/12/10 15:14			
Phenanthrene-d10	152468	12.46	158374	12.454	96	50 - 200	0.0060	+/-0.50	
Perylene-d12	75651	24.371	72628	24.365	104	50 - 200	0.0060	+/-0.50	
32SS-36-0002 (1004265-22)			Lab File ID: 0426522.D			Analyzed: 06/12/10 15:50			
Phenanthrene-d10	133002	12.46	158374	12.454	84	50 - 200	0.0060	+/-0.50	
Perylene-d12	72697	24.371	72628	24.365	100	50 - 200	0.0060	+/-0.50	
32SB-36-0506 (1004265-23)			Lab File ID: 0426523.D			Analyzed: 06/12/10 16:26			
Phenanthrene-d10	128892	12.461	158374	12.454	81	50 - 200	0.0070	+/-0.50	
Perylene-d12	63583	24.372	72628	24.365	88	50 - 200	0.0070	+/-0.50	
32SB-FD042710-02 (1004265-26)			Lab File ID: 0426526.D			Analyzed: 06/12/10 17:02			
Phenanthrene-d10	131878	12.46	158374	12.454	83	50 - 200	0.0060	+/-0.50	
Perylene-d12	58376	24.38	72628	24.365	80	50 - 200	0.0150	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16739	Instrument:	MS-BNA3
		Calibration:	0161002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16739-CCV1)			Lab File ID: SEQ-CCV3.D			Analyzed: 06/13/10 13:34			
Phenanthrene-d10	130911	12.469	109351	12.47	120	50 - 200	-0.0010	+/-0.50	
Perylene-d12	64518	24.38	46195	24.39	140	50 - 200	-0.0100	+/-0.50	
32SS-33-0002 (1004265-18)			Lab File ID: 0426518D.D			Analyzed: 06/13/10 14:10			
Phenanthrene-d10	95533	12.469	130911	12.469	73	50 - 200	0.0000	+/-0.50	
Perylene-d12	58314	24.38	64518	24.38	90	50 - 200	0.0000	+/-0.50	
32SS-37-0002 (1004265-24)			Lab File ID: 0426524D.D			Analyzed: 06/13/10 14:46			
Phenanthrene-d10	101851	12.469	130911	12.469	78	50 - 200	0.0000	+/-0.50	
Perylene-d12	54694	24.379	64518	24.38	85	50 - 200	-0.0010	+/-0.50	
32SB-37-0506 (1004265-25)			Lab File ID: 0426525D.D			Analyzed: 06/13/10 15:22			
Phenanthrene-d10	92998	12.469	130911	12.469	71	50 - 200	0.0000	+/-0.50	
Perylene-d12	52567	24.389	64518	24.38	81	50 - 200	0.0090	+/-0.50	

PREPARATION BENCH SHEET

0E11010

Empirical Laboratories, LLC

Printed: 6/18/2010 8:58:17AM

Matrix: Solid **Prepared using: EXT - EXT_3546** **Surrogate used: 10E0467**

Lab Number	Test Code	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Extraction Comments
1004265-04	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004265-15	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004265-08	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004265-16	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004265-06	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004265-02	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004265-07	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004264-21	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004265-11	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004265-14	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004265-03	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004264-23	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004265-09	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004265-10	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004265-12	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004265-01	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004264-22	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version
1004264-26	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	Rocky. See version.
0E11010-BLK1	QC	05/11/2010 16:35	15	1				500	
0E11010-BS1	QC	05/11/2010 16:35	15	1	10E0520		1000	500	
0E11010-MS1	QC	05/11/2010 16:35	15	1	10E0520	1004264-21	1000	500	Source cont. A.
0E11010-MSD1	QC	05/11/2010 16:35	15	1	10E0520	1004264-21	1000	500	Source cont. A.
1004265-05	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version

Spiking Witnessed By Date

Preparation Reviewed By Date

Extracts Received By Date

1083

CTOF273_003

PREPARATION BENCH SHEET

0E11010

Empirical Laboratories, LLC

Printed: 6/18/2010 8:58:17AM

Matrix: Solid **Prepared using: EXT - EXT_3546** **Surrogate used: 10E0467**

Lab Number	Test Code	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Extraction Comments
1004265-13	SMS_PAH_8270C_3546_LOW	05/11/2010 16:35	15	1				500	See version

Spiking Witnessed By Date

Preparation Reviewed By Date

Extracts Received By Date

1084

CTOF273_003

PREPARATION BENCH SHEET

0E11013

Empirical Laboratories, LLC

Printed: 6/17/2010 12:13:49PM

Matrix: Solid **Prepared using: EXT - EXT_3546** **Surrogate used: 10E0467**

Lab Number	Test Code	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Extraction Comments
1004265-25	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004277-15	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004277-19	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004277-11	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004277-12	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004277-07	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	MS/MSD.
1004277-16	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004277-20	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004265-19	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004265-20	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004265-22	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004265-17	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004265-24	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004266-01	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004266-03	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004265-18	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004265-21	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
1004265-26	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version
0E11013-BLK1	QC	05/20/2010 13:40	15	1				500	
0E11013-BS1	QC	05/20/2010 13:40	15	1	10E0990		1000	500	A,B,C
0E11013-MS1	QC	05/20/2010 13:40	15	1	10E0990	1004277-07	1000	500	A,B,C
0E11013-MSD1	QC	05/20/2010 13:40	15	1	10E0990	1004277-07	1000	500	A,B,C
1004265-23	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version

Spiking Witnessed By Date

Preparation Reviewed By Date

Extracts Received By Date

1085

CTOF273_003

PREPARATION BENCH SHEET

0E11013

Empirical Laboratories, LLC

Printed: 6/17/2010 12:13:49PM

Matrix: Solid **Prepared using: EXT - EXT_3546** **Surrogate used: 10E0467**

Lab Number	Test Code	Prepared	Initial (g)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Extraction Comments
1004266-02	SMS_PAH_8270C_3546_LOW	05/20/2010 13:40	15	1				500	See version

Spiking Witnessed By Date

Preparation Reviewed By Date

Extracts Received By Date

1086

CTOF273_003

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE 1 OF 1

CLIENT NSWC Crane	JOB NUMBER 02111
SUBJECT Calculation Check SDG CTOF273_003	
BASED ON	DRAWING NUMBER
BY J. Kalinyak / CHECKED BY	APPROVED BY / DATE 07/26/10

Indeno (1,2,3-cd) pyrene Sample 3255-26-0002

$$\frac{7632 \times 1\,mg/\mu l \times 1000\,\mu l}{35822 \times 0.9166 \times 15.0\,g \times 0.875} \simeq 17.7\,\mu g/kg$$

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_003
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0156001	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	6/3/2010 10:00:02AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.6012431	7.184963	9.083455	0.1514793			CCC (30)	
Acenaphthylene	0.9158405	9.534423	8.697545	0.1224601			15	
Anthracene	0.8705871	12.60701	12.99	0.1331843			15	
Benzo(a)anthracene	0.7827159	11.93588	20.47909	0.1037901			15	
Benzo(a)pyrene	1.030906	16.82034	24.56209	9.824416E-02		0.9996429	CCC (30)	
Benzo(b)fluoranthene	1.129732	17.94265	23.74682	0.1340174	0.9995021		0.995	
Benzo(g,h,i)perylene	0.9698277	5.644128	26.92336	0.1059566			15	
Benzo(k)fluoranthene	1.107235	15.53366	23.83891	0.1427109		0.9995849	0.99	
Chrysene	0.8305551	8.726862	20.58036	0.113825			15	
Dibenz(a,h)anthracene	0.855389	11.29456	26.542	7.745018E-02			15	
Fluoranthene	0.933897	12.06893	16.25082	0.108705			CCC (30)	
Fluorene	0.6453976	9.224112	10.32127	0.1362755			15	
2-Fluorobiphenyl	0.694446	6.728885	7.654455	0.1153448			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	0.9165747	14.56335	26.47864	8.292637E-02			15	
1-Methylnaphthalene	0.582316	8.672515	7.157364	0.1267128			15	
2-Methylnaphthalene	0.6301093	6.416041	6.996091	9.985584E-02			15	
Naphthalene	0.9310503	9.373293	5.993454	0.1135701			15	
Nitrobenzene-d5							15	
Phenanthrene	0.9661153	6.161989	12.843	0.1252231			15	
Phenol-d6							15	
Pyrene	0.9799586	10.54414	16.87882	0.1189006			15	
Terphenyl-d14	0.6581084	10.97145	17.571	8.350396E-02			15	
2,4,6-Tribromophenol	7.286756E-02	24.60508	10.93736	0.1598562	0.9994666		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	

Empirical Laboratories, LLC

Data file : \\ELABNSH05\TARGET\chem\bna3.i\060610b3E.b\0426506.D
Lab Smp Id: 1004265-06 Client Smp ID: 32SS-26-0002
Inj Date : 06-JUN-2010 23:57 MS Autotune Date: 28-JUL-1998 06:19
Operator : ADM Inst ID: bna3.i
Smp Info : 1004265-06;;15;1000;;UG/KG;11-MAY-2010
Misc Info : ;0;;;;0E11010;pahsurmis.sub;
Comment :
Method : \\ELABNSH05\TARGET\chem\bna3.i\060610b3E.b\IXBN3LOW.m
Meth Date : 10-Jun-2010 10:08 mcobb Quant Type: ISTD
Cal Date : 03-JUN-2010 16:39 Cal File: SEQ-CALB.D
Als bottle: 27
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: pahsurmis.sub
Target Version: 4.04
Processing Host: TARGET09_VM

Concentration Formula: Amt * DF * Uf * Vt*Vi/(Amt * Vi * (Solids/100))

Name	Value	Description
DF	1.000	Dilution Factor
Uf	1.000	ng unit correction factor
Vt	1000.000	Volume of final extract (uL)(1000 low, 2
Amt	15.000	Mass of initial extraction
Vi	1.000	Volume injected (uL)
Solids	100.000	Percent Solids

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng/ul)	FINAL (UG/KG)
* 101 Phenanthrene-d10	188	12.672	12.674	(1.000)	80845	1.00000	
50 Naphthalene	128	5.923	5.925	(0.467)	2983	0.03963	2.642(a)
54 2-Methylnaphthalene	142	6.917	6.918	(0.546)	1779	0.03492	2.328(a)
55 1-Methylnaphthalene	142	7.075	7.085	(0.558)	1532	0.03254	2.169(a)
$ 73 2-Fluorobiphenyl	172	7.576	7.568	(0.598)	2489373	44.3403	2956
76 Acenaphthylene	152	8.606	8.607	(0.679)	10459	0.14126	9.417
$ 106 2,4,6-Tribromophenol	330	10.834	10.835	(0.855)	451562	65.5734	4372(A)
110 Phenanthrene	178	12.737	12.739	(1.005)	8371	0.10718	7.145
111 Anthracene	178	12.877	12.878	(1.016)	13599	0.19322	12.88
115 Fluoranthene	202	16.135	16.136	(1.273)	14546	0.19266	12.84
133 Pyrene	202	16.766	16.768	(1.323)	12509	0.15789	10.53
* 153 Perylene-d12	264	24.583	24.594	(1.000)	35822	1.00000	
$ 134 Terphenyl-d14	244	17.481	17.464	(1.379)	1232517	23.1655	1544

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng/ul)	FINAL (UG/KG)
137 Benzo(a)anthracene	228	20.368	20.370	(1.607)	4350	0.06874	4.583
138 Chrysene	228	20.471	20.462	(1.615)	5405	0.08050	5.366
139 Bis(2-ethylhexyl)phthalate	149	20.990	20.992	(0.854)	3328	0.19854	13.24
155 Benzo(b)fluoranthene	252	23.599	23.600	(0.960)	20870	0.45684	30.46
156 Benzo(k)fluoranthene	252	23.683	23.702	(0.963)	6575	0.14908	9.939(MH)
157 Benzo(a)pyrene	252	24.462	24.464	(0.995)	10406	0.30292	20.19
158 Indeno(1,2,3-cd)pyrene	276	26.375	26.385	(1.073)	7632	0.23245	15.50
160 Benzo(g,h,i)perylene	276	26.820	26.812	(1.091)	8747	0.25178	16.78

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**TONY KLIMEK**	**DATE:**	**AUGUST 10, 2010**
FROM:	**CHERYLE LU**	**COPIES:**	**DV FILE**

SUBJECT: **DATA VALIDATION – VOLATILE ORGANIC AND POLYCYCLIC AROMATIC HYDROCARBON**

CTOF273, NAVAL AIR STATION CRANE, INDIANA

SAMPLE DELIVERY GROUP (SDG) – CTOF273_004

SAMPLES: 3/Solids

32SS-FD042710-02 32SS-FD042710-03 32SB-FD042710-03

Overview

The sample set for SDG CTOF273_004, consists of three field duplicate soil samples. One sample was analyzed for benzene, toluene ethylbenzene, and total xylenes (BTEX) by Method 8260B and three (3) samples were analyzed for polycyclic aromatic hydrocarbon (PAH) by Method 8270C.

The samples were collected by Tetra Tech NUS on April 27, 2010, and analyzed by Empirical Laboratories.

These data were evaluated based on the following parameters:

* • Data Completeness
• Holding Times
* • GC/MS tuning
• Initial and Continuing Calibrations
* • Laboratory Method and Field Quality Control Blank Analyses
* • Surrogate Recoveries
* • Internal Standard Recoveries
* • Laboratory Control Sample Results
* • Matrix Spike/ Matrix Spike Duplicate Results
• Field Duplicate Precision
* • Detection Limits

* - Quality control criteria were met for this parameter.

Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

Volatile Organic (BTEX):

The data results from method blank, surrogates, calibration standards, internal standards and laboratory control sample were within the quality control (QC) limits.

Polycyclic Aromatic Hydrocarbon (PAH):

The data results from method blank, surrogates, laboratory control sample and internal standards were within the quality control (QC) limits.

The percent difference (%D) value of chrysene (28%) in the continuing calibration verification (0F16723-CCV1) on 6/12/2010 at 11:37 on instrument MS-BNA3 was greater than 20%. The nondetected results of chrysene were qualified as estimated nondetect "UJ" for samples 32SS-FD042710-02, 32SS-FD042710-03 and 32SB-FD042710-03.

The holding time from sample collection to extraction was performed between 22 and 23 days after collection but but was within two times of the holding period (28 days). Ttherefore, an estimated nondetected results were qualified as estimated "UJ" in the affected samples.

Field Duplicate Precision:

The relative percent difference (RPD) values for several PAH compounds were outside the QC limits, with the exception of benzo(a)anthracene, chrysene, dibenzo(a,h)anthracene, and naphthalene. Nondetected results for affected compounds were qualified as estimated "UJ" in samples 32SS-FD042710-02 and 32SS-21-0002.

Notes:

The positive results reported below the reporting limit (RL) were qualified as estimated "J", due to uncertainty near the detection limit.

Executive Summary

Laboratory Performance: A continuing calibration noncompliance was noted for chrysene affecting all samples.

Other Factors Affecting Data Quality: Field duplicate imprecision for several PAHs was noted in the sample pair 32SS-FD042710-02 and 32SS-21-0002.

The data for the analysis were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999), and the NFESC guidelines "Navy IRCDQM" (September 1999)". The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech NUS
Cheryle C. Lu
Senior Toxicologist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Data Qualifier Key:

J - The result is an estimated quantity. The associated numerical value may be inaccurate or imprecise

U - Nondetected result.

UJ - Estimated nondetect. The associated numerical value may be inaccurate or imprecise.

Report Number: L10110209
Report Date : November 19, 2010

Sample Number: L10110209-02
Client ID: IN HOUSE QC/8260 TV=20PPB
Matrix: Water
Workgroup Number: WG347957
Collect Date: 11/02/2010 00:01
Sample Tag: 01

PrePrep Method: NONE
Prep Method: 5030B/5030C/5035
Analytical Method: 8260B
Analyst: FJB
Dilution: 1
Units: ug/L

Instrument: HPMS11
Prep Date: 11/08/2010 12:18
Cal Date: 10/29/2010 18:44
Run Date: 11/08/2010 12:18
File ID: 11M70248

Analyte	CAS. Number	Result	Qual	RL	MDL
Carbon disulfide	75-15-0	21.1		5.00	0.500
Carbon tetrachloride	56-23-5	20.0		5.00	0.250
Chlorobenzene	108-90-7	20.3		5.00	0.125
Chlorodibromomethane	124-48-1	20.6		5.00	0.250
Chloroethane	75-00-3	27.1		10.0	0.500
Chloroform	67-66-3	20.0		5.00	0.125
Chloromethane	74-87-3	18.8		10.0	0.500
cis-1,2-Dichloroethene	156-59-2	21.3		5.00	0.250
cis-1,3-Dichloropropene	10061-01-5	17.1		5.00	0.250
Dibromomethane	74-95-3	20.6		5.00	0.250
Dichlorodifluoromethane	75-71-8	21.7		10.0	0.250
Ethylbenzene	100-41-4	21.6		5.00	0.250
Hexachlorobutadiene	87-68-3	20.6		5.00	0.250
Isopropylbenzene	98-82-8	18.8		5.00	0.250
m-,p-Xylene	179601-23-1	42.3		5.00	0.500
Methylene chloride	75-09-2	22.2		5.00	0.250
n-Butylbenzene	104-51-8	25.1		5.00	0.250
n-Propylbenzene	103-65-1	18.4		5.00	0.125
Naphthalene	91-20-3	18.0		10.0	0.200
o-Xylene	95-47-6	22.5		5.00	0.250
p-Isopropyltoluene	99-87-6	22.2		5.00	0.250
sec-Butylbenzene	135-98-8	23.4		5.00	0.250
Styrene	100-42-5	22.3		5.00	0.125
tert-Butylbenzene	98-06-6	21.8		5.00	0.250
Tetrachloroethene	127-18-4	20.6		5.00	0.250
Toluene	108-88-3	22.0		5.00	0.250
trans-1,2-Dichloroethene	156-60-5	22.1		5.00	0.250
trans-1,3-Dichloropropene	10061-02-6	20.1		5.00	0.500
Trichloroethene	79-01-6	19.3		5.00	0.250
Trichlorofluoromethane	75-69-4	21.9		10.0	0.250
Vinyl acetate	108-05-4	12.3		10.0	2.50
Vinyl chloride	75-01-4	20.7		10.0	0.250

Surrogate	% Recovery	Lower	Upper	Qual
1,2-Dichloroethane-d4	96.8	80	120	
4-Bromofluorobenzene	98.0	86	115	
Dibromofluoromethane	101	86	118	
Toluene-d8	106	88	110	

Microbac

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 02111	NSAMPLE	32SB-FD042710-03			32SS-FD042710-02			32SS-FD042710-03		
SDG: CTOF273_004	LAB_ID	1004266-03			1004266-01			1004266-02		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	87.8			84.9			88.0		
	DUP_OF	32SB-32-0506			32SS-21-0002			32SS-32-0002		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		7.6	UJ	H	7.85	UJ	H	7.58	UJ	H
BENZO(A)PYRENE		5.69	UJ	H	5.89	UJ	HG	5.68	UJ	H
BENZO(B)FLUORANTHENE		7.6	UJ	H	7.85	UJ	HG	7.58	UJ	H
BENZO(K)FLUORANTHENE		7.6	UJ	H	7.85	UJ	HG	7.58	UJ	H
CHRYSENE		7.6	UJ	CH	7.85	UJ	CH	7.58	UJ	CH
DIBENZO(A,H)ANTHRACENE		5.69	UJ	H	5.89	UJ	H	5.68	UJ	H
INDENO(1,2,3-CD)PYRENE		7.6	UJ	H	7.85	UJ	HG	7.58	UJ	H
NAPHTHALENE		5.69	UJ	H	5.89	UJ	H	5.68	UJ	H

PROJ_NO: 02111	NSAMPLE	32SB-FD042710-03		
SDG: CTOF273_004	LAB_ID	1004266-03		
FRACTION: OV	SAMP_DATE	4/27/2010		
MEDIA: SOIL	QC_TYPE	NM		
	UNITS	UG/KG		
	PCT_SOLIDS	87.8		
	DUP_OF	32SB-32-0506		
PARAMETER		RESULT	VQL	QLCD
BENZENE		0.435	U	
ETHYLBENZENE		0.693	U	
TOLUENE		0.795	U	
TOTAL XYLENES		0.647	U	

APPENDIX B
RESULTS AS REPORTED BY THE LABORATORY

ANALYSIS DATA SHEET

32SB-FD042710-03

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004266-03	File ID:	0426603.D
Sampled:	04/27/10 14:10	Prepared:	05/10/10 13:59	Analyzed:	05/10/10 20:28
Solids:	87.80	Preparation:	5035	Dilution:	1

Batch: 0E10025 Sequence: 0E13518 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.435	5.00	U
100-41-4	Ethylbenzene		0.693	9.25	U
108-88-3	Toluene		0.795	9.25	U
1330-20-7	Xylenes (total)		0.647	9.25	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	27.74	29.24	105	85 - 120	
Dibromofluoromethane	27.74	27.06	97.6	80 - 125	
1,2-Dichloroethane-d4	27.74	28.37	102	75 - 140	
Toluene-d8	27.74	28.24	102	85 - 115	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0130002	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/7/2010 9:01:33AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	1.072069	4.777662	13.77363	2.989758E-02			15	
Bromofluorobenzene	0.8397075	6.434109	18.2985	2.305661E-02			15	
Ethylbenzene	2.911353	12.32509	17.49371	7.889913E-03			CCC (20)	
Naphthalene	1.929638	13.77676	21.93187	8.914289E-03			15	
Methyl t-Butyl Ether	0.7656045	3.435099	10.40713	4.151465E-02			15	
Toluene	1.422543	12.62549	16.10688	1.093417E-02			CCC (20)	
m,p-Xylene	2.139192	17.90708	17.64143	1.326399E-02		0.9998704	0.99	
o-Xylene	2.105664	14.8487	17.96983	3.930673E-03			15	
Xylenes (total)	2.150116	17.06447	0	0		0.9998992	0.99	
Dibromofluoromethane	0.3074291	2.04296	12.30138	4.654776E-02			15	
1,2-Dichloroethane-d4	6.679317E-02	3.711545	12.98763	2.467597E-02			15	
Toluene-d8	2.047687	4.711146	16.03913	1.096841E-02			15	

INITIAL CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-ICV1.D	Calibration Date:	05/07/10 09:01
Sequence:	0E13002	Injection Date:	05/07/10
Lab Sample ID:	0E13002-ICV1	Injection Time:	23:22

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzene	A	100.0	99.09	1.072069	1.062337		-0.9	20
Ethylbenzene	A	100.0	86.70	2.911353	2.524206		-13.3	20
Toluene	A	100.0	89.48	1.422543	1.27282		-10.5	20
Xylenes (total)	Q	300.0	284.2	2.150116	1.761576		-5.3	20
Bromofluorobenzene	A	30.00	29.24	0.8397075	0.8183789		-2.5	20
Dibromofluoromethane	A	30.00	30.33	0.3074291	0.3108571		1.1	20
1,2-Dichloroethane-d4	A	30.00	30.54	6.679317E-02	6.799794E-02		1.8	20
Toluene-d8	A	30.00	29.08	2.047687	1.984594		-3.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

HOLDING TIME SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_004

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SB-FD042710-03	04/27/10 14:10	04/28/10 08:30	05/10/10 13:59	N/A	14.00	05/10/10 20:28	13.26	14.00	

ANALYSIS SEQUENCE SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13518	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13518-TUN1	SEQ-TUN1.D	05/10/10 10:46
Calibration Check	0E13518-CCV1	SEQ-CCV1.D	05/10/10 11:17
LCS	0E10025-BS1	V4LCS01.D	05/10/10 12:18
Blank	0E10025-BLK1	V4BLK01.D	05/10/10 14:21
32SB-FD042710-03	1004266-03	0426603.D	05/10/10 20:28

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/10/10
Instrument ID:	MS-VOA4	Injection Time:	10:46
Sequence:	0E13518	Lab Sample ID:	0E13518-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	31.6	PASS
75	30 - 60% of 95	50.8	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.86	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	56.1	PASS
175	5 - 9% of 174	8.26	PASS
176	95 - 101% of 174	95.4	PASS
177	5 - 9% of 176	7.08	PASS

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13518	Instrument:	MS-VOA4
		Calibration:	0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E13518-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/10/10 11:17			
Fluorobenzene	464858	14.043	672772	14.056	69	50 - 200	-0.0130	+/-0.50	
Chlorobenzene-d5	235025	17.31	278531	17.313	84	50 - 200	-0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	176657	19.367	217185	19.369	81	50 - 200	-0.0020	+/-0.50	
LCS (0E10025-BS1)			Lab File ID: V4LCS01.D			Analyzed: 05/10/10 12:18			
Fluorobenzene	512501	14.042	464858	14.043	110	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	236464	17.309	235025	17.31	101	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	192710	19.365	176657	19.367	109	50 - 200	-0.0020	+/-0.50	
Blank (0E10025-BLK1)			Lab File ID: V4BLK01.D			Analyzed: 05/10/10 14:21			
Fluorobenzene	535627	14.04	464858	14.043	115	50 - 200	-0.0030	+/-0.50	
Chlorobenzene-d5	243414	17.306	235025	17.31	104	50 - 200	-0.0040	+/-0.50	
1,4-Dichlorobenzene-d4	222520	19.363	176657	19.367	126	50 - 200	-0.0040	+/-0.50	
32SB-FD042710-03 (1004266-03)			Lab File ID: 0426603.D			Analyzed: 05/10/10 20:28			
Fluorobenzene	326973	14.058	464858	14.043	70	50 - 200	0.0150	+/-0.50	
Chlorobenzene-d5	147477	17.315	235025	17.31	63	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	115627	19.381	176657	19.367	65	50 - 200	0.0140	+/-0.50	

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/07/10 09:01
Sequence:	0E13518	Injection Date:	05/10/10
Lab Sample ID:	0E13518-CCV1	Injection Time:	11:17

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	106.8	1.072069	1.145476		6.8	20
Ethylbenzene	A	100.0	89.19	2.911353	2.596576		-10.8	20
Naphthalene	A	100.0	95.21	1.929638	1.837237		-4.8	20
Methyl t-Butyl Ether	A	100.0	98.68	0.7656045	0.755503		-1.3	20
Toluene	A	100.0	92.26	1.422543	1.312496		-7.7	20
m,p-Xylene	Q	200.0	207.2	2.139192	1.781679		3.6	20
o-Xylene	A	100.0	90.57	2.105664	1.907106		-9.4	20
Xylenes (total)	Q	300.0	297.8	2.150116	1.823488		-0.7	20
Bromofluorobenzene	A	30.00	29.84	0.8397075	0.8352643		-0.5	20
Dibromofluoromethane	A	30.00	32.13	0.3074291	0.3292726		7.1	20
1,2-Dichloroethane-d4	A	30.00	30.14	6.679317E-02	6.710867E-02		0.5	20
Toluene-d8	A	30.00	31.36	2.047687	2.140874		4.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E10025-BLK1	File ID:	V4BLK01.D
Sampled:		Prepared:		Analyzed:	05/10/10 14:21
Solids:		Preparation:	5035	Dilution:	

Batch: 0E10025 Sequence: 0E13518 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	34.12	114	85 - 120	
Dibromofluoromethane	30.00	32.13	107	80 - 125	
1,2-Dichloroethane-d4	30.00	32.36	108	75 - 140	
Toluene-d8	30.00	31.89	106	85 - 115	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13518	Instrument:	MS-VOA4
		Calibration:	0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E13518-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/10/10 11:17		
Bromofluorobenzene	30.00	99.5	80 - 120	18.284	18.284	0.0000	+/-1.000	
Dibromofluoromethane	30.00	107	80 - 120	12.282	12.282	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	100	80 - 120	12.981	12.981	0.0000	+/-1.000	
Toluene-d8	30.00	105	80 - 120	16.031	16.031	0.0000	+/-1.000	
LCS (0E10025-BS1) ug/Kg wet				Lab File ID: V4LCS01.D		Analyzed: 05/10/10 12:18		
Bromofluorobenzene	30.00	100	85 - 120	18.283	18.284	-0.0010	+/-1.000	
Dibromofluoromethane	30.00	99.8	80 - 125	12.29	12.282	0.0080	+/-1.000	
1,2-Dichloroethane-d4	30.00	90.5	75 - 140	12.979	12.981	-0.0020	+/-1.000	
Toluene-d8	30.00	99.5	85 - 115	16.029	16.031	-0.0020	+/-1.000	
Blank (0E10025-BLK1) ug/Kg wet				Lab File ID: V4BLK01.D		Analyzed: 05/10/10 14:21		
Bromofluorobenzene	30.00	114	85 - 120	18.29	18.284	0.0060	+/-1.000	
Dibromofluoromethane	30.00	107	80 - 125	12.288	12.282	0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	108	75 - 140	12.977	12.981	-0.0040	+/-1.000	
Toluene-d8	30.00	106	85 - 115	16.027	16.031	-0.0040	+/-1.000	
32SB-FD042710-03 (1004266-03) ug/Kg dry				Lab File ID: 0426603.D		Analyzed: 05/10/10 20:28		
Bromofluorobenzene	27.74	105	85 - 120	18.299	18.284	0.0150	+/-1.000	
Dibromofluoromethane	27.74	97.6	80 - 125	12.297	12.282	0.0150	+/-1.000	
1,2-Dichloroethane-d4	27.74	102	75 - 140	12.986	12.981	0.0050	+/-1.000	
Toluene-d8	27.74	102	85 - 115	16.036	16.031	0.0050	+/-1.000	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E10025	Laboratory ID:	0E10025-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	46.06	92.1	75 - 125
Ethylbenzene	50.00	45.42	90.8	75 - 125
Toluene	50.00	45.32	90.6	70 - 125
Xylenes (total)	150.0	131.8	87.9	75 - 125

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_004

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E10025 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E10025-BLK1	05/10/10 12:00	5.00	5.00
LCS	0E10025-BS1	05/10/10 12:00	5.00	5.00
32SB-FD042710-03	1004266-03	05/10/10 13:59	6.16	5.00

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_004

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E11013 Batch Matrix: Solid Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E11013-BLK1	05/20/10 13:40	15.00	1.00
LCS	0E11013-BS1	05/20/10 13:40	15.00	1.00
32SS-FD042710-02	1004266-01	05/20/10 13:40	15.00	1.00
32SS-FD042710-03	1004266-02	05/20/10 13:40	15.00	1.00
32SB-FD042710-03	1004266-03	05/20/10 13:40	15.00	1.00

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E11013	Laboratory ID:	0E11013-BS1
Preparation:	EXT_3546	Initial/Final:	15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.67	86.89	130	31 - 146
Benzo(a)pyrene	66.67	53.72	80.6	28 - 128
Benzo(b)fluoranthene	66.67	63.69	95.5	30 - 139
Benzo(k)fluoranthene	66.67	68.37	103	42 - 129
Chrysene	66.67	73.56	110	39 - 134
Dibenz(a,h)anthracene	66.67	85.92	129	30 - 138
Indeno(1,2,3-cd)pyrene	66.67	88.70	133	17 - 164
Naphthalene	66.67	57.05	85.6	29 - 106

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16723	Instrument:	MS-BNA3
		Calibration:	0161002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16723-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 06/12/10 11:37		
2-Fluorobiphenyl	5.000	107	80 - 120	7.413	7.413	0.0000	+/-0.500	
Terphenyl-d14	5.000	110	80 - 120	17.235	17.235	0.0000	+/-0.500	
LCS (0E11013-BS1) ug/Kg wet				Lab File ID: E11013L1.D		Analyzed: 06/12/10 12:13		
2-Fluorobiphenyl	3333	97.1	14 - 129	7.42	7.413	0.0070	+/-0.500	
Terphenyl-d14	3333	86.4	14 - 129	17.242	17.235	0.0070	+/-0.500	
Blank (0E11013-BLK1) ug/Kg wet				Lab File ID: E11013B1.D		Analyzed: 06/12/10 12:49		
2-Fluorobiphenyl	3333	126	14 - 129	7.422	7.413	0.0090	+/-0.500	
Terphenyl-d14	3333	104	14 - 129	17.244	17.235	0.0090	+/-0.500	
32SS-FD042710-02 (1004266-01) ug/Kg dry				Lab File ID: 0426601.D		Analyzed: 06/12/10 17:38		
2-Fluorobiphenyl	3925	72.3	14 - 129	7.428	7.413	0.0150	+/-0.500	
Terphenyl-d14	3925	50.1	14 - 129	17.25	17.235	0.0150	+/-0.500	
32SS-FD042710-03 (1004266-02) ug/Kg dry				Lab File ID: 0426602.D		Analyzed: 06/12/10 18:14		
2-Fluorobiphenyl	3790	95.4	14 - 129	7.428	7.413	0.0150	+/-0.500	
Terphenyl-d14	3790	58.3	14 - 129	17.25	17.235	0.0150	+/-0.500	
32SB-FD042710-03 (1004266-03) ug/Kg dry				Lab File ID: 0426603.D		Analyzed: 06/12/10 18:50		
2-Fluorobiphenyl	3797	93.5	14 - 129	7.428	7.413	0.0150	+/-0.500	
Terphenyl-d14	3797	53.0	14 - 129	17.25	17.235	0.0150	+/-0.500	

ANALYSIS SEQUENCE SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16101	Instrument:	MS-BNA3
Calibration:	0161002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16101-TUN1	SEQ-TUN1.D	06/09/10 22:00
Cal Standard	0F16101-CAL1	SEQ-CAL1.D	06/09/10 22:21
Cal Standard	0F16101-CAL2	SEQ-CAL2.D	06/09/10 22:57
Cal Standard	0F16101-CAL3	SEQ-CAL3.D	06/09/10 23:33
Cal Standard	0F16101-CAL4	SEQ-CAL4.D	06/10/10 00:10
Cal Standard	0F16101-CAL5	SEQ-CAL5.D	06/10/10 00:46
Cal Standard	0F16101-CAL6	SEQ-CAL6.D	06/10/10 01:22
Cal Standard	0F16101-CAL7	SEQ-CAL7.D	06/10/10 01:58
Cal Standard	0F16101-CAL8	SEQ-CAL8.D	06/10/10 02:34
Cal Standard	0F16101-CAL9	SEQ-CAL9.D	06/10/10 03:10
Cal Standard	0F16101-CALA	SEQ-CALA.D	06/10/10 03:47
Cal Standard	0F16101-CALB	SEQ-CALB.D	06/10/10 04:23
Initial Cal Check	0F16101-ICV1	SEQ-ICV1.D	06/10/10 04:59

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/09/10
Instrument ID:	MS-BNA3	Injection Time:	22:00
Sequence:	0F16101	Lab Sample ID:	0F16101-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	41	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	46.6	PASS
70	Less than 2% of 69	0.373	PASS
127	40 - 60% of 198	52.1	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.88	PASS
275	10 - 30% of 198	25.8	PASS
365	1 - 200% of 198	3.06	PASS
441	0.001 - 100% of 443	73	PASS
442	40 - 200% of 198	76.4	PASS
443	17 - 23% of 442	19.9	PASS

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0161002	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	6/9/2010 2:36:40PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.786274	9.577482	8.827818	8.701544E-02			CCC (30)	
Acenaphthylene	1.21382	13.93835	8.448273	8.020422E-02			15	
Anthracene	0.8565716	13.35312	12.68555	0.0437723		0.9965319	0.99	
Benzo(a)anthracene	0.5502005	25.35066	20.14791	3.724692E-02	0.9971164		0.995	
Benzo(a)pyrene	0.963022	29.14946	24.25627	0.0396758	0.9978688		CCC (30)	
Benzo(b)fluoranthene	1.109058	29.03611	23.311	5.698884E-02	0.9977015		0.995	
Benzo(g,h,i)perylene	1.144808	17.70931	26.6111	2.691288E-02	0.9940619		0.995	*
Benzo(k)fluoranthene	1.244685	13.47436	23.40864	6.974615E-02		0.9990568	0.99	
Chrysene	0.6385135	11.86689	20.24573	0.046851	0.999541		0.995	
Dibenz(a,h)anthracene	0.8922049	25.66608	26.25891	2.493493E-02		0.9956229	0.99	
Fluoranthene	0.7487376	20.49171	15.92809	5.045146E-02	0.9993594		CCC (30)	
Fluorene	0.7298324	15.00874	10.04655	8.243873E-02	0.9991819		0.995	
2-Fluorobiphenyl	0.9931515	15.39381	7.432	8.333368E-02		0.997918	0.99	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	0.899166	24.90014	26.19636	3.894349E-02		0.9952191	0.99	
1-Methylnaphthalene	0.8184576	14.6224	6.947636	5.542856E-02			15	
2-Methylnaphthalene	0.8899234	13.70893	6.790546	0.0599914			15	
Naphthalene	1.415819	14.97382	5.818455	9.857723E-02			15	
Nitrobenzene-d5							15	
Phenanthrene	0.9983893	7.84061	12.53873	6.340399E-02			15	
Phenol-d6							15	
Pyrene	0.8081301	15.14012	16.55264	5.656614E-02		0.9951965	0.99	
Terphenyl-d14	0.5588801	18.64392	17.26073	2.669893E-02	0.9989362		0.995	
2,4,6-Tribromophenol	6.258919E-02	34.34367	10.65255	8.128201E-02	0.9982302		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0161002
Lab File ID:	SEQ-ICV1.D	Calibration Date:	06/09/10 14:36
Sequence:	0F16101	Injection Date:	06/10/10
Lab Sample ID:	0F16101-ICV1	Injection Time:	04:59

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Acenaphthene	A	5.000	4.827	0.786274	0.7590863		-3.5	20
Acenaphthylene	A	5.000	5.223	1.21382	1.268044		4.5	20
Anthracene	Q	5.000	4.995	0.8565716	1.001175		-0.09	20
Benzo(a)anthracene	L	5.000	5.440	0.5502005	0.7229815		8.8	20
Benzo(a)pyrene	L	5.000	5.157	0.963022	1.23492		3.1	20
Benzo(b)fluoranthene	L	5.000	4.741	1.109058	1.30343		-5.2	20
Benzo(g,h,i)perylene	L	5.000	4.511	1.144808	1.312552		-9.8	20
Benzo(k)fluoranthene	Q	5.000	4.973	1.244685	1.4313		-0.5	20
Chrysene	L	5.000	5.960	0.6385135	0.7816841		19.2	20
Dibenz(a,h)anthracene	Q	5.000	4.247	0.8922049	1.165855		-15.1	20
Fluoranthene	L	5.000	5.638	0.7487376	0.9784458		12.8	20
Fluorene	L	5.000	5.179	0.7298324	0.8113299		3.6	20
Indeno(1,2,3-cd)pyrene	Q	5.000	4.171	0.899166	1.091454		-16.6	20
1-Methylnaphthalene	A	5.000	4.722	0.8184576	0.7730303		-5.6	20
2-Methylnaphthalene	A	5.000	5.098	0.8899234	0.9073801		2.0	20
Naphthalene	A	5.000	4.618	1.415819	1.307792		-7.6	20
Phenanthrene	A	5.000	5.348	0.9983893	1.067861		7.0	20
Pyrene	Q	5.000	5.054	0.8081301	0.930862		1.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16723	Instrument:	MS-BNA3
Calibration:	0161002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16723-TUN1	SEQ-TUN1.D	06/12/10 11:15
Calibration Check	0F16723-CCV1	SEQ-CCV1.D	06/12/10 11:37
LCS	0E11013-BS1	E11013L1.D	06/12/10 12:13
Blank	0E11013-BLK1	E11013B1.D	06/12/10 12:49
32SS-FD042710-02	1004266-01	0426601.D	06/12/10 17:38
32SS-FD042710-03	1004266-02	0426602.D	06/12/10 18:14
32SB-FD042710-03	1004266-03	0426603.D	06/12/10 18:50

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/12/10
Instrument ID:	MS-BNA3	Injection Time:	11:15
Sequence:	0F16723	Lab Sample ID:	0F16723-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	38.9	PASS
68	Less than 2% of 69	0.00501	PASS
69	Less than 200% of 198	45	PASS
70	Less than 2% of 69	0.491	PASS
127	40 - 60% of 198	50.5	PASS
197	Less than 1% of 198	0.0149	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.05	PASS
275	10 - 30% of 198	25.9	PASS
365	1 - 200% of 198	2.95	PASS
441	0.001 - 100% of 443	76.4	PASS
442	40 - 200% of 198	80.3	PASS
443	17 - 23% of 442	19.4	PASS

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16723	Instrument:	MS-BNA3
		Calibration:	0161002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16723-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 06/12/10 11:37			
Phenanthrene-d10	158374	12.454	109351	12.47	145	50 - 200	-0.0160	+/-0.50	
Perylene-d12	72628	24.365	46195	24.39	157	50 - 200	-0.0250	+/-0.50	
LCS (0E11013-BS1)			Lab File ID: E11013L1.D			Analyzed: 06/12/10 12:13			
Phenanthrene-d10	142591	12.461	158374	12.454	90	50 - 200	0.0070	+/-0.50	
Perylene-d12	58185	24.372	72628	24.365	80	50 - 200	0.0070	+/-0.50	
Blank (0E11013-BLK1)			Lab File ID: E11013B1.D			Analyzed: 06/12/10 12:49			
Phenanthrene-d10	126307	12.463	158374	12.454	80	50 - 200	0.0090	+/-0.50	
Perylene-d12	49082	24.374	72628	24.365	68	50 - 200	0.0090	+/-0.50	
32SS-FD042710-02 (1004266-01)			Lab File ID: 0426601.D			Analyzed: 06/12/10 17:38			
Phenanthrene-d10	134243	12.469	158374	12.454	85	50 - 200	0.0150	+/-0.50	
Perylene-d12	72306	24.37	72628	24.365	100	50 - 200	0.0050	+/-0.50	
32SS-FD042710-03 (1004266-02)			Lab File ID: 0426602.D			Analyzed: 06/12/10 18:14			
Phenanthrene-d10	108836	12.46	158374	12.454	69	50 - 200	0.0060	+/-0.50	
Perylene-d12	53642	24.38	72628	24.365	74	50 - 200	0.0150	+/-0.50	
32SB-FD042710-03 (1004266-03)			Lab File ID: 0426603.D			Analyzed: 06/12/10 18:50			
Phenanthrene-d10	120220	12.459	158374	12.454	76	50 - 200	0.0050	+/-0.50	
Perylene-d12	74042	24.37	72628	24.365	102	50 - 200	0.0050	+/-0.50	

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0161002
Lab File ID:	SEQ-CCV1.D	Calibration Date:	06/09/10 14:36
Sequence:	0F16723	Injection Date:	06/12/10
Lab Sample ID:	0F16723-CCV1	Injection Time:	11:37

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.131	0.786274	0.8068446		2.6	20
Acenaphthylene	A	5.000	5.766	1.21382	1.39973		15.3	20
Anthracene	Q	5.000	5.207	0.8565716	1.044179		4.1	20
Benzo(a)anthracene	L	5.000	5.525	0.5502005	0.7357773		10.5	20
Benzo(a)pyrene	L	5.000	5.366	0.963022	1.286212		7.3	20
Benzo(b)fluoranthene	L	5.000	5.696	1.109058	1.573732		13.9	20
Benzo(g,h,i)perylene	L	5.000	4.647	1.144808	1.353563		-7.1	20
Benzo(k)fluoranthene	Q	5.000	5.531	1.244685	1.590188		10.6	20
Chrysene	L	5.000	6.398	0.6385135	0.8396126		28.0	20 *
Dibenz(a,h)anthracene	Q	5.000	4.338	0.8922049	1.192917		-13.2	20
Fluoranthene	L	5.000	5.933	0.7487376	1.029877		18.7	20
Fluorene	L	5.000	5.275	0.7298324	0.8262417		5.5	20
Indeno(1,2,3-cd)pyrene	Q	5.000	4.386	0.899166	1.155885		-12.3	20
1-Methylnaphthalene	A	5.000	5.174	0.8184576	0.8470027		3.5	20
2-Methylnaphthalene	A	5.000	5.320	0.8899234	0.9469168		6.4	20
Naphthalene	A	5.000	4.926	1.415819	1.394951		-1.5	20
Phenanthrene	A	5.000	5.731	0.9983893	1.14429		14.6	20
Pyrene	Q	5.000	5.616	0.8081301	1.039421		12.3	20
2-Fluorobiphenyl	Q	5.000	5.359	0.9931515	1.068672		7.2	20
Terphenyl-d14	L	5.000	5.479	0.5588801	0.7089421		9.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_004
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E11013-BLK1	File ID:	E11013B1.D
Sampled:		Prepared:		Analyzed:	06/12/10 12:49
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.33	6.67	U
50-32-8	Benzo(a)pyrene		1.33	5.00	U
205-99-2	Benzo(b)fluoranthene		1.33	6.67	U
207-08-9	Benzo(k)fluoranthene		1.33	6.67	U
218-01-9	Chrysene		1.33	6.67	X, U
53-70-3	Dibenz(a,h)anthracene		1.33	5.00	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.33	6.67	U
91-20-3	Naphthalene		1.33	5.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	4213	126	14 - 129	
Terphenyl-d14	3333	3454	104	14 - 129	

HOLDING TIME SUMMARY
SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_004

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SS-FD042710-02	04/27/10 11:45	04/28/10 08:30	05/20/10 13:40	23.08	14.00	06/12/10 17:38	23.17	40.00	*
32SS-FD042710-03	04/27/10 14:10	04/28/10 08:30	05/20/10 13:40	22.98	14.00	06/12/10 18:14	23.19	40.00	*
32SB-FD042710-03	04/27/10 14:10	04/28/10 08:30	05/20/10 13:40	22.98	14.00	06/12/10 18:50	23.22	40.00	*

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**TONY KLIMEK**	**DATE:**	**AUGUST 11, 2010**
FROM:	**CHERYLE LU**	**COPIES:**	**DV FILE**

SUBJECT: **DATA VALIDATION – VOLATILE ORGANIC AND POLYCYCLIC AROMATIC HYDROCARBON**

CTOF273, NAVAL AIR STATION CRANE, INDIANA

SAMPLE DELIVERY GROUP (SDG) – CTOF273_005

SAMPLES: 20/Solids

32SS-31-0002	32SB-31-0607	32SS-35-0002	32SB-35-0507
32SS-38-0002	32SB-38-0506	32SS-39-0002	32SB-39-0507
32SS-40-0002	32SB-40-0506	32SS-41-0002	32SB-41-0507
32SS-FD042810-04	32SB-DW01-0002	32SB-DW01-0809	32SS-42-0002
32SS-FD042810-05	32SB-FD042810-04	32SB-FD042810-05	32SB-42-0506

6/Aqueous

32GW-03	32GW-FD042710-01	32SS-RB042710-01
32SS-RB042710-02	32SS-RB042710-03	32SS-RB042710-04

Overview

The sample set for SDG CTOF273_005, consists of 20 soil samples and six (6) water samples. Five field duplicate pairs (32SS-42-0002/32SS-FD042810-04, 32SB-42-0506/32SB-FD042810-04, 32SB-DW01-0809/32SB-FD042810-05, 32SS-DW01-0002/32SS-FD042810-05 and 32GW-03/32GW-FD042710-01) were included within this SDG. Ten soil samples and six water samples were analyzed for benzene, , toluene, ethylbenzene, and total xylenes (BTEX) by Method 8260B, and 20 soil samples and six water samples were analyzed for polycyclic aromatic hydrocarbon (PAH) by Method 8270C. The samples were collected by Tetra Tech NUS on April 27 and April 28, 2010, and analyzed by Empirical Laboratories under USEPA approved methods and instrumentation in all analytical work and met DoD QSM 4.1 laboratory requirements (2009).

These data were evaluated based on the following parameters:

* • Data Completeness
• Holding Times
* • Instrument performance and tuning
• Internal Standard
• Initial and Continuing Calibrations
* • Laboratory Method and Field Quality Control Blank Analyses
* • Surrogate Recoveries
* • Laboratory Control Sample Results
• Matrix Spike/ Matrix Spike Duplicate Results
* • Detection Limits

* - Quality control criteria were met for this parameter.

Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

Volatile Organic:

The data results from method blank, laboratory control sample (LCS) and calibration standards were within the quality control (QC) limits.

Two soil samples, 32SB-42-0506 and 32SB-DW01-0809, were analyzed past the holding time (HT) but within two times of HT period. Nondetected results were qualified as estimated "UJ" in the affected samples.

The %R of xylenes in matrix spike (MS) was within the QC limit, but the %R in MS duplicate (MSD) was slightly lower (74.1%) than the QC limit (75%), and the relative percent difference (RPD) value (17.6%) was within the QC limit (30%) for sample 32SB-35-0507. No qualification was required.

The percent recoveries (%Rs) of benzene, ethylbenzene, toluene and xylenes (BETX) in the LCS (0E10038-BS1) was within the QC limit, but the %Rs of the aforementioned compounds in the LCS duplicate (0E10038-BS1-dup) was greater than the QC limit and the RPD values were greater than the QC limits. No qualification was required since no samples were associated with this LCS-dup.

The surrogate percent recoveries (%Rs) of bromofluorobenzene and toluene-d8 were greater than the quality control limits for sample 32SB-DW01-0809. The sample was re-analyzed outside of holding time at a dilution and the surrogate %Rs were within the QC limits. The original analysis was used for validation. No action was taken because all results were nondetected.

The surrogate percent recoveries (%Rs) of bromofluorobenzene and toluene-d8 were greater than the quality control limits for samples 32SB-39-0507, 32SB-FD042810-04, and 32SB-FD042810-05. No re-analyses were performed. No qualification was required because all results were nondetected.

The internal standards associated with all the reported analytes failed criteria in samples 32SB-DW01-0809, however, the re-analysis results indicated that all internal standards for this sample were within the criteria. Because the initial analysis was used for validation, nondetected results were qualified as estimated "UJ".

The internal standards associated with all the reported analytes below the low limit (LL) in sample 32SB-40-0506, however, no re-analysis was performed. Positive and nondetected results were qualified as estimated, "J" and "UJ", respectively.

Field Precision

The precision results for field duplicate samples were within laboratory QC acceptance criteria for the BTEX analyses, no qualification was required.

Polycyclic Aromatic Hydrocarbon (PAH):

The data results from surrogates, laboratory control sample and laboratory control sample duplicate (LCS/LCSD) were within the quality control (QC) limits.

All water and several soil samples (7) were extracted past the holding time (HT) but within two times of HT period. Positive and nondetected results were qualified as estimated, "J" and "UJ", respectively, in the affected samples.

The following compounds were detected in a method blank sample (analyzed on 5/30/2010):

Blank Batch #	Compound	Maximum Concentration (ug/L)	Blank Action Level (ug/L)
E08002-BLK1	Benzo(a)anthracene	0.069	0.345
	Benzo(a)pyrene	0.106	0.530
	Benzo(b)fluoranthene	0.0835	0.4175
	Benzo(k)fluoranthene	0.0792	0.396
	Chrysene	0.0930	0.465
	Dibenzo(a)anthracene	0.0752	0.376

An action level of five times (5X) for laboratory contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot and dilution factors, if applicable, were taken into consideration when evaluating for blank contamination. No qualifier was needed since the aforementioned compounds were not detected in any affected samples. Field quality control blanks were not qualified for laboratory method blank contamination.

The %Rs of naphthalene in matrix spike /matrix spike duplicate (MS/MSD) were within the QC limits, but the RPD value (31.7%) was slightly greater than the QC limit (30%). No qualification was required for nondetected result in sample 32SB-31-0607.

The %R of chrysene in MS was slightly greater than the QC limit, but the %R of chrysene in the MSD and the RPD value were within the QC limit. No qualification was required for nondetected result in sample 32SB-39-0507.

The percent difference (%D) value of benzo(k)fluoranthene (25.3%) in the continuing calibration verification (0F15510-CCV1) on 5/30/2010 at 03:13 on instrument MS-BNA3 was greater than 25%. No qualification was required since no field sample was affected.

The %D values of benzo(k)fluoranthene (35.8%) and naphthalene (-28.3%) in the continuing calibration verification (0F15511-CCV1) on 5/30/2010 at 15:47 on instrument MS-BNA3 were greater than 25%. An estimated nondetect "UJ" qualifier was applied to the nondetected results of the affected aqueous samples since there were no positive results for these two compounds.

The %D value of chrysene (28%) in the continuing calibration verification (0F16723-CCV1) on 6/12/2010 at 11:37 on instrument MS-BNA3 was greater than 25%. An estimated nondetect "UJ" qualifier was applied to the nondetected results of the affected samples since there were no positive results for chrysene in the affected samples.

The %D value of chrysene (26.2%) in the continuing calibration verification (0F16725-CCV1) on 6/13/2010 at 00:34 on instrument MS-BNA3 was greater than 25%. An estimated nondetect "UJ" qualifier was applied to the nondetected results of the affected samples since there were no positive results for Chrysene in the affected samples.

The %D value of benzo(k)fluoranthene (34.6%) in the continuing calibration verification (0F16727-CCV1) on 6/15/2010 at 07:53 on instrument MS-BNA4 was greater than 25%. An estimated nondetect "UJ" qualifier was applied to the nondetected results of the affected samples since there were no positive results for benzo(k)fluoranthene in the affected samples.

The %D values of dibenzo(a, h)anthracene (42.3%) and indeno(1,2,3)pyrene (46.6%) in the continuing calibration verification (0F16811-CCV1) on 6/12/2010 at 17:00 on instrument MS-BNA4 were greater than 25%. An estimated nondetect "UJ" qualifier was applied to the nondetected results of the affected samples since there were no positive results for these two compounds in the affected samples.

The %D values of benzo(a,h)anthracene (29.5%), chrysene (30.4%), dibenzo(a,h)anthracene (34.4%) and indeno(1,2,3)pyrene (37.3%) in the continuing calibration verification (0F16819-CCV1) on 6/13/2010 at 05:49 on instrument MS-BNA4 were greater than 25%. An estimated "J" qualifier was applied to the positive results, and an estimated nondetect "UJ" qualifier was applied to the nondetected results of the affected samples.

Field Precision

The precision results for field duplicate samples were within laboratory QC acceptance criteria for the PAH analyses, no qualification was required.

Notes:

The positive results reported below the reporting limit (RL) were qualified as estimated "J", due to uncertainty near the detection limit.

A sample ID was 32SB-41-0506 on the Chain-of-Custody, but was reported as 32SB-41-0507 by the laboratory. The sample ID should be reported as 32SB-41-0506.

Executive Summary

Laboratory Performance: All water and several soil samples were extracted or analyzed past the holding time (HT) but within two times of HT period for PAH analysis. Two volatile fraction samples were analyzed outside of holding time. Low internal standard recoveries were noted in two samples. Minor calibration noncompliances were noted affecting the PAH fraction.

Other Factors Affecting Data Quality: One method blank was contaminated with several PAH compounds, however, the contaminants were not detected in the associated samples.

The data for the analysis were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999), and the Department of Defense document entitled "Quality Systems Manual (QSM) for Environmental Laboratories January 2006".

The text of this report has been formulated to address only those problem areas affecting data quality.

For Tetra Tech NUS
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Senior Toxicologist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 02111 SDG: CTOF273_005 FRACTION: OV MEDIA: WATER	NSAMPLE	32GW-03			32GW-FD042710-01			32SS-RB042710-01			32SS-RB042710-02		
	LAB_ID	1004277-01			1004277-02			1004277-03			1004277-04		
	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF				32GW-03								
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.14	U		0.14	U		0.14	U		0.14	U	
ETHYLBENZENE		0.15	U		0.15	U		0.15	U		0.15	U	
TOLUENE		0.19	U		0.19	U		0.19	U		0.19	U	
TOTAL XYLENES		0.22	U		0.22	U		0.22	U		0.22	U	

PROJ_NO: 02111 SDG: CTOF273_005 FRACTION: OV MEDIA: WATER	NSAMPLE	32SS-RB042710-03			32SS-RB042810-04		
	LAB_ID	1004277-05			1004277-06		
	SAMP_DATE	4/27/2010			4/27/2010		
	QC_TYPE	NM			NM		
	UNITS	UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.14	U		0.14	U	
ETHYLBENZENE		0.15	U		0.15	U	
TOLUENE		0.19	U		0.19	U	
TOTAL XYLENES		0.22	U		0.22	U	

PROJ_NO: 02111 SDG: CTOF273_005 FRACTION: OV MEDIA: SOIL	NSAMPLE	32SB-31-0607			32SB-35-0507			32SB-38-0506			32SB-39-0507		
	LAB_ID	1004277-08			1004277-10			1004277-12			1004277-14		
	SAMP_DATE	4/28/2010			4/28/2010			4/27/2010			4/28/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	87.1			85.7			82.9			81.9		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.467	U		0.481	U		0.471	U		0.479	U	
ETHYLBENZENE		0.746	U		0.767	U		0.752	U		0.764	U	
TOLUENE		0.855	U		0.879	U		0.862	U		0.876	U	
TOTAL XYLENES		0.696	U		0.716	U		0.702	U		0.713	U	

PROJ_NO: 02111 SDG: CTOF273_005 FRACTION: OV MEDIA: SOIL	NSAMPLE	32SB-40-0506			32SB-41-0506			32SB-42-0506			32SB-DW01-0809		
	LAB_ID	1004277-16			1004277-18			1004277-20RE1			1004277-26		
	SAMP_DATE	4/27/2010			4/28/2010			4/27/2010			4/28/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	85.3			85.9			88.1			86.5		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.474	UJ	N	0.487	U		0.486	UJ	H	0.522	UJ	HN
ETHYLBENZENE		0.757	UJ	N	0.778	U		0.776	UJ	H	0.833	UJ	HN
TOLUENE		0.868	UJ	N	0.892	U		0.889	UJ	H	0.955	UJ	HN
TOTAL XYLENES		1.72	J	PN	0.726	U		0.724	UJ	H	0.777	UJ	HN

PROJ_NO: 02111 SDG: CTOF273_005 FRACTION: OV MEDIA: SOIL	NSAMPLE	32SB-FD042810-04			32SB-FD042810-05		
	LAB_ID	1004277-23			1004277-24		
	SAMP_DATE	4/28/2010			4/28/2010		
	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	88.2			79.6		
	DUP_OF	32SB-42-0506			32SB-DW01-0809		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.456	U		0.527	U	
ETHYLBENZENE		0.728	U		0.841	U	
TOLUENE		0.835	U		0.964	U	
TOTAL XYLENES		0.68	U		0.785	U	

PROJ_NO: 02111	NSAMPLE	32GW-03			32GW-FD042710-01			32SS-RB042710-01			32SS-RB042710-02		
SDG: CTOF273_005	LAB_ID	1004277-01			1004277-02			1004277-03			1004277-04		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/27/2010			4/27/2010			4/27/2010		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF				32GW-03								
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		0.0187	UJ	H	0.0187	UJ	H	0.0189	UJ	H	0.0196	UJ	H
BENZO(A)PYRENE		0.0187	UJ	H	0.0187	UJ	H	0.0189	UJ	H	0.0196	UJ	H
BENZO(B)FLUORANTHENE		0.0187	UJ	H	0.0187	UJ	H	0.0189	UJ	H	0.0196	UJ	H
BENZO(K)FLUORANTHENE		0.0187	UJ	CH	0.0187	UJ	CH	0.0189	UJ	CH	0.0196	UJ	CH
CHRYSENE		0.0187	UJ	H	0.0187	UJ	H	0.0189	UJ	H	0.0196	UJ	H
DIBENZO(A,H)ANTHRACENE		0.0187	UJ	H	0.0187	UJ	H	0.0189	UJ	H	0.0196	UJ	H
INDENO(1,2,3-CD)PYRENE		0.0187	UJ	H	0.0187	UJ	H	0.0189	UJ	H	0.0196	UJ	H
NAPHTHALENE		0.0187	UJ	CH	0.0187	UJ	CH	0.0189	UJ	CH	0.0196	UJ	CH

PROJ_NO: 02111	NSAMPLE	32SS-RB042710-03			32SS-RB042810-04		
SDG: CTOF273_005	LAB_ID	1004277-05			1004277-06		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/27/2010		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		0.0222	UJ	H	0.0196	UJ	H
BENZO(A)PYRENE		0.0222	UJ	H	0.0196	UJ	H
BENZO(B)FLUORANTHENE		0.0222	UJ	H	0.0196	UJ	H
BENZO(K)FLUORANTHENE		0.0222	UJ	CH	0.0196	UJ	H
CHRYSENE		0.0222	UJ	H	0.0196	UJ	H
DIBENZO(A,H)ANTHRACENE		0.0222	UJ	H	0.0196	UJ	H
INDENO(1,2,3-CD)PYRENE		0.0222	UJ	H	0.0196	UJ	H
NAPHTHALENE		0.0222	UJ	CH	0.0196	UJ	H

PROJ_NO: 02111 SDG: CTOF273_005 FRACTION: PAH MEDIA: SOIL	NSAMPLE	32SB-31-0607			32SB-35-0507			32SB-38-0506			32SB-39-0507		
	LAB_ID	1004277-08			1004277-10			1004277-12			1004277-14		
	SAMP_DATE	4/28/2010			4/28/2010			4/27/2010			4/28/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	87.1			85.7			82.9			81.9		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.53	U		1.55	U		1.61	UJ	H	1.62	U	
BENZO(A)PYRENE		1.53	U		1.55	U		1.61	UJ	H	1.62	U	
BENZO(B)FLUORANTHENE		1.53	U		1.55	U		1.61	UJ	H	1.62	U	
BENZO(K)FLUORANTHENE		1.53	U		1.55	U		1.61	UJ	H	1.62	U	
CHRYSENE		1.53	U		1.55	U		1.61	UJ	CH	1.62	U	
DIBENZO(A,H)ANTHRACENE		1.53	UJ	C	1.55	UJ	C	1.61	UJ	H	1.62	UJ	C
INDENO(1,2,3-CD)PYRENE		1.53	UJ	C	1.55	UJ	C	1.61	UJ	H	1.62	UJ	C
NAPHTHALENE		1.53	U		1.55	U		1.61	UJ	H	1.62	U	

PROJ_NO: 02111	NSAMPLE	32SB-40-0506			32SB-41-0506			32SB-42-0506			32SB-DW01-0809		
SDG: CTOF273_005	LAB_ID	1004277-16			1004277-18			1004277-20			1004277-26		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/28/2010			4/27/2010			4/28/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	85.3			85.9			88.1			86.5		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.56	UJ	H	1.55	UJ	C	1.51	UJ	H	9.44	J	C
BENZO(A)PYRENE		1.56	UJ	H	1.55	U		1.51	UJ	H	7.43		
BENZO(B)FLUORANTHENE		1.56	UJ	H	1.55	U		1.51	UJ	H	7.78		
BENZO(K)FLUORANTHENE		1.56	UJ	H	1.55	U		1.51	UJ	H	9.45		
CHRYSENE		1.56	UJ	CH	1.55	UJ	C	1.51	UJ	CH	15.3	J	C
DIBENZO(A,H)ANTHRACENE		1.56	UJ	H	1.55	UJ	C	1.51	UJ	H	9.23	J	C
INDENO(1,2,3-CD)PYRENE		1.56	UJ	H	1.55	UJ	C	1.51	UJ	H	7.05	J	PC
NAPHTHALENE		1.56	UJ	H	1.55	U		1.51	UJ	H	1.54	U	

PROJ_NO: 02111	NSAMPLE	32SB-FD042810-04			32SB-FD042810-05			32SS-31-0002			32SS-35-0002		
SDG: CTOF273_005	LAB_ID	1004277-23			1004277-24			1004277-07			1004277-09		
FRACTION: PAH	SAMP_DATE	4/28/2010			4/28/2010			4/28/2010			4/28/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	88.2			79.6			86.0			86.0		
	DUP_OF	32SB-42-0506			32SB-DW01-0809								
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		6.41	J	PC	16.7	U		1.55	UJ	H	1.55	U	
BENZO(A)PYRENE		4.36	J	P	16.7	U		1.55	UJ	H	1.55	U	
BENZO(B)FLUORANTHENE		4.72	J	P	16.7	U		1.55	UJ	H	1.55	U	
BENZO(K)FLUORANTHENE		4.93	J	P	16.7	UJ	C	1.55	UJ	H	1.55	U	
CHRYSENE		5.99	J	PC	16.7	U		1.55	UJ	CH	1.55	U	
DIBENZO(A,H)ANTHRACENE		5.97	J	C	16.7	U		1.55	UJ	H	1.55	UJ	C
INDENO(1,2,3-CD)PYRENE		5.64	J	PC	16.7	U		1.55	UJ	H	1.55	UJ	C
NAPHTHALENE		3.84	J	P	16.7	U		1.55	UJ	H	1.55	U	

8-11-10
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PROJ_NO: 02111	NSAMPLE	32SS-38-0002			32SS-39-0002			32SS-40-0002			32SS-41-0002		
SDG: CTOF273_005	LAB_ID	1004277-11			1004277-13			1004277-15			1004277-17		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/28/2010			4/27/2010			4/28/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	88.0			85.9			86.9			86.1		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.51	UJ	H	1.55	U		1.53	UJ	H	1.55	U	
BENZO(A)PYRENE		1.51	UJ	H	1.55	U		1.53	UJ	H	1.55	U	
BENZO(B)FLUORANTHENE		1.51	UJ	H	1.55	U		1.53	UJ	H	1.55	U	
BENZO(K)FLUORANTHENE		1.51	UJ	H	1.55	U		1.53	UJ	H	1.55	U	
CHRYSENE		1.51	UJ	CH	1.55	U		1.53	UJ	CH	1.55	U	
DIBENZO(A,H)ANTHRACENE		1.51	UJ	H	1.55	UJ	C	1.53	UJ	H	1.55	UJ	C
INDENO(1,2,3-CD)PYRENE		1.51	UJ	H	1.55	UJ	C	1.53	UJ	H	1.55	UJ	C
NAPHTHALENE		1.51	UJ	H	1.55	U		1.53	UJ	H	1.55	U	

PROJ_NO: 02111	NSAMPLE	32SS-42-0002			32SS-DW01-0002			32SS-FD042810-04			32SS-FD042810-05		
SDG: CTOF273_005	LAB_ID	1004277-19			1004277-25			1004277-21			1004277-22		
FRACTION: PAH	SAMP_DATE	4/27/2010			4/28/2010			4/28/2010			4/28/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	86.0			81.6			87.9			86.8		
	DUP_OF							32SS-42-0002			32SS-DW01-0002		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.55	UJ	H	16.3	U		1.51	UJ	C	1.53	UJ	C
BENZO(A)PYRENE		1.55	UJ	H	16.3	U		1.51	U		1.53	U	
BENZO(B)FLUORANTHENE		1.55	UJ	H	16.3	U		1.51	U		1.53	U	
BENZO(K)FLUORANTHENE		1.55	UJ	H	16.3	UJ	C	1.51	U		1.53	U	
CHRYSENE		1.55	UJ	CH	16.3	U		1.51	UJ	C	1.53	UJ	C
DIBENZO(A,H)ANTHRACENE		1.55	UJ	H	16.3	U		1.51	UJ	C	1.53	UJ	C
INDENO(1,2,3-CD)PYRENE		1.55	UJ	H	16.3	U		1.51	UJ	C	1.53	UJ	C
NAPHTHALENE		1.55	UJ	H	16.3	U		1.51	U		1.53	U	

APPENDIX B
RESULTS AS REPORTED BY THE LABORATORY

Data for SW8260B Forms

ANALYSIS DATA SHEET

32GW-03

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1004277-01	File ID:	0427701.D
Sampled:	04/27/10 16:42	Prepared:	05/10/10 00:00	Analyzed:	05/10/10 18:59
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E10024 Sequence: 0E13404 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.16	101	75 - 120	
Dibromofluoromethane	30.00	29.94	99.8	85 - 115	
1,2-Dichloroethane-d4	30.00	29.82	99.4	70 - 120	
Toluene-d8	30.00	32.38	108	85 - 120	

ANALYSIS DATA SHEET

32GW-FD042710-01

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1004277-02	File ID:	0427702.D
Sampled:	04/27/10 00:00	Prepared:	05/10/10 00:00	Analyzed:	05/10/10 19:29
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E10024 Sequence: 0E13404 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.40	101	75 - 120	
Dibromofluoromethane	30.00	30.07	100	85 - 115	
1,2-Dichloroethane-d4	30.00	30.10	100	70 - 120	
Toluene-d8	30.00	31.94	106	85 - 120	

ANALYSIS DATA SHEET

32SS-RB042710-01

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-03	File ID:	0427703.D
Sampled:	04/27/10 08:10	Prepared:	05/10/10 00:00	Analyzed:	05/10/10 19:59
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E10024 Sequence: 0E13404 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.12	104	75 - 120	
Dibromofluoromethane	30.00	29.64	98.8	85 - 115	
1,2-Dichloroethane-d4	30.00	29.88	99.6	70 - 120	
Toluene-d8	30.00	32.44	108	85 - 120	

ANALYSIS DATA SHEET

32SS-RB042710-02

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-04	File ID:	0427704.D
Sampled:	04/27/10 11:50	Prepared:	05/10/10 00:00	Analyzed:	05/10/10 20:29
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E10024 Sequence: 0E13404 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.89	99.6	75 - 120	
Dibromofluoromethane	30.00	29.73	99.1	85 - 115	
1,2-Dichloroethane-d4	30.00	29.50	98.3	70 - 120	
Toluene-d8	30.00	31.91	106	85 - 120	

ANALYSIS DATA SHEET

32SS-RB042710-03

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-05	File ID:	0427705.D
Sampled:	04/27/10 15:10	Prepared:	05/10/10 00:00	Analyzed:	05/10/10 20:59
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E10024 Sequence: 0E13404 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.38	101	75 - 120	
Dibromofluoromethane	30.00	30.15	101	85 - 115	
1,2-Dichloroethane-d4	30.00	30.06	100	70 - 120	
Toluene-d8	30.00	32.49	108	85 - 120	

ANALYSIS DATA SHEET

32SS-RB042810-04

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-06	File ID:	0427706.D
Sampled:	04/27/10 11:16	Prepared:	05/10/10 00:00	Analyzed:	05/10/10 21:28
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E10024 Sequence: 0E13404 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.15	100	75 - 120	
Dibromofluoromethane	30.00	29.59	98.6	85 - 115	
1,2-Dichloroethane-d4	30.00	30.27	101	70 - 120	
Toluene-d8	30.00	32.42	108	85 - 120	

ANALYSIS DATA SHEET

32SB-31-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-08	File ID:	0427708.D
Sampled:	04/28/10 10:10	Prepared:	05/11/10 15:28	Analyzed:	05/12/10 01:23
Solids:	87.13	Preparation:	5035	Dilution:	1

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.467	5.00	U
100-41-4	Ethylbenzene		0.746	9.95	Y, U
108-88-3	Toluene		0.855	9.95	Y, U
1330-20-7	Xylenes (total)		0.696	9.95	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.84	33.32	112	85 - 120	
Dibromofluoromethane	29.84	30.86	103	80 - 125	
1,2-Dichloroethane-d4	29.84	29.51	98.9	75 - 140	
Toluene-d8	29.84	31.53	106	85 - 115	

ANALYSIS DATA SHEET

32SB-35-0507

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-10	File ID:	0427710.D
Sampled:	04/28/10 10:25	Prepared:	05/11/10 15:28	Analyzed:	05/12/10 01:54
Solids:	85.65	Preparation:	5035	Dilution:	1

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.481	5.00	U
100-41-4	Ethylbenzene		0.767	10.2	Y, U
108-88-3	Toluene		0.879	10.2	Y, U
1330-20-7	Xylenes (total)		0.716	10.2	N, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.67	35.97	117	85 - 120	
Dibromofluoromethane	30.67	32.46	106	80 - 125	
1,2-Dichloroethane-d4	30.67	31.88	104	75 - 140	
Toluene-d8	30.67	34.08	111	85 - 115	

ANALYSIS DATA SHEET

32SB-38-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-12	File ID:	0427712.D
Sampled:	04/27/10 08:50	Prepared:	05/10/10 17:35	Analyzed:	05/11/10 03:02
Solids:	82.86	Preparation:	5035	Dilution:	1

Batch: 0E10038 Sequence: 0E13718 Calibration: UNASSIGNED Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.471	5.00	Q, U
100-41-4	Ethylbenzene		0.752	10.0	Q, U
108-88-3	Toluene		0.862	10.0	Q, U
1330-20-7	Xylenes (total)		0.702	10.0	Q, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.07	30.39	101	85 - 120	
Dibromofluoromethane	30.07	29.26	97.3	80 - 125	
1,2-Dichloroethane-d4	30.07	27.30	90.8	75 - 140	
Toluene-d8	30.07	33.35	111	85 - 115	

ANALYSIS DATA SHEET

32SB-39-0507

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-14	File ID:	0427714.D
Sampled:	04/28/10 10:45	Prepared:	05/11/10 15:28	Analyzed:	05/12/10 02:24
Solids:	81.93	Preparation:	5035	Dilution:	1

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.479	5.00	U
100-41-4	Ethylbenzene		0.764	10.2	Y, U
108-88-3	Toluene		0.876	10.2	Y, U
1330-20-7	Xylenes (total)		0.713	10.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.57	37.43	122	85 - 120	*
Dibromofluoromethane	30.57	32.14	105	80 - 125	
1,2-Dichloroethane-d4	30.57	30.12	98.6	75 - 140	
Toluene-d8	30.57	36.02	118	85 - 115	*

ANALYSIS DATA SHEET

32SB-40-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-16	File ID:	0427716.D
Sampled:	04/27/10 09:00	Prepared:	05/10/10 17:35	Analyzed:	05/11/10 03:41
Solids:	85.26	Preparation:	5035	Dilution:	1

Batch: 0E10038 Sequence: 0E13718 Calibration: UNASSIGNED Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.474	5.00	Q, S, U
100-41-4	Ethylbenzene		0.757	10.1	Q, S, U
108-88-3	Toluene		0.868	10.1	Q, S, U
1330-20-7	Xylenes (total)	1.72	0.707	10.1	Q, S, J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.28	30.16	99.6	85 - 120	
Dibromofluoromethane	30.28	31.69	105	80 - 125	
1,2-Dichloroethane-d4	30.28	29.97	99.0	75 - 140	
Toluene-d8	30.28	32.35	107	85 - 115	

ANALYSIS DATA SHEET

32SB-41-0507

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7/30/2010

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-18	File ID:	0427718.D
Sampled:	04/28/10 09:20	Prepared:	05/11/10 15:28	Analyzed:	05/12/10 02:55
Solids:	85.94	Preparation:	5035	Dilution:	1

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.487	5.00	U
100-41-4	Ethylbenzene		0.778	10.4	Y, U
108-88-3	Toluene		0.892	10.4	Y, U
1330-20-7	Xylenes (total)		0.726	10.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	31.11	35.39	114	85 - 120	
Dibromofluoromethane	31.11	34.68	111	80 - 125	
1,2-Dichloroethane-d4	31.11	34.00	109	75 - 140	
Toluene-d8	31.11	33.28	107	85 - 115	

ANALYSIS DATA SHEET

32SB-42-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-20RE1	File ID:	0427720.D
Sampled:	04/27/10 09:30	Prepared:	05/20/10 11:09	Analyzed:	05/20/10 21:21
Solids:	88.07	Preparation:	5035	Dilution:	1

Batch: 0E20008 Sequence: 0E14105 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.486	5.00	H1, U
100-41-4	Ethylbenzene		0.776	10.3	H1, U
108-88-3	Toluene		0.889	10.3	H1, U
1330-20-7	Xylenes (total)		0.724	10.3	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	31.02	31.76	102	85 - 120	
Dibromofluoromethane	31.02	29.25	94.3	80 - 125	
1,2-Dichloroethane-d4	31.02	26.97	86.9	75 - 140	
Toluene-d8	31.02	32.58	105	85 - 115	

ANALYSIS DATA SHEET

32SB-FD042810-04

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-23	File ID:	0427723.D
Sampled:	04/28/10 00:00	Prepared:	05/11/10 15:28	Analyzed:	05/12/10 03:26
Solids:	88.18	Preparation:	5035	Dilution:	1

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.456	5.00	U
100-41-4	Ethylbenzene		0.728	9.71	Y, U
108-88-3	Toluene		0.835	9.71	Y, U
1330-20-7	Xylenes (total)		0.680	9.71	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.13	37.29	128	85 - 120	*
Dibromofluoromethane	29.13	32.61	112	80 - 125	
1,2-Dichloroethane-d4	29.13	30.37	104	75 - 140	
Toluene-d8	29.13	34.38	118	85 - 115	*

ANALYSIS DATA SHEET

32SB-FD042810-05

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-24	File ID:	0427724.D
Sampled:	04/28/10 00:00	Prepared:	05/11/10 15:28	Analyzed:	05/12/10 03:56
Solids:	79.63	Preparation:	5035	Dilution:	1

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.527	5.00	U
100-41-4	Ethylbenzene		0.841	11.2	Y, U
108-88-3	Toluene		0.964	11.2	Y, U
1330-20-7	Xylenes (total)		0.785	11.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	33.64	42.28	126	85 - 120	*
Dibromofluoromethane	33.64	36.69	109	80 - 125	
1,2-Dichloroethane-d4	33.64	32.35	96.2	75 - 140	
Toluene-d8	33.64	40.58	121	85 - 115	*

ANALYSIS DATA SHEET

32SB-DW01-0809

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-26	File ID:	0427726.D
Sampled:	04/28/10 12:54	Prepared:	05/15/10 14:52	Analyzed:	05/16/10 03:05
Solids:	86.45	Preparation:	5035	Dilution:	1

Batch: 0E15003 Sequence: 0E14109 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.522	5.00	H1, U
100-41-4	Ethylbenzene		0.833	11.1	H1, S, Y, U
108-88-3	Toluene		0.955	11.1	H1, S, U
1330-20-7	Xylenes (total)		0.777	11.1	S, H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	33.30	89.77	270	85 - 120	*
Dibromofluoromethane	33.30	33.82	102	80 - 125	
1,2-Dichloroethane-d4	33.30	32.20	96.7	75 - 140	
Toluene-d8	33.30	48.40	145	85 - 115	*

ANALYSIS DATA SHEET

32SB-DW01-0809

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-26RE1	File ID:	0427726D.D
Sampled:	04/28/10 12:54	Prepared:	05/21/10 00:00	Analyzed:	05/21/10 21:06
Solids:	86.45	Preparation:	5035	Dilution:	50

Batch: 0E21026 Sequence: 0F15210 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		25.8	220	H1, U
100-41-4	Ethylbenzene		41.2	550	H1, U
108-88-3	Toluene		47.3	550	H1, U
1330-20-7	Xylenes (total)		38.5	550	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	32.99	38.11	116	85 - 120	
Dibromofluoromethane	32.99	31.80	96.4	80 - 125	
1,2-Dichloroethane-d4	32.99	29.38	89.1	75 - 140	
Toluene-d8	32.99	34.34	104	85 - 115	

Data for SW8270C (PAH) Forms

ANALYSIS DATA SHEET

32GW-03

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1004277-01	File ID:	0427701.D
Sampled:	04/27/10 16:42	Prepared:	05/08/10 11:10	Analyzed:	05/30/10 16:23
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0E08002 Sequence: 0F15511 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0187	0.0935	H2, U
50-32-8	Benzo(a)pyrene		0.0187	0.0935	X, H2, U
205-99-2	Benzo(b)fluoranthene		0.0187	0.0935	H2, X, U
207-08-9	Benzo(k)fluoranthene		0.0187	0.0935	H2, X, U
218-01-9	Chrysene		0.0187	0.0935	H2, U
53-70-3	Dibenz(a,h)anthracene		0.0187	0.0935	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0187	0.0935	H2, U
91-20-3	Naphthalene		0.0187	0.0935	H2, Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.73	29.26	62.6	34 - 167	
Terphenyl-d14	46.73	24.50	52.4	34 - 167	

ANALYSIS DATA SHEET

32GW-FD042710-01

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1004277-02	File ID:	0427702.D
Sampled:	04/27/10 00:00	Prepared:	05/08/10 11:10	Analyzed:	05/30/10 17:00
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0E08002 Sequence: 0F15511 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0187	0.0935	H2, U
50-32-8	Benzo(a)pyrene		0.0187	0.0935	H2, X, U
205-99-2	Benzo(b)fluoranthene		0.0187	0.0935	H2, X, U
207-08-9	Benzo(k)fluoranthene		0.0187	0.0935	H2, X, U
218-01-9	Chrysene		0.0187	0.0935	H2, U
53-70-3	Dibenz(a,h)anthracene		0.0187	0.0935	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0187	0.0935	H2, U
91-20-3	Naphthalene		0.0187	0.0935	H2, Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.73	31.71	67.9	34 - 167	
Terphenyl-d14	46.73	39.45	84.4	34 - 167	

ANALYSIS DATA SHEET

32SS-RB042710-01

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-03	File ID:	0427703.D
Sampled:	04/27/10 08:10	Prepared:	05/08/10 11:10	Analyzed:	05/30/10 17:36
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0E08002 Sequence: 0F15511 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0189	0.0943	H2, U
50-32-8	Benzo(a)pyrene		0.0189	0.0943	H2, X, U
205-99-2	Benzo(b)fluoranthene		0.0189	0.0943	H2, X, U
207-08-9	Benzo(k)fluoranthene		0.0189	0.0943	H2, X, U
218-01-9	Chrysene		0.0189	0.0943	H2, U
53-70-3	Dibenz(a,h)anthracene		0.0189	0.0943	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0189	0.0943	H2, U
91-20-3	Naphthalene		0.0189	0.0943	H2, Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	47.17	28.43	60.3	34 - 167	
Terphenyl-d14	47.17	43.86	93.0	34 - 167	

ANALYSIS DATA SHEET

32SS-RB042710-02

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-04	File ID:	0427704.D
Sampled:	04/27/10 11:50	Prepared:	05/08/10 11:10	Analyzed:	05/30/10 18:12
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0E08002 Sequence: 0F15511 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0196	0.0980	H2, U
50-32-8	Benzo(a)pyrene		0.0196	0.0980	H2, X, U
205-99-2	Benzo(b)fluoranthene		0.0196	0.0980	H2, X, U
207-08-9	Benzo(k)fluoranthene		0.0196	0.0980	H2, X, U
218-01-9	Chrysene		0.0196	0.0980	H2, U
53-70-3	Dibenz(a,h)anthracene		0.0196	0.0980	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0196	0.0980	H2, U
91-20-3	Naphthalene		0.0196	0.0980	H2, Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	49.02	30.56	62.4	34 - 167	
Terphenyl-d14	49.02	52.37	107	34 - 167	

ANALYSIS DATA SHEET

32SS-RB042710-03

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-05	File ID:	0427705.D
Sampled:	04/27/10 15:10	Prepared:	05/08/10 11:10	Analyzed:	05/30/10 18:48
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0E08002 Sequence: 0F15511 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0222	0.111	H2, U
50-32-8	Benzo(a)pyrene		0.0222	0.111	H2, X, U
205-99-2	Benzo(b)fluoranthene		0.0222	0.111	H2, X, U
207-08-9	Benzo(k)fluoranthene		0.0222	0.111	H2, X, U
218-01-9	Chrysene		0.0222	0.111	H2, U
53-70-3	Dibenz(a,h)anthracene		0.0222	0.111	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0222	0.111	H2, U
91-20-3	Naphthalene		0.0222	0.111	H2, Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	55.56	35.21	63.4	34 - 167	
Terphenyl-d14	55.56	55.30	99.5	34 - 167	

ANALYSIS DATA SHEET

32SS-RB042810-04

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-06	File ID:	0427706.D
Sampled:	04/27/10 11:16	Prepared:	05/11/10 12:00	Analyzed:	06/05/10 20:36
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0E11002 Sequence: 0F16006 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0196	0.0980	H2, U
50-32-8	Benzo(a)pyrene		0.0196	0.0980	H2, U
205-99-2	Benzo(b)fluoranthene		0.0196	0.0980	H2, U
207-08-9	Benzo(k)fluoranthene		0.0196	0.0980	H2, U
218-01-9	Chrysene		0.0196	0.0980	H2, U
53-70-3	Dibenz(a,h)anthracene		0.0196	0.0980	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0196	0.0980	H2, U
91-20-3	Naphthalene		0.0196	0.0980	H2, U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	49.02	50.27	103	34 - 167	
Terphenyl-d14	49.02	59.70	122	34 - 167	

ANALYSIS DATA SHEET

32SS-31-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-07	File ID:	0427707.D
Sampled:	04/28/10 10:10	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 19:27
Solids:	86.02	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.75	U
50-32-8	Benzo(a)pyrene		1.55	5.81	U
205-99-2	Benzo(b)fluoranthene		1.55	7.75	U
207-08-9	Benzo(k)fluoranthene		1.55	7.75	U
218-01-9	Chrysene		1.55	7.75	X, U
53-70-3	Dibenz(a,h)anthracene		1.55	5.81	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.75	U
91-20-3	Naphthalene		1.55	5.81	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3875	3457	89.2	14 - 129	
Terphenyl-d14	3875	2025	52.3	14 - 129	

ANALYSIS DATA SHEET

32SB-31-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-08	File ID:	0427708.D
Sampled:	04/28/10 10:10	Prepared:	05/12/10 19:30	Analyzed:	06/12/10 18:42
Solids:	87.13	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.53	7.66	U
50-32-8	Benzo(a)pyrene		1.53	5.74	X, U
205-99-2	Benzo(b)fluoranthene		1.53	7.66	U
207-08-9	Benzo(k)fluoranthene		1.53	7.66	U
218-01-9	Chrysene		1.53	7.66	U
53-70-3	Dibenz(a,h)anthracene		1.53	5.74	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.53	7.66	X, U
91-20-3	Naphthalene		1.53	5.74	N, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3826	3467	90.6	14 - 129	
Terphenyl-d14	3826	2954	77.2	14 - 129	

ANALYSIS DATA SHEET

32SS-35-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-09	File ID:	0427709.D
Sampled:	04/28/10 10:25	Prepared:	05/12/10 19:30	Analyzed:	06/12/10 19:16
Solids:	86.02	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.75	U
50-32-8	Benzo(a)pyrene		1.55	5.81	X, U
205-99-2	Benzo(b)fluoranthene		1.55	7.75	U
207-08-9	Benzo(k)fluoranthene		1.55	7.75	U
218-01-9	Chrysene		1.55	7.75	U
53-70-3	Dibenz(a,h)anthracene		1.55	5.81	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.75	X, U
91-20-3	Naphthalene		1.55	5.81	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3875	3300	85.2	14 - 129	
Terphenyl-d14	3875	3178	82.0	14 - 129	

ANALYSIS DATA SHEET

32SB-35-0507

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-10	File ID:	0427710.D
Sampled:	04/28/10 10:25	Prepared:	05/12/10 19:30	Analyzed:	06/12/10 19:50
Solids:	85.65	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.79	U
50-32-8	Benzo(a)pyrene		1.55	5.84	X, U
205-99-2	Benzo(b)fluoranthene		1.55	7.79	U
207-08-9	Benzo(k)fluoranthene		1.55	7.79	U
218-01-9	Chrysene		1.55	7.79	U
53-70-3	Dibenz(a,h)anthracene		1.55	5.84	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.79	X, U
91-20-3	Naphthalene		1.55	5.84	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3892	3725	95.7	14 - 129	
Terphenyl-d14	3892	3338	85.8	14 - 129	

ANALYSIS DATA SHEET

32SS-38-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-11	File ID:	0427711.D
Sampled:	04/27/10 08:50	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 20:03
Solids:	87.96	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.51	7.58	U
50-32-8	Benzo(a)pyrene		1.51	5.68	U
205-99-2	Benzo(b)fluoranthene		1.51	7.58	U
207-08-9	Benzo(k)fluoranthene		1.51	7.58	U
218-01-9	Chrysene		1.51	7.58	X, U
53-70-3	Dibenz(a,h)anthracene		1.51	5.68	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.51	7.58	U
91-20-3	Naphthalene		1.51	5.68	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3790	3355	88.5	14 - 129	
Terphenyl-d14	3790	2171	57.3	14 - 129	

ANALYSIS DATA SHEET

32SB-38-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-12	File ID:	0427712.D
Sampled:	04/27/10 08:50	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 20:39
Solids:	82.86	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.61	8.05	U
50-32-8	Benzo(a)pyrene		1.61	6.03	U
205-99-2	Benzo(b)fluoranthene		1.61	8.05	U
207-08-9	Benzo(k)fluoranthene		1.61	8.05	U
218-01-9	Chrysene		1.61	8.05	X, U
53-70-3	Dibenz(a,h)anthracene		1.61	6.03	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.61	8.05	U
91-20-3	Naphthalene		1.61	6.03	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4023	3282	81.6	14 - 129	
Terphenyl-d14	4023	2248	55.9	14 - 129	

ANALYSIS DATA SHEET

32SS-39-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-13	File ID:	0427713.D
Sampled:	04/28/10 10:45	Prepared:	05/12/10 19:30	Analyzed:	06/12/10 20:25
Solids:	85.92	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.76	U
50-32-8	Benzo(a)pyrene		1.55	5.82	X, U
205-99-2	Benzo(b)fluoranthene		1.55	7.76	U
207-08-9	Benzo(k)fluoranthene		1.55	7.76	U
218-01-9	Chrysene		1.55	7.76	U
53-70-3	Dibenz(a,h)anthracene		1.55	5.82	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.76	X, U
91-20-3	Naphthalene		1.55	5.82	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3880	3569	92.0	14 - 129	
Terphenyl-d14	3880	3504	90.3	14 - 129	

ANALYSIS DATA SHEET

32SB-39-0507

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-14	File ID:	0427714.D
Sampled:	04/28/10 10:45	Prepared:	05/12/10 19:30	Analyzed:	06/12/10 20:59
Solids:	81.93	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.62	8.14	U
50-32-8	Benzo(a)pyrene		1.62	6.10	X, U
205-99-2	Benzo(b)fluoranthene		1.62	8.14	U
207-08-9	Benzo(k)fluoranthene		1.62	8.14	U
218-01-9	Chrysene		1.62	8.14	N, U
53-70-3	Dibenz(a,h)anthracene		1.62	6.10	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.62	8.14	X, U
91-20-3	Naphthalene		1.62	6.10	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4069	3310	81.3	14 - 129	
Terphenyl-d14	4069	4069	100	14 - 129	

ANALYSIS DATA SHEET

32SS-40-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-15	File ID:	0427715.D
Sampled:	04/27/10 09:00	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 21:15
Solids:	86.92	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.53	7.67	U
50-32-8	Benzo(a)pyrene		1.53	5.75	U
205-99-2	Benzo(b)fluoranthene		1.53	7.67	U
207-08-9	Benzo(k)fluoranthene		1.53	7.67	U
218-01-9	Chrysene		1.53	7.67	X, U
53-70-3	Dibenz(a,h)anthracene		1.53	5.75	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.53	7.67	U
91-20-3	Naphthalene		1.53	5.75	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3835	3023	78.8	14 - 129	
Terphenyl-d14	3835	2024	52.8	14 - 129	

ANALYSIS DATA SHEET

32SB-40-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-16	File ID:	0427716.D
Sampled:	04/27/10 09:00	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 21:51
Solids:	85.26	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.56	7.82	U
50-32-8	Benzo(a)pyrene		1.56	5.86	U
205-99-2	Benzo(b)fluoranthene		1.56	7.82	U
207-08-9	Benzo(k)fluoranthene		1.56	7.82	U
218-01-9	Chrysene		1.56	7.82	X, U
53-70-3	Dibenz(a,h)anthracene		1.56	5.86	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.56	7.82	U
91-20-3	Naphthalene		1.56	5.86	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3909	4196	107	14 - 129	
Terphenyl-d14	3909	2840	72.7	14 - 129	

ANALYSIS DATA SHEET

32SS-41-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-17	File ID:	0427717.D
Sampled:	04/28/10 09:20	Prepared:	05/12/10 19:30	Analyzed:	06/12/10 21:33
Solids:	86.07	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.75	U
50-32-8	Benzo(a)pyrene		1.55	5.81	X, U
205-99-2	Benzo(b)fluoranthene		1.55	7.75	U
207-08-9	Benzo(k)fluoranthene		1.55	7.75	U
218-01-9	Chrysene		1.55	7.75	U
53-70-3	Dibenz(a,h)anthracene		1.55	5.81	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.75	X, U
91-20-3	Naphthalene		1.55	5.81	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3873	2948	76.1	14 - 129	
Terphenyl-d14	3873	2994	77.3	14 - 129	

ANALYSIS DATA SHEET

32SB-41-~~0507~~

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CCL 7/30/2010

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_005	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1004277-18	File ID:	0427718.D
Sampled:	04/28/10 09:20	Prepared:	05/12/10 19:30	Analyzed:	06/13/10 10:56
Solids:	85.94	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.76	X, U
50-32-8	Benzo(a)pyrene		1.55	5.82	X, U
205-99-2	Benzo(b)fluoranthene		1.55	7.76	U
207-08-9	Benzo(k)fluoranthene		1.55	7.76	U
218-01-9	Chrysene		1.55	7.76	X, U
53-70-3	Dibenz(a,h)anthracene		1.55	5.82	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.76	X, U
91-20-3	Naphthalene		1.55	5.82	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3879	3903	101	14 - 129	
Terphenyl-d14	3879	3583	92.4	14 - 129	

ANALYSIS DATA SHEET

32SS-42-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-19	File ID:	0427719.D
Sampled:	04/27/10 09:30	Prepared:	05/20/10 13:40	Analyzed:	06/13/10 02:24
Solids:	86.00	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.76	U
50-32-8	Benzo(a)pyrene		1.55	5.81	U
205-99-2	Benzo(b)fluoranthene		1.55	7.76	U
207-08-9	Benzo(k)fluoranthene		1.55	7.76	U
218-01-9	Chrysene		1.55	7.76	X, U
53-70-3	Dibenz(a,h)anthracene		1.55	5.81	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.76	U
91-20-3	Naphthalene		1.55	5.81	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3876	2300	59.3	14 - 129	
Terphenyl-d14	3876	2311	59.6	14 - 129	

ANALYSIS DATA SHEET

32SB-42-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-20	File ID:	0427720.D
Sampled:	04/27/10 09:30	Prepared:	05/20/10 13:40	Analyzed:	06/13/10 03:00
Solids:	88.07	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.51	7.57	U
50-32-8	Benzo(a)pyrene		1.51	5.68	U
205-99-2	Benzo(b)fluoranthene		1.51	7.57	U
207-08-9	Benzo(k)fluoranthene		1.51	7.57	U
218-01-9	Chrysene		1.51	7.57	X, U
53-70-3	Dibenz(a,h)anthracene		1.51	5.68	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.51	7.57	U
91-20-3	Naphthalene		1.51	5.68	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3785	3519	93.0	14 - 129	
Terphenyl-d14	3785	2433	64.3	14 - 129	

ANALYSIS DATA SHEET

32SS-FD042810-04

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-21	File ID:	0427721.D
Sampled:	04/28/10 00:00	Prepared:	05/12/10 19:30	Analyzed:	06/13/10 06:23
Solids:	87.90	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.51	7.59	X, U
50-32-8	Benzo(a)pyrene		1.51	5.69	X, U
205-99-2	Benzo(b)fluoranthene		1.51	7.59	U
207-08-9	Benzo(k)fluoranthene		1.51	7.59	U
218-01-9	Chrysene		1.51	7.59	X, U
53-70-3	Dibenz(a,h)anthracene		1.51	5.69	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.51	7.59	X, U
91-20-3	Naphthalene		1.51	5.69	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3792	3346	88.2	14 - 129	
Terphenyl-d14	3792	3309	87.3	14 - 129	

ANALYSIS DATA SHEET

32SS-FD042810-05

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-22	File ID:	0427722.D
Sampled:	04/28/10 00:00	Prepared:	05/12/10 19:30	Analyzed:	06/13/10 06:57
Solids:	86.82	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.53	7.68	X, U
50-32-8	Benzo(a)pyrene		1.53	5.76	X, U
205-99-2	Benzo(b)fluoranthene		1.53	7.68	U
207-08-9	Benzo(k)fluoranthene		1.53	7.68	U
218-01-9	Chrysene		1.53	7.68	X, U
53-70-3	Dibenz(a,h)anthracene		1.53	5.76	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.53	7.68	X, U
91-20-3	Naphthalene		1.53	5.76	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3839	3018	78.6	14 - 129	
Terphenyl-d14	3839	3312	86.3	14 - 129	

ANALYSIS DATA SHEET

32SB-FD042810-04

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-23	File ID:	0427723.D
Sampled:	04/28/10 00:00	Prepared:	05/12/10 19:30	Analyzed:	06/13/10 07:31
Solids:	88.18	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	6.41	1.51	7.56	X, J
50-32-8	Benzo(a)pyrene	4.36	1.51	5.67	X, J
205-99-2	Benzo(b)fluoranthene	4.72	1.51	7.56	J
207-08-9	Benzo(k)fluoranthene	4.93	1.51	7.56	J
218-01-9	Chrysene	5.99	1.51	7.56	X, J
53-70-3	Dibenz(a,h)anthracene	5.97	1.51	5.67	X
193-39-5	Indeno(1,2,3-cd)pyrene	5.64	1.51	7.56	X, J
91-20-3	Naphthalene	3.84	1.51	5.67	J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3780	3477	92.0	14 - 129	
Terphenyl-d14	3780	3380	89.4	14 - 129	

ANALYSIS DATA SHEET

32SB-FD042810-05

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-24	File ID:	0427724D.D
Sampled:	04/28/10 00:00	Prepared:	05/12/10 19:30	Analyzed:	06/15/10 12:24
Solids:	79.63	Preparation:	EXT_3546	Dilution:	10

Batch: 0E12916 Sequence: 0F16727 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		16.7	83.8	U
50-32-8	Benzo(a)pyrene		16.7	62.8	X, U
205-99-2	Benzo(b)fluoranthene		16.7	83.8	U
207-08-9	Benzo(k)fluoranthene		16.7	83.8	X, U
218-01-9	Chrysene		16.7	83.8	U
53-70-3	Dibenz(a,h)anthracene		16.7	62.8	U
193-39-5	Indeno(1,2,3-cd)pyrene		16.7	83.8	U
91-20-3	Naphthalene		16.7	62.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4186	2980	71.2	14 - 129	
Terphenyl-d14	4186	3158	75.4	14 - 129	

ANALYSIS DATA SHEET

32SS-DW01-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-25	File ID:	0427725D.D
Sampled:	04/28/10 12:54	Prepared:	05/12/10 19:30	Analyzed:	06/15/10 12:59
Solids:	81.59	Preparation:	EXT_3546	Dilution:	10

Batch: 0E12916 Sequence: 0F16727 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		16.3	81.8	U
50-32-8	Benzo(a)pyrene		16.3	61.3	X, U
205-99-2	Benzo(b)fluoranthene		16.3	81.8	U
207-08-9	Benzo(k)fluoranthene		16.3	81.8	X, U
218-01-9	Chrysene		16.3	81.8	U
53-70-3	Dibenz(a,h)anthracene		16.3	61.3	U
193-39-5	Indeno(1,2,3-cd)pyrene		16.3	81.8	U
91-20-3	Naphthalene		16.3	61.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4086	2421	59.2	14 - 129	
Terphenyl-d14	4086	2689	65.8	14 - 129	

ANALYSIS DATA SHEET

32SB-DW01-0809

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-26	File ID:	0427726.D
Sampled:	04/28/10 12:54	Prepared:	05/12/10 19:30	Analyzed:	06/13/10 12:39
Solids:	86.45	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	9.44	1.54	7.72	X
50-32-8	Benzo(a)pyrene	7.43	1.54	5.78	X
205-99-2	Benzo(b)fluoranthene	7.78	1.54	7.72	
207-08-9	Benzo(k)fluoranthene	9.45	1.54	7.72	
218-01-9	Chrysene	15.3	1.54	7.72	X
53-70-3	Dibenz(a,h)anthracene	9.23	1.54	5.78	X
193-39-5	Indeno(1,2,3-cd)pyrene	7.05	1.54	7.72	X, J
91-20-3	Naphthalene		1.54	5.78	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3856	2992	77.6	14 - 129	
Terphenyl-d14	3856	3630	94.2	14 - 129	

Data for SW8260B Forms

ANALYSIS DATA SHEET

32GW-03

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1004277-01	File ID:	0427701.D
Sampled:	04/27/10 16:42	Prepared:	05/10/10 00:00	Analyzed:	05/10/10 18:59
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E10024 Sequence: 0E13404 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.16	101	75 - 120	
Dibromofluoromethane	30.00	29.94	99.8	85 - 115	
1,2-Dichloroethane-d4	30.00	29.82	99.4	70 - 120	
Toluene-d8	30.00	32.38	108	85 - 120	

ANALYSIS DATA SHEET

32GW-FD042710-01

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1004277-02	File ID:	0427702.D
Sampled:	04/27/10 00:00	Prepared:	05/10/10 00:00	Analyzed:	05/10/10 19:29
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E10024 Sequence: 0E13404 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.40	101	75 - 120	
Dibromofluoromethane	30.00	30.07	100	85 - 115	
1,2-Dichloroethane-d4	30.00	30.10	100	70 - 120	
Toluene-d8	30.00	31.94	106	85 - 120	

ANALYSIS DATA SHEET

32SS-RB042710-01

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-03	File ID:	0427703.D
Sampled:	04/27/10 08:10	Prepared:	05/10/10 00:00	Analyzed:	05/10/10 19:59
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E10024 Sequence: 0E13404 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.12	104	75 - 120	
Dibromofluoromethane	30.00	29.64	98.8	85 - 115	
1,2-Dichloroethane-d4	30.00	29.88	99.6	70 - 120	
Toluene-d8	30.00	32.44	108	85 - 120	

ANALYSIS DATA SHEET

32SS-RB042710-02

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-04	File ID:	0427704.D
Sampled:	04/27/10 11:50	Prepared:	05/10/10 00:00	Analyzed:	05/10/10 20:29
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E10024 Sequence: 0E13404 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.89	99.6	75 - 120	
Dibromofluoromethane	30.00	29.73	99.1	85 - 115	
1,2-Dichloroethane-d4	30.00	29.50	98.3	70 - 120	
Toluene-d8	30.00	31.91	106	85 - 120	

ANALYSIS DATA SHEET

32SS-RB042710-03

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-05	File ID:	0427705.D
Sampled:	04/27/10 15:10	Prepared:	05/10/10 00:00	Analyzed:	05/10/10 20:59
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E10024 Sequence: 0E13404 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.38	101	75 - 120	
Dibromofluoromethane	30.00	30.15	101	85 - 115	
1,2-Dichloroethane-d4	30.00	30.06	100	70 - 120	
Toluene-d8	30.00	32.49	108	85 - 120	

ANALYSIS DATA SHEET

32SS-RB042810-04

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-06	File ID:	0427706.D
Sampled:	04/27/10 11:16	Prepared:	05/10/10 00:00	Analyzed:	05/10/10 21:28
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E10024 Sequence: 0E13404 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.15	100	75 - 120	
Dibromofluoromethane	30.00	29.59	98.6	85 - 115	
1,2-Dichloroethane-d4	30.00	30.27	101	70 - 120	
Toluene-d8	30.00	32.42	108	85 - 120	

ANALYSIS DATA SHEET

32SB-31-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-08	File ID:	0427708.D
Sampled:	04/28/10 10:10	Prepared:	05/11/10 15:28	Analyzed:	05/12/10 01:23
Solids:	87.13	Preparation:	5035	Dilution:	1

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.467	5.00	U
100-41-4	Ethylbenzene		0.746	9.95	Y, U
108-88-3	Toluene		0.855	9.95	Y, U
1330-20-7	Xylenes (total)		0.696	9.95	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.84	33.32	112	85 - 120	
Dibromofluoromethane	29.84	30.86	103	80 - 125	
1,2-Dichloroethane-d4	29.84	29.51	98.9	75 - 140	
Toluene-d8	29.84	31.53	106	85 - 115	

ANALYSIS DATA SHEET

32SB-35-0507

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-10	File ID:	0427710.D
Sampled:	04/28/10 10:25	Prepared:	05/11/10 15:28	Analyzed:	05/12/10 01:54
Solids:	85.65	Preparation:	5035	Dilution:	1

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.481	5.00	U
100-41-4	Ethylbenzene		0.767	10.2	Y, U
108-88-3	Toluene		0.879	10.2	Y, U
1330-20-7	Xylenes (total)		0.716	10.2	N, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.67	35.97	117	85 - 120	
Dibromofluoromethane	30.67	32.46	106	80 - 125	
1,2-Dichloroethane-d4	30.67	31.88	104	75 - 140	
Toluene-d8	30.67	34.08	111	85 - 115	

ANALYSIS DATA SHEET

32SB-38-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-12	File ID:	0427712.D
Sampled:	04/27/10 08:50	Prepared:	05/10/10 17:35	Analyzed:	05/11/10 03:02
Solids:	82.86	Preparation:	5035	Dilution:	1

Batch: 0E10038 Sequence: 0E13718 Calibration: UNASSIGNED Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.471	5.00	Q, U
100-41-4	Ethylbenzene		0.752	10.0	Q, U
108-88-3	Toluene		0.862	10.0	Q, U
1330-20-7	Xylenes (total)		0.702	10.0	Q, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.07	30.39	101	85 - 120	
Dibromofluoromethane	30.07	29.26	97.3	80 - 125	
1,2-Dichloroethane-d4	30.07	27.30	90.8	75 - 140	
Toluene-d8	30.07	33.35	111	85 - 115	

ANALYSIS DATA SHEET

32SB-39-0507

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-14	File ID:	0427714.D
Sampled:	04/28/10 10:45	Prepared:	05/11/10 15:28	Analyzed:	05/12/10 02:24
Solids:	81.93	Preparation:	5035	Dilution:	1

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.479	5.00	U
100-41-4	Ethylbenzene		0.764	10.2	Y, U
108-88-3	Toluene		0.876	10.2	Y, U
1330-20-7	Xylenes (total)		0.713	10.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.57	37.43	122	85 - 120	*
Dibromofluoromethane	30.57	32.14	105	80 - 125	
1,2-Dichloroethane-d4	30.57	30.12	98.6	75 - 140	
Toluene-d8	30.57	36.02	118	85 - 115	*

ANALYSIS DATA SHEET

32SB-40-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-16	File ID:	0427716.D
Sampled:	04/27/10 09:00	Prepared:	05/10/10 17:35	Analyzed:	05/11/10 03:41
Solids:	85.26	Preparation:	5035	Dilution:	1

Batch: 0E10038 Sequence: 0E13718 Calibration: UNASSIGNED Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.474	5.00	Q, S, U
100-41-4	Ethylbenzene		0.757	10.1	Q, S, U
108-88-3	Toluene		0.868	10.1	Q, S, U
1330-20-7	Xylenes (total)	1.72	0.707	10.1	Q, S, J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.28	30.16	99.6	85 - 120	
Dibromofluoromethane	30.28	31.69	105	80 - 125	
1,2-Dichloroethane-d4	30.28	29.97	99.0	75 - 140	
Toluene-d8	30.28	32.35	107	85 - 115	

ANALYSIS DATA SHEET

32SB-41-0507

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-18	File ID:	0427718.D
Sampled:	04/28/10 09:20	Prepared:	05/11/10 15:28	Analyzed:	05/12/10 02:55
Solids:	85.94	Preparation:	5035	Dilution:	1

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.487	5.00	U
100-41-4	Ethylbenzene		0.778	10.4	Y, U
108-88-3	Toluene		0.892	10.4	Y, U
1330-20-7	Xylenes (total)		0.726	10.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	31.11	35.39	114	85 - 120	
Dibromofluoromethane	31.11	34.68	111	80 - 125	
1,2-Dichloroethane-d4	31.11	34.00	109	75 - 140	
Toluene-d8	31.11	33.28	107	85 - 115	

ANALYSIS DATA SHEET

32SB-42-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-20RE1	File ID:	0427720.D
Sampled:	04/27/10 09:30	Prepared:	05/20/10 11:09	Analyzed:	05/20/10 21:21
Solids:	88.07	Preparation:	5035	Dilution:	1

Batch: 0E20008 Sequence: 0E14105 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.486	5.00	H1, U
100-41-4	Ethylbenzene		0.776	10.3	H1, U
108-88-3	Toluene		0.889	10.3	H1, U
1330-20-7	Xylenes (total)		0.724	10.3	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	31.02	31.76	102	85 - 120	
Dibromofluoromethane	31.02	29.25	94.3	80 - 125	
1,2-Dichloroethane-d4	31.02	26.97	86.9	75 - 140	
Toluene-d8	31.02	32.58	105	85 - 115	

ANALYSIS DATA SHEET

32SB-FD042810-04

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-23	File ID:	0427723.D
Sampled:	04/28/10 00:00	Prepared:	05/11/10 15:28	Analyzed:	05/12/10 03:26
Solids:	88.18	Preparation:	5035	Dilution:	1

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.456	5.00	U
100-41-4	Ethylbenzene		0.728	9.71	Y, U
108-88-3	Toluene		0.835	9.71	Y, U
1330-20-7	Xylenes (total)		0.680	9.71	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.13	37.29	128	85 - 120	*
Dibromofluoromethane	29.13	32.61	112	80 - 125	
1,2-Dichloroethane-d4	29.13	30.37	104	75 - 140	
Toluene-d8	29.13	34.38	118	85 - 115	*

ANALYSIS DATA SHEET

32SB-FD042810-05

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-24	File ID:	0427724.D
Sampled:	04/28/10 00:00	Prepared:	05/11/10 15:28	Analyzed:	05/12/10 03:56
Solids:	79.63	Preparation:	5035	Dilution:	1

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.527	5.00	U
100-41-4	Ethylbenzene		0.841	11.2	Y, U
108-88-3	Toluene		0.964	11.2	Y, U
1330-20-7	Xylenes (total)		0.785	11.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	33.64	42.28	126	85 - 120	*
Dibromofluoromethane	33.64	36.69	109	80 - 125	
1,2-Dichloroethane-d4	33.64	32.35	96.2	75 - 140	
Toluene-d8	33.64	40.58	121	85 - 115	*

ANALYSIS DATA SHEET

32SB-DW01-0809

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-26	File ID:	0427726.D
Sampled:	04/28/10 12:54	Prepared:	05/15/10 14:52	Analyzed:	05/16/10 03:05
Solids:	86.45	Preparation:	5035	Dilution:	1

Batch: 0E15003 Sequence: 0E14109 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.522	5.00	H1, U
100-41-4	Ethylbenzene		0.833	11.1	H1, S, Y, U
108-88-3	Toluene		0.955	11.1	H1, S, U
1330-20-7	Xylenes (total)		0.777	11.1	S, H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	33.30	89.77	270	85 - 120	*
Dibromofluoromethane	33.30	33.82	102	80 - 125	
1,2-Dichloroethane-d4	33.30	32.20	96.7	75 - 140	
Toluene-d8	33.30	48.40	145	85 - 115	*

ANALYSIS DATA SHEET

32SB-DW01-0809

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-26RE1	File ID:	0427726D.D
Sampled:	04/28/10 12:54	Prepared:	05/21/10 00:00	Analyzed:	05/21/10 21:06
Solids:	86.45	Preparation:	5035	Dilution:	50

Batch: 0E21026 Sequence: 0F15210 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		25.8	220	H1, U
100-41-4	Ethylbenzene		41.2	550	H1, U
108-88-3	Toluene		47.3	550	H1, U
1330-20-7	Xylenes (total)		38.5	550	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	32.99	38.11	116	85 - 120	
Dibromofluoromethane	32.99	31.80	96.4	80 - 125	
1,2-Dichloroethane-d4	32.99	29.38	89.1	75 - 140	
Toluene-d8	32.99	34.34	104	85 - 115	

Data for SW8270C (PAH) Forms

ANALYSIS DATA SHEET

32GW-03

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1004277-01	File ID:	0427701.D
Sampled:	04/27/10 16:42	Prepared:	05/08/10 11:10	Analyzed:	05/30/10 16:23
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0E08002 Sequence: 0F15511 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0187	0.0935	H2, U
50-32-8	Benzo(a)pyrene		0.0187	0.0935	X, H2, U
205-99-2	Benzo(b)fluoranthene		0.0187	0.0935	H2, X, U
207-08-9	Benzo(k)fluoranthene		0.0187	0.0935	H2, X, U
218-01-9	Chrysene		0.0187	0.0935	H2, U
53-70-3	Dibenz(a,h)anthracene		0.0187	0.0935	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0187	0.0935	H2, U
91-20-3	Naphthalene		0.0187	0.0935	H2, Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.73	29.26	62.6	34 - 167	
Terphenyl-d14	46.73	24.50	52.4	34 - 167	

ANALYSIS DATA SHEET

32GW-FD042710-01

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1004277-02	File ID:	0427702.D
Sampled:	04/27/10 00:00	Prepared:	05/08/10 11:10	Analyzed:	05/30/10 17:00
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0E08002 Sequence: 0F15511 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0187	0.0935	H2, U
50-32-8	Benzo(a)pyrene		0.0187	0.0935	H2, X, U
205-99-2	Benzo(b)fluoranthene		0.0187	0.0935	H2, X, U
207-08-9	Benzo(k)fluoranthene		0.0187	0.0935	H2, X, U
218-01-9	Chrysene		0.0187	0.0935	H2, U
53-70-3	Dibenz(a,h)anthracene		0.0187	0.0935	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0187	0.0935	H2, U
91-20-3	Naphthalene		0.0187	0.0935	H2, Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.73	31.71	67.9	34 - 167	
Terphenyl-d14	46.73	39.45	84.4	34 - 167	

ANALYSIS DATA SHEET

32SS-RB042710-01

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-03	File ID:	0427703.D
Sampled:	04/27/10 08:10	Prepared:	05/08/10 11:10	Analyzed:	05/30/10 17:36
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0E08002 Sequence: 0F15511 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0189	0.0943	H2, U
50-32-8	Benzo(a)pyrene		0.0189	0.0943	H2, X, U
205-99-2	Benzo(b)fluoranthene		0.0189	0.0943	H2, X, U
207-08-9	Benzo(k)fluoranthene		0.0189	0.0943	H2, X, U
218-01-9	Chrysene		0.0189	0.0943	H2, U
53-70-3	Dibenz(a,h)anthracene		0.0189	0.0943	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0189	0.0943	H2, U
91-20-3	Naphthalene		0.0189	0.0943	H2, Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	47.17	28.43	60.3	34 - 167	
Terphenyl-d14	47.17	43.86	93.0	34 - 167	

ANALYSIS DATA SHEET

32SS-RB042710-02

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-04	File ID:	0427704.D
Sampled:	04/27/10 11:50	Prepared:	05/08/10 11:10	Analyzed:	05/30/10 18:12
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0E08002 Sequence: 0F15511 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0196	0.0980	H2, U
50-32-8	Benzo(a)pyrene		0.0196	0.0980	H2, X, U
205-99-2	Benzo(b)fluoranthene		0.0196	0.0980	H2, X, U
207-08-9	Benzo(k)fluoranthene		0.0196	0.0980	H2, X, U
218-01-9	Chrysene		0.0196	0.0980	H2, U
53-70-3	Dibenz(a,h)anthracene		0.0196	0.0980	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0196	0.0980	H2, U
91-20-3	Naphthalene		0.0196	0.0980	H2, Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	49.02	30.56	62.4	34 - 167	
Terphenyl-d14	49.02	52.37	107	34 - 167	

ANALYSIS DATA SHEET

32SS-RB042710-03

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-05	File ID:	0427705.D
Sampled:	04/27/10 15:10	Prepared:	05/08/10 11:10	Analyzed:	05/30/10 18:48
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0E08002 Sequence: 0F15511 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0222	0.111	H2, U
50-32-8	Benzo(a)pyrene		0.0222	0.111	H2, X, U
205-99-2	Benzo(b)fluoranthene		0.0222	0.111	H2, X, U
207-08-9	Benzo(k)fluoranthene		0.0222	0.111	H2, X, U
218-01-9	Chrysene		0.0222	0.111	H2, U
53-70-3	Dibenz(a,h)anthracene		0.0222	0.111	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0222	0.111	H2, U
91-20-3	Naphthalene		0.0222	0.111	H2, Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	55.56	35.21	63.4	34 - 167	
Terphenyl-d14	55.56	55.30	99.5	34 - 167	

ANALYSIS DATA SHEET

32SS-RB042810-04

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004277-06	File ID:	0427706.D
Sampled:	04/27/10 11:16	Prepared:	05/11/10 12:00	Analyzed:	06/05/10 20:36
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0E11002 Sequence: 0F16006 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0196	0.0980	H2, U
50-32-8	Benzo(a)pyrene		0.0196	0.0980	H2, U
205-99-2	Benzo(b)fluoranthene		0.0196	0.0980	H2, U
207-08-9	Benzo(k)fluoranthene		0.0196	0.0980	H2, U
218-01-9	Chrysene		0.0196	0.0980	H2, U
53-70-3	Dibenz(a,h)anthracene		0.0196	0.0980	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0196	0.0980	H2, U
91-20-3	Naphthalene		0.0196	0.0980	H2, U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	49.02	50.27	103	34 - 167	
Terphenyl-d14	49.02	59.70	122	34 - 167	

ANALYSIS DATA SHEET

32SS-31-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-07	File ID:	0427707.D
Sampled:	04/28/10 10:10	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 19:27
Solids:	86.02	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.75	U
50-32-8	Benzo(a)pyrene		1.55	5.81	U
205-99-2	Benzo(b)fluoranthene		1.55	7.75	U
207-08-9	Benzo(k)fluoranthene		1.55	7.75	U
218-01-9	Chrysene		1.55	7.75	X, U
53-70-3	Dibenz(a,h)anthracene		1.55	5.81	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.75	U
91-20-3	Naphthalene		1.55	5.81	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3875	3457	89.2	14 - 129	
Terphenyl-d14	3875	2025	52.3	14 - 129	

ANALYSIS DATA SHEET

32SB-31-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-08	File ID:	0427708.D
Sampled:	04/28/10 10:10	Prepared:	05/12/10 19:30	Analyzed:	06/12/10 18:42
Solids:	87.13	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.53	7.66	U
50-32-8	Benzo(a)pyrene		1.53	5.74	X, U
205-99-2	Benzo(b)fluoranthene		1.53	7.66	U
207-08-9	Benzo(k)fluoranthene		1.53	7.66	U
218-01-9	Chrysene		1.53	7.66	U
53-70-3	Dibenz(a,h)anthracene		1.53	5.74	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.53	7.66	X, U
91-20-3	Naphthalene		1.53	5.74	N, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3826	3467	90.6	14 - 129	
Terphenyl-d14	3826	2954	77.2	14 - 129	

ANALYSIS DATA SHEET

32SS-35-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-09	File ID:	0427709.D
Sampled:	04/28/10 10:25	Prepared:	05/12/10 19:30	Analyzed:	06/12/10 19:16
Solids:	86.02	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.75	U
50-32-8	Benzo(a)pyrene		1.55	5.81	X, U
205-99-2	Benzo(b)fluoranthene		1.55	7.75	U
207-08-9	Benzo(k)fluoranthene		1.55	7.75	U
218-01-9	Chrysene		1.55	7.75	U
53-70-3	Dibenz(a,h)anthracene		1.55	5.81	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.75	X, U
91-20-3	Naphthalene		1.55	5.81	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3875	3300	85.2	14 - 129	
Terphenyl-d14	3875	3178	82.0	14 - 129	

ANALYSIS DATA SHEET

32SB-35-0507

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-10	File ID:	0427710.D
Sampled:	04/28/10 10:25	Prepared:	05/12/10 19:30	Analyzed:	06/12/10 19:50
Solids:	85.65	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.79	U
50-32-8	Benzo(a)pyrene		1.55	5.84	X, U
205-99-2	Benzo(b)fluoranthene		1.55	7.79	U
207-08-9	Benzo(k)fluoranthene		1.55	7.79	U
218-01-9	Chrysene		1.55	7.79	U
53-70-3	Dibenz(a,h)anthracene		1.55	5.84	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.79	X, U
91-20-3	Naphthalene		1.55	5.84	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3892	3725	95.7	14 - 129	
Terphenyl-d14	3892	3338	85.8	14 - 129	

ANALYSIS DATA SHEET

32SS-38-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-11	File ID:	0427711.D
Sampled:	04/27/10 08:50	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 20:03
Solids:	87.96	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.51	7.58	U
50-32-8	Benzo(a)pyrene		1.51	5.68	U
205-99-2	Benzo(b)fluoranthene		1.51	7.58	U
207-08-9	Benzo(k)fluoranthene		1.51	7.58	U
218-01-9	Chrysene		1.51	7.58	X, U
53-70-3	Dibenz(a,h)anthracene		1.51	5.68	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.51	7.58	U
91-20-3	Naphthalene		1.51	5.68	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3790	3355	88.5	14 - 129	
Terphenyl-d14	3790	2171	57.3	14 - 129	

ANALYSIS DATA SHEET

32SB-38-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-12	File ID:	0427712.D
Sampled:	04/27/10 08:50	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 20:39
Solids:	82.86	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.61	8.05	U
50-32-8	Benzo(a)pyrene		1.61	6.03	U
205-99-2	Benzo(b)fluoranthene		1.61	8.05	U
207-08-9	Benzo(k)fluoranthene		1.61	8.05	U
218-01-9	Chrysene		1.61	8.05	X, U
53-70-3	Dibenz(a,h)anthracene		1.61	6.03	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.61	8.05	U
91-20-3	Naphthalene		1.61	6.03	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4023	3282	81.6	14 - 129	
Terphenyl-d14	4023	2248	55.9	14 - 129	

ANALYSIS DATA SHEET

32SS-39-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-13	File ID:	0427713.D
Sampled:	04/28/10 10:45	Prepared:	05/12/10 19:30	Analyzed:	06/12/10 20:25
Solids:	85.92	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.76	U
50-32-8	Benzo(a)pyrene		1.55	5.82	X, U
205-99-2	Benzo(b)fluoranthene		1.55	7.76	U
207-08-9	Benzo(k)fluoranthene		1.55	7.76	U
218-01-9	Chrysene		1.55	7.76	U
53-70-3	Dibenz(a,h)anthracene		1.55	5.82	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.76	X, U
91-20-3	Naphthalene		1.55	5.82	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3880	3569	92.0	14 - 129	
Terphenyl-d14	3880	3504	90.3	14 - 129	

ANALYSIS DATA SHEET

32SB-39-0507

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-14	File ID:	0427714.D
Sampled:	04/28/10 10:45	Prepared:	05/12/10 19:30	Analyzed:	06/12/10 20:59
Solids:	81.93	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.62	8.14	U
50-32-8	Benzo(a)pyrene		1.62	6.10	X, U
205-99-2	Benzo(b)fluoranthene		1.62	8.14	U
207-08-9	Benzo(k)fluoranthene		1.62	8.14	U
218-01-9	Chrysene		1.62	8.14	N, U
53-70-3	Dibenz(a,h)anthracene		1.62	6.10	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.62	8.14	X, U
91-20-3	Naphthalene		1.62	6.10	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4069	3310	81.3	14 - 129	
Terphenyl-d14	4069	4069	100	14 - 129	

ANALYSIS DATA SHEET

32SS-40-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-15	File ID:	0427715.D
Sampled:	04/27/10 09:00	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 21:15
Solids:	86.92	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.53	7.67	U
50-32-8	Benzo(a)pyrene		1.53	5.75	U
205-99-2	Benzo(b)fluoranthene		1.53	7.67	U
207-08-9	Benzo(k)fluoranthene		1.53	7.67	U
218-01-9	Chrysene		1.53	7.67	X, U
53-70-3	Dibenz(a,h)anthracene		1.53	5.75	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.53	7.67	U
91-20-3	Naphthalene		1.53	5.75	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3835	3023	78.8	14 - 129	
Terphenyl-d14	3835	2024	52.8	14 - 129	

ANALYSIS DATA SHEET

32SB-40-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-16	File ID:	0427716.D
Sampled:	04/27/10 09:00	Prepared:	05/20/10 13:40	Analyzed:	06/12/10 21:51
Solids:	85.26	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.56	7.82	U
50-32-8	Benzo(a)pyrene		1.56	5.86	U
205-99-2	Benzo(b)fluoranthene		1.56	7.82	U
207-08-9	Benzo(k)fluoranthene		1.56	7.82	U
218-01-9	Chrysene		1.56	7.82	X, U
53-70-3	Dibenz(a,h)anthracene		1.56	5.86	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.56	7.82	U
91-20-3	Naphthalene		1.56	5.86	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3909	4196	107	14 - 129	
Terphenyl-d14	3909	2840	72.7	14 - 129	

ANALYSIS DATA SHEET

32SS-41-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-17	File ID:	0427717.D
Sampled:	04/28/10 09:20	Prepared:	05/12/10 19:30	Analyzed:	06/12/10 21:33
Solids:	86.07	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.75	U
50-32-8	Benzo(a)pyrene		1.55	5.81	X, U
205-99-2	Benzo(b)fluoranthene		1.55	7.75	U
207-08-9	Benzo(k)fluoranthene		1.55	7.75	U
218-01-9	Chrysene		1.55	7.75	U
53-70-3	Dibenz(a,h)anthracene		1.55	5.81	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.75	X, U
91-20-3	Naphthalene		1.55	5.81	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3873	2948	76.1	14 - 129	
Terphenyl-d14	3873	2994	77.3	14 - 129	

ANALYSIS DATA SHEET

32SB-41-0507

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-18	File ID:	0427718.D
Sampled:	04/28/10 09:20	Prepared:	05/12/10 19:30	Analyzed:	06/13/10 10:56
Solids:	85.94	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.76	X, U
50-32-8	Benzo(a)pyrene		1.55	5.82	X, U
205-99-2	Benzo(b)fluoranthene		1.55	7.76	U
207-08-9	Benzo(k)fluoranthene		1.55	7.76	U
218-01-9	Chrysene		1.55	7.76	X, U
53-70-3	Dibenz(a,h)anthracene		1.55	5.82	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.76	X, U
91-20-3	Naphthalene		1.55	5.82	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3879	3903	101	14 - 129	
Terphenyl-d14	3879	3583	92.4	14 - 129	

ANALYSIS DATA SHEET

32SS-42-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-19	File ID:	0427719.D
Sampled:	04/27/10 09:30	Prepared:	05/20/10 13:40	Analyzed:	06/13/10 02:24
Solids:	86.00	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.76	U
50-32-8	Benzo(a)pyrene		1.55	5.81	U
205-99-2	Benzo(b)fluoranthene		1.55	7.76	U
207-08-9	Benzo(k)fluoranthene		1.55	7.76	U
218-01-9	Chrysene		1.55	7.76	X, U
53-70-3	Dibenz(a,h)anthracene		1.55	5.81	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.76	U
91-20-3	Naphthalene		1.55	5.81	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3876	2300	59.3	14 - 129	
Terphenyl-d14	3876	2311	59.6	14 - 129	

ANALYSIS DATA SHEET

32SB-42-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-20	File ID:	0427720.D
Sampled:	04/27/10 09:30	Prepared:	05/20/10 13:40	Analyzed:	06/13/10 03:00
Solids:	88.07	Preparation:	EXT_3546	Dilution:	1

Batch: 0E11013 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.51	7.57	U
50-32-8	Benzo(a)pyrene		1.51	5.68	U
205-99-2	Benzo(b)fluoranthene		1.51	7.57	U
207-08-9	Benzo(k)fluoranthene		1.51	7.57	U
218-01-9	Chrysene		1.51	7.57	X, U
53-70-3	Dibenz(a,h)anthracene		1.51	5.68	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.51	7.57	U
91-20-3	Naphthalene		1.51	5.68	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3785	3519	93.0	14 - 129	
Terphenyl-d14	3785	2433	64.3	14 - 129	

ANALYSIS DATA SHEET

32SS-FD042810-04

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-21	File ID:	0427721.D
Sampled:	04/28/10 00:00	Prepared:	05/12/10 19:30	Analyzed:	06/13/10 06:23
Solids:	87.90	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.51	7.59	X, U
50-32-8	Benzo(a)pyrene		1.51	5.69	X, U
205-99-2	Benzo(b)fluoranthene		1.51	7.59	U
207-08-9	Benzo(k)fluoranthene		1.51	7.59	U
218-01-9	Chrysene		1.51	7.59	X, U
53-70-3	Dibenz(a,h)anthracene		1.51	5.69	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.51	7.59	X, U
91-20-3	Naphthalene		1.51	5.69	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3792	3346	88.2	14 - 129	
Terphenyl-d14	3792	3309	87.3	14 - 129	

ANALYSIS DATA SHEET

32SS-FD042810-05

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-22	File ID:	0427722.D
Sampled:	04/28/10 00:00	Prepared:	05/12/10 19:30	Analyzed:	06/13/10 06:57
Solids:	86.82	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.53	7.68	X, U
50-32-8	Benzo(a)pyrene		1.53	5.76	X, U
205-99-2	Benzo(b)fluoranthene		1.53	7.68	U
207-08-9	Benzo(k)fluoranthene		1.53	7.68	U
218-01-9	Chrysene		1.53	7.68	X, U
53-70-3	Dibenz(a,h)anthracene		1.53	5.76	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.53	7.68	X, U
91-20-3	Naphthalene		1.53	5.76	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3839	3018	78.6	14 - 129	
Terphenyl-d14	3839	3312	86.3	14 - 129	

ANALYSIS DATA SHEET

32SB-FD042810-04

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-23	File ID:	0427723.D
Sampled:	04/28/10 00:00	Prepared:	05/12/10 19:30	Analyzed:	06/13/10 07:31
Solids:	88.18	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	6.41	1.51	7.56	X, J
50-32-8	Benzo(a)pyrene	4.36	1.51	5.67	X, J
205-99-2	Benzo(b)fluoranthene	4.72	1.51	7.56	J
207-08-9	Benzo(k)fluoranthene	4.93	1.51	7.56	J
218-01-9	Chrysene	5.99	1.51	7.56	X, J
53-70-3	Dibenz(a,h)anthracene	5.97	1.51	5.67	X
193-39-5	Indeno(1,2,3-cd)pyrene	5.64	1.51	7.56	X, J
91-20-3	Naphthalene	3.84	1.51	5.67	J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3780	3477	92.0	14 - 129	
Terphenyl-d14	3780	3380	89.4	14 - 129	

ANALYSIS DATA SHEET

32SB-FD042810-05

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-24	File ID:	0427724D.D
Sampled:	04/28/10 00:00	Prepared:	05/12/10 19:30	Analyzed:	06/15/10 12:24
Solids:	79.63	Preparation:	EXT_3546	Dilution:	10

Batch: 0E12916 Sequence: 0F16727 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		16.7	83.8	U
50-32-8	Benzo(a)pyrene		16.7	62.8	X, U
205-99-2	Benzo(b)fluoranthene		16.7	83.8	U
207-08-9	Benzo(k)fluoranthene		16.7	83.8	X, U
218-01-9	Chrysene		16.7	83.8	U
53-70-3	Dibenz(a,h)anthracene		16.7	62.8	U
193-39-5	Indeno(1,2,3-cd)pyrene		16.7	83.8	U
91-20-3	Naphthalene		16.7	62.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4186	2980	71.2	14 - 129	
Terphenyl-d14	4186	3158	75.4	14 - 129	

ANALYSIS DATA SHEET

32SS-DW01-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-25	File ID:	0427725D.D
Sampled:	04/28/10 12:54	Prepared:	05/12/10 19:30	Analyzed:	06/15/10 12:59
Solids:	81.59	Preparation:	EXT_3546	Dilution:	10

Batch: 0E12916 Sequence: 0F16727 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		16.3	81.8	U
50-32-8	Benzo(a)pyrene		16.3	61.3	X, U
205-99-2	Benzo(b)fluoranthene		16.3	81.8	U
207-08-9	Benzo(k)fluoranthene		16.3	81.8	X, U
218-01-9	Chrysene		16.3	81.8	U
53-70-3	Dibenz(a,h)anthracene		16.3	61.3	U
193-39-5	Indeno(1,2,3-cd)pyrene		16.3	81.8	U
91-20-3	Naphthalene		16.3	61.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4086	2421	59.2	14 - 129	
Terphenyl-d14	4086	2689	65.8	14 - 129	

ANALYSIS DATA SHEET

32SB-DW01-0809

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004277-26	File ID:	0427726.D
Sampled:	04/28/10 12:54	Prepared:	05/12/10 19:30	Analyzed:	06/13/10 12:39
Solids:	86.45	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	9.44	1.54	7.72	X
50-32-8	Benzo(a)pyrene	7.43	1.54	5.78	X
205-99-2	Benzo(b)fluoranthene	7.78	1.54	7.72	
207-08-9	Benzo(k)fluoranthene	9.45	1.54	7.72	
218-01-9	Chrysene	15.3	1.54	7.72	X
53-70-3	Dibenz(a,h)anthracene	9.23	1.54	5.78	X
193-39-5	Indeno(1,2,3-cd)pyrene	7.05	1.54	7.72	X, J
91-20-3	Naphthalene		1.54	5.78	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3856	2992	77.6	14 - 129	
Terphenyl-d14	3856	3630	94.2	14 - 129	

APPENDIX C
SUPPORT DOCUMENTATION

Sample Delivery Group Case Narrative

Receipt Information
The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Sample 1004277-03 had a discrepancy between the sample time on the label and the time on the Chain of Custody. Per the Client, the sample was logged in with a sample time consistent with the label of 8:10.

Changes to the Revision
This is an original submittal of the final report package.

Analytical Information
All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. The following information is provided specific to individual methods:

Chromatographic Flags for Manual Integration:
The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.
B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.
C: The peak was manually integrated to correct the baseline from the original chromatogram.
D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

SW8260B:
The samples 1004277-20RE1, 1004277-26, and 1004277-26RE1 were analyzed outside holding time; however the samples were analyzed within a 2X of the holding time.

The continuing calibration standards failed criteria in 0E13517-CCV1 for Ethylbenzene and Toluene. The blank spike failed criteria for all analytes in batch 0E10038. The matrix spikes associated with sample 1004277-10 failed accuracy and/or precision criteria for Xylenes. The surrogates failed criteria in sample 1004277-14, 1004277-23, 1004277-24, 1004277-26 for Bromofluorobenzene and Toluene-d8.

The internal standards failed criteria in sample 1004277-16, 1004277-26 and the affected analytes are qualified. No additional anomalies or deviations are noted and the data is properly qualified.

SW8270C PAHs:
Samples 1004277-01, 1004277-02, 1004277-03, 1004277-04, 1004277-05, 1004277-06 were extracted outside the method holding time; however, the samples were prepped within a 2X of the holding time.

The continuing calibration standard failed criteria in 0F15511-CCV1 for Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Naphthalene, in 0F16723-CCV1 for Chrysene, in 0F16811-CCV1 for Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, in 0F16819-CCV1 for Benzo(a)anthracene, Benzo(a)pyrene, Chrysene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, in 0F16725-CCV1 for Chrysene, Dibenz(a,h)anthracene, and in 0F16727-CCV1 for Benzo(a)pyrene, Benzo(k)fluoranthene.

The matrix spikes associated with sample 1004277-08 failed accuracy and/or precision criteria for Naphthalene, in 1004277-14 for Chrysene. No additional anomalies or deviations are noted and the data is properly qualified.

Data Qualifiers
As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL), also known as Reporting Limit **(RL),** is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

*****: A failing quality control criteria is associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the EQL. One should feel confident that the result is greater than zero and less than the EQL.

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In metals, the qualifier indicates that the parameters MDL/RL

has been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The RPD and/or percent recovery failed in the associated Blank Spike and/or Blank Spike Duplicate.

S: The Internal Standard failed criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

LIMS Definitions / Naming Conventions:
The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

BLK: LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

BS: LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "**RE"** implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:
I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, Ms. Marcia K. McGinnity is authorized to sign this Statement of Data Authenticity.

Mr. Rick D. Davis
Laboratory Technical Director / VP Operations

Sample Receipt Information

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 2 OF 5

PROJECT NO: 112G02111	SITE NAME: SWMU 32
PROJECT MANAGER AND PHONE NUMBER	Tony Klimek 513-557-5057
LABORATORY NAME AND CONTACT:	Empirical Kim Kostzer
SAMPLERS (SIGNATURE)	Betsy Collins
FIELD OPERATIONS LEADER AND PHONE NUMBER	George Ten Eyck
ADDRESS	621 Mainstream Drive Suite 270
CARRIER/WAYBILL NUMBER	
CITY, STATE	Nashville, TN 37228

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAH 8270C	VOCs-8260B(BTEX)							COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	G							
PRESERVATIVE USED						4°C	HCL 4°C							
04/27	1642	32GW-03	GW	G	25	X	X							1004277-01
04/27	0000	32GW-FD042710-01	GW	G	25	X	X							-02
~~04/27~~	~~1642~~	~~32GW-03~~	~~GW~~	~~G~~	~~3~~		~~X~~	EE						
~~04/27~~	~~0000~~	~~32GW-FD042710-01~~	~~GW~~	~~G~~	~~3~~		~~X~~	EE						
04/27	0805	32SS-RB042710-01	SS	G	35	X	X							rinse blank -03
04/27	1150	32SS-RB042710-02	SS	G	35	X	X							rinse blank -04
04/27	1510	32SS-RB042710-03	SS	G	35	X	X							rinse blank -05
04/28	1116	32SS-RB042810-04	SS	G	35	X	X							rinse blank -06

1. RELINQUISHED BY Betsy Collins	DATE 04/28/10	TIME 1525	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE 4/29/10	TIME 08:30

COMMENTS 0.3°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

CTOF273_005 Summ Package

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 3 OF 5

PROJECT NO: 112G02111
SITE NAME: SWMU 32
PROJECT MANAGER AND PHONE NUMBER: Tony Klimek 513-557-5057
LABORATORY NAME AND CONTACT: Kim Rostzer - Empirical Labs
SAMPLERS (SIGNATURE): Betsy Collis
FIELD OPERATIONS LEADER AND PHONE NUMBER: George Ten Eyck
ADDRESS: 621 Mainstream Drive, Suite 270
CARRIER/WAYBILL NUMBER:
CITY, STATE: Nashville, TN 37228

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: PAHs							COMMENTS
4/28	1010	32SS-31-0002	SS	G	3	x					1004277-	07	MS/MSD
	1010	32SB-31-0607	SB	G	3	x					-	08	MS/MSD
	1025	32SS-35-0002	SS	G	3	x					-	09	MS/MSD
	1025	32SB-35-0507	SB	G	3	x					-	10	MS/MSD
	0850	32SS-38-0002	SS	G	1	x					-	11	
	0850	32SB-38-0506	SB	G	1	x					-	12	
	1045	32SS-39-0002	SS	G	3	x					-	13	MS/MSD
	1045	32SB-39-0507	SB	G	3	x					-	14	MS/MSD
	0900	32SS-40-0002	SS	G	1	x					-	15	
	0900	32SB-40-0506	SB	G	1	x					-	16	
	0920	32SS-41-0002	SS	G	3	x					-	17	MS/MSD
	0920	32SB-41-0506	SB	G	3	x					-	18	MS/MSD
	0930	32SS-42-0002	SS	G	1	x					-	19	

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Betsy Collis	042810	1525	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	9/29/10	08:30

COMMENTS: 0.3°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

CTOF273_005 Summ Package 10

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 4 OF 5

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G02111	SWMU 32	Tony Klinek 573-557-5057	Kim Kostzer Empirical Labs
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
Betsy Colley		George Ten Eyck	621 Mainstream Drive, Suite 270
		CARRIER/WAYBILL NUMBER	CITY, STATE
			Nashville, TN 37228

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): P
PRESERVATIVE USED: 4°C HCl

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: BTEX							COMMENTS (1004277 ws 4/29/10)
4/28	1035	32SB-35-0507	SB	G	12	X						-10	MS/MSD -20
	0850	32SB-38-0506			3/12	X						-12	-21
	1045	32SB-39-0507			12	X						-14	MS/MSD -22
	0900	32SB-40-0506			3	X						-16	-23
	0920	32SB-41-0506			12	X						-18	MS/MSD -24
	0930	32SB-42-0506			3	X						-20	-25
	0000	32SB-FD042810-04			3	X						-23	-26
	0000	32SB-FD042810-05			3	X						-24	
	1254	32SB-DW01-0809			3	X						-26	
	1341	32SB-DW02-0506			3	X						-02	1004278
	1430	32SB-DW03-0304			3	X						-04	
	1205	32SB-ST01-0203			3	X						-05	

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Betsy Colley	042810	1525	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	4/29/10	08:30

COMMENTS 0.3°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 5 OF 5

PROJECT NO: 112G02111
SITE NAME: SWMU 32
PROJECT MANAGER AND PHONE NUMBER: Tony Klinek 513-557-5057
LABORATORY NAME AND CONTACT: Kim Rostzer - Empirical Labs
SAMPLERS (SIGNATURE): Betsy Collins
FIELD OPERATIONS LEADER AND PHONE NUMBER: George Ten Eyck
ADDRESS: 621 Mainstream Drive, Suite 270
CARRIER/WAYBILL NUMBER:
CITY, STATE: Nashville, TN 37228

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G P
PRESERVATIVE USED: 4°C 4°C HCl

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	BTEX							COMMENTS
4/28	0930	32SB-42-0506	SB	G	1	X							-20	1004277
	0000	32SS-FD042810-04	SS	G	1	X							-21	
	0000	32SS-FD042810-05	SS	G	1	X							-22	
	0000	32SB-FD042810-04	SB	G	1	X							-23	
	0000	32SB-FD042810-05	SB	G	1	X							-24	
	1254	32SS-DW01-0002	SS	G	1	X							-25	
	1254	32SB-DW01-0809	SB	G	1	X							-26	
	1341	32SS-DW02-0002	SS	G	1	X							-01	1004278
	1341	32SB-DW02-0506	SB	G	1	X							-02	
	1430	32SS-DW03-0002	SS	G	1	X							-03	
	1430	32SB-DW03-0304	SB	G	1	X							-04	
	1205	32SB-ST01-0203	SB	G	1	X							-05	
	1010	32SB-31-0607	SB	G	12		X					1004277	-08	MS/MSD

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Betsy Collins	042810	1525	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	4/29/10	08:30

COMMENTS: 0.3°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

12

CTOF273_005 Summ Package

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004276, 1004277, 1004278 Number of Coolers: 1 of 4

Client: TTNUS Project: SWMU32

Date/Time Received: 4/29/10 08:30 Date cooler(s) opened: 4/29/10

Opened By (print): Will Schwab (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered
   EL Courier Other: _____

If applicable, enter airbill number here: 3376

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 2 Seal date: 4/28/10 Seal Initials: _____

3. Were custody seals unbroken and intact at the date and time of arrival?	Yes	No	N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler?	Yes	No	N/A
5. Were custody papers filled out properly (ink, signed, etc.)?	Yes	No	N/A
6. Did you sign custody papers in the appropriate place for acceptance?	Yes	No	N/A
7. Was project identifiable from custody papers?	Yes	No	N/A
8. If required, was enough ice present in the cooler(s)?	Yes	No	N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 0-3 °C

Dates samples were logged-in: 4/29/10

9. Initial this form to acknowledge login of sample(s): (Name): Will Schwab (Initial): WS

10. Were all bottle lids intact and sealed tightly?	Yes	No	N/A
11. Did all bottles arrive unbroken?	Yes	No	N/A
12. Was all required bottle label information complete?	Yes	No	N/A
13. Did all bottle labels agree with custody papers? 4/29/10 WS	Yes	No *	N/A
14. Were correct containers used for the analyses indicated?	Yes	No	N/A
15. Were preservative levels correct in all applicable sample containers?	Yes	No	N/A
16. Was residual chlorine present in any applicable sample containers?	Yes	No	N/A
17. Was sufficient amount of sample sent for the analyses required?	Yes	No	N/A
18. Was headspace present in any included VOA vials?	Yes	No	N/A

If Non-Conformance issues were present, list by sample ID: _____

* On WO 1004277 - Sample 32SS-RB042710-01 CAR#: _____
on COC says collected at 08:05, however container labels say 08:10!

1004278 - Trip Blank rec'd & not on COC - Tagged as -06!

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004277, 1004278 Number of Coolers: 2 of 4

Client: JTNDS Project: SWM032

Date/Time Received: 4/29/10 08:30 Date cooler(s) opened: 4/29/10

Opened By (print): Will Schwab (signature): [illegible]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 3365

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 2 Seal date: 4/28/10 Seal Initials: [illegible]

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 0-2 °C

Dates samples were logged-in: 4/29/10

9. Initial this form to acknowledge login of sample(s): (Name): _____ (Initial): _____
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

See page 1 of 4

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004277, 1004278 Number of Coolers: 3 of 4

Client: TTNUS Project: SWMU32

Date/Time Received: 4/29/10 08:30 Date cooler(s) opened: 4/29/10

Opened By (print): Will Schwab (signature): [illegible]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 3398

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 2 Seal date: 4/28/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 0.1 °C

~~Dates samples were logged-in: 4/29/10~~

9. Initial this form to acknowledge login of sample(s): (Name): _____ (Initial): _____
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

See page 1 of 4

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004277, 1004278 Number of Coolers: 4 of 4

Client: TTNUS Project: SWMU32

Date/Time Received: **4/29/10** **08:30** Date cooler(s) opened: **4/29/10**

Opened By (print): Will Schwab (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 3387

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 2 Seal date: 4/28/10 Seal Initials: _____

3. Were custody seals unbroken and intact at the date and time of arrival?	Yes	No	N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler?	Yes	No	N/A
5. Were custody papers filled out properly (ink, signed, etc.)?	Yes	No	N/A
6. Did you sign custody papers in the appropriate place for acceptance?	Yes	No	N/A
7. Was project identifiable from custody papers?	Yes	No	N/A
8. If required, was enough ice present in the cooler(s)?	Yes	No	N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 6.7 °C

Dates samples were logged-in: 4/29/10

9. Initial this form to acknowledge login of sample(s): (Name): _____ (Initial): _____

10. Were all bottle lids intact and sealed tightly?	Yes	No	N/A
11. Did all bottles arrive unbroken?	Yes	No	N/A
12. Was all required bottle label information complete?	Yes	No	N/A
13. Did all bottle labels agree with custody papers?	Yes	No	N/A
14. Were correct containers used for the analyses indicated?	Yes	No	N/A
15. Were preservative levels correct in all applicable sample containers?	Yes	No	N/A
16. Was residual chlorine present in any applicable sample containers?	Yes	No	N/A
17. Was sufficient amount of sample sent for the analyses required?	Yes	No	N/A
18. Was headspace present in any included VOA vials?	Yes	No	N/A

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

See page 1 of 4

WORK ORDER

Printed: 5/19/2010 7:04:29AM

1004277

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32

Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Report To:
Tetra Tech NUS, Inc. (T010)
Tobrena Skeen
Foster Plaza 7, 661 Anderson Drive
Pittsburgh, PA 15220
Phone: (412) 921-8182
Fax: (412) 921-4040

Invoice To:
Tetra Tech NUS, Inc. (T010)
Accounts Payable
Foster Plaza 7, 661 Anderson Drive
Pittsburgh, PA 15220
Phone :(412) 921-8182
Fax: (412) 921-4040

Date Due: 05/20/2010 16:00 (15 day TAT)

Received By: William Schwab
Date Received: 04/29/2010 08:30

Logged In By: William Schwab
Date Logged In: 04/29/2010 11:50

Samples Received at: **0.2°C**

Custody Seals	Yes	Received On Ice	Yes
Containers Intact	Yes		
COC/Labels Agree	Yes		
Preservation Confir	Yes		

Analysis	Due	TAT	Expires	Comments
1004277-01 32GW-03 [Water] Sampled 04/27/2010 16:42 Central				**DoD QSM 4.1**
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/11/2010 16:42	See version
SMS_PAH_8270C_3510_LOW	05/17/2010 14:00	15	05/04/2010 16:42	See version
1004277-02 32GW-FD042710-01 [Water] Sampled 04/27/2010 00:00 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3510_LOW	05/17/2010 14:00	15	05/04/2010 00:00	See version
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/11/2010 00:00	See version
1004277-03 32SS-RB042710-01 [Water] Sampled 04/27/2010 08:05 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3510_LOW	05/17/2010 14:00	15	05/04/2010 08:05	See version
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/11/2010 08:05	See version
1004277-04 32SS-RB042710-02 [Water] Sampled 04/27/2010 11:50 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3510_LOW	05/17/2010 14:00	15	05/04/2010 11:50	See version
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/11/2010 11:50	See version
1004277-05 32SS-RB042710-03 [Water] Sampled 04/27/2010 15:10 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3510_LOW	05/17/2010 14:00	15	05/04/2010 15:10	See version
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/11/2010 15:10	See version
1004277-06 32SS-RB042710-04 [Water] Sampled 04/27/2010 11:16 Central				**DoD QSM 4.1**
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/11/2010 11:16	See version
SMS_PAH_8270C_3510_LOW	05/17/2010 14:00	15	05/04/2010 11:16	See version

1004277

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Analysis	Due	TAT	Expires	Comments
1004277-07 32SS-31-0002 [Solid] Sampled 04/28/2010 10:10 Central				**MS/MSD. DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/12/2010 10:10	MS/MSD.
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/05/2010 10:10	MS/MSD.
1004277-08 32SB-31-0607 [Solid] Sampled 04/28/2010 10:10 Central				**MS/MSD. DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/12/2010 10:10	MS/MSD.
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/12/2010 10:10	MS/MSD. ENCORES!
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/05/2010 10:10	MS/MSD.
1004277-09 32SS-35-0002 [Solid] Sampled 04/28/2010 10:25 Central				**MS/MSD. DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/12/2010 10:25	MS/MSD.
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/05/2010 10:25	MS/MSD.
1004277-10 32SB-35-0507 [Solid] Sampled 04/28/2010 10:25 Central				**MS/MSD. DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/12/2010 10:25	MS/MSD.
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/05/2010 10:25	MS/MSD.
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/12/2010 10:25	MS/MSD. ENCORES!
1004277-11 32SS-38-0002 [Solid] Sampled 04/27/2010 08:50 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/04/2010 08:50	
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/11/2010 08:50	See version
1004277-12 32SB-38-0506 [Solid] Sampled 04/27/2010 08:50 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/04/2010 08:50	
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/11/2010 08:50	ENCORES!
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/11/2010 08:50	See version
1004277-13 32SS-39-0002 [Solid] Sampled 04/28/2010 10:45 Central				**MS/MSD. DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/12/2010 10:45	MS/MSD.
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/05/2010 10:45	MS/MSD.
1004277-14 32SB-39-0507 [Solid] Sampled 04/28/2010 10:45 Central				**MS/MSD. DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/05/2010 10:45	MS/MSD.
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/12/2010 10:45	MS/MSD. ENCORES!
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/12/2010 10:45	MS/MSD.
1004277-15 32SS-40-0002 [Solid] Sampled 04/27/2010 09:00 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/11/2010 09:00	See version
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/04/2010 09:00	

1004277

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Analysis	Due	TAT	Expires	Comments
1004277-16 32SB-40-0506 [Solid] Sampled 04/27/2010 09:00 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/04/2010 09:00	
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/11/2010 09:00	See version
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/11/2010 09:00	ENCORES!
1004277-17 32SS-41-0002 [Solid] Sampled 04/28/2010 09:20 Central				**MS/MSD. DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/05/2010 09:20	MS/MSD.
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/12/2010 09:20	MS/MSD.
1004277-18 32SB-41-0507 [Solid] Sampled 04/28/2010 09:20 Central				**MS/MSD. DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/05/2010 09:20	MS/MSD.
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/12/2010 09:20	MS/MSD.
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/12/2010 09:20	MS/MSD. ENCORES!
1004277-19 32SS-42-0002 [Solid] Sampled 04/27/2010 09:30 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/11/2010 09:30	See version
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/04/2010 09:30	
1004277-20 32SB-42-0506 [Solid] Sampled 04/27/2010 09:30 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/11/2010 09:30	See version
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/11/2010 09:30	ENCORES!
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/04/2010 09:30	
1004277-21 32SS-FD042810-04 [Solid] Sampled 04/28/2010 00:00 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/12/2010 00:00	See version
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/05/2010 00:00	
1004277-22 32SS-FD042810-05 [Solid] Sampled 04/28/2010 00:00 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/05/2010 00:00	
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/12/2010 00:00	See version
1004277-23 32SB-FD042810-04 [Solid] Sampled 04/28/2010 00:00 Central				**DoD QSM 4.1**
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/12/2010 00:00	See version
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/12/2010 00:00	ENCORES!
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/05/2010 00:00	
1004277-24 32SB-FD042810-05 [Solid] Sampled 04/28/2010 00:00 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/05/2010 00:00	
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/12/2010 00:00	See version
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/12/2010 00:00	ENCORES!

1004277

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Analysis	Due	TAT	Expires	Comments
1004277-25 32SS-DW01-0002 [Solid] Sampled 04/28/2010 12:54 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/05/2010 12:54	
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/12/2010 12:54	See version
1004277-26 32SB-DW01-0809 [Solid] Sampled 04/28/2010 12:54 Central				**DoD QSM 4.1**
WC_PERCENT_SOLIDS_2540B	05/17/2010 14:00	15	05/05/2010 12:54	
SMS_PAH_8270C_3546_LOW	05/17/2010 14:00	15	05/12/2010 12:54	See version
VOC_8260B_BTEXMN	05/17/2010 14:00	15	05/12/2010 12:54	ENCORES!

Reviewed By

Date

Method 8260 Supporting Data

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E12804	Instrument:	MS-VOA3
Calibration:	0128001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E12804-TUN1	SEQ-TUN1.D	05/07/10 13:11
Cal Standard	0E12804-CAL1	SEQ-CAL1.D	05/07/10 13:41
Cal Standard	0E12804-CAL2	SEQ-CAL2.D	05/07/10 14:11
Cal Standard	0E12804-CAL3	SEQ-CAL3.D	05/07/10 14:42
Cal Standard	0E12804-CAL4	SEQ-CAL4.D	05/07/10 15:12
Cal Standard	0E12804-CAL5	SEQ-CAL5.D	05/07/10 15:42
Cal Standard	0E12804-CAL6	SEQ-CAL6.D	05/07/10 16:13
Cal Standard	0E12804-CAL7	SEQ-CAL7.D	05/07/10 16:43
Cal Standard	0E12804-CAL8	SEQ-CAL8.D	05/07/10 17:13
Cal Standard	0E12804-CAL9	SEQ-CAL9.D	05/07/10 17:43
Initial Cal Check	0E12804-ICV1	SEQ-ICV1.D	05/07/10 18:14
Cal Standard	0E12804-CALA	SEQ-CALA.D	05/07/10 18:44
Cal Standard	0E12804-CALB	SEQ-CALB.D	05/07/10 19:14
Cal Standard	0E12804-CALC	SEQ-CALC.D	05/07/10 19:45
Cal Standard	0E12804-CALD	SEQ-CALD.D	05/07/10 20:15
Cal Standard	0E12804-CALE	SEQ-CALE.D	05/07/10 20:45
Cal Standard	0E12804-CALF	SEQ-CALF.D	05/07/10 21:15
Cal Standard	0E12804-CALG	SEQ-CALG.D	05/07/10 21:45
Cal Standard	0E12804-CALH	SEQ-CALH.D	05/07/10 22:15
Cal Standard	0E12804-CALI	SEQ-CALI.D	05/07/10 22:46
MS Tune	0E12804-TUN2	SEQ-TUN2.D	05/07/10 23:46
Cal Standard	0E12804-CALJ	SEQ-CALJ.D	05/08/10 00:16
Cal Standard	0E12804-CALK	SEQ-CALK.D	05/08/10 00:46
Cal Standard	0E12804-CALL	SEQ-CALL.D	05/08/10 01:16
Cal Standard	0E12804-CALM	SEQ-CALM.D	05/08/10 01:46
Cal Standard	0E12804-CALN	SEQ-CALN.D	05/08/10 02:16
Cal Standard	0E12804-CALO	SEQ-CALO.D	05/08/10 02:46
Cal Standard	0E12804-CALP	SEQ-CALP.D	05/08/10 03:16
Cal Standard	0E12804-CALQ	SEQ-CALQ.D	05/08/10 03:46
Cal Standard	0E12804-CALR	SEQ-CALR.D	05/08/10 04:16

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13002	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13002-TUN1	SEQ-TUN1.D	05/07/10 18:43
Cal Standard	0E13002-CAL1	SEQ-CAL1.D	05/07/10 19:17
Cal Standard	0E13002-CAL2	SEQ-CAL2.D	05/07/10 19:47
Cal Standard	0E13002-CAL3	SEQ-CAL3.D	05/07/10 20:18
Cal Standard	0E13002-CAL4	SEQ-CAL4.D	05/07/10 20:49
Cal Standard	0E13002-CAL5	SEQ-CAL5.D	05/07/10 21:20
Cal Standard	0E13002-CAL6	SEQ-CAL6.D	05/07/10 21:51
Cal Standard	0E13002-CAL7	SEQ-CAL7.D	05/07/10 22:21
Cal Standard	0E13002-CAL8	SEQ-CAL8.D	05/07/10 22:52
Initial Cal Check	0E13002-ICV1	SEQ-ICV1.D	05/07/10 23:22
Cal Standard	0E13002-CAL9	SEQ-CAL9.D	05/07/10 23:53
Cal Standard	0E13002-CALA	SEQ-CALA.D	05/08/10 00:24
Cal Standard	0E13002-CALB	SEQ-CALB.D	05/08/10 00:55
Cal Standard	0E13002-CALC	SEQ-CALC.D	05/08/10 01:25
Cal Standard	0E13002-CALD	SEQ-CALD.D	05/08/10 01:56
Cal Standard	0E13002-CALE	SEQ-CALE.D	05/08/10 02:27
Cal Standard	0E13002-CALF	SEQ-CALF.D	05/08/10 02:57
Cal Standard	0E13002-CALG	SEQ-CALG.D	05/08/10 03:28
MS Tune	0E13002-TUN2	SEQ-TUN2.D	05/08/10 04:29
Cal Standard	0E13002-CALH	SEQ-CALH.D	05/08/10 04:59
Cal Standard	0E13002-CALI	SEQ-CALI.D	05/08/10 05:30
Cal Standard	0E13002-CALJ	SEQ-CALJ.D	05/08/10 06:01
Cal Standard	0E13002-CALK	SEQ-CALK.D	05/08/10 06:31
Cal Standard	0E13002-CALL	SEQ-CALL.D	05/08/10 07:02
Cal Standard	0E13002-CALM	SEQ-CALM.D	05/08/10 07:32
Cal Standard	0E13002-CALN	SEQ-CALN.D	05/08/10 08:03
Cal Standard	0E13002-CALO	SEQ-CALO.D	05/08/10 08:34

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13404	Instrument:	MS-VOA3
Calibration:	0128001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13404-TUN1	SEQ-TUN1.D	05/10/10 11:29
Calibration Check	0E13404-CCV1	SEQ-CCV1.D	05/10/10 11:59
LCS	0E10024-BS1	V3LCS01.D	05/10/10 12:59
Blank	0E10024-BLK1	V3BLK01.D	05/10/10 14:59
32GW-03	1004277-01	0427701.D	05/10/10 18:59
32GW-FD042710-01	1004277-02	0427702.D	05/10/10 19:29
32SS-RB042710-01	1004277-03	0427703.D	05/10/10 19:59
32SS-RB042710-02	1004277-04	0427704.D	05/10/10 20:29
32SS-RB042710-03	1004277-05	0427705.D	05/10/10 20:59
32SS-RB042810-04	1004277-06	0427706.D	05/10/10 21:28

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13517	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13517-TUN1	SEQ-TUNE.D	05/11/10 22:50
Calibration Check	0E13517-CCV1	SEQ-CCV3.D	05/11/10 23:21
LCS	0E11031-BS1	V4LCS03.D	05/11/10 23:51
Blank	0E11031-BLK1	V4BLK02.D	05/12/10 00:53
32SB-31-0607	1004277-08	0427708.D	05/12/10 01:23
32SB-35-0507	1004277-10	0427710.D	05/12/10 01:54
32SB-39-0507	1004277-14	0427714.D	05/12/10 02:24
32SB-41-0507	1004277-18	0427718.D	05/12/10 02:55
32SB-FD042810-04	1004277-23	0427723.D	05/12/10 03:26
32SB-FD042810-05	1004277-24	0427724.D	05/12/10 03:56
32SB-31-0607	0E11031-MS1	0427708M.D	05/12/10 06:30
32SB-31-0607	0E11031-MSD1	0427708S.D	05/12/10 07:00
32SB-35-0507	0E11031-MS2	0427710M.D	05/12/10 07:31
32SB-35-0507	0E11031-MSD2	0427710S.D	05/12/10 08:02
32SB-39-0507	0E11031-MS3	0427714M.D	05/12/10 08:32
32SB-39-0507	0E11031-MSD3	0427714S.D	05/12/10 09:03
32SB-41-0507	0E11031-MS4	0427718M.D	05/12/10 09:34
32SB-41-0507	0E11031-MSD4	0427718S.D	05/12/10 10:17

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13718	Instrument:	MS-VOA1
Calibration:	UNASSIGNED		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13718-TUN1	SEQ-TUN3.D	05/10/10 18:50
Calibration Check	0E13718-CCV1	SEQ-CCV1.D	05/10/10 19:22
LCS	0E10038-BS1	LCS1.D	05/10/10 20:39
Blank	0E10038-BLK1	MBLK1.D	05/10/10 22:34
32SB-38-0506	1004277-12	0427712.D	05/11/10 03:02
32SB-40-0506	1004277-16	0427716.D	05/11/10 03:41
LCS Dup	0E10038-BSD1	LCSD1.D	05/11/10 04:57

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13909	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13909-TUN1	SEQ-TUN1.D	05/16/10 13:42
Cal Standard	0E13909-CAL1	SEQ-CAL1.D	05/16/10 14:17
Cal Standard	0E13909-CAL2	SEQ-CAL2.D	05/16/10 14:57
Cal Standard	0E13909-CAL3	SEQ-CAL3.D	05/16/10 15:36
Cal Standard	0E13909-CAL4	SEQ-CAL4.D	05/16/10 16:15
Cal Standard	0E13909-CAL5	SEQ-CAL5.D	05/16/10 16:54
Cal Standard	0E13909-CAL6	SEQ-CAL6.D	05/16/10 17:34
Cal Standard	0E13909-CAL7	SEQ-CAL7.D	05/16/10 18:13
Cal Standard	0E13909-CAL8	SEQ-CAL8.D	05/16/10 18:52
Initial Cal Check	0E13909-ICV1	SEQ-ICV1.D	05/16/10 19:31
Cal Standard	0E13909-CAL9	SEQ-CAL9.D	05/16/10 20:10
Cal Standard	0E13909-CALA	SEQ-CALA.D	05/16/10 20:49
Cal Standard	0E13909-CALB	SEQ-CALB.D	05/16/10 21:28
Cal Standard	0E13909-CALC	SEQ-CALC.D	05/16/10 22:07
Cal Standard	0E13909-CALD	SEQ-CALD.D	05/16/10 22:46
Cal Standard	0E13909-CALE	SEQ-CALE.D	05/16/10 23:25
Cal Standard	0E13909-CALF	SEQ-CALF.D	05/17/10 00:04
Cal Standard	0E13909-CALG	SEQ-CALG.D	05/17/10 01:13
Cal Standard	0E13909-CALH	SEQ-CALH.D	05/17/10 02:31
Cal Standard	0E13909-CALI	SEQ-CALI.D	05/17/10 03:10
Cal Standard	0E13909-CALJ	SEQ-CALJ.D	05/17/10 03:49
Cal Standard	0E13909-CALK	SEQ-CALK.D	05/17/10 04:28
Cal Standard	0E13909-CALL	SEQ-CALL.D	05/17/10 05:07
Cal Standard	0E13909-CALM	SEQ-CALM.D	05/17/10 05:46
Cal Standard	0E13909-CALN	SEQ-CALN.D	05/17/10 06:25
Cal Standard	0E13909-CALO	SEQ-CALO.D	05/17/10 07:04

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14024	Instrument:	MS-VOA4
Calibration:	0144005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14024-TUN1	SEQ-TUN1.D	05/13/10 13:56
Cal Standard	0E14024-CAL1	SEQ-CAL1.D	05/13/10 14:27
Cal Standard	0E14024-CAL2	SEQ-CAL2.D	05/13/10 14:58
Cal Standard	0E14024-CAL3	SEQ-CAL3.D	05/13/10 15:29
Cal Standard	0E14024-CAL4	SEQ-CAL4.D	05/13/10 16:00
Cal Standard	0E14024-CAL5	SEQ-CAL5.D	05/13/10 16:31
Cal Standard	0E14024-CAL6	SEQ-CAL6.D	05/13/10 17:02
Cal Standard	0E14024-CAL7	SEQ-CAL7.D	05/13/10 17:33
Cal Standard	0E14024-CAL8	SEQ-CAL8.D	05/13/10 18:03
Cal Standard	0E14024-CAL9	SEQ-CAL9.D	05/13/10 19:05
Cal Standard	0E14024-CALA	SEQ-CALA.D	05/13/10 19:36
Cal Standard	0E14024-CALB	SEQ-CALB.D	05/13/10 20:07
Cal Standard	0E14024-CALC	SEQ-CALC.D	05/13/10 20:38
Cal Standard	0E14024-CALD	SEQ-CALD.D	05/13/10 21:09
Cal Standard	0E14024-CALE	SEQ-CALE.D	05/13/10 21:39
Cal Standard	0E14024-CALF	SEQ-CALF.D	05/13/10 22:10
Cal Standard	0E14024-CALG	SEQ-CALG.D	05/13/10 22:41
MS Tune	0E14024-TUN2	SEQ-TUN2.D	05/13/10 23:42
Cal Standard	0E14024-CALH	SEQ-CALH.D	05/14/10 00:13
Cal Standard	0E14024-CALI	SEQ-CALI.D	05/14/10 00:44
Cal Standard	0E14024-CALJ	SEQ-CALJ.D	05/14/10 01:14
Cal Standard	0E14024-CALK	SEQ-CALK.D	05/14/10 01:45
Cal Standard	0E14024-CALL	SEQ-CALL.D	05/14/10 02:16
Cal Standard	0E14024-CALM	SEQ-CALM.D	05/14/10 02:46
Cal Standard	0E14024-CALN	SEQ-CALN.D	05/14/10 03:17
Cal Standard	0E14024-CALO	SEQ-CALO.D	05/14/10 03:48
MS Tune	0E14024-TUN3	SEQ-TUN1A.D	05/14/10 11:07
Initial Cal Check	0E14024-ICV4	SEQ-ICV4.D	05/14/10 11:37

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14105	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14105-TUN1	SEQ-TUN1.D	05/20/10 13:38
Calibration Check	0E14105-CCV1	SEQ-CCV1.D	05/20/10 14:10
LCS	0E20008-BS1	V1LCS1.D	05/20/10 15:29
Blank	0E20008-BLK1	V1BLK01.D	05/20/10 17:26
32SB-42-0506	1004277-20RE1	0427720.D	05/20/10 21:21
LCS Dup	0E20008-BSD1	V1LCSD1.D	05/20/10 23:18

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14109	Instrument:	MS-VOA4
Calibration:	0144005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14109-TUN1	SEQ-TUN3.D	05/15/10 19:25
Calibration Check	0E14109-CCV1	SEQ-CCV1.D	05/15/10 19:55
LCS	0E15003-BS1	V4LCS01.D	05/15/10 20:57
Blank	0E15003-BLK1	V4BLK01.D	05/15/10 22:29
32SB-DW01-0809	1004277-26	0427726.D	05/16/10 03:05
LCS Dup	0E15003-BSD1	V4LCSD01.D	05/16/10 07:41

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15210	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15210-TUN1	SEQ-TUN1.D	05/21/10 15:57
Calibration Check	0F15210-CCV1	SEQ-CCV1.D	05/21/10 16:29
LCS	0E21026-BS1	V1LCS1.D	05/21/10 17:08
Blank	0E21026-BLK2	V1MBLK1.D	05/21/10 19:08
32SB-DW01-0809	1004277-26RE1	0427726D.D	05/21/10 21:06

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13404

SDG: CTOF273_005
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA3
Calibration: 0128001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E13404-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/10/10 11:59		
Bromofluorobenzene	30.00	96.4	80 - 120	17.207	17.207	0.0000	+/-1.000	
Dibromofluoromethane	30.00	99.2	80 - 120	10.454	10.454	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	96.8	80 - 120	11.385	11.385	0.0000	+/-1.000	
Toluene-d8	30.00	95.2	80 - 120	14.883	14.883	0.0000	+/-1.000	
LCS (0E10024-BS1) ug/L				Lab File ID: V3LCS01.D		Analyzed: 05/10/10 12:59		
Bromofluorobenzene	30.00	102	75 - 120	17.207	17.207	0.0000	+/-1.000	
Dibromofluoromethane	30.00	100	85 - 115	10.454	10.454	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	98.5	70 - 120	11.379	11.385	-0.0060	+/-1.000	
Toluene-d8	30.00	99.8	85 - 120	14.877	14.883	-0.0060	+/-1.000	
Blank (0E10024-BLK1) ug/L				Lab File ID: V3BLK01.D		Analyzed: 05/10/10 14:59		
Bromofluorobenzene	30.00	103	75 - 120	17.213	17.207	0.0060	+/-1.000	
Dibromofluoromethane	30.00	100	85 - 115	10.46	10.454	0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	101	70 - 120	11.385	11.385	0.0000	+/-1.000	
Toluene-d8	30.00	108	85 - 120	14.883	14.883	0.0000	+/-1.000	
32GW-03 (1004277-01) ug/L				Lab File ID: 0427701.D		Analyzed: 05/10/10 18:59		
Bromofluorobenzene	30.00	101	75 - 120	17.213	17.207	0.0060	+/-1.000	
Dibromofluoromethane	30.00	99.8	85 - 115	10.472	10.454	0.0180	+/-1.000	
1,2-Dichloroethane-d4	30.00	99.4	70 - 120	11.397	11.385	0.0120	+/-1.000	
Toluene-d8	30.00	108	85 - 120	14.883	14.883	0.0000	+/-1.000	
32GW-FD042710-01 (1004277-02) ug/L				Lab File ID: 0427702.D		Analyzed: 05/10/10 19:29		
Bromofluorobenzene	30.00	101	75 - 120	17.213	17.207	0.0060	+/-1.000	
Dibromofluoromethane	30.00	100	85 - 115	10.466	10.454	0.0120	+/-1.000	
1,2-Dichloroethane-d4	30.00	100	70 - 120	11.397	11.385	0.0120	+/-1.000	
Toluene-d8	30.00	106	85 - 120	14.889	14.883	0.0060	+/-1.000	
32SS-RB042710-01 (1004277-03) ug/L				Lab File ID: 0427703.D		Analyzed: 05/10/10 19:59		
Bromofluorobenzene	30.00	104	75 - 120	17.213	17.207	0.0060	+/-1.000	
Dibromofluoromethane	30.00	98.8	85 - 115	10.466	10.454	0.0120	+/-1.000	
1,2-Dichloroethane-d4	30.00	99.6	70 - 120	11.391	11.385	0.0060	+/-1.000	
Toluene-d8	30.00	108	85 - 120	14.889	14.883	0.0060	+/-1.000	
32SS-RB042710-02 (1004277-04) ug/L				Lab File ID: 0427704.D		Analyzed: 05/10/10 20:29		
Bromofluorobenzene	30.00	99.6	75 - 120	17.213	17.207	0.0060	+/-1.000	
Dibromofluoromethane	30.00	99.1	85 - 115	10.466	10.454	0.0120	+/-1.000	
1,2-Dichloroethane-d4	30.00	98.3	70 - 120	11.391	11.385	0.0060	+/-1.000	
Toluene-d8	30.00	106	85 - 120	14.889	14.883	0.0060	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13404	Instrument:	MS-VOA3
		Calibration:	0128001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
32SS-RB042710-03 (1004277-05) ug/L				Lab File ID: 0427705.D		Analyzed: 05/10/10 20:59		
Bromofluorobenzene	30.00	101	75 - 120	17.219	17.207	0.0120	+/-1.000	
Dibromofluoromethane	30.00	101	85 - 115	10.472	10.454	0.0180	+/-1.000	
1,2-Dichloroethane-d4	30.00	100	70 - 120	11.397	11.385	0.0120	+/-1.000	
Toluene-d8	30.00	108	85 - 120	14.889	14.883	0.0060	+/-1.000	
32SS-RB042810-04 (1004277-06) ug/L				Lab File ID: 0427706.D		Analyzed: 05/10/10 21:28		
Bromofluorobenzene	30.00	100	75 - 120	17.219	17.207	0.0120	+/-1.000	
Dibromofluoromethane	30.00	98.6	85 - 115	10.472	10.454	0.0180	+/-1.000	
1,2-Dichloroethane-d4	30.00	101	70 - 120	11.397	11.385	0.0120	+/-1.000	
Toluene-d8	30.00	108	85 - 120	14.889	14.883	0.0060	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_005
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Sequence: 0E13517
Instrument: MS-VOA4
Calibration: 0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
32SB-FD042810-04 (1004277-23) ug/Kg dry				Lab File ID: 0427723.D		Analyzed: 05/12/10 03:26		
Bromofluorobenzene	29.13	128	85 - 120	18.3	18.291	0.0090	+/-1.000	*
Dibromofluoromethane	29.13	112	80 - 125	12.297	12.298	-0.0010	+/-1.000	
1,2-Dichloroethane-d4	29.13	104	75 - 140	12.996	12.977	0.0190	+/-1.000	
Toluene-d8	29.13	118	85 - 115	16.036	16.037	-0.0010	+/-1.000	*
32SB-FD042810-05 (1004277-24) ug/Kg dry				Lab File ID: 0427724.D		Analyzed: 05/12/10 03:56		
Bromofluorobenzene	33.64	126	85 - 120	18.29	18.291	-0.0010	+/-1.000	*
Dibromofluoromethane	33.64	109	80 - 125	12.298	12.298	0.0000	+/-1.000	
1,2-Dichloroethane-d4	33.64	96.2	75 - 140	12.987	12.977	0.0100	+/-1.000	
Toluene-d8	33.64	121	85 - 115	16.037	16.037	0.0000	+/-1.000	*
Matrix Spike (0E11031-MS1) ug/Kg dry				Lab File ID: 0427708M.D		Analyzed: 05/12/10 06:30		
Bromofluorobenzene	36.86	99.4	85 - 120	18.294	18.291	0.0030	+/-1.000	
Dibromofluoromethane	36.86	105	80 - 125	12.302	12.298	0.0040	+/-1.000	
1,2-Dichloroethane-d4	36.86	93.8	75 - 140	12.99	12.977	0.0130	+/-1.000	
Toluene-d8	36.86	95.2	85 - 115	16.041	16.037	0.0040	+/-1.000	
Matrix Spike Dup (0E11031-MSD1) ug/Kg dry				Lab File ID: 0427708S.D		Analyzed: 05/12/10 07:00		
Bromofluorobenzene	38.17	103	85 - 120	18.295	18.291	0.0040	+/-1.000	
Dibromofluoromethane	38.17	104	80 - 125	12.293	12.298	-0.0050	+/-1.000	
1,2-Dichloroethane-d4	38.17	97.5	75 - 140	12.982	12.977	0.0050	+/-1.000	
Toluene-d8	38.17	101	85 - 115	16.032	16.037	-0.0050	+/-1.000	
Matrix Spike (0E11031-MS2) ug/Kg dry				Lab File ID: 0427710M.D		Analyzed: 05/12/10 07:31		
Bromofluorobenzene	28.76	98.3	85 - 120	18.294	18.291	0.0030	+/-1.000	
Dibromofluoromethane	28.76	110	80 - 125	12.301	12.298	0.0030	+/-1.000	
1,2-Dichloroethane-d4	28.76	106	75 - 140	12.98	12.977	0.0030	+/-1.000	
Toluene-d8	28.76	98.5	85 - 115	16.031	16.037	-0.0060	+/-1.000	
Matrix Spike Dup (0E11031-MSD2) ug/Kg dry				Lab File ID: 0427710S.D		Analyzed: 05/12/10 08:02		
Bromofluorobenzene	28.48	104	85 - 120	18.29	18.291	-0.0010	+/-1.000	
Dibromofluoromethane	28.48	113	80 - 125	12.298	12.298	0.0000	+/-1.000	
1,2-Dichloroethane-d4	28.48	109	75 - 140	12.987	12.977	0.0100	+/-1.000	
Toluene-d8	28.48	102	85 - 115	16.037	16.037	0.0000	+/-1.000	
Matrix Spike (0E11031-MS3) ug/Kg dry				Lab File ID: 0427714M.D		Analyzed: 05/12/10 08:32		
Bromofluorobenzene	32.29	101	85 - 120	18.29	18.291	-0.0010	+/-1.000	
Dibromofluoromethane	32.29	107	80 - 125	12.298	12.298	0.0000	+/-1.000	
1,2-Dichloroethane-d4	32.29	101	75 - 140	12.987	12.977	0.0100	+/-1.000	
Toluene-d8	32.29	101	85 - 115	16.037	16.037	0.0000	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13517	Instrument:	MS-VOA4
		Calibration:	0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (0E11031-MSD3) ug/Kg dry				Lab File ID: 0427714S.D		Analyzed: 05/12/10 09:03		
Bromofluorobenzene	32.41	99.6	85 - 120	18.294	18.291	0.0030	+/-1.000	
Dibromofluoromethane	32.41	105	80 - 125	12.292	12.298	-0.0060	+/-1.000	
1,2-Dichloroethane-d4	32.41	101	75 - 140	12.981	12.977	0.0040	+/-1.000	
Toluene-d8	32.41	103	85 - 115	16.031	16.037	-0.0060	+/-1.000	
Matrix Spike (0E11031-MS4) ug/Kg dry				Lab File ID: 0427718M.D		Analyzed: 05/12/10 09:34		
Bromofluorobenzene	31.06	100	85 - 120	18.294	18.291	0.0030	+/-1.000	
Dibromofluoromethane	31.06	108	80 - 125	12.292	12.298	-0.0060	+/-1.000	
1,2-Dichloroethane-d4	31.06	101	75 - 140	12.981	12.977	0.0040	+/-1.000	
Toluene-d8	31.06	101	85 - 115	16.031	16.037	-0.0060	+/-1.000	
Matrix Spike Dup (0E11031-MSD4) ug/Kg dry				Lab File ID: 0427718S.D		Analyzed: 05/12/10 10:17		
Bromofluorobenzene	31.17	99.5	85 - 120	18.29	18.291	-0.0010	+/-1.000	
Dibromofluoromethane	31.17	115	80 - 125	12.297	12.298	-0.0010	+/-1.000	
1,2-Dichloroethane-d4	31.17	111	75 - 140	12.976	12.977	-0.0010	+/-1.000	
Toluene-d8	31.17	101	85 - 115	16.036	16.037	-0.0010	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13718	Instrument:	MS-VOA1
		Calibration:	UNASSIGNED

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E13718-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/10/10 19:22		
Bromofluorobenzene	30.00	96.1	80 - 120	21.712	21.712	0.0000	+/-1.000	
Dibromofluoromethane	30.00	92.6	80 - 120	11.755	11.755	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	89.7	80 - 120	12.521	12.521	0.0000	+/-1.000	
Toluene-d8	30.00	105	80 - 120	17.025	17.025	0.0000	+/-1.000	
LCS (0E10038-BS1) ug/Kg wet				Lab File ID: LCS1.D		Analyzed: 05/10/10 20:39		
Bromofluorobenzene	30.00	97.0	85 - 120	21.708	21.712	-0.0040	+/-1.000	
Dibromofluoromethane	30.00	93.9	80 - 125	11.738	11.755	-0.0170	+/-1.000	
1,2-Dichloroethane-d4	30.00	88.4	75 - 140	12.52	12.521	-0.0010	+/-1.000	
Toluene-d8	30.00	107	85 - 115	17.024	17.025	-0.0010	+/-1.000	
Blank (0E10038-BLK1) ug/Kg wet				Lab File ID: MBLK1.D		Analyzed: 05/10/10 22:34		
Bromofluorobenzene	30.00	97.5	85 - 120	21.715	21.712	0.0030	+/-1.000	
Dibromofluoromethane	30.00	96.9	80 - 125	11.752	11.755	-0.0030	+/-1.000	
1,2-Dichloroethane-d4	30.00	83.8	75 - 140	12.533	12.521	0.0120	+/-1.000	
Toluene-d8	30.00	113	85 - 115	17.033	17.025	0.0080	+/-1.000	
32SB-38-0506 (1004277-12) ug/Kg dry				Lab File ID: 0427712.D		Analyzed: 05/11/10 03:02		
Bromofluorobenzene	30.07	101	85 - 120	21.728	21.712	0.0160	+/-1.000	
Dibromofluoromethane	30.07	97.3	80 - 125	11.766	11.755	0.0110	+/-1.000	
1,2-Dichloroethane-d4	30.07	90.8	75 - 140	12.532	12.521	0.0110	+/-1.000	
Toluene-d8	30.07	111	85 - 115	17.047	17.025	0.0220	+/-1.000	
32SB-40-0506 (1004277-16) ug/Kg dry				Lab File ID: 0427716.D		Analyzed: 05/11/10 03:41		
Bromofluorobenzene	30.28	99.6	85 - 120	21.726	21.712	0.0140	+/-1.000	
Dibromofluoromethane	30.28	105	80 - 125	11.765	11.755	0.0100	+/-1.000	
1,2-Dichloroethane-d4	30.28	99.0	75 - 140	12.546	12.521	0.0250	+/-1.000	
Toluene-d8	30.28	107	85 - 115	17.045	17.025	0.0200	+/-1.000	
LCS Dup (0E10038-BSD1) ug/Kg wet				Lab File ID: LCSD1.D		Analyzed: 05/11/10 04:57		
Bromofluorobenzene	30.00	94.4	85 - 120	21.723	21.712	0.0110	+/-1.000	
Dibromofluoromethane	30.00	94.3	80 - 125	11.755	11.755	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	87.8	75 - 140	12.536	12.521	0.0150	+/-1.000	
Toluene-d8	30.00	105	85 - 115	17.039	17.025	0.0140	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14105	Instrument:	MS-VOA1
		Calibration:	0141001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E14105-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/20/10 14:10		
Bromofluorobenzene	30.00	98.4	80 - 120	22.473	22.473	0.0000	+/-1.000	
Dibromofluoromethane	30.00	94.5	80 - 120	12.412	12.412	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	90.0	80 - 120	13.211	13.211	0.0000	+/-1.000	
Toluene-d8	30.00	98.4	80 - 120	17.751	17.751	0.0000	+/-1.000	
LCS (0E20008-BS1) ug/Kg wet				Lab File ID: V1LCS1.D		Analyzed: 05/20/10 15:29		
Bromofluorobenzene	30.00	99.5	85 - 120	22.462	22.473	-0.0110	+/-1.000	
Dibromofluoromethane	30.00	96.6	80 - 125	12.412	12.412	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	89.3	75 - 140	13.211	13.211	0.0000	+/-1.000	
Toluene-d8	30.00	99.6	85 - 115	17.754	17.751	0.0030	+/-1.000	
Blank (0E20008-BLK1) ug/Kg wet				Lab File ID: V1BLK01.D		Analyzed: 05/20/10 17:26		
Bromofluorobenzene	30.00	105	85 - 120	22.471	22.473	-0.0020	+/-1.000	
Dibromofluoromethane	30.00	102	80 - 125	12.416	12.412	0.0040	+/-1.000	
1,2-Dichloroethane-d4	30.00	105	75 - 140	13.198	13.211	-0.0130	+/-1.000	
Toluene-d8	30.00	101	85 - 115	17.752	17.751	0.0010	+/-1.000	
32SB-42-0506 (1004277-20RE1) ug/Kg dry				Lab File ID: 0427720.D		Analyzed: 05/20/10 21:21		
Bromofluorobenzene	31.02	102	85 - 120	22.467	22.473	-0.0060	+/-1.000	
Dibromofluoromethane	31.02	94.3	80 - 125	12.417	12.412	0.0050	+/-1.000	
1,2-Dichloroethane-d4	31.02	86.9	75 - 140	13.199	13.211	-0.0120	+/-1.000	
Toluene-d8	31.02	105	85 - 115	17.752	17.751	0.0010	+/-1.000	
LCS Dup (0E20008-BSD1) ug/Kg wet				Lab File ID: V1LCSD1.D		Analyzed: 05/20/10 23:18		
Bromofluorobenzene	30.00	99.4	85 - 120	22.46	22.473	-0.0130	+/-1.000	
Dibromofluoromethane	30.00	98.8	80 - 125	12.404	12.412	-0.0080	+/-1.000	
1,2-Dichloroethane-d4	30.00	88.2	75 - 140	13.201	13.211	-0.0100	+/-1.000	
Toluene-d8	30.00	104	85 - 115	17.744	17.751	-0.0070	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13517

SDG: CTOF273_005
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
32SB-FD042810-04 (1004277-23) ug/Kg dry				Lab File ID: 0427723.D		Analyzed: 05/12/10 03:26		
Bromofluorobenzene	29.13	128	85 - 120	18.3	18.291	0.0090	+/-1.000	*
Dibromofluoromethane	29.13	112	80 - 125	12.297	12.298	-0.0010	+/-1.000	
1,2-Dichloroethane-d4	29.13	104	75 - 140	12.996	12.977	0.0190	+/-1.000	
Toluene-d8	29.13	118	85 - 115	16.036	16.037	-0.0010	+/-1.000	*
32SB-FD042810-05 (1004277-24) ug/Kg dry				Lab File ID: 0427724.D		Analyzed: 05/12/10 03:56		
Bromofluorobenzene	33.64	126	85 - 120	18.29	18.291	-0.0010	+/-1.000	*
Dibromofluoromethane	33.64	109	80 - 125	12.298	12.298	0.0000	+/-1.000	
1,2-Dichloroethane-d4	33.64	96.2	75 - 140	12.987	12.977	0.0100	+/-1.000	
Toluene-d8	33.64	121	85 - 115	16.037	16.037	0.0000	+/-1.000	*
Matrix Spike (0E11031-MS1) ug/Kg dry				Lab File ID: 0427708M.D		Analyzed: 05/12/10 06:30		
Bromofluorobenzene	36.86	99.4	85 - 120	18.294	18.291	0.0030	+/-1.000	
Dibromofluoromethane	36.86	105	80 - 125	12.302	12.298	0.0040	+/-1.000	
1,2-Dichloroethane-d4	36.86	93.8	75 - 140	12.99	12.977	0.0130	+/-1.000	
Toluene-d8	36.86	95.2	85 - 115	16.041	16.037	0.0040	+/-1.000	
Matrix Spike Dup (0E11031-MSD1) ug/Kg dry				Lab File ID: 0427708S.D		Analyzed: 05/12/10 07:00		
Bromofluorobenzene	38.17	103	85 - 120	18.295	18.291	0.0040	+/-1.000	
Dibromofluoromethane	38.17	104	80 - 125	12.293	12.298	-0.0050	+/-1.000	
1,2-Dichloroethane-d4	38.17	97.5	75 - 140	12.982	12.977	0.0050	+/-1.000	
Toluene-d8	38.17	101	85 - 115	16.032	16.037	-0.0050	+/-1.000	
Matrix Spike (0E11031-MS2) ug/Kg dry				Lab File ID: 0427710M.D		Analyzed: 05/12/10 07:31		
Bromofluorobenzene	28.76	98.3	85 - 120	18.294	18.291	0.0030	+/-1.000	
Dibromofluoromethane	28.76	110	80 - 125	12.301	12.298	0.0030	+/-1.000	
1,2-Dichloroethane-d4	28.76	106	75 - 140	12.98	12.977	0.0030	+/-1.000	
Toluene-d8	28.76	98.5	85 - 115	16.031	16.037	-0.0060	+/-1.000	
Matrix Spike Dup (0E11031-MSD2) ug/Kg dry				Lab File ID: 0427710S.D		Analyzed: 05/12/10 08:02		
Bromofluorobenzene	28.48	104	85 - 120	18.29	18.291	-0.0010	+/-1.000	
Dibromofluoromethane	28.48	113	80 - 125	12.298	12.298	0.0000	+/-1.000	
1,2-Dichloroethane-d4	28.48	109	75 - 140	12.987	12.977	0.0100	+/-1.000	
Toluene-d8	28.48	102	85 - 115	16.037	16.037	0.0000	+/-1.000	
Matrix Spike (0E11031-MS3) ug/Kg dry				Lab File ID: 0427714M.D		Analyzed: 05/12/10 08:32		
Bromofluorobenzene	32.29	101	85 - 120	18.29	18.291	-0.0010	+/-1.000	
Dibromofluoromethane	32.29	107	80 - 125	12.298	12.298	0.0000	+/-1.000	
1,2-Dichloroethane-d4	32.29	101	75 - 140	12.987	12.977	0.0100	+/-1.000	
Toluene-d8	32.29	101	85 - 115	16.037	16.037	0.0000	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13517

SDG: CTOF273_005
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E13517-CCV1) ug/L				Lab File ID: SEQ-CCV3.D		Analyzed: 05/11/10 23:21		
Bromofluorobenzene	30.00	90.1	80 - 120	18.291	18.291	0.0000	+/-1.000	
Dibromofluoromethane	30.00	106	80 - 120	12.298	12.298	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	96.9	80 - 120	12.977	12.977	0.0000	+/-1.000	
Toluene-d8	30.00	99.7	80 - 120	16.037	16.037	0.0000	+/-1.000	
LCS (0E11031-BS1) ug/Kg wet				Lab File ID: V4LCS03.D		Analyzed: 05/11/10 23:51		
Bromofluorobenzene	30.00	99.6	85 - 120	18.291	18.291	0.0000	+/-1.000	
Dibromofluoromethane	30.00	108	80 - 125	12.298	12.298	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	100	75 - 140	12.987	12.977	0.0100	+/-1.000	
Toluene-d8	30.00	99.9	85 - 115	16.037	16.037	0.0000	+/-1.000	
Blank (0E11031-BLK1) ug/Kg wet				Lab File ID: V4BLK02.D		Analyzed: 05/12/10 00:53		
Bromofluorobenzene	30.00	115	85 - 120	18.298	18.291	0.0070	+/-1.000	
Dibromofluoromethane	30.00	114	80 - 125	12.296	12.298	-0.0020	+/-1.000	
1,2-Dichloroethane-d4	30.00	114	75 - 140	12.985	12.977	0.0080	+/-1.000	
Toluene-d8	30.00	105	85 - 115	16.035	16.037	-0.0020	+/-1.000	
32SB-31-0607 (1004277-08) ug/Kg dry				Lab File ID: 0427708.D		Analyzed: 05/12/10 01:23		
Bromofluorobenzene	29.84	112	85 - 120	18.293	18.291	0.0020	+/-1.000	
Dibromofluoromethane	29.84	103	80 - 125	12.301	12.298	0.0030	+/-1.000	
1,2-Dichloroethane-d4	29.84	98.9	75 - 140	12.99	12.977	0.0130	+/-1.000	
Toluene-d8	29.84	106	85 - 115	16.04	16.037	0.0030	+/-1.000	
32SB-35-0507 (1004277-10) ug/Kg dry				Lab File ID: 0427710.D		Analyzed: 05/12/10 01:54		
Bromofluorobenzene	30.67	117	85 - 120	18.3	18.291	0.0090	+/-1.000	
Dibromofluoromethane	30.67	106	80 - 125	12.297	12.298	-0.0010	+/-1.000	
1,2-Dichloroethane-d4	30.67	104	75 - 140	12.986	12.977	0.0090	+/-1.000	
Toluene-d8	30.67	111	85 - 115	16.036	16.037	-0.0010	+/-1.000	
X **32SB-39-0507 (1004277-14) ug/Kg dry**				Lab File ID: 0427714.D		Analyzed: 05/12/10 02:24		
Bromofluorobenzene	30.57	122	85 - 120	18.294	18.291	0.0030	+/-1.000	*
Dibromofluoromethane	30.57	105	80 - 125	12.302	12.298	0.0040	+/-1.000	
1,2-Dichloroethane-d4	30.57	98.6	75 - 140	12.991	12.977	0.0140	+/-1.000	
Toluene-d8	30.57	118	85 - 115	16.041	16.037	0.0040	+/-1.000	*
32SB-41-0507 (1004277-18) ug/Kg dry				Lab File ID: 0427718.D		Analyzed: 05/12/10 02:55		
Bromofluorobenzene	31.11	114	85 - 120	18.294	18.291	0.0030	+/-1.000	
Dibromofluoromethane	31.11	111	80 - 125	12.302	12.298	0.0040	+/-1.000	
1,2-Dichloroethane-d4	31.11	109	75 - 140	12.99	12.977	0.0130	+/-1.000	
Toluene-d8	31.11	107	85 - 115	16.041	16.037	0.0040	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14109	Instrument:	MS-VOA4
		Calibration:	0144005

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E14109-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/15/10 19:55		
Bromofluorobenzene	30.00	101	80 - 120	18.291	18.291	0.0000	+/-1.000	
Dibromofluoromethane	30.00	112	80 - 120	12.319	12.319	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	102	80 - 120	13.007	13.007	0.0000	+/-1.000	
Toluene-d8	30.00	98.0	80 - 120	16.038	16.038	0.0000	+/-1.000	
LCS (0E15003-BS1) ug/Kg wet				Lab File ID: V4LCS01.D		Analyzed: 05/15/10 20:57		
Bromofluorobenzene	30.00	102	85 - 120	18.289	18.291	-0.0020	+/-1.000	
Dibromofluoromethane	30.00	110	80 - 125	12.317	12.319	-0.0020	+/-1.000	
1,2-Dichloroethane-d4	30.00	102	75 - 140	13.006	13.007	-0.0010	+/-1.000	
Toluene-d8	30.00	105	85 - 115	16.036	16.038	-0.0020	+/-1.000	
Blank (0E15003-BLK1) ug/Kg wet				Lab File ID: V4BLK01.D		Analyzed: 05/15/10 22:29		
Bromofluorobenzene	30.00	103	85 - 120	18.29	18.291	-0.0010	+/-1.000	
Dibromofluoromethane	30.00	102	80 - 125	12.317	12.319	-0.0020	+/-1.000	
1,2-Dichloroethane-d4	30.00	94.9	75 - 140	13.006	13.007	-0.0010	+/-1.000	
Toluene-d8	30.00	103	85 - 115	16.037	16.038	-0.0010	+/-1.000	
32SB-DW01-0809 (1004277-26) ug/Kg dry				Lab File ID: 0427726.D		Analyzed: 05/16/10 03:05		
Bromofluorobenzene	33.30	270	85 - 120	18.266	18.291	-0.0250	+/-1.000	*
Dibromofluoromethane	33.30	102	80 - 125	12.332	12.319	0.0130	+/-1.000	
1,2-Dichloroethane-d4	33.30	96.7	75 - 140	13.011	13.007	0.0040	+/-1.000	
Toluene-d8	33.30	145	85 - 115	16.042	16.038	0.0040	+/-1.000	*
LCS Dup (0E15003-BSD1) ug/Kg wet				Lab File ID: V4LCSD01.D		Analyzed: 05/16/10 07:41		
Bromofluorobenzene	30.00	96.7	85 - 120	18.294	18.291	0.0030	+/-1.000	
Dibromofluoromethane	30.00	103	80 - 125	12.332	12.319	0.0130	+/-1.000	
1,2-Dichloroethane-d4	30.00	98.1	75 - 140	13.011	13.007	0.0040	+/-1.000	
Toluene-d8	30.00	102	85 - 115	16.041	16.038	0.0030	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Sequence: 0F15210

SDG: CTOF273_005

Project: CTOF273 NSA Crane SMU32

Instrument: MS-VOA1

Calibration: 0141001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15210-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/21/10 16:29		
Bromofluorobenzene	30.00	95.6	80 - 120	22.476	22.476	0.0000	+/-1.000	
Dibromofluoromethane	30.00	94.2	80 - 120	12.43	12.43	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	79.1	80 - 120	13.213	13.213	0.0000	+/-1.000	*
Toluene-d8	30.00	99.0	80 - 120	17.755	17.755	0.0000	+/-1.000	
LCS (0E21026-BS1) ug/Kg wet				Lab File ID: V1LCS1.D		Analyzed: 05/21/10 17:08		
Bromofluorobenzene	30.00	94.5	85 - 120	22.467	22.476	-0.0090	+/-1.000	
Dibromofluoromethane	30.00	94.0	80 - 125	12.419	12.43	-0.0110	+/-1.000	
1,2-Dichloroethane-d4	30.00	81.6	75 - 140	13.218	13.213	0.0050	+/-1.000	
Toluene-d8	30.00	101	85 - 115	17.76	17.755	0.0050	+/-1.000	
Blank (0E21026-BLK2) ug/Kg wet				Lab File ID: V1MBLK1.D		Analyzed: 05/21/10 19:08		
Bromofluorobenzene	30.00	104	85 - 120	22.47	22.476	-0.0060	+/-1.000	
Dibromofluoromethane	30.00	90.3	80 - 125	12.407	12.43	-0.0230	+/-1.000	
1,2-Dichloroethane-d4	30.00	105	75 - 140	13.189	13.213	-0.0240	+/-1.000	
Toluene-d8	30.00	101	85 - 115	17.748	17.755	-0.0070	+/-1.000	
32SB-DW01-0809 (1004277-26RE1) ug/Kg dry				Lab File ID: 0427726D.D		Analyzed: 05/21/10 21:06		
Bromofluorobenzene	32.99	116	85 - 120	22.464	22.476	-0.0120	+/-1.000	
Dibromofluoromethane	32.99	96.4	80 - 125	12.416	12.43	-0.0140	+/-1.000	
1,2-Dichloroethane-d4	32.99	89.1	75 - 140	13.199	13.213	-0.0140	+/-1.000	
Toluene-d8	32.99	104	85 - 115	17.756	17.755	0.0010	+/-1.000	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Water		
Batch:	0E10024	Laboratory ID:	0E10024-BS1
Preparation:	5030B	Initial/Final:	5 mL / 5 mL

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	41.0	82.0	80 - 120
Ethylbenzene	50.00	40.2	80.4	75 - 125
Toluene	50.00	40.1	80.1	75 - 120
Xylenes (total)	150.0	125	83.2	75 - 130

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E11031	Laboratory ID:	0E11031-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	48.87	97.7	75 - 125
Ethylbenzene	50.00	43.35	86.7	75 - 125
Toluene	50.00	44.68	89.4	70 - 125
Xylenes (total)	150.0	130.0	86.6	75 - 125

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E15003	Laboratory ID:	0E15003-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	59.69	119	75 - 125
Ethylbenzene	50.00	56.32	113	75 - 125
Toluene	50.00	58.68	117	70 - 125
Xylenes (total)	150.0	180.2	120	75 - 125

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzene	50.00	53.54	107	10.9	30	75 - 125
Ethylbenzene	50.00	50.08	100	11.7	30	75 - 125
Toluene	50.00	50.89	102	14.2	30	70 - 125
Xylenes (total)	150.0	150.9	101	17.7	30	75 - 125

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E20008	Laboratory ID:	0E20008-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	54.00	108	75 - 125
Ethylbenzene	50.00	53.23	106	75 - 125
Toluene	50.00	52.95	106	70 - 125
Xylenes (total)	150.0	156.6	104	75 - 125

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzene	50.00	44.68	89.4	18.9	30	75 - 125
Ethylbenzene	50.00	45.71	91.4	15.2	30	75 - 125
Toluene	50.00	46.44	92.9	13.1	30	70 - 125
Xylenes (total)	150.0	136.3	90.9	13.9	30	75 - 125

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E10038	Laboratory ID:	0E10038-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	46.22	92.4	75 - 125
Ethylbenzene	50.00	48.29	96.6	75 - 125
Toluene	50.00	49.94	99.9	70 - 125
Xylenes (total)	150.0	141.1	94.1	75 - 125

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #		% RPD #		QC LIMITS RPD	QC LIMITS REC.
Benzene	**50.00**	**69.03**	**138**	*	**39.6**	*	**30**	**75 - 125**
Ethylbenzene	**50.00**	**69.51**	**139**	*	**36.0**	*	**30**	**75 - 125**
Toluene	**50.00**	**70.85**	**142**	*	**34.6**	*	**30**	**70 - 125**
Xylenes (total)	**150.0**	**204.6**	**136**	*	**36.7**	*	**30**	**75 - 125**

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E21026	Laboratory ID:	0E21026-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	48.79	97.6	75 - 125
Ethylbenzene	50.00	49.68	99.4	75 - 125
Toluene	50.00	49.63	99.3	70 - 125
Xylenes (total)	150.0	145.0	96.6	75 - 125

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8260B

32SB-31-0607

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E11031

% Solids: 87.13

Source Sample Name: **1004277-08**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzene	61.44	ND	56.31	91.6		75 - 125
Ethylbenzene	61.44	ND	49.70	80.9		75 - 125
Toluene	61.44	ND	49.00	79.8		70 - 125
Xylenes (total)	184.3	ND	149.0	80.8		75 - 125

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzene	63.62	56.89	89.4	1.04		30	75 - 125
Ethylbenzene	63.62	51.93	81.6	4.39		30	75 - 125
Toluene	63.62	51.24	80.5	4.47		30	70 - 125
Xylenes (total)	190.9	152.2	79.8	2.13		30	75 - 125

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8260B

32SB-39-0507

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E11031

% Solids: 81.93

Source Sample Name: **1004277-14**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzene	53.82	ND	51.14	95.0		75 - 125
Ethylbenzene	53.82	ND	45.81	85.1		75 - 125
Toluene	53.82	ND	45.39	84.3		70 - 125
Xylenes (total)	161.5	ND	139.0	86.1		75 - 125

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzene	54.01	49.14	91.0	3.99		30	75 - 125
Ethylbenzene	54.01	45.50	84.3	0.670		30	75 - 125
Toluene	54.01	47.63	88.2	4.82		30	70 - 125
Xylenes (total)	162.0	138.5	85.5	0.364		30	75 - 125

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8260B

32SB-41-0507

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E11031

% Solids: 85.94

Source Sample Name: **1004277-18**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzene	51.76	ND	49.41	95.5		75 - 125
Ethylbenzene	51.76	ND	43.40	83.8		75 - 125
Toluene	51.76	ND	44.55	86.1		70 - 125
Xylenes (total)	155.3	ND	129.5	83.4		75 - 125

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzene	51.94	46.65	89.8	5.74		30	75 - 125
Ethylbenzene	51.94	42.41	81.6	2.30		30	75 - 125
Toluene	51.94	42.86	82.5	3.85		30	70 - 125
Xylenes (total)	155.8	120.5	77.3	7.20		30	75 - 125

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8260B

32SB-35-0507

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E11031

% Solids: 85.65

Source Sample Name: **1004277-10**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzene	47.93	ND	46.86	97.8		75 - 125
Ethylbenzene	47.93	ND	41.72	87.0		75 - 125
Toluene	47.93	ND	42.35	88.4		70 - 125
Xylenes (total)	143.8	ND	125.9	87.6		75 - 125

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS	
						RPD	REC.
Benzene	47.46	38.35	80.8	20.0		30	75 - 125
Ethylbenzene	47.46	35.69	75.2	15.6		30	75 - 125
Toluene	47.46	35.41	74.6	17.9		30	70 - 125
Xylenes (total)	142.4	105.5	74.1	17.6	*	30	75 - 125

HOLDING TIME SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32GW-03	04/27/10 16:42	04/29/10 08:30	05/10/10 00:00	N/A	14.00	05/10/10 18:59	13.10	14.00	
32GW-FD042710-01	04/27/10 00:00	04/29/10 08:30	05/10/10 00:00	N/A	14.00	05/10/10 19:29	13.81	14.00	
32SS-RB042710-01	04/27/10 08:10	04/29/10 08:30	05/10/10 00:00	N/A	14.00	05/10/10 19:59	13.49	14.00	
32SS-RB042710-02	04/27/10 11:50	04/29/10 08:30	05/10/10 00:00	N/A	14.00	05/10/10 20:29	13.36	14.00	
32SS-RB042710-03	04/27/10 15:10	04/29/10 08:30	05/10/10 00:00	N/A	14.00	05/10/10 20:59	13.24	14.00	
32SS-RB042810-04	04/27/10 11:16	04/29/10 08:30	05/10/10 00:00	N/A	14.00	05/10/10 21:28	13.43	14.00	
32SB-31-0607	04/28/10 10:10	04/29/10 08:30	05/11/10 15:28	N/A	14.00	05/12/10 01:23	13.63	14.00	
32SB-35-0507	04/28/10 10:25	04/29/10 08:30	05/11/10 15:28	N/A	14.00	05/12/10 01:54	13.65	14.00	
32SB-38-0506	04/27/10 08:50	04/29/10 08:30	05/10/10 17:35	N/A	14.00	05/11/10 03:02	13.76	14.00	
32SB-39-0507	04/28/10 10:45	04/29/10 08:30	05/11/10 15:28	N/A	14.00	05/12/10 02:24	13.65	14.00	
32SB-40-0506	04/27/10 09:00	04/29/10 08:30	05/10/10 17:35	N/A	14.00	05/11/10 03:41	13.78	14.00	
32SB-41-0507	04/28/10 09:20	04/29/10 08:30	05/11/10 15:28	N/A	14.00	05/12/10 02:55	13.73	14.00	
32SB-42-0506	04/27/10 09:30	04/29/10 08:30	05/20/10 11:09	N/A	14.00	05/20/10 21:21	23.49	14.00	*
32SB-FD042810-04	04/28/10 00:00	04/29/10 08:30	05/11/10 15:28	N/A	14.00	05/12/10 03:26	14.14	14.00	
32SB-FD042810-05	04/28/10 00:00	04/29/10 08:30	05/11/10 15:28	N/A	14.00	05/12/10 03:56	14.16	14.00	
32SB-DW01-0809	04/28/10 12:54	04/29/10 08:30	05/15/10 14:52	N/A	14.00	05/16/10 03:05	17.59	14.00	*
32SB-DW01-0809	04/28/10 12:54	04/29/10 08:30	05/21/10 00:00	N/A	14.00	05/21/10 21:06	23.34	14.00	*

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E10024 Batch Matrix: Water Preparation: 5030B

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E10024-BLK1	05/10/10 00:00	5.00	5.00
LCS	0E10024-BS1	05/10/10 00:00	5.00	5.00
32GW-03	1004277-01	05/10/10 00:00	5.00	5.00
32GW-FD042710-01	1004277-02	05/10/10 00:00	5.00	5.00
32SS-RB042710-01	1004277-03	05/10/10 00:00	5.00	5.00
32SS-RB042710-02	1004277-04	05/10/10 00:00	5.00	5.00
32SS-RB042710-03	1004277-05	05/10/10 00:00	5.00	5.00
32SS-RB042810-04	1004277-06	05/10/10 00:00	5.00	5.00

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E10038 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E10038-BLK1	05/10/10 17:35	5.00	5.00
LCS	0E10038-BS1	05/10/10 17:35	5.00	5.00
LCS Dup	0E10038-BSD1	05/10/10 17:35	5.00	5.00
32SB-38-0506	1004277-12	05/10/10 17:35	6.02	5.00
32SB-40-0506	1004277-16	05/10/10 17:35	5.81	5.00

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E11031 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E11031-BLK1	05/11/10 15:49	5.00	5.00
LCS	0E11031-BS1	05/11/10 15:49	5.00	5.00
32SB-31-0607	0E11031-MS1	05/11/10 15:49	4.67	5.00
32SB-35-0507	0E11031-MS2	05/11/10 15:49	6.09	5.00
32SB-39-0507	0E11031-MS3	05/11/10 15:49	5.67	5.00
32SB-41-0507	0E11031-MS4	05/11/10 15:49	5.62	5.00
32SB-31-0607	0E11031-MSD1	05/11/10 15:49	4.51	5.00
32SB-35-0507	0E11031-MSD2	05/11/10 15:49	6.15	5.00
32SB-39-0507	0E11031-MSD3	05/11/10 15:49	5.65	5.00
32SB-41-0507	0E11031-MSD4	05/11/10 15:49	5.60	5.00
32SB-31-0607	1004277-08	05/11/10 15:28	5.77	5.00
32SB-35-0507	1004277-10	05/11/10 15:28	5.71	5.00
32SB-39-0507	1004277-14	05/11/10 15:28	5.99	5.00
32SB-41-0507	1004277-18	05/11/10 15:28	5.61	5.00
32SB-FD042810-04	1004277-23	05/11/10 15:28	5.84	5.00
32SB-FD042810-05	1004277-24	05/11/10 15:28	5.60	5.00

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E15003 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E15003-BLK1	05/15/10 14:56	5.00	5.00
LCS	0E15003-BS1	05/15/10 14:56	5.00	5.00
LCS Dup	0E15003-BSD1	05/15/10 14:56	5.00	5.00
32SB-DW01-0809	1004277-26	05/15/10 14:52	5.21	5.00

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E20008 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E20008-BLK1	05/20/10 11:09	5.00	5.00
LCS	0E20008-BS1	05/20/10 11:09	5.00	5.00
LCS Dup	0E20008-BSD1	05/20/10 11:09	5.00	5.00
32SB-42-0506	1004277-20RE1	05/20/10 11:09	5.49	5.00

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E21026 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E21026-BLK2	05/21/10 00:00	5.00	5.00
LCS	0E21026-BS1	05/21/10 00:00	5.00	5.00
32SB-DW01-0809	1004277-26RE1	05/21/10 00:00	5.26	5.00

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/07/10
Instrument ID:	MS-VOA3	Injection Time:	13:11
Sequence:	0E12804	Lab Sample ID:	0E12804-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	21	PASS
75	30 - 60% of 95	48.9	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.32	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	70.9	PASS
175	5 - 9% of 174	6.93	PASS
176	95 - 101% of 174	98.2	PASS
177	5 - 9% of 176	7.81	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/07/10
Instrument ID:	MS-VOA3	Injection Time:	23:46
Sequence:	0E12804	Lab Sample ID:	0E12804-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	20.1	PASS
75	30 - 60% of 95	49.7	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.39	PASS
173	Less than 2% of 174	0.632	PASS
174	50 - 200% of 95	71	PASS
175	5 - 9% of 174	7.33	PASS
176	95 - 101% of 174	98.7	PASS
177	5 - 9% of 176	5.91	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/07/10
Instrument ID:	MS-VOA4	Injection Time:	18:43
Sequence:	0E13002	Lab Sample ID:	0E13002-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	32.2	PASS
75	30 - 60% of 95	50.5	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.01	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	70.3	PASS
175	5 - 9% of 174	7.68	PASS
176	95 - 101% of 174	95.1	PASS
177	5 - 9% of 176	5.92	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/08/10
Instrument ID:	MS-VOA4	Injection Time:	04:29
Sequence:	0E13002	Lab Sample ID:	0E13002-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	25.2	PASS
75	30 - 60% of 95	44.3	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.93	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	72	PASS
175	5 - 9% of 174	8.06	PASS
176	95 - 101% of 174	95.2	PASS
177	5 - 9% of 176	6.4	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/10/10
Instrument ID:	MS-VOA3	Injection Time:	11:29
Sequence:	0E13404	Lab Sample ID:	0E13404-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	17.6	PASS
75	30 - 60% of 95	46.7	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.44	PASS
173	Less than 2% of 174	0.636	PASS
174	50 - 200% of 95	87.4	PASS
175	5 - 9% of 174	7.2	PASS
176	95 - 101% of 174	96.8	PASS
177	5 - 9% of 176	6.94	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUNE.D	Injection Date:	05/11/10
Instrument ID:	MS-VOA4	Injection Time:	22:50
Sequence:	0E13517	Lab Sample ID:	0E13517-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	30.9	PASS
75	30 - 60% of 95	51.6	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.95	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	80.4	PASS
175	5 - 9% of 174	8.38	PASS
176	95 - 101% of 174	95.5	PASS
177	5 - 9% of 176	6.66	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN3.D	Injection Date:	05/10/10
Instrument ID:	MS-VOA1	Injection Time:	18:50
Sequence:	0E13718	Lab Sample ID:	0E13718-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	19.6	PASS
75	30 - 60% of 95	46.1	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.6	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	55.5	PASS
175	5 - 9% of 174	7.31	PASS
176	95 - 101% of 174	96.5	PASS
177	5 - 9% of 176	7.51	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/16/10
Instrument ID:	MS-VOA1	Injection Time:	13:42
Sequence:	0E13909	Lab Sample ID:	0E13909-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	21.1	PASS
75	30 - 60% of 95	47.2	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.37	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	67.1	PASS
175	5 - 9% of 174	7.31	PASS
176	95 - 101% of 174	95.7	PASS
177	5 - 9% of 176	6.29	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/13/10
Instrument ID:	MS-VOA4	Injection Time:	13:56
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	24.2	PASS
75	30 - 60% of 95	46.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.6	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	72.9	PASS
175	5 - 9% of 174	8.01	PASS
176	95 - 101% of 174	97.4	PASS
177	5 - 9% of 176	6.63	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/13/10
Instrument ID:	MS-VOA4	Injection Time:	23:42
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	27.6	PASS
75	30 - 60% of 95	49	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.84	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	50.2	PASS
175	5 - 9% of 174	7.16	PASS
176	95 - 101% of 174	95.8	PASS
177	5 - 9% of 176	7.75	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1A.D	Injection Date:	05/14/10
Instrument ID:	MS-VOA4	Injection Time:	11:07
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN3

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	25.5	PASS
75	30 - 60% of 95	48.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.2	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	62.6	PASS
175	5 - 9% of 174	8.21	PASS
176	95 - 101% of 174	95.7	PASS
177	5 - 9% of 176	6.95	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/20/10
Instrument ID:	MS-VOA1	Injection Time:	13:38
Sequence:	0E14105	Lab Sample ID:	0E14105-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	21.7	PASS
75	30 - 60% of 95	45.6	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.35	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	67.6	PASS
175	5 - 9% of 174	6.92	PASS
176	95 - 101% of 174	95.4	PASS
177	5 - 9% of 176	6.29	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN3.D	Injection Date:	05/15/10
Instrument ID:	MS-VOA4	Injection Time:	19:25
Sequence:	0E14109	Lab Sample ID:	0E14109-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	23.2	PASS
75	30 - 60% of 95	45.9	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.71	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	79.2	PASS
175	5 - 9% of 174	8.16	PASS
176	95 - 101% of 174	97.5	PASS
177	5 - 9% of 176	6.59	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/21/10
Instrument ID:	MS-VOA1	Injection Time:	15:57
Sequence:	0F15210	Lab Sample ID:	0F15210-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	23.5	PASS
75	30 - 60% of 95	46.8	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.56	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	55.5	PASS
175	5 - 9% of 174	7.52	PASS
176	95 - 101% of 174	96	PASS
177	5 - 9% of 176	6.52	PASS

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13718

SDG: CTOF273_005
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA1
Calibration: UNASSIGNED

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E13718-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/10/10 19:22			
Fluorobenzene	1522728	13.882				50 - 200	13.8820	+/-0.50	
Chlorobenzene-d5	619439	19.579				50 - 200	19.5790	+/-0.50	
1,4-Dichlorobenzene-d4	489858	24.05				50 - 200	24.0500	+/-0.50	
LCS (0E10038-BS1)			Lab File ID: LCS1.D			Analyzed: 05/10/10 20:39			
Fluorobenzene	1484039	13.88	1522728	13.882	97	50 - 200	-0.0020	+/-0.50	
Chlorobenzene-d5	596508	19.577	619439	19.579	96	50 - 200	-0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	473281	24.044	489858	24.05	97	50 - 200	-0.0060	+/-0.50	
Blank (0E10038-BLK1)			Lab File ID: MBLK1.D			Analyzed: 05/10/10 22:34			
Fluorobenzene	1427546	13.877	1522728	13.882	94	50 - 200	-0.0050	+/-0.50	
Chlorobenzene-d5	563945	19.585	619439	19.579	91	50 - 200	0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	442149	24.05	489858	24.05	90	50 - 200	0.0000	+/-0.50	
32SB-38-0506 (1004277-12)			Lab File ID: 0427712.D			Analyzed: 05/11/10 03:02			
Fluorobenzene	1169415	13.891	1522728	13.882	77	50 - 200	0.0090	+/-0.50	
Chlorobenzene-d5	469504	19.598	619439	19.579	76	50 - 200	0.0190	+/-0.50	
1,4-Dichlorobenzene-d4	373388	24.063	489858	24.05	76	50 - 200	0.0130	+/-0.50	
X **32SB-40-0506 (1004277-16)**			Lab File ID: 0427716.D			Analyzed: 05/11/10 03:41			
Fluorobenzene	447474	13.905	1522728	13.882	29	50 - 200	0.0230	+/-0.50	*
Chlorobenzene-d5	190666	19.597	619439	19.579	31	50 - 200	0.0180	+/-0.50	*
1,4-Dichlorobenzene-d4	155261	24.075	489858	24.05	32	50 - 200	0.0250	+/-0.50	*
LCS Dup (0E10038-BSD1)			Lab File ID: LCSD1.D			Analyzed: 05/11/10 04:57			
Fluorobenzene	1510508	13.881	1522728	13.882	99	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	625094	19.592	619439	19.579	101	50 - 200	0.0130	+/-0.50	
1,4-Dichlorobenzene-d4	492781	24.06	489858	24.05	101	50 - 200	0.0100	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E14109

SDG: CTOF273_005
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0144005

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E14109-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/15/10 19:55			
Fluorobenzene	843423	14.06	822611	14.04	103	50 - 200	0.0200	+/-0.50	
Chlorobenzene-d5	404132	17.317	341417	17.297	118	50 - 200	0.0200	+/-0.50	
1,4-Dichlorobenzene-d4	278121	19.374	297455	19.354	94	50 - 200	0.0200	+/-0.50	
LCS (0E15003-BS1)			Lab File ID: V4LCS01.D			Analyzed: 05/15/10 20:57			
Fluorobenzene	843029	14.058	843423	14.06	100	50 - 200	-0.0020	+/-0.50	
Chlorobenzene-d5	378372	17.315	404132	17.317	94	50 - 200	-0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	283789	19.372	278121	19.374	102	50 - 200	-0.0020	+/-0.50	
Blank (0E15003-BLK1)			Lab File ID: V4BLK01.D			Analyzed: 05/15/10 22:29			
Fluorobenzene	922615	14.059	843423	14.06	109	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	387301	17.316	404132	17.317	96	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	325105	19.373	278121	19.374	117	50 - 200	-0.0010	+/-0.50	
32SB-DW01-0809 (1004277-26)			Lab File ID: 0427726.D			Analyzed: 05/16/10 03:05			
Fluorobenzene	621773	14.074	843423	14.06	74	50 - 200	0.0140	+/-0.50	
Chlorobenzene-d5	183642	17.331	404132	17.317	45	50 - 200	0.0140	+/-0.50	*
1,4-Dichlorobenzene-d4	100279	19.377	278121	19.374	36	50 - 200	0.0030	+/-0.50	*
LCS Dup (0E15003-BSD1)			Lab File ID: V4LCSD01.D			Analyzed: 05/16/10 07:41			
Fluorobenzene	905421	14.073	843423	14.06	107	50 - 200	0.0130	+/-0.50	
Chlorobenzene-d5	410430	17.32	404132	17.317	102	50 - 200	0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	276738	19.377	278121	19.374	100	50 - 200	0.0030	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13404

SDG: CTOF273_005
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA3
Calibration: 0128001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E13404-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/10/10 11:59			
Fluorobenzene	1219985	12.669	1370254	12.699	89	50 - 200	-0.0300	+/-0.50	
Chlorobenzene-d5	541583	16.234	547120	16.258	99	50 - 200	-0.0240	+/-0.50	
1,4-Dichlorobenzene-d4	577745	18.229	538426	18.247	107	50 - 200	-0.0180	+/-0.50	
LCS (0E10024-BS1)			Lab File ID: V3LCS01.D			Analyzed: 05/10/10 12:59			
Fluorobenzene	1201486	12.668	1219985	12.669	98	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	518148	16.233	541583	16.234	96	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	540720	18.229	577745	18.229	94	50 - 200	0.0000	+/-0.50	
Blank (0E10024-BLK1)			Lab File ID: V3BLK01.D			Analyzed: 05/10/10 14:59			
Fluorobenzene	1121236	12.675	1219985	12.669	92	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	458940	16.239	541583	16.234	85	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	453287	18.229	577745	18.229	78	50 - 200	0.0000	+/-0.50	
32GW-03 (1004277-01)			Lab File ID: 0427701.D			Analyzed: 05/10/10 18:59			
Fluorobenzene	1120091	12.681	1219985	12.669	92	50 - 200	0.0120	+/-0.50	
Chlorobenzene-d5	456332	16.24	541583	16.234	84	50 - 200	0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	443386	18.235	577745	18.229	77	50 - 200	0.0060	+/-0.50	
32GW-FD042710-01 (1004277-02)			Lab File ID: 0427702.D			Analyzed: 05/10/10 19:29			
Fluorobenzene	1110066	12.681	1219985	12.669	91	50 - 200	0.0120	+/-0.50	
Chlorobenzene-d5	453559	16.24	541583	16.234	84	50 - 200	0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	442412	18.235	577745	18.229	77	50 - 200	0.0060	+/-0.50	
32SS-RB042710-01 (1004277-03)			Lab File ID: 0427703.D			Analyzed: 05/10/10 19:59			
Fluorobenzene	1110324	12.681	1219985	12.669	91	50 - 200	0.0120	+/-0.50	
Chlorobenzene-d5	448020	16.24	541583	16.234	83	50 - 200	0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	439384	18.235	577745	18.229	76	50 - 200	0.0060	+/-0.50	
32SS-RB042710-02 (1004277-04)			Lab File ID: 0427704.D			Analyzed: 05/10/10 20:29			
Fluorobenzene	1095524	12.681	1219985	12.669	90	50 - 200	0.0120	+/-0.50	
Chlorobenzene-d5	454469	16.24	541583	16.234	84	50 - 200	0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	439483	18.235	577745	18.229	76	50 - 200	0.0060	+/-0.50	
32SS-RB042710-03 (1004277-05)			Lab File ID: 0427705.D			Analyzed: 05/10/10 20:59			
Fluorobenzene	1093723	12.681	1219985	12.669	90	50 - 200	0.0120	+/-0.50	
Chlorobenzene-d5	447842	16.246	541583	16.234	83	50 - 200	0.0120	+/-0.50	
1,4-Dichlorobenzene-d4	438871	18.235	577745	18.229	76	50 - 200	0.0060	+/-0.50	
32SS-RB042810-04 (1004277-06)			Lab File ID: 0427706.D			Analyzed: 05/10/10 21:28			
Fluorobenzene	1098499	12.681	1219985	12.669	90	50 - 200	0.0120	+/-0.50	
Chlorobenzene-d5	448087	16.246	541583	16.234	83	50 - 200	0.0120	+/-0.50	
1,4-Dichlorobenzene-d4	432894	18.235	577745	18.229	75	50 - 200	0.0060	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_005
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Sequence: 0E13517
Instrument: MS-VOA4
Calibration: 0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E13517-CCV1)			Lab File ID: SEQ-CCV3.D			Analyzed: 05/11/10 23:21			
Fluorobenzene	468484	14.05	672772	14.056	70	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	241095	17.316	278531	17.313	87	50 - 200	0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	174163	19.373	217185	19.369	80	50 - 200	0.0040	+/-0.50	
LCS (0E11031-BS1)			Lab File ID: V4LCS03.D			Analyzed: 05/11/10 23:51			
Fluorobenzene	465286	14.05	468484	14.05	99	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	236420	17.316	241095	17.316	98	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	189130	19.373	174163	19.373	109	50 - 200	0.0000	+/-0.50	
Blank (0E11031-BLK1)			Lab File ID: V4BLK02.D			Analyzed: 05/12/10 00:53			
Fluorobenzene	511755	14.047	468484	14.05	109	50 - 200	-0.0030	+/-0.50	
Chlorobenzene-d5	240713	17.314	241095	17.316	100	50 - 200	-0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	241226	19.371	174163	19.373	139	50 - 200	-0.0020	+/-0.50	
32SB-31-0607 (1004277-08)			Lab File ID: 0427708.D			Analyzed: 05/12/10 01:23			
Fluorobenzene	550820	14.052	468484	14.05	118	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	244172	17.319	241095	17.316	101	50 - 200	0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	236727	19.375	174163	19.373	136	50 - 200	0.0020	+/-0.50	
32SB-35-0507 (1004277-10)			Lab File ID: 0427710.D			Analyzed: 05/12/10 01:54			
Fluorobenzene	535297	14.059	468484	14.05	114	50 - 200	0.0090	+/-0.50	
Chlorobenzene-d5	233699	17.316	241095	17.316	97	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	231739	19.372	174163	19.373	133	50 - 200	-0.0010	+/-0.50	
32SB-39-0507 (1004277-14)			Lab File ID: 0427714.D			Analyzed: 05/12/10 02:24			
Fluorobenzene	398694	14.054	468484	14.05	85	50 - 200	0.0040	+/-0.50	
Chlorobenzene-d5	162154	17.32	241095	17.316	67	50 - 200	0.0040	+/-0.50	
1,4-Dichlorobenzene-d4	164938	19.377	174163	19.373	95	50 - 200	0.0040	+/-0.50	
32SB-41-0507 (1004277-18)			Lab File ID: 0427718.D			Analyzed: 05/12/10 02:55			
Fluorobenzene	285747	14.053	468484	14.05	61	50 - 200	0.0030	+/-0.50	
Chlorobenzene-d5	134199	17.32	241095	17.316	56	50 - 200	0.0040	+/-0.50	
1,4-Dichlorobenzene-d4	126219	19.376	174163	19.373	72	50 - 200	0.0030	+/-0.50	
32SB-FD042810-04 (1004277-23)			Lab File ID: 0427723.D			Analyzed: 05/12/10 03:26			
Fluorobenzene	500472	14.059	468484	14.05	107	50 - 200	0.0090	+/-0.50	
Chlorobenzene-d5	219839	17.316	241095	17.316	91	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	229608	19.372	174163	19.373	132	50 - 200	-0.0010	+/-0.50	
32SB-FD042810-05 (1004277-24)			Lab File ID: 0427724.D			Analyzed: 05/12/10 03:56			
Fluorobenzene	501920	14.05	468484	14.05	107	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	206543	17.316	241095	17.316	86	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	161902	19.373	174163	19.373	93	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_005
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Sequence: 0E13517
Instrument: MS-VOA4
Calibration: 0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike (0E11031-MS1)			Lab File ID: 0427708M.D			Analyzed: 05/12/10 06:30			
Fluorobenzene	504261	14.053	468484	14.05	108	50 - 200	0.0030	+/-0.50	
Chlorobenzene-d5	247980	17.32	241095	17.316	103	50 - 200	0.0040	+/-0.50	
1,4-Dichlorobenzene-d4	205611	19.376	174163	19.373	118	50 - 200	0.0030	+/-0.50	
Matrix Spike Dup (0E11031-MSD1)			Lab File ID: 0427708S.D			Analyzed: 05/12/10 07:00			
Fluorobenzene	491372	14.054	468484	14.05	105	50 - 200	0.0040	+/-0.50	
Chlorobenzene-d5	236619	17.311	241095	17.316	98	50 - 200	-0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	211620	19.378	174163	19.373	122	50 - 200	0.0050	+/-0.50	
Matrix Spike (0E11031-MS2)			Lab File ID: 0427710M.D			Analyzed: 05/12/10 07:31			
Fluorobenzene	461367	14.053	468484	14.05	98	50 - 200	0.0030	+/-0.50	
Chlorobenzene-d5	229846	17.32	241095	17.316	95	50 - 200	0.0040	+/-0.50	
1,4-Dichlorobenzene-d4	199899	19.376	174163	19.373	115	50 - 200	0.0030	+/-0.50	
Matrix Spike Dup (0E11031-MSD2)			Lab File ID: 0427710S.D			Analyzed: 05/12/10 08:02			
Fluorobenzene	446512	14.049	468484	14.05	95	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	218527	17.316	241095	17.316	91	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	196345	19.373	174163	19.373	113	50 - 200	0.0000	+/-0.50	
Matrix Spike (0E11031-MS3)			Lab File ID: 0427714M.D			Analyzed: 05/12/10 08:32			
Fluorobenzene	467125	14.049	468484	14.05	100	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	227316	17.316	241095	17.316	94	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	199665	19.373	174163	19.373	115	50 - 200	0.0000	+/-0.50	
Matrix Spike Dup (0E11031-MSD3)			Lab File ID: 0427714S.D			Analyzed: 05/12/10 09:03			
Fluorobenzene	448424	14.043	468484	14.05	96	50 - 200	-0.0070	+/-0.50	
Chlorobenzene-d5	215503	17.31	241095	17.316	89	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	186863	19.367	174163	19.373	107	50 - 200	-0.0060	+/-0.50	
Matrix Spike (0E11031-MS4)			Lab File ID: 0427718M.D			Analyzed: 05/12/10 09:34			
Fluorobenzene	441668	14.044	468484	14.05	94	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	218439	17.31	241095	17.316	91	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	180185	19.367	174163	19.373	103	50 - 200	-0.0060	+/-0.50	
Matrix Spike Dup (0E11031-MSD4)			Lab File ID: 0427718S.D			Analyzed: 05/12/10 10:17			
Fluorobenzene	445653	14.049	468484	14.05	95	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	225806	17.316	241095	17.316	94	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	191585	19.372	174163	19.373	110	50 - 200	-0.0010	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14105	Instrument:	MS-VOA1
		Calibration:	0141001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E14105-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/20/10 14:10			
Fluorobenzene	2441510	14.573	2403751	14.57	102	50 - 200	0.0030	+/-0.50	
Chlorobenzene-d5	1066089	20.324	960429	20.321	111	50 - 200	0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	819746	24.828	805672	24.823	102	50 - 200	0.0050	+/-0.50	
LCS (0E20008-BS1)			Lab File ID: V1LCS1.D			Analyzed: 05/20/10 15:29			
Fluorobenzene	2650496	14.572	2441510	14.573	109	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	1148925	20.324	1066089	20.324	108	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	906986	24.82	819746	24.828	111	50 - 200	-0.0080	+/-0.50	
Blank (0E20008-BLK1)			Lab File ID: V1BLK01.D			Analyzed: 05/20/10 17:26			
Fluorobenzene	2472993	14.575	2441510	14.573	101	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	1034994	20.323	1066089	20.324	97	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	854031	24.822	819746	24.828	104	50 - 200	-0.0060	+/-0.50	
32SB-42-0506 (1004277-20RE1)			Lab File ID: 0427720.D			Analyzed: 05/20/10 21:21			
Fluorobenzene	2355335	14.575	2441510	14.573	96	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	944307	20.321	1066089	20.324	89	50 - 200	-0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	747538	24.819	819746	24.828	91	50 - 200	-0.0090	+/-0.50	
LCS Dup (0E20008-BSD1)			Lab File ID: V1LCSD1.D			Analyzed: 05/20/10 23:18			
Fluorobenzene	2825815	14.575	2441510	14.573	116	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	1107707	20.319	1066089	20.324	104	50 - 200	-0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	862673	24.814	819746	24.828	105	50 - 200	-0.0140	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15210	Instrument:	MS-VOA1
		Calibration:	0141001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15210-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/21/10 16:29			
Fluorobenzene	2662943	14.59	2403751	14.57	111	50 - 200	0.0200	+/-0.50	
Chlorobenzene-d5	1157308	20.342	960429	20.321	120	50 - 200	0.0210	+/-0.50	
1,4-Dichlorobenzene-d4	837707	24.832	805672	24.823	104	50 - 200	0.0090	+/-0.50	
LCS (0E21026-BS1)			Lab File ID: V1LCS1.D			Analyzed: 05/21/10 17:08			
Fluorobenzene	2759485	14.58	2662943	14.59	104	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	1150251	20.335	1157308	20.342	99	50 - 200	-0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	841774	24.822	837707	24.832	100	50 - 200	-0.0100	+/-0.50	
Blank (0E21026-BLK2)			Lab File ID: V1MBLK1.D			Analyzed: 05/21/10 19:08			
Fluorobenzene	2551659	14.551	2662943	14.59	96	50 - 200	-0.0390	+/-0.50	
Chlorobenzene-d5	1070031	20.321	1157308	20.342	92	50 - 200	-0.0210	+/-0.50	
1,4-Dichlorobenzene-d4	852037	24.824	837707	24.832	102	50 - 200	-0.0080	+/-0.50	
32SB-DW01-0809 (1004277-26RE1)			Lab File ID: 0427726D.D			Analyzed: 05/21/10 21:06			
Fluorobenzene	2769180	14.576	2662943	14.59	104	50 - 200	-0.0140	+/-0.50	
Chlorobenzene-d5	1109194	20.328	1157308	20.342	96	50 - 200	-0.0140	+/-0.50	
1,4-Dichlorobenzene-d4	913564	24.82	837707	24.832	109	50 - 200	-0.0120	+/-0.50	

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA3	Calibration:	0128001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/07/10 15:51
Sequence:	0E13404	Injection Date:	05/10/10
Lab Sample ID:	0E13404-CCV1	Injection Time:	11:59

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	99.13	0.8513296	0.8439187		-0.9	20
Ethylbenzene	A	100.0	96.92	2.118108	2.052829		-3.1	20
Toluene	A	100.0	99.97	1.247637	1.247273		-0.03	20
Xylenes (total)	A	300.0	292.4	1.65548	1.655874		0.02	20
Bromofluorobenzene	A	30.00	28.93	0.8488807	0.8186852		-3.6	20
Dibromofluoromethane	A	30.00	29.76	0.2645697	0.2624393		-0.8	20
1,2-Dichloroethane-d4	A	30.00	29.05	5.822815E-02	5.639168E-02		-3.2	20
Toluene-d8	A	30.00	28.56	2.233741	2.126332		-4.8	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-CCV3.D	Calibration Date:	05/07/10 09:01
Sequence:	0E13517	Injection Date:	05/11/10
Lab Sample ID:	0E13517-CCV1	Injection Time:	23:21

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	93.58	1.072069	1.003261		-6.4	20
Ethylbenzene	A	100.0	75.57	2.911353	2.200046		-24.4	20 *
Toluene	A	100.0	79.31	1.422543	1.128231		-20.7	20 *
Xylenes (total)	Q	300.0	246.6	2.150116	1.565743		-17.8	20
Bromofluorobenzene	A	30.00	27.04	0.8397075	0.7567183		-9.9	20
Dibromofluoromethane	A	30.00	31.88	0.3074291	0.3266856		6.3	20
1,2-Dichloroethane-d4	A	30.00	29.08	6.679317E-02	6.474074E-02		-3.1	20
Toluene-d8	A	30.00	29.90	2.047687	2.041125		-0.3	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA1	Calibration:	0141001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/16/10 05:53
Sequence:	0E14105	Injection Date:	05/20/10
Lab Sample ID:	0E14105-CCV1	Injection Time:	14:10

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	89.38	0.9538096	0.852482		-10.6	20
Ethylbenzene	A	100.0	85.50	2.625901	2.245226		-14.5	20
Toluene	A	100.0	87.09	1.306087	1.137517		-12.9	20
Xylenes (total)	A	300.0	249.0	1.983846	1.646787		-17.0	20
Bromofluorobenzene	A	30.00	29.53	0.806614	0.7940735		-1.6	20
Dibromofluoromethane	A	30.00	28.34	0.2558456	0.2417086		-5.5	20
1,2-Dichloroethane-d4	A	30.00	27.00	6.111453E-02	5.500776E-02		-10.0	20
Toluene-d8	A	30.00	29.52	2.151044	2.116707		-1.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0144005
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/13/10 12:58
Sequence:	0E14109	Injection Date:	05/15/10
Lab Sample ID:	0E14109-CCV1	Injection Time:	19:55

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	94.85	1.044291	0.9905176		-5.1	20
Ethylbenzene	A	100.0	79.76	2.698668	2.152489		-20.2	20 *
Toluene	A	100.0	83.07	1.328513	1.103647		-16.9	20
Xylenes (total)	Q	300.0	258.5	2.00992	1.52534		-13.8	20
Bromofluorobenzene	A	30.00	30.23	0.8537608	0.8602882		0.8	20
Dibromofluoromethane	A	30.00	33.56	0.2871282	0.3211603		11.9	20
1,2-Dichloroethane-d4	A	30.00	30.64	6.763165E-02	0.0690804		2.1	20
Toluene-d8	A	30.00	29.41	1.971808	1.932812		-2.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA1	Calibration:	0141001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/16/10 05:53
Sequence:	0F15210	Injection Date:	05/21/10
Lab Sample ID:	0F15210-CCV1	Injection Time:	16:29

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	96.53	0.9538096	0.9207242		-3.5	20
Ethylbenzene	A	100.0	92.24	2.625901	2.422007		-7.8	20
Toluene	A	100.0	94.46	1.306087	1.233704		-5.5	20
Xylenes (total)	A	300.0	269.3	1.983846	1.781017		-10.2	20
Bromofluorobenzene	A	30.00	28.69	0.806614	0.7713755		-4.4	20
Dibromofluoromethane	A	30.00	28.25	0.2558456	0.2409428		-5.8	20
1,2-Dichloroethane-d4	A	30.00	23.73	6.111453E-02	4.833412E-02		-20.9	20 *
Toluene-d8	A	30.00	29.70	2.151044	2.129762		-1.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_005
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Matrix:
Laboratory ID: 0E10024-BLK1
File ID: V3BLK01.D
Sampled:
Prepared:
Analyzed: 05/10/10 14:59
Solids:
Preparation: 5030B
Dilution:
Batch: 0E10024
Sequence: 0E13404
Calibration: 0128001
Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.80	103	75 - 120	
Dibromofluoromethane	30.00	30.14	100	85 - 115	
1,2-Dichloroethane-d4	30.00	30.33	101	70 - 120	
Toluene-d8	30.00	32.27	108	85 - 120	

ANALYSIS DATA SHEET

LCS

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E10024-BS1	File ID:	V3LCS01.D
Sampled:		Prepared:		Analyzed:	05/10/10 12:59
Solids:		Preparation:	5030B	Dilution:	

Batch:	0E10024	Sequence:	0E13404	Calibration:	0128001	Instrument:	MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene	41.0	0.140	1.00	
100-41-4	Ethylbenzene	40.2	0.150	1.00	
108-88-3	Toluene	40.1	0.190	1.00	
1330-20-7	Xylenes (total)	125	0.220	1.00	

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.49	102	75 - 120	
Dibromofluoromethane	30.00	30.11	100	85 - 115	
1,2-Dichloroethane-d4	30.00	29.54	98.5	70 - 120	
Toluene-d8	30.00	29.95	99.8	85 - 120	

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E10038-BLK1 File ID: MBLK1.D

Sampled: Prepared: Analyzed: 05/10/10 22:34

Solids: Preparation: 5035 Dilution:

Batch: 0E10038 Sequence: 0E13718 Calibration: UNASSIGNED Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	Q, U
100-41-4	Ethylbenzene		0.750	10.0	Q, U
108-88-3	Toluene		0.860	10.0	Q, U
1330-20-7	Xylenes (total)		0.700	10.0	Q, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.26	97.5	85 - 120	
Dibromofluoromethane	30.00	29.06	96.9	80 - 125	
1,2-Dichloroethane-d4	30.00	25.13	83.8	75 - 140	
Toluene-d8	30.00	33.81	113	85 - 115	

ANALYSIS DATA SHEET

LCS

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E10038-BS1	File ID:	LCS1.D
Sampled:		Prepared:		Analyzed:	05/10/10 20:39
Solids:		Preparation:	5035	Dilution:	

Batch:	0E10038	Sequence:	0E13718	Calibration:	UNASSIGNED	Instrument:	MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene	46.22	0.470	4.00	
100-41-4	Ethylbenzene	48.29	0.750	10.0	
108-88-3	Toluene	49.94	0.860	10.0	
1330-20-7	Xylenes (total)	141.1	0.700	10.0	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.09	97.0	85 - 120	
Dibromofluoromethane	30.00	28.16	93.9	80 - 125	
1,2-Dichloroethane-d4	30.00	26.53	88.4	75 - 140	
Toluene-d8	30.00	32.07	107	85 - 115	

ANALYSIS DATA SHEET

LCS Dup

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E10038-BSD1	File ID:	LCSD1.D
Sampled:		Prepared:		Analyzed:	05/11/10 04:57
Solids:		Preparation:	5035	Dilution:	

Batch:	0E10038	Sequence:	0E13718	Calibration:	UNASSIGNED	Instrument:	MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene	69.03	0.470	4.00	
100-41-4	Ethylbenzene	69.51	0.750	10.0	
108-88-3	Toluene	70.85	0.860	10.0	
1330-20-7	Xylenes (total)	204.6	0.700	10.0	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	28.32	94.4	85 - 120	
Dibromofluoromethane	30.00	28.28	94.3	80 - 125	
1,2-Dichloroethane-d4	30.00	26.34	87.8	75 - 140	
Toluene-d8	30.00	31.58	105	85 - 115	

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E11031-BLK1 File ID: V4BLK02.D

Sampled: Prepared: Analyzed: 05/12/10 00:53

Solids: Preparation: 5035 Dilution:

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	Y, U
108-88-3	Toluene		0.860	10.0	Y, U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	34.40	115	85 - 120	
Dibromofluoromethane	30.00	34.06	114	80 - 125	
1,2-Dichloroethane-d4	30.00	34.24	114	75 - 140	
Toluene-d8	30.00	31.60	105	85 - 115	

ANALYSIS DATA SHEET

LCS

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E11031-BS1 File ID: V4LCS03.D

Sampled: Prepared: Analyzed: 05/11/10 23:51

Solids: Preparation: 5035 Dilution:

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene	48.87	0.470	4.00	
100-41-4	Ethylbenzene	43.35	0.750	10.0	Y
108-88-3	Toluene	44.68	0.860	10.0	Y
1330-20-7	Xylenes (total)	130.0	0.700	10.0	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.89	99.6	85 - 120	
Dibromofluoromethane	30.00	32.33	108	80 - 125	
1,2-Dichloroethane-d4	30.00	30.10	100	75 - 140	
Toluene-d8	30.00	29.98	99.9	85 - 115	

ANALYSIS DATA SHEET

Matrix Spike

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E11031-MS1 File ID: 0427708M.D

Sampled: Prepared: Analyzed: 05/12/10 06:30

Solids: Preparation: 5035 Dilution:

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene	56.31	0.578	4.92	
100-41-4	Ethylbenzene	49.70	0.922	12.3	Y
108-88-3	Toluene	49.00	1.06	12.3	Y
1330-20-7	Xylenes (total)	149.0	0.860	12.3	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	36.86	36.64	99.4	85 - 120	
Dibromofluoromethane	36.86	38.70	105	80 - 125	
1,2-Dichloroethane-d4	36.86	34.58	93.8	75 - 140	
Toluene-d8	36.86	35.10	95.2	85 - 115	

ANALYSIS DATA SHEET

Matrix Spike

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E11031-MS2 File ID: 0427710M.D

Sampled: Prepared: Analyzed: 05/12/10 07:31

Solids: Preparation: 5035 Dilution:

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene	46.86	0.451	3.83	
100-41-4	Ethylbenzene	41.72	0.719	9.59	Y
108-88-3	Toluene	42.35	0.824	9.59	Y
1330-20-7	Xylenes (total)	125.9	0.671	9.59	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	28.76	28.26	98.3	85 - 120	
Dibromofluoromethane	28.76	31.71	110	80 - 125	
1,2-Dichloroethane-d4	28.76	30.54	106	75 - 140	
Toluene-d8	28.76	28.33	98.5	85 - 115	

ANALYSIS DATA SHEET

Matrix Spike

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E11031-MS3 File ID: 0427714M.D

Sampled: Prepared: Analyzed: 05/12/10 08:32

Solids: Preparation: 5035 Dilution:

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene	51.14	0.506	4.31	
100-41-4	Ethylbenzene	45.81	0.807	10.8	Y
108-88-3	Toluene	45.39	0.926	10.8	Y
1330-20-7	Xylenes (total)	139.0	0.753	10.8	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	32.29	32.72	101	85 - 120	
Dibromofluoromethane	32.29	34.71	107	80 - 125	
1,2-Dichloroethane-d4	32.29	32.49	101	75 - 140	
Toluene-d8	32.29	32.70	101	85 - 115	

ANALYSIS DATA SHEET

Matrix Spike

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E11031-MS4 File ID: 0427718M.D

Sampled: Prepared: Analyzed: 05/12/10 09:34

Solids: Preparation: 5035 Dilution:

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene	49.41	0.487	4.14	
100-41-4	Ethylbenzene	43.40	0.776	10.4	Y
108-88-3	Toluene	44.55	0.890	10.4	Y
1330-20-7	Xylenes (total)	129.5	0.725	10.4	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	31.06	31.13	100	85 - 120	
Dibromofluoromethane	31.06	33.54	108	80 - 125	
1,2-Dichloroethane-d4	31.06	31.24	101	75 - 140	
Toluene-d8	31.06	31.33	101	85 - 115	

ANALYSIS DATA SHEET

Matrix Spike Dup

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E11031-MSD1 File ID: 0427708S.D

Sampled: Prepared: Analyzed: 05/12/10 07:00

Solids: Preparation: 5035 Dilution:

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene	56.89	0.598	5.09	
100-41-4	Ethylbenzene	51.93	0.954	12.7	Y
108-88-3	Toluene	51.24	1.09	12.7	Y
1330-20-7	Xylenes (total)	152.2	0.891	12.7	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	38.17	39.13	103	85 - 120	
Dibromofluoromethane	38.17	39.73	104	80 - 125	
1,2-Dichloroethane-d4	38.17	37.21	97.5	75 - 140	
Toluene-d8	38.17	38.67	101	85 - 115	

ANALYSIS DATA SHEET

Matrix Spike Dup

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E11031-MSD2 File ID: 0427710S.D

Sampled: Prepared: Analyzed: 05/12/10 08:02

Solids: Preparation: 5035 Dilution:

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene	38.35	0.446	3.80	
100-41-4	Ethylbenzene	35.69	0.712	9.49	Y
108-88-3	Toluene	35.41	0.816	9.49	Y
1330-20-7	Xylenes (total)	105.5	0.664	9.49	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	28.48	29.57	104	85 - 120	
Dibromofluoromethane	28.48	32.08	113	80 - 125	
1,2-Dichloroethane-d4	28.48	31.06	109	75 - 140	
Toluene-d8	28.48	29.01	102	85 - 115	

ANALYSIS DATA SHEET

Matrix Spike Dup

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E11031-MSD3 File ID: 0427714S.D

Sampled: Prepared: Analyzed: 05/12/10 09:03

Solids: Preparation: 5035 Dilution:

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene	49.14	0.508	4.32	
100-41-4	Ethylbenzene	45.50	0.810	10.8	Y
108-88-3	Toluene	47.63	0.929	10.8	Y
1330-20-7	Xylenes (total)	138.5	0.756	10.8	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	32.41	32.27	99.6	85 - 120	
Dibromofluoromethane	32.41	34.04	105	80 - 125	
1,2-Dichloroethane-d4	32.41	32.58	101	75 - 140	
Toluene-d8	32.41	33.29	103	85 - 115	

ANALYSIS DATA SHEET

Matrix Spike Dup

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E11031-MSD4 File ID: 0427718S.D

Sampled: Prepared: Analyzed: 05/12/10 10:17

Solids: Preparation: 5035 Dilution:

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene	46.65	0.488	4.16	
100-41-4	Ethylbenzene	42.41	0.779	10.4	Y
108-88-3	Toluene	42.86	0.893	10.4	Y
1330-20-7	Xylenes (total)	120.5	0.727	10.4	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	31.17	31.00	99.5	85 - 120	
Dibromofluoromethane	31.17	35.89	115	80 - 125	
1,2-Dichloroethane-d4	31.17	34.56	111	75 - 140	
Toluene-d8	31.17	31.51	101	85 - 115	

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E15003-BLK1 File ID: V4BLK01.D

Sampled: Prepared: Analyzed: 05/15/10 22:29

Solids: Preparation: 5035 Dilution:

Batch: 0E15003 Sequence: 0E14109 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	Y, U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.91	103	85 - 120	
Dibromofluoromethane	30.00	30.57	102	80 - 125	
1,2-Dichloroethane-d4	30.00	28.47	94.9	75 - 140	
Toluene-d8	30.00	30.82	103	85 - 115	

ANALYSIS DATA SHEET

LCS

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_005
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Matrix:
Laboratory ID: 0E15003-BS1
File ID: V4LCS01.D
Sampled:
Prepared:
Analyzed: 05/15/10 20:57
Solids:
Preparation: 5035
Dilution:
Batch: 0E15003
Sequence: 0E14109
Calibration: 0144005
Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene	59.69	0.470	4.00	
100-41-4	Ethylbenzene	56.32	0.750	10.0	Y
108-88-3	Toluene	58.68	0.860	10.0	
1330-20-7	Xylenes (total)	180.2	0.700	10.0	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.59	102	85 - 120	
Dibromofluoromethane	30.00	33.06	110	80 - 125	
1,2-Dichloroethane-d4	30.00	30.66	102	75 - 140	
Toluene-d8	30.00	31.47	105	85 - 115	

ANALYSIS DATA SHEET

LCS Dup

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E15003-BSD1	File ID:	V4LCSD01.D
Sampled:		Prepared:		Analyzed:	05/16/10 07:41
Solids:		Preparation:	5035	Dilution:	

Batch:	0E15003	Sequence:	0E14109	Calibration:	0144005	Instrument:	MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene	53.54	0.470	4.00	
100-41-4	Ethylbenzene	50.08	0.750	10.0	Y
108-88-3	Toluene	50.89	0.860	10.0	
1330-20-7	Xylenes (total)	150.9	0.700	10.0	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.00	96.7	85 - 120	
Dibromofluoromethane	30.00	30.87	103	80 - 125	
1,2-Dichloroethane-d4	30.00	29.42	98.1	75 - 140	
Toluene-d8	30.00	30.46	102	85 - 115	

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E20008-BLK1 File ID: V1BLK01.D

Sampled: Prepared: Analyzed: 05/20/10 17:26

Solids: Preparation: 5035 Dilution:

Batch: 0E20008 Sequence: 0E14105 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.63	105	85 - 120	
Dibromofluoromethane	30.00	30.62	102	80 - 125	
1,2-Dichloroethane-d4	30.00	31.37	105	75 - 140	
Toluene-d8	30.00	30.27	101	85 - 115	

ANALYSIS DATA SHEET

LCS

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E20008-BS1 File ID: V1LCS1.D

Sampled: Prepared: Analyzed: 05/20/10 15:29

Solids: Preparation: 5035 Dilution:

Batch: 0E20008 Sequence: 0E14105 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene	54.00	0.470	4.00	
100-41-4	Ethylbenzene	53.23	0.750	10.0	
108-88-3	Toluene	52.95	0.860	10.0	
1330-20-7	Xylenes (total)	156.6	0.700	10.0	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.86	99.5	85 - 120	
Dibromofluoromethane	30.00	28.97	96.6	80 - 125	
1,2-Dichloroethane-d4	30.00	26.79	89.3	75 - 140	
Toluene-d8	30.00	29.87	99.6	85 - 115	

ANALYSIS DATA SHEET

LCS Dup

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E20008-BSD1 File ID: V1LCSD1.D

Sampled: Prepared: Analyzed: 05/20/10 23:18

Solids: Preparation: 5035 Dilution:

Batch: 0E20008 Sequence: 0E14105 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene	44.68	0.470	4.00	
100-41-4	Ethylbenzene	45.71	0.750	10.0	
108-88-3	Toluene	46.44	0.860	10.0	
1330-20-7	Xylenes (total)	136.3	0.700	10.0	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.82	99.4	85 - 120	
Dibromofluoromethane	30.00	29.63	98.8	80 - 125	
1,2-Dichloroethane-d4	30.00	26.47	88.2	75 - 140	
Toluene-d8	30.00	31.12	104	85 - 115	

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E21026-BLK2 File ID: V1MBLK1.D

Sampled: Prepared: Analyzed: 05/21/10 19:08

Solids: Preparation: 5035 Dilution:

Batch: 0E21026 Sequence: 0F15210 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		23.5	200	U
100-41-4	Ethylbenzene		37.5	500	U
108-88-3	Toluene		43.0	500	U
1330-20-7	Xylenes (total)		35.0	500	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.19	104	85 - 120	
Dibromofluoromethane	30.00	27.08	90.3	80 - 125	
1,2-Dichloroethane-d4	30.00	31.55	105	75 - 140	
Toluene-d8	30.00	30.36	101	85 - 115	

ANALYSIS DATA SHEET

LCS

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E21026-BS1 File ID: V1LCS1.D

Sampled: Prepared: Analyzed: 05/21/10 17:08

Solids: Preparation: 5035 Dilution:

Batch: 0E21026 Sequence: 0F15210 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene	48.79	0.470	4.00	
100-41-4	Ethylbenzene	49.68	0.750	10.0	
108-88-3	Toluene	49.63	0.860	10.0	
1330-20-7	Xylenes (total)	145.0	0.700	10.0	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	28.35	94.5	85 - 120	
Dibromofluoromethane	30.00	28.19	94.0	80 - 125	
1,2-Dichloroethane-d4	30.00	24.49	81.6	75 - 140	
Toluene-d8	30.00	30.43	101	85 - 115	

HOLDING TIME SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32GW-03	04/27/10 16:42	04/29/10 08:30	05/10/10 00:00	N/A	14.00	05/10/10 18:59	13.10	14.00	
32GW-FD042710-01	04/27/10 00:00	04/29/10 08:30	05/10/10 00:00	N/A	14.00	05/10/10 19:29	13.81	14.00	
32SS-RB042710-01	04/27/10 08:10	04/29/10 08:30	05/10/10 00:00	N/A	14.00	05/10/10 19:59	13.49	14.00	
32SS-RB042710-02	04/27/10 11:50	04/29/10 08:30	05/10/10 00:00	N/A	14.00	05/10/10 20:29	13.36	14.00	
32SS-RB042710-03	04/27/10 15:10	04/29/10 08:30	05/10/10 00:00	N/A	14.00	05/10/10 20:59	13.24	14.00	
32SS-RB042810-04	04/27/10 11:16	04/29/10 08:30	05/10/10 00:00	N/A	14.00	05/10/10 21:28	13.43	14.00	
32SB-31-0607	04/28/10 10:10	04/29/10 08:30	05/11/10 15:28	N/A	14.00	05/12/10 01:23	13.63	14.00	
32SB-35-0507	04/28/10 10:25	04/29/10 08:30	05/11/10 15:28	N/A	14.00	05/12/10 01:54	13.65	14.00	
32SB-38-0506	04/27/10 08:50	04/29/10 08:30	05/10/10 17:35	N/A	14.00	05/11/10 03:02	13.76	14.00	
32SB-39-0507	04/28/10 10:45	04/29/10 08:30	05/11/10 15:28	N/A	14.00	05/12/10 02:24	13.65	14.00	
32SB-40-0506	04/27/10 09:00	04/29/10 08:30	05/10/10 17:35	N/A	14.00	05/11/10 03:41	13.78	14.00	
32SB-41-0507	04/28/10 09:20	04/29/10 08:30	05/11/10 15:28	N/A	14.00	05/12/10 02:55	13.73	14.00	
32SB-42-0506	04/27/10 09:30	04/29/10 08:30	05/20/10 11:09	N/A	14.00	05/20/10 21:21	23.49	14.00	*
32SB-FD042810-04	04/28/10 00:00	04/29/10 08:30	05/11/10 15:28	N/A	14.00	05/12/10 03:26	14.14	14.00	
32SB-FD042810-05	04/28/10 00:00	04/29/10 08:30	05/11/10 15:28	N/A	14.00	05/12/10 03:56	14.16	14.00	
32SB-DW01-0809	04/28/10 12:54	04/29/10 08:30	05/15/10 14:52	N/A	14.00	05/16/10 03:05	17.59	14.00	*
32SB-DW01-0809	04/28/10 12:54	04/29/10 08:30	05/21/10 00:00	N/A	14.00	05/21/10 21:06	23.34	14.00	*

Method 8270 Supporting Data

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15510	Instrument:	MS-BNA3
		Calibration:	0132007

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15510-CCV1) ug/mL				Lab File ID: SEQ-CCV2.D		Analyzed: 05/30/10 03:13		
2-Fluorobiphenyl	5.000	95.9	80 - 120	7.689	7.689	0.0000	+/-0.500	
Terphenyl-d14	5.000	99.9	80 - 120	17.622	17.622	0.0000	+/-0.500	
LCS (0E08002-BS1) ug/L				Lab File ID: E08002L1.D		Analyzed: 05/30/10 03:49		
2-Fluorobiphenyl	50.00	58.5	34 - 167	7.697	7.689	0.0080	+/-0.500	
Terphenyl-d14	50.00	110	34 - 167	17.649	17.622	0.0270	+/-0.500	
LCS Dup (0E08002-BSD1) ug/L				Lab File ID: E08002L2.D		Analyzed: 05/30/10 04:25		
2-Fluorobiphenyl	50.00	70.6	34 - 167	7.7	7.689	0.0110	+/-0.500	
Terphenyl-d14	50.00	105	34 - 167	17.642	17.622	0.0200	+/-0.500	
Blank (0E08002-BLK1) ug/L				Lab File ID: E08002B1.D		Analyzed: 05/30/10 05:01		
2-Fluorobiphenyl	50.00	77.0	34 - 167	7.697	7.689	0.0080	+/-0.500	
Terphenyl-d14	50.00	131	34 - 167	17.649	17.622	0.0270	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15511	Instrument:	MS-BNA3
		Calibration:	0132007

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15511-CCV1) ug/mL				Lab File ID: SEQ-CCV3.D		Analyzed: 05/30/10 15:47		
2-Fluorobiphenyl	5.000	90.6	80 - 120	7.688	7.688	0.0000	+/-0.500	
Terphenyl-d14	5.000	103	80 - 120	17.622	17.622	0.0000	+/-0.500	
32GW-03 (1004277-01) ug/L				Lab File ID: 0427701.D		Analyzed: 05/30/10 16:23		
2-Fluorobiphenyl	46.73	62.6	34 - 167	7.698	7.688	0.0100	+/-0.500	
Terphenyl-d14	46.73	52.4	34 - 167	17.632	17.622	0.0100	+/-0.500	
32GW-FD042710-01 (1004277-02) ug/L				Lab File ID: 0427702.D		Analyzed: 05/30/10 17:00		
2-Fluorobiphenyl	46.73	67.9	34 - 167	7.697	7.688	0.0090	+/-0.500	
Terphenyl-d14	46.73	84.4	34 - 167	17.64	17.622	0.0180	+/-0.500	
32SS-RB042710-01 (1004277-03) ug/L				Lab File ID: 0427703.D		Analyzed: 05/30/10 17:36		
2-Fluorobiphenyl	47.17	60.3	34 - 167	7.698	7.688	0.0100	+/-0.500	
Terphenyl-d14	47.17	93.0	34 - 167	17.641	17.622	0.0190	+/-0.500	
32SS-RB042710-02 (1004277-04) ug/L				Lab File ID: 0427704.D		Analyzed: 05/30/10 18:12		
2-Fluorobiphenyl	49.02	62.4	34 - 167	7.69	7.688	0.0020	+/-0.500	
Terphenyl-d14	49.02	107	34 - 167	17.642	17.622	0.0200	+/-0.500	
32SS-RB042710-03 (1004277-05) ug/L				Lab File ID: 0427705.D		Analyzed: 05/30/10 18:48		
2-Fluorobiphenyl	55.56	63.4	34 - 167	7.69	7.688	0.0020	+/-0.500	
Terphenyl-d14	55.56	99.5	34 - 167	17.642	17.622	0.0200	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16006	Instrument:	MS-BNA3
		Calibration:	0156001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16006-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 06/05/10 18:45		
2-Fluorobiphenyl	5.000	118	80 - 120	7.578	7.578	0.0000	+/-0.500	
Terphenyl-d14	5.000	105	80 - 120	17.464	17.464	0.0000	+/-0.500	
LCS (0E11002-BS1) ug/L				Lab File ID: E11002L1.D		Analyzed: 06/05/10 19:24		
2-Fluorobiphenyl	50.00	88.3	34 - 167	7.587	7.578	0.0090	+/-0.500	
Terphenyl-d14	50.00	105	34 - 167	17.492	17.464	0.0280	+/-0.500	
Blank (0E11002-BLK1) ug/L				Lab File ID: E11002B1.D		Analyzed: 06/05/10 20:00		
2-Fluorobiphenyl	50.00	89.0	34 - 167	7.589	7.578	0.0110	+/-0.500	
Terphenyl-d14	50.00	111	34 - 167	17.494	17.464	0.0300	+/-0.500	
32SS-RB042810-04 (1004277-06) ug/L				Lab File ID: 0427706.D		Analyzed: 06/05/10 20:36		
2-Fluorobiphenyl	49.02	103	34 - 167	7.586	7.578	0.0080	+/-0.500	
Terphenyl-d14	49.02	122	34 - 167	17.491	17.464	0.0270	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16723	Instrument:	MS-BNA3
		Calibration:	0161002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16723-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 06/12/10 11:37		
2-Fluorobiphenyl	5.000	107	80 - 120	7.413	7.413	0.0000	+/-0.500	
Terphenyl-d14	5.000	110	80 - 120	17.235	17.235	0.0000	+/-0.500	
LCS (0E11013-BS1) ug/Kg wet				Lab File ID: E11013L1.D		Analyzed: 06/12/10 12:13		
2-Fluorobiphenyl	3333	97.1	14 - 129	7.42	7.413	0.0070	+/-0.500	
Terphenyl-d14	3333	86.4	14 - 129	17.242	17.235	0.0070	+/-0.500	
Blank (0E11013-BLK1) ug/Kg wet				Lab File ID: E11013B1.D		Analyzed: 06/12/10 12:49		
2-Fluorobiphenyl	3333	126	14 - 129	7.422	7.413	0.0090	+/-0.500	
Terphenyl-d14	3333	104	14 - 129	17.244	17.235	0.0090	+/-0.500	
32SS-31-0002 (1004277-07) ug/Kg dry				Lab File ID: 0427707.D		Analyzed: 06/12/10 19:27		
2-Fluorobiphenyl	3875	89.2	14 - 129	7.422	7.413	0.0090	+/-0.500	
Terphenyl-d14	3875	52.3	14 - 129	17.253	17.235	0.0180	+/-0.500	
32SS-38-0002 (1004277-11) ug/Kg dry				Lab File ID: 0427711.D		Analyzed: 06/12/10 20:03		
2-Fluorobiphenyl	3790	88.5	14 - 129	7.42	7.413	0.0070	+/-0.500	
Terphenyl-d14	3790	57.3	14 - 129	17.251	17.235	0.0160	+/-0.500	
32SB-38-0506 (1004277-12) ug/Kg dry				Lab File ID: 0427712.D		Analyzed: 06/12/10 20:39		
2-Fluorobiphenyl	4023	81.6	14 - 129	7.42	7.413	0.0070	+/-0.500	
Terphenyl-d14	4023	55.9	14 - 129	17.242	17.235	0.0070	+/-0.500	
32SS-40-0002 (1004277-15) ug/Kg dry				Lab File ID: 0427715.D		Analyzed: 06/12/10 21:15		
2-Fluorobiphenyl	3835	78.8	14 - 129	7.422	7.413	0.0090	+/-0.500	
Terphenyl-d14	3835	52.8	14 - 129	17.244	17.235	0.0090	+/-0.500	
32SB-40-0506 (1004277-16) ug/Kg dry				Lab File ID: 0427716.D		Analyzed: 06/12/10 21:51		
2-Fluorobiphenyl	3909	107	14 - 129	7.418	7.413	0.0050	+/-0.500	
Terphenyl-d14	3909	72.7	14 - 129	17.249	17.235	0.0140	+/-0.500	
Matrix Spike (0E11013-MS1) ug/Kg dry				Lab File ID: 0427707M.D		Analyzed: 06/12/10 22:27		
2-Fluorobiphenyl	3875	85.9	14 - 129	7.421	7.413	0.0080	+/-0.500	
Terphenyl-d14	3875	59.2	14 - 129	17.253	17.235	0.0180	+/-0.500	
Matrix Spike Dup (0E11013-MSD1) ug/Kg dry				Lab File ID: 0427707S.D		Analyzed: 06/12/10 23:04		
2-Fluorobiphenyl	3875	84.4	14 - 129	7.419	7.413	0.0060	+/-0.500	
Terphenyl-d14	3875	51.9	14 - 129	17.25	17.235	0.0150	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16725	Instrument:	MS-BNA3
		Calibration:	0161002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16725-CCV1) ug/mL				Lab File ID: SEQ-CCV2.D		Analyzed: 06/13/10 00:34		
2-Fluorobiphenyl	5.000	97.0	80 - 120	7.419	7.419	0.0000	+/-0.500	
Terphenyl-d14	5.000	110	80 - 120	17.241	17.241	0.0000	+/-0.500	
32SS-42-0002 (1004277-19) ug/Kg dry				Lab File ID: 0427719.D		Analyzed: 06/13/10 02:24		
2-Fluorobiphenyl	3876	59.3	14 - 129	7.419	7.419	0.0000	+/-0.500	
Terphenyl-d14	3876	59.6	14 - 129	17.251	17.241	0.0100	+/-0.500	
32SB-42-0506 (1004277-20) ug/Kg dry				Lab File ID: 0427720.D		Analyzed: 06/13/10 03:00		
2-Fluorobiphenyl	3785	93.0	14 - 129	7.428	7.419	0.0090	+/-0.500	
Terphenyl-d14	3785	64.3	14 - 129	17.249	17.241	0.0080	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16727	Instrument:	MS-BNA4
		Calibration:	0098001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16727-CCV1) ug/mL				Lab File ID: SEQ-CCV2.D		Analyzed: 06/15/10 07:53		
2-Fluorobiphenyl	5.000	98.4	80 - 120	7.828	7.828	0.0000	+/-0.500	
Terphenyl-d14	5.000	106	80 - 120	17.728	17.728	0.0000	+/-0.500	
32SB-FD042810-05 (1004277-24) ug/Kg dry				Lab File ID: 0427724D.D		Analyzed: 06/15/10 12:24		
2-Fluorobiphenyl	4186	71.2	14 - 129	7.837	7.828	0.0090	+/-0.500	
Terphenyl-d14	4186	75.4	14 - 129	17.728	17.728	0.0000	+/-0.500	
32SS-DW01-0002 (1004277-25) ug/Kg dry				Lab File ID: 0427725D.D		Analyzed: 06/15/10 12:59		
2-Fluorobiphenyl	4086	59.2	14 - 129	7.855	7.828	0.0270	+/-0.500	
Terphenyl-d14	4086	65.8	14 - 129	17.737	17.728	0.0090	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16811	Instrument:	MS-BNA4
		Calibration:	0098001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16811-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 06/12/10 17:00		
2-Fluorobiphenyl	5.000	95.6	80 - 120	7.865	7.865	0.0000	+/-0.500	
Terphenyl-d14	5.000	108	80 - 120	17.765	17.765	0.0000	+/-0.500	
LCS (0E12916-BS1) ug/Kg wet				Lab File ID: E12916L1.D		Analyzed: 06/12/10 17:34		
2-Fluorobiphenyl	3333	78.0	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3333	69.5	14 - 129	17.775	17.765	0.0100	+/-0.500	
Blank (0E12916-BLK1) ug/Kg wet				Lab File ID: E12916B1.D		Analyzed: 06/12/10 18:08		
2-Fluorobiphenyl	3333	79.5	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3333	71.7	14 - 129	17.784	17.765	0.0190	+/-0.500	
32SB-31-0607 (1004277-08) ug/Kg dry				Lab File ID: 0427708.D		Analyzed: 06/12/10 18:42		
2-Fluorobiphenyl	3826	90.6	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3826	77.2	14 - 129	17.784	17.765	0.0190	+/-0.500	
32SS-35-0002 (1004277-09) ug/Kg dry				Lab File ID: 0427709.D		Analyzed: 06/12/10 19:16		
2-Fluorobiphenyl	3875	85.2	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3875	82.0	14 - 129	17.784	17.765	0.0190	+/-0.500	
32SB-35-0507 (1004277-10) ug/Kg dry				Lab File ID: 0427710.D		Analyzed: 06/12/10 19:50		
2-Fluorobiphenyl	3892	95.7	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3892	85.8	14 - 129	17.784	17.765	0.0190	+/-0.500	
32SS-39-0002 (1004277-13) ug/Kg dry				Lab File ID: 0427713.D		Analyzed: 06/12/10 20:25		
2-Fluorobiphenyl	3880	92.0	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3880	90.3	14 - 129	17.784	17.765	0.0190	+/-0.500	
32SB-39-0507 (1004277-14) ug/Kg dry				Lab File ID: 0427714.D		Analyzed: 06/12/10 20:59		
2-Fluorobiphenyl	4069	81.3	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	4069	100	14 - 129	17.784	17.765	0.0190	+/-0.500	
32SS-41-0002 (1004277-17) ug/Kg dry				Lab File ID: 0427717.D		Analyzed: 06/12/10 21:33		
2-Fluorobiphenyl	3873	76.1	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3873	77.3	14 - 129	17.784	17.765	0.0190	+/-0.500	
Matrix Spike (0E12916-MS1) ug/Kg dry				Lab File ID: 0427708M.D		Analyzed: 06/12/10 22:07		
2-Fluorobiphenyl	3826	90.1	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3826	78.2	14 - 129	17.784	17.765	0.0190	+/-0.500	
Matrix Spike (0E12916-MS2) ug/Kg dry				Lab File ID: 0427709M.D		Analyzed: 06/12/10 22:41		
2-Fluorobiphenyl	3875	84.5	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3875	78.7	14 - 129	17.784	17.765	0.0190	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16811	Instrument:	MS-BNA4
		Calibration:	0098001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Matrix Spike (0E12916-MS3) ug/Kg dry				Lab File ID: 0427710M.D		Analyzed: 06/12/10 23:16		
2-Fluorobiphenyl	3892	93.3	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3892	79.1	14 - 129	17.784	17.765	0.0190	+/-0.500	
Matrix Spike (0E12916-MS4) ug/Kg dry				Lab File ID: 0427713M.D		Analyzed: 06/12/10 23:50		
2-Fluorobiphenyl	3880	96.4	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3880	86.4	14 - 129	17.784	17.765	0.0190	+/-0.500	
Matrix Spike (0E12916-MS5) ug/Kg dry				Lab File ID: 0427714M.D		Analyzed: 06/13/10 00:24		
2-Fluorobiphenyl	4069	101	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	4069	93.5	14 - 129	17.784	17.765	0.0190	+/-0.500	
Matrix Spike (0E12916-MS6) ug/Kg dry				Lab File ID: 0427717M.D		Analyzed: 06/13/10 00:59		
2-Fluorobiphenyl	3873	79.2	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3873	76.8	14 - 129	17.784	17.765	0.0190	+/-0.500	
Matrix Spike Dup (0E12916-MSD1) ug/Kg dry				Lab File ID: 0427708S.D		Analyzed: 06/13/10 01:33		
2-Fluorobiphenyl	3826	65.5	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3826	64.3	14 - 129	17.784	17.765	0.0190	+/-0.500	
Matrix Spike Dup (0E12916-MSD2) ug/Kg dry				Lab File ID: 0427709S.D		Analyzed: 06/13/10 02:07		
2-Fluorobiphenyl	3875	77.3	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3875	72.7	14 - 129	17.784	17.765	0.0190	+/-0.500	
Matrix Spike Dup (0E12916-MSD3) ug/Kg dry				Lab File ID: 0427710S.D		Analyzed: 06/13/10 02:42		
2-Fluorobiphenyl	3892	84.8	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3892	75.7	14 - 129	17.784	17.765	0.0190	+/-0.500	
Matrix Spike Dup (0E12916-MSD4) ug/Kg dry				Lab File ID: 0427713S.D		Analyzed: 06/13/10 03:16		
2-Fluorobiphenyl	3880	75.2	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3880	77.9	14 - 129	17.784	17.765	0.0190	+/-0.500	
Matrix Spike Dup (0E12916-MSD5) ug/Kg dry				Lab File ID: 0427714S.D		Analyzed: 06/13/10 03:50		
2-Fluorobiphenyl	4069	83.7	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	4069	86.9	14 - 129	17.784	17.765	0.0190	+/-0.500	
Matrix Spike Dup (0E12916-MSD6) ug/Kg dry				Lab File ID: 0427717S.D		Analyzed: 06/13/10 04:24		
2-Fluorobiphenyl	3873	83.7	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3873	76.2	14 - 129	17.784	17.765	0.0190	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16819	Instrument:	MS-BNA4
		Calibration:	0098001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16819-CCV1) ug/mL				Lab File ID: SEQ-CCV2.D		Analyzed: 06/13/10 05:49		
2-Fluorobiphenyl	5.000	104	80 - 120	7.865	7.865	0.0000	+/-0.500	
Terphenyl-d14	5.000	113	80 - 120	17.756	17.756	0.0000	+/-0.500	
32SS-FD042810-04 (1004277-21) ug/Kg dry				Lab File ID: 0427721.D		Analyzed: 06/13/10 06:23		
2-Fluorobiphenyl	3792	88.2	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3792	87.3	14 - 129	17.784	17.756	0.0280	+/-0.500	
32SS-FD042810-05 (1004277-22) ug/Kg dry				Lab File ID: 0427722.D		Analyzed: 06/13/10 06:57		
2-Fluorobiphenyl	3839	78.6	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3839	86.3	14 - 129	17.793	17.756	0.0370	+/-0.500	
32SB-FD042810-04 (1004277-23) ug/Kg dry				Lab File ID: 0427723.D		Analyzed: 06/13/10 07:31		
2-Fluorobiphenyl	3780	92.0	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3780	89.4	14 - 129	17.784	17.756	0.0280	+/-0.500	
32SB-41-0507 (1004277-18) ug/Kg dry				Lab File ID: 0427718.D		Analyzed: 06/13/10 10:56		
2-Fluorobiphenyl	3879	101	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3879	92.4	14 - 129	17.775	17.756	0.0190	+/-0.500	
32SB-DW01-0809 (1004277-26) ug/Kg dry				Lab File ID: 0427726.D		Analyzed: 06/13/10 12:39		
2-Fluorobiphenyl	3856	77.6	14 - 129	7.893	7.865	0.0280	+/-0.500	
Terphenyl-d14	3856	94.2	14 - 129	17.812	17.756	0.0560	+/-0.500	
Matrix Spike (0E12916-MS7) ug/Kg dry				Lab File ID: 0427718M.D		Analyzed: 06/13/10 13:13		
2-Fluorobiphenyl	3879	93.6	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3879	96.4	14 - 129	17.784	17.756	0.0280	+/-0.500	
Matrix Spike Dup (0E12916-MSD7) ug/Kg dry				Lab File ID: 0427718S.D		Analyzed: 06/13/10 13:47		
2-Fluorobiphenyl	3879	86.2	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3879	81.4	14 - 129	17.784	17.756	0.0280	+/-0.500	

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Water		
Batch:	0E08002	Laboratory ID:	0E08002-BS1
Preparation:	EXT_3510	Initial/Final:	1000 mL / 1 mL

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	1.000	0.9804	98.0	58 - 141
Benzo(a)pyrene	1.000	1.072	107	31 - 142
Benzo(b)fluoranthene	1.000	1.122	112	42 - 156
Benzo(k)fluoranthene	1.000	1.205	120	49 - 165
Chrysene	1.000	1.162	116	51 - 155
Dibenz(a,h)anthracene	1.000	0.9237	92.4	28 - 153
Indeno(1,2,3-cd)pyrene	1.000	0.9592	95.9	20 - 167
Naphthalene	1.000	0.5755	57.5	39 - 125

ANALYTE	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzo(a)anthracene	1.000	1.097	110	11.2	30	58 - 141
Benzo(a)pyrene	1.000	1.081	108	0.849	30	31 - 142
Benzo(b)fluoranthene	1.000	1.110	111	1.09	30	42 - 156
Benzo(k)fluoranthene	1.000	1.294	129	7.18	30	49 - 165
Chrysene	1.000	1.270	127	8.85	30	51 - 155
Dibenz(a,h)anthracene	1.000	0.8860	88.6	4.17	30	28 - 153
Indeno(1,2,3-cd)pyrene	1.000	0.9608	96.1	0.164	30	20 - 167
Naphthalene	1.000	0.6921	69.2	18.4	30	39 - 125

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Water		
Batch:	0E11002	Laboratory ID:	0E11002-BS1
Preparation:	EXT_3510	Initial/Final:	1000 mL / 1 mL

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	1.000	0.9606	96.1	58 - 141
Benzo(a)pyrene	1.000	0.9083	90.8	31 - 142
Benzo(b)fluoranthene	1.000	0.9114	91.1	42 - 156
Benzo(k)fluoranthene	1.000	1.111	111	49 - 165
Chrysene	1.000	1.020	102	51 - 155
Dibenz(a,h)anthracene	1.000	0.8398	84.0	28 - 153
Indeno(1,2,3-cd)pyrene	1.000	0.7920	79.2	20 - 167
Naphthalene	1.000	0.9360	93.6	39 - 125

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E11013	Laboratory ID:	0E11013-BS1
Preparation:	EXT_3546	Initial/Final:	15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.67	86.89	130	31 - 146
Benzo(a)pyrene	66.67	53.72	80.6	28 - 128
Benzo(b)fluoranthene	66.67	63.69	95.5	30 - 139
Benzo(k)fluoranthene	66.67	68.37	103	42 - 129
Chrysene	66.67	73.56	110	39 - 134
Dibenz(a,h)anthracene	66.67	85.92	129	30 - 138
Indeno(1,2,3-cd)pyrene	66.67	88.70	133	17 - 164
Naphthalene	66.67	57.05	85.6	29 - 106

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E12916	Laboratory ID:	0E12916-BS1
Preparation:	EXT_3546	Initial/Final:	15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.67	58.89	88.3	31 - 146
Benzo(a)pyrene	66.67	52.35	78.5	28 - 128
Benzo(b)fluoranthene	66.67	54.21	81.3	30 - 139
Benzo(k)fluoranthene	66.67	55.37	83.1	42 - 129
Chrysene	66.67	59.67	89.5	39 - 134
Dibenz(a,h)anthracene	66.67	65.76	98.6	30 - 138
Indeno(1,2,3-cd)pyrene	66.67	69.64	104	17 - 164
Naphthalene	66.67	51.94	77.9	29 - 106

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SS-31-0002

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E11013

% Solids: 86.02

Source Sample Name: **1004277-07**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	77.50	ND	104.6	135		31 - 146
Benzo(a)pyrene	77.50	ND	63.34	81.7		28 - 128
Benzo(b)fluoranthene	77.50	ND	64.68	83.5		30 - 139
Benzo(k)fluoranthene	77.50	ND	62.72	80.9		42 - 129
Chrysene	77.50	ND	68.42	88.3		39 - 134
Dibenz(a,h)anthracene	77.50	ND	82.22	106		30 - 138
Indeno(1,2,3-cd)pyrene	77.50	ND	91.85	119		17 - 164
Naphthalene	77.50	ND	57.36	74.0		29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzo(a)anthracene	77.50	96.03	124	8.55		30	31 - 146
Benzo(a)pyrene	77.50	63.60	82.1	0.414		30	28 - 128
Benzo(b)fluoranthene	77.50	58.14	75.0	10.7		30	30 - 139
Benzo(k)fluoranthene	77.50	60.52	78.1	3.57		30	42 - 129
Chrysene	77.50	61.06	78.8	11.4		30	39 - 134
Dibenz(a,h)anthracene	77.50	83.31	108	1.32		30	30 - 138
Indeno(1,2,3-cd)pyrene	77.50	88.27	114	3.97		30	17 - 164
Naphthalene	77.50	55.21	71.2	3.82		30	29 - 106

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SB-31-0607

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E12916

% Solids: 87.13

Source Sample Name: **1004277-08**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	76.51	ND	84.07	110		31 - 146
Benzo(a)pyrene	76.51	ND	74.05	96.8		28 - 128
Benzo(b)fluoranthene	76.51	ND	78.87	103		30 - 139
Benzo(k)fluoranthene	76.51	ND	80.93	106		42 - 129
Chrysene	76.51	ND	84.52	110		39 - 134
Dibenz(a,h)anthracene	76.51	ND	97.42	127		30 - 138
Indeno(1,2,3-cd)pyrene	76.51	ND	104.2	136		17 - 164
Naphthalene	76.51	ND	66.59	87.0		29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzo(a)anthracene	76.51	68.28	89.2	20.7		30	31 - 146
Benzo(a)pyrene	76.51	64.82	84.7	13.3		30	28 - 128
Benzo(b)fluoranthene	76.51	66.58	87.0	16.9		30	30 - 139
Benzo(k)fluoranthene	76.51	68.00	88.9	17.4		30	42 - 129
Chrysene	76.51	68.69	89.8	20.7		30	39 - 134
Dibenz(a,h)anthracene	76.51	83.37	109	15.5		30	30 - 138
Indeno(1,2,3-cd)pyrene	76.51	87.23	114	17.7		30	17 - 164
Naphthalene	76.51	48.39	63.2	31.7	*	30	29 - 106

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SS-35-0002

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E12916

% Solids: 86.02

Source Sample Name: **1004277-09**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	77.50	ND	83.43	108		31 - 146
Benzo(a)pyrene	77.50	ND	74.61	96.3		28 - 128
Benzo(b)fluoranthene	77.50	ND	81.73	105		30 - 139
Benzo(k)fluoranthene	77.50	ND	82.62	107		42 - 129
Chrysene	77.50	ND	82.97	107		39 - 134
Dibenz(a,h)anthracene	77.50	ND	97.91	126		30 - 138
Indeno(1,2,3-cd)pyrene	77.50	ND	105.8	137		17 - 164
Naphthalene	77.50	ND	63.76	82.3		29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzo(a)anthracene	77.50	67.77	87.4	20.7		30	31 - 146
Benzo(a)pyrene	77.50	67.29	86.8	10.3		30	28 - 128
Benzo(b)fluoranthene	77.50	71.82	92.7	12.9		30	30 - 139
Benzo(k)fluoranthene	77.50	74.13	95.7	10.8		30	42 - 129
Chrysene	77.50	68.69	88.6	18.8		30	39 - 134
Dibenz(a,h)anthracene	77.50	82.72	107	16.8		30	30 - 138
Indeno(1,2,3-cd)pyrene	77.50	87.19	113	19.3		30	17 - 164
Naphthalene	77.50	57.74	74.5	9.91		30	29 - 106

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SB-35-0507

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E12916

% Solids: 85.65

Source Sample Name: **1004277-10**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	77.84	ND	83.67	107		31 - 146
Benzo(a)pyrene	77.84	ND	74.02	95.1		28 - 128
Benzo(b)fluoranthene	77.84	ND	77.75	99.9		30 - 139
Benzo(k)fluoranthene	77.84	ND	79.41	102		42 - 129
Chrysene	77.84	ND	83.05	107		39 - 134
Dibenz(a,h)anthracene	77.84	ND	92.23	118		30 - 138
Indeno(1,2,3-cd)pyrene	77.84	ND	99.27	128		17 - 164
Naphthalene	77.84	ND	70.54	90.6		29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzo(a)anthracene	77.84	79.47	102	5.14		30	31 - 146
Benzo(a)pyrene	77.84	71.29	91.6	3.76		30	28 - 128
Benzo(b)fluoranthene	77.84	73.64	94.6	5.43		30	30 - 139
Benzo(k)fluoranthene	77.84	76.47	98.2	3.77		30	42 - 129
Chrysene	77.84	79.99	103	3.76		30	39 - 134
Dibenz(a,h)anthracene	77.84	91.74	118	0.529		30	30 - 138
Indeno(1,2,3-cd)pyrene	77.84	96.16	124	3.18		30	17 - 164
Naphthalene	77.84	67.39	86.6	4.57		30	29 - 106

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SS-39-0002

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E12916

% Solids: 85.92

Source Sample Name: **1004277-13**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	77.59	ND	97.49	126		31 - 146
Benzo(a)pyrene	77.59	ND	74.58	96.1		28 - 128
Benzo(b)fluoranthene	77.59	ND	78.62	101		30 - 139
Benzo(k)fluoranthene	77.59	ND	76.21	98.2		42 - 129
Chrysene	77.59	ND	96.13	124		39 - 134
Dibenz(a,h)anthracene	77.59	ND	89.33	115		30 - 138
Indeno(1,2,3-cd)pyrene	77.59	ND	95.56	123		17 - 164
Naphthalene	77.59	ND	74.34	95.8		29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzo(a)anthracene	77.59	74.12	95.5	27.2		30	31 - 146
Benzo(a)pyrene	77.59	68.32	88.0	8.77		30	28 - 128
Benzo(b)fluoranthene	77.59	71.03	91.5	10.2		30	30 - 139
Benzo(k)fluoranthene	77.59	72.67	93.7	4.75		30	42 - 129
Chrysene	77.59	74.89	96.5	24.8		30	39 - 134
Dibenz(a,h)anthracene	77.59	76.43	98.5	15.6		30	30 - 138
Indeno(1,2,3-cd)pyrene	77.59	83.26	107	13.8		30	17 - 164
Naphthalene	77.59	56.78	73.2	26.8		30	29 - 106

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SB-39-0507

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E12916

% Solids: 81.93

Source Sample Name: **1004277-14**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	81.37	ND	107.4	132		31 - 146
Benzo(a)pyrene	81.37	ND	81.62	100		28 - 128
Benzo(b)fluoranthene	81.37	ND	86.04	106		30 - 139
Benzo(k)fluoranthene	81.37	ND	87.16	107		42 - 129
Chrysene	81.37	ND	109.6	135	*	39 - 134
Dibenz(a,h)anthracene	81.37	ND	102.6	126		30 - 138
Indeno(1,2,3-cd)pyrene	81.37	ND	109.6	135		17 - 164
Naphthalene	81.37	ND	79.94	98.2		29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzo(a)anthracene	81.37	90.65	111	16.9		30	31 - 146
Benzo(a)pyrene	81.37	81.24	99.8	0.458		30	28 - 128
Benzo(b)fluoranthene	81.37	85.21	105	0.970		30	30 - 139
Benzo(k)fluoranthene	81.37	87.50	108	0.396		30	42 - 129
Chrysene	81.37	92.90	114	16.5		30	39 - 134
Dibenz(a,h)anthracene	81.37	102.4	126	0.237		30	30 - 138
Indeno(1,2,3-cd)pyrene	81.37	104.3	128	5.01		30	17 - 164
Naphthalene	81.37	67.23	82.6	17.3		30	29 - 106

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SS-41-0002

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E12916

% Solids: 86.07

Source Sample Name: **1004277-17**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	77.46	ND	68.37	88.3		31 - 146
Benzo(a)pyrene	77.46	ND	70.60	91.1		28 - 128
Benzo(b)fluoranthene	77.46	ND	75.90	98.0		30 - 139
Benzo(k)fluoranthene	77.46	ND	75.85	97.9		42 - 129
Chrysene	77.46	ND	69.72	90.0		39 - 134
Dibenz(a,h)anthracene	77.46	ND	86.75	112		30 - 138
Indeno(1,2,3-cd)pyrene	77.46	ND	95.74	124		17 - 164
Naphthalene	77.46	ND	61.16	79.0		29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzo(a)anthracene	77.46	81.70	105	17.8		30	31 - 146
Benzo(a)pyrene	77.46	65.09	84.0	8.12		30	28 - 128
Benzo(b)fluoranthene	77.46	64.80	83.7	15.8		30	30 - 139
Benzo(k)fluoranthene	77.46	69.07	89.2	9.36		30	42 - 129
Chrysene	77.46	80.52	104	14.4		30	39 - 134
Dibenz(a,h)anthracene	77.46	105.1	136	19.1		30	30 - 138
Indeno(1,2,3-cd)pyrene	77.46	81.64	105	15.9		30	17 - 164
Naphthalene	77.46	63.60	82.1	3.92		30	29 - 106

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SB-41-0507

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E12916

% Solids: 85.94

Source Sample Name: **1004277-18**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	77.57	ND	101.3	131		31 - 146
Benzo(a)pyrene	77.57	ND	74.92	96.6		28 - 128
Benzo(b)fluoranthene	77.57	ND	80.34	104		30 - 139
Benzo(k)fluoranthene	77.57	ND	79.07	102		42 - 129
Chrysene	77.57	ND	101.4	131		39 - 134
Dibenz(a,h)anthracene	77.57	ND	89.01	115		30 - 138
Indeno(1,2,3-cd)pyrene	77.57	ND	92.23	119		17 - 164
Naphthalene	77.57	ND	70.88	91.4		29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzo(a)anthracene	77.57	84.79	109	17.8		30	31 - 146
Benzo(a)pyrene	77.57	76.83	99.0	2.53		30	28 - 128
Benzo(b)fluoranthene	77.57	79.82	103	0.640		30	30 - 139
Benzo(k)fluoranthene	77.57	79.48	102	0.508		30	42 - 129
Chrysene	77.57	88.45	114	13.6		30	39 - 134
Dibenz(a,h)anthracene	77.57	97.00	125	8.59		30	30 - 138
Indeno(1,2,3-cd)pyrene	77.57	102.6	132	10.6		30	17 - 164
Naphthalene	77.57	61.37	79.1	14.4		30	29 - 106

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E08002 Batch Matrix: Water Preparation: EXT_3510

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E08002-BLK1	05/08/10 11:10	1,000.00	1.00
LCS	0E08002-BS1	05/08/10 11:10	1,000.00	1.00
LCS Dup	0E08002-BSD1	05/08/10 11:10	1,000.00	1.00
32GW-03	1004277-01	05/08/10 11:10	1,070.00	1.00
32GW-FD042710-01	1004277-02	05/08/10 11:10	1,070.00	1.00
32SS-RB042710-01	1004277-03	05/08/10 11:10	1,060.00	1.00
32SS-RB042710-02	1004277-04	05/08/10 11:10	1,020.00	1.00
32SS-RB042710-03	1004277-05	05/08/10 11:10	900.00	1.00

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E11002 Batch Matrix: Water Preparation: EXT_3510

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E11002-BLK1	05/11/10 12:00	1,000.00	1.00
LCS	0E11002-BS1	05/11/10 12:00	1,000.00	1.00
32SS-RB042810-04	1004277-06	05/11/10 12:00	1,020.00	1.00

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E11013 Batch Matrix: Solid Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E11013-BLK1	05/20/10 13:40	15.00	1.00
LCS	0E11013-BS1	05/20/10 13:40	15.00	1.00
32SS-31-0002	0E11013-MS1	05/20/10 13:40	15.00	1.00
32SS-31-0002	0E11013-MSD1	05/20/10 13:40	15.00	1.00
32SS-31-0002	1004277-07	05/20/10 13:40	15.00	1.00
32SS-38-0002	1004277-11	05/20/10 13:40	15.00	1.00
32SB-38-0506	1004277-12	05/20/10 13:40	15.00	1.00
32SS-40-0002	1004277-15	05/20/10 13:40	15.00	1.00
32SB-40-0506	1004277-16	05/20/10 13:40	15.00	1.00
32SS-42-0002	1004277-19	05/20/10 13:40	15.00	1.00
32SB-42-0506	1004277-20	05/20/10 13:40	15.00	1.00

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E12916 Batch Matrix: Solid Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E12916-BLK1	05/12/10 19:30	15.00	1.00
LCS	0E12916-BS1	05/12/10 19:30	15.00	1.00
32SB-31-0607	0E12916-MS1	05/12/10 19:30	15.00	1.00
32SS-35-0002	0E12916-MS2	05/12/10 19:30	15.00	1.00
32SB-35-0507	0E12916-MS3	05/12/10 19:30	15.00	1.00
32SS-39-0002	0E12916-MS4	05/12/10 19:30	15.00	1.00
32SB-39-0507	0E12916-MS5	05/12/10 19:30	15.00	1.00
32SS-41-0002	0E12916-MS6	05/12/10 19:30	15.00	1.00
32SB-41-0507	0E12916-MS7	05/12/10 19:30	15.00	1.00
32SB-31-0607	0E12916-MSD1	05/12/10 19:30	15.00	1.00
32SS-35-0002	0E12916-MSD2	05/12/10 19:30	15.00	1.00
32SB-35-0507	0E12916-MSD3	05/12/10 19:30	15.00	1.00
32SS-39-0002	0E12916-MSD4	05/12/10 19:30	15.00	1.00
32SB-39-0507	0E12916-MSD5	05/12/10 19:30	15.00	1.00
32SS-41-0002	0E12916-MSD6	05/12/10 19:30	15.00	1.00
32SB-41-0507	0E12916-MSD7	05/12/10 19:30	15.00	1.00
32SB-31-0607	1004277-08	05/12/10 19:30	15.00	1.00
32SS-35-0002	1004277-09	05/12/10 19:30	15.00	1.00
32SB-35-0507	1004277-10	05/12/10 19:30	15.00	1.00
32SS-39-0002	1004277-13	05/12/10 19:30	15.00	1.00
32SB-39-0507	1004277-14	05/12/10 19:30	15.00	1.00
32SS-41-0002	1004277-17	05/12/10 19:30	15.00	1.00
32SB-41-0507	1004277-18	05/12/10 19:30	15.00	1.00
32SS-FD042810-04	1004277-21	05/12/10 19:30	15.00	1.00
32SS-FD042810-05	1004277-22	05/12/10 19:30	15.00	1.00
32SB-FD042810-04	1004277-23	05/12/10 19:30	15.00	1.00
32SB-FD042810-05	1004277-24	05/12/10 19:30	15.00	1.00
32SS-DW01-0002	1004277-25	05/12/10 19:30	15.00	1.00
32SB-DW01-0809	1004277-26	05/12/10 19:30	15.00	1.00

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15510	Instrument:	MS-BNA3
		Calibration:	0132007

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15510-CCV1)			Lab File ID: SEQ-CCV2.D			Analyzed: 05/30/10 03:13			
Phenanthrene-d10	169257	12.832	233208	13.276	73	50 - 200	-0.4440	+/-0.50	
Perylene-d12	98171	24.724	135470	25.094	72	50 - 200	-0.3700	+/-0.50	
LCS (0E08002-BS1)			Lab File ID: E08002L1.D			Analyzed: 05/30/10 03:49			
Phenanthrene-d10	151898	12.831	169257	12.832	90	50 - 200	-0.0010	+/-0.50	
Perylene-d12	87874	24.723	98171	24.724	90	50 - 200	-0.0010	+/-0.50	
LCS Dup (0E08002-BSD1)			Lab File ID: E08002L2.D			Analyzed: 05/30/10 04:25			
Phenanthrene-d10	146414	12.824	169257	12.832	87	50 - 200	-0.0080	+/-0.50	
Perylene-d12	86435	24.725	98171	24.724	88	50 - 200	0.0010	+/-0.50	
Blank (0E08002-BLK1)			Lab File ID: E08002B1.D			Analyzed: 05/30/10 05:01			
Phenanthrene-d10	140559	12.831	169257	12.832	83	50 - 200	-0.0010	+/-0.50	
Perylene-d12	97391	24.723	98171	24.724	99	50 - 200	-0.0010	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15511	Instrument:	MS-BNA3
		Calibration:	0132007

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15511-CCV1)			Lab File ID: SEQ-CCV3.D			Analyzed: 05/30/10 15:47			
Phenanthrene-d10	172322	12.831	233208	13.276	74	50 - 200	-0.4450	+/-0.50	
Perylene-d12	91186	24.724	135470	25.094	67	50 - 200	-0.3700	+/-0.50	
32GW-03 (1004277-01)			Lab File ID: 0427701.D			Analyzed: 05/30/10 16:23			
Phenanthrene-d10	165123	12.832	172322	12.831	96	50 - 200	0.0010	+/-0.50	
Perylene-d12	89282	24.734	91186	24.724	98	50 - 200	0.0100	+/-0.50	
32GW-FD042710-01 (1004277-02)			Lab File ID: 0427702.D			Analyzed: 05/30/10 17:00			
Phenanthrene-d10	145663	12.831	172322	12.831	85	50 - 200	0.0000	+/-0.50	
Perylene-d12	83887	24.733	91186	24.724	92	50 - 200	0.0090	+/-0.50	
32SS-RB042710-01 (1004277-03)			Lab File ID: 0427703.D			Analyzed: 05/30/10 17:36			
Phenanthrene-d10	157084	12.832	172322	12.831	91	50 - 200	0.0010	+/-0.50	
Perylene-d12	99025	24.724	91186	24.724	109	50 - 200	0.0000	+/-0.50	
32SS-RB042710-02 (1004277-04)			Lab File ID: 0427704.D			Analyzed: 05/30/10 18:12			
Phenanthrene-d10	145889	12.824	172322	12.831	85	50 - 200	-0.0070	+/-0.50	
Perylene-d12	76887	24.725	91186	24.724	84	50 - 200	0.0010	+/-0.50	
32SS-RB042710-03 (1004277-05)			Lab File ID: 0427705.D			Analyzed: 05/30/10 18:48			
Phenanthrene-d10	155927	12.824	172322	12.831	90	50 - 200	-0.0070	+/-0.50	
Perylene-d12	83181	24.726	91186	24.724	91	50 - 200	0.0020	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16006	Instrument:	MS-BNA3
		Calibration:	0156001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16006-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 06/05/10 18:45			
Phenanthrene-d10	113150	12.683	114187	12.766	99	50 - 200	-0.0830	+/-0.50	
Perylene-d12	53124	24.594	78489	24.667	68	50 - 200	-0.0730	+/-0.50	
LCS (0E11002-BS1)			Lab File ID: E11002L1.D			Analyzed: 06/05/10 19:24			
Phenanthrene-d10	114697	12.684	113150	12.683	101	50 - 200	0.0010	+/-0.50	
Perylene-d12	70390	24.594	53124	24.594	133	50 - 200	0.0000	+/-0.50	
Blank (0E11002-BLK1)			Lab File ID: E11002B1.D			Analyzed: 06/05/10 20:00			
Phenanthrene-d10	113837	12.676	113150	12.683	101	50 - 200	-0.0070	+/-0.50	
Perylene-d12	72704	24.596	53124	24.594	137	50 - 200	0.0020	+/-0.50	
32SS-RB042810-04 (1004277-06)			Lab File ID: 0427706.D			Analyzed: 06/05/10 20:36			
Phenanthrene-d10	111566	12.682	113150	12.683	99	50 - 200	-0.0010	+/-0.50	
Perylene-d12	74109	24.593	53124	24.594	140	50 - 200	-0.0010	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16723	Instrument:	MS-BNA3
		Calibration:	0161002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16723-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 06/12/10 11:37			
Phenanthrene-d10	158374	12.454	109351	12.47	145	50 - 200	-0.0160	+/-0.50	
Perylene-d12	72628	24.365	46195	24.39	157	50 - 200	-0.0250	+/-0.50	
LCS (0E11013-BS1)			Lab File ID: E11013L1.D			Analyzed: 06/12/10 12:13			
Phenanthrene-d10	142591	12.461	158374	12.454	90	50 - 200	0.0070	+/-0.50	
Perylene-d12	58185	24.372	72628	24.365	80	50 - 200	0.0070	+/-0.50	
Blank (0E11013-BLK1)			Lab File ID: E11013B1.D			Analyzed: 06/12/10 12:49			
Phenanthrene-d10	126307	12.463	158374	12.454	80	50 - 200	0.0090	+/-0.50	
Perylene-d12	49082	24.374	72628	24.365	68	50 - 200	0.0090	+/-0.50	
32SS-31-0002 (1004277-07)			Lab File ID: 0427707.D			Analyzed: 06/12/10 19:27			
Phenanthrene-d10	132505	12.463	158374	12.454	84	50 - 200	0.0090	+/-0.50	
Perylene-d12	65100	24.373	72628	24.365	90	50 - 200	0.0080	+/-0.50	
32SS-38-0002 (1004277-11)			Lab File ID: 0427711.D			Analyzed: 06/12/10 20:03			
Phenanthrene-d10	138093	12.461	158374	12.454	87	50 - 200	0.0070	+/-0.50	
Perylene-d12	74348	24.372	72628	24.365	102	50 - 200	0.0070	+/-0.50	
32SB-38-0506 (1004277-12)			Lab File ID: 0427712.D			Analyzed: 06/12/10 20:39			
Phenanthrene-d10	112469	12.461	158374	12.454	71	50 - 200	0.0070	+/-0.50	
Perylene-d12	57105	24.371	72628	24.365	79	50 - 200	0.0060	+/-0.50	
32SS-40-0002 (1004277-15)			Lab File ID: 0427715.D			Analyzed: 06/12/10 21:15			
Phenanthrene-d10	115256	12.463	158374	12.454	73	50 - 200	0.0090	+/-0.50	
Perylene-d12	58764	24.374	72628	24.365	81	50 - 200	0.0090	+/-0.50	
32SB-40-0506 (1004277-16)			Lab File ID: 0427716.D			Analyzed: 06/12/10 21:51			
Phenanthrene-d10	96566	12.459	158374	12.454	61	50 - 200	0.0050	+/-0.50	
Perylene-d12	63548	24.37	72628	24.365	87	50 - 200	0.0050	+/-0.50	
Matrix Spike (0E11013-MS1)			Lab File ID: 0427707M.D			Analyzed: 06/12/10 22:27			
Phenanthrene-d10	127920	12.462	158374	12.454	81	50 - 200	0.0080	+/-0.50	
Perylene-d12	71735	24.373	72628	24.365	99	50 - 200	0.0080	+/-0.50	
Matrix Spike Dup (0E11013-MSD1)			Lab File ID: 0427707S.D			Analyzed: 06/12/10 23:04			
Phenanthrene-d10	112699	12.46	158374	12.454	71	50 - 200	0.0060	+/-0.50	
Perylene-d12	59796	24.371	72628	24.365	82	50 - 200	0.0060	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16725	Instrument:	MS-BNA3
		Calibration:	0161002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16725-CCV1)			Lab File ID: SEQ-CCV2.D			Analyzed: 06/13/10 00:34			
Phenanthrene-d10	109485	12.46	109351	12.47	100	50 - 200	-0.0100	+/-0.50	
Perylene-d12	58227	24.37	46195	24.39	126	50 - 200	-0.0200	+/-0.50	
32SS-42-0002 (1004277-19)			Lab File ID: 0427719.D			Analyzed: 06/13/10 02:24			
Phenanthrene-d10	117527	12.46	109485	12.46	107	50 - 200	0.0000	+/-0.50	
Perylene-d12	64486	24.371	58227	24.37	111	50 - 200	0.0010	+/-0.50	
32SB-42-0506 (1004277-20)			Lab File ID: 0427720.D			Analyzed: 06/13/10 03:00			
Phenanthrene-d10	114396	12.459	109485	12.46	104	50 - 200	-0.0010	+/-0.50	
Perylene-d12	65735	24.379	58227	24.37	113	50 - 200	0.0090	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16727	Instrument:	MS-BNA4
		Calibration:	0098001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16727-CCV1)			Lab File ID: SEQ-CCV2.D			Analyzed: 06/15/10 07:53			
Phenanthrene-d10	164677	12.978	196258	13.55	84	50 - 200	-0.5720	+/-0.50	
Perylene-d12	72056	24.803	108221	25.217	67	50 - 200	-0.4140	+/-0.50	
32SB-FD042810-05 (1004277-24)			Lab File ID: 0427724D.D			Analyzed: 06/15/10 12:24			
Phenanthrene-d10	165506	12.996	164677	12.978	101	50 - 200	0.0180	+/-0.50	
Perylene-d12	80762	24.803	72056	24.803	112	50 - 200	0.0000	+/-0.50	
32SS-DW01-0002 (1004277-25)			Lab File ID: 0427725D.D			Analyzed: 06/15/10 12:59			
Phenanthrene-d10	156582	13.015	164677	12.978	95	50 - 200	0.0370	+/-0.50	
Perylene-d12	58267	24.803	72056	24.803	81	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16811	Instrument:	MS-BNA4
		Calibration:	0098001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16811-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 06/12/10 17:00			
Phenanthrene-d10	210196	13.015	196258	13.55	107	50 - 200	-0.5350	+/-0.50	
Perylene-d12	141123	24.821	108221	25.217	130	50 - 200	-0.3960	+/-0.50	
LCS (0E12916-BS1)			Lab File ID: E12916L1.D			Analyzed: 06/12/10 17:34			
Phenanthrene-d10	137078	13.015	210196	13.015	65	50 - 200	0.0000	+/-0.50	
Perylene-d12	101741	24.821	141123	24.821	72	50 - 200	0.0000	+/-0.50	
Blank (0E12916-BLK1)			Lab File ID: E12916B1.D			Analyzed: 06/12/10 18:08			
Phenanthrene-d10	162612	13.015	210196	13.015	77	50 - 200	0.0000	+/-0.50	
Perylene-d12	105994	24.821	141123	24.821	75	50 - 200	0.0000	+/-0.50	
32SB-31-0607 (1004277-08)			Lab File ID: 0427708.D			Analyzed: 06/12/10 18:42			
Phenanthrene-d10	165650	13.015	210196	13.015	79	50 - 200	0.0000	+/-0.50	
Perylene-d12	114522	24.821	141123	24.821	81	50 - 200	0.0000	+/-0.50	
32SS-35-0002 (1004277-09)			Lab File ID: 0427709.D			Analyzed: 06/12/10 19:16			
Phenanthrene-d10	168728	13.015	210196	13.015	80	50 - 200	0.0000	+/-0.50	
Perylene-d12	134705	24.821	141123	24.821	95	50 - 200	0.0000	+/-0.50	
32SB-35-0507 (1004277-10)			Lab File ID: 0427710.D			Analyzed: 06/12/10 19:50			
Phenanthrene-d10	137950	13.015	210196	13.015	66	50 - 200	0.0000	+/-0.50	
Perylene-d12	118444	24.821	141123	24.821	84	50 - 200	0.0000	+/-0.50	
32SS-39-0002 (1004277-13)			Lab File ID: 0427713.D			Analyzed: 06/12/10 20:25			
Phenanthrene-d10	152889	13.015	210196	13.015	73	50 - 200	0.0000	+/-0.50	
Perylene-d12	123212	24.821	141123	24.821	87	50 - 200	0.0000	+/-0.50	
32SB-39-0507 (1004277-14)			Lab File ID: 0427714.D			Analyzed: 06/12/10 20:59			
Phenanthrene-d10	128990	13.015	210196	13.015	61	50 - 200	0.0000	+/-0.50	
Perylene-d12	119651	24.821	141123	24.821	85	50 - 200	0.0000	+/-0.50	
32SS-41-0002 (1004277-17)			Lab File ID: 0427717.D			Analyzed: 06/12/10 21:33			
Phenanthrene-d10	187810	13.015	210196	13.015	89	50 - 200	0.0000	+/-0.50	
Perylene-d12	138717	24.821	141123	24.821	98	50 - 200	0.0000	+/-0.50	
Matrix Spike (0E12916-MS1)			Lab File ID: 0427708M.D			Analyzed: 06/12/10 22:07			
Phenanthrene-d10	163645	13.015	210196	13.015	78	50 - 200	0.0000	+/-0.50	
Perylene-d12	124388	24.812	141123	24.821	88	50 - 200	-0.0090	+/-0.50	
Matrix Spike (0E12916-MS2)			Lab File ID: 0427709M.D			Analyzed: 06/12/10 22:41			
Phenanthrene-d10	194611	13.015	210196	13.015	93	50 - 200	0.0000	+/-0.50	
Perylene-d12	139033	24.821	141123	24.821	99	50 - 200	0.0000	+/-0.50	
Matrix Spike (0E12916-MS3)			Lab File ID: 0427710M.D			Analyzed: 06/12/10 23:16			
Phenanthrene-d10	166545	13.015	210196	13.015	79	50 - 200	0.0000	+/-0.50	
Perylene-d12	125295	24.821	141123	24.821	89	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16811	Instrument:	MS-BNA4
		Calibration:	0098001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike (0E12916-MS4)			Lab File ID: 0427713M.D			Analyzed: 06/12/10 23:50			
Phenanthrene-d10	143362	13.015	210196	13.015	68	50 - 200	0.0000	+/-0.50	
Perylene-d12	127136	24.812	141123	24.821	90	50 - 200	-0.0090	+/-0.50	
Matrix Spike (0E12916-MS5)			Lab File ID: 0427714M.D			Analyzed: 06/13/10 00:24			
Phenanthrene-d10	127027	13.015	210196	13.015	60	50 - 200	0.0000	+/-0.50	
Perylene-d12	116666	24.821	141123	24.821	83	50 - 200	0.0000	+/-0.50	
Matrix Spike (0E12916-MS6)			Lab File ID: 0427717M.D			Analyzed: 06/13/10 00:59			
Phenanthrene-d10	171001	13.015	210196	13.015	81	50 - 200	0.0000	+/-0.50	
Perylene-d12	103212	24.821	141123	24.821	73	50 - 200	0.0000	+/-0.50	
Matrix Spike Dup (0E12916-MSD1)			Lab File ID: 0427708S.D			Analyzed: 06/13/10 01:33			
Phenanthrene-d10	181267	13.015	210196	13.015	86	50 - 200	0.0000	+/-0.50	
Perylene-d12	133810	24.812	141123	24.821	95	50 - 200	-0.0090	+/-0.50	
Matrix Spike Dup (0E12916-MSD2)			Lab File ID: 0427709S.D			Analyzed: 06/13/10 02:07			
Phenanthrene-d10	155432	13.015	210196	13.015	74	50 - 200	0.0000	+/-0.50	
Perylene-d12	99836	24.821	141123	24.821	71	50 - 200	0.0000	+/-0.50	
Matrix Spike Dup (0E12916-MSD3)			Lab File ID: 0427710S.D			Analyzed: 06/13/10 02:42			
Phenanthrene-d10	157647	13.015	210196	13.015	75	50 - 200	0.0000	+/-0.50	
Perylene-d12	115251	24.812	141123	24.821	82	50 - 200	-0.0090	+/-0.50	
Matrix Spike Dup (0E12916-MSD4)			Lab File ID: 0427713S.D			Analyzed: 06/13/10 03:16			
Phenanthrene-d10	164858	13.015	210196	13.015	78	50 - 200	0.0000	+/-0.50	
Perylene-d12	114545	24.812	141123	24.821	81	50 - 200	-0.0090	+/-0.50	
Matrix Spike Dup (0E12916-MSD5)			Lab File ID: 0427714S.D			Analyzed: 06/13/10 03:50			
Phenanthrene-d10	196603	13.015	210196	13.015	94	50 - 200	0.0000	+/-0.50	
Perylene-d12	134718	24.812	141123	24.821	95	50 - 200	-0.0090	+/-0.50	
Matrix Spike Dup (0E12916-MSD6)			Lab File ID: 0427717S.D			Analyzed: 06/13/10 04:24			
Phenanthrene-d10	144157	13.015	210196	13.015	69	50 - 200	0.0000	+/-0.50	
Perylene-d12	125619	24.812	141123	24.821	89	50 - 200	-0.0090	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16819	Instrument:	MS-BNA4
		Calibration:	0098001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16819-CCV1)			Lab File ID: SEQ-CCV2.D			Analyzed: 06/13/10 05:49			
Phenanthrene-d10	161735	13.005	196258	13.55	82	50 - 200	-0.5450	+/-0.50	
Perylene-d12	125566	24.812	108221	25.217	116	50 - 200	-0.4050	+/-0.50	
32SS-FD042810-04 (1004277-21)			Lab File ID: 0427721.D			Analyzed: 06/13/10 06:23			
Phenanthrene-d10	144073	13.015	161735	13.005	89	50 - 200	0.0100	+/-0.50	
Perylene-d12	103435	24.821	125566	24.812	82	50 - 200	0.0090	+/-0.50	
32SS-FD042810-05 (1004277-22)			Lab File ID: 0427722.D			Analyzed: 06/13/10 06:57			
Phenanthrene-d10	139824	13.034	161735	13.005	86	50 - 200	0.0290	+/-0.50	
Perylene-d12	119048	24.812	125566	24.812	95	50 - 200	0.0000	+/-0.50	
32SB-FD042810-04 (1004277-23)			Lab File ID: 0427723.D			Analyzed: 06/13/10 07:31			
Phenanthrene-d10	174765	13.015	161735	13.005	108	50 - 200	0.0100	+/-0.50	
Perylene-d12	144730	24.812	125566	24.812	115	50 - 200	0.0000	+/-0.50	
32SB-41-0507 (1004277-18)			Lab File ID: 0427718.D			Analyzed: 06/13/10 10:56			
Phenanthrene-d10	129070	13.015	161735	13.005	80	50 - 200	0.0100	+/-0.50	
Perylene-d12	111777	24.812	125566	24.812	89	50 - 200	0.0000	+/-0.50	
32SB-DW01-0809 (1004277-26)			Lab File ID: 0427726.D			Analyzed: 06/13/10 12:39			
Phenanthrene-d10	156509	13.061	161735	13.005	97	50 - 200	0.0560	+/-0.50	
Perylene-d12	96934	24.821	125566	24.812	77	50 - 200	0.0090	+/-0.50	
Matrix Spike (0E12916-MS7)			Lab File ID: 0427718M.D			Analyzed: 06/13/10 13:13			
Phenanthrene-d10	135238	13.015	161735	13.005	84	50 - 200	0.0100	+/-0.50	
Perylene-d12	113231	24.821	125566	24.812	90	50 - 200	0.0090	+/-0.50	
Matrix Spike Dup (0E12916-MSD7)			Lab File ID: 0427718S.D			Analyzed: 06/13/10 13:47			
Phenanthrene-d10	155832	13.015	161735	13.005	96	50 - 200	0.0100	+/-0.50	
Perylene-d12	112237	24.821	125566	24.812	89	50 - 200	0.0090	+/-0.50	

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0132007
Lab File ID:	SEQ-ICV1.D	Calibration Date:	05/10/10 17:04
Sequence:	0E13201	Injection Date:	05/10/10
Lab Sample ID:	0E13201-ICV1	Injection Time:	21:49

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzo(a)anthracene	L	5.000	4.798	0.6443703	0.7694452		-4.0	20
Benzo(a)pyrene	L	5.000	5.058	0.8806429	1.097758		1.2	20
Benzo(b)fluoranthene	L	5.000	5.112	1.02129	1.247038		2.2	20
Benzo(k)fluoranthene	A	5.000	5.888	1.114795	1.312769		17.8	20
Chrysene	A	5.000	5.580	0.7443354	0.8306387		11.6	20
Dibenz(a,h)anthracene	L	5.000	4.856	0.824039	0.8818608		-2.9	20
Indeno(1,2,3-cd)pyrene	L	5.000	5.009	0.792655	0.9204299		0.2	20
Naphthalene	A	5.000	4.558	1.28018	1.167106		-8.8	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0156001
Lab File ID:	SEQ-ICV1.D	Calibration Date:	06/03/10 10:00
Sequence:	0F15501	Injection Date:	06/03/10
Lab Sample ID:	0F15501-ICV1	Injection Time:	17:16

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzo(a)anthracene	A	5.000	5.465	0.7827159	0.8554742		9.3	20
Benzo(a)pyrene	Q	5.000	4.888	1.030906	1.147426		-2.2	20
Benzo(b)fluoranthene	L	5.000	4.779	1.129732	1.225146		-4.4	20
Benzo(k)fluoranthene	Q	5.000	4.634	1.107235	1.16417		-7.3	20
Chrysene	A	5.000	4.997	0.8305551	0.8300321		-0.06	20
Dibenz(a,h)anthracene	A	5.000	5.286	0.855389	0.904263		5.7	20
Indeno(1,2,3-cd)pyrene	A	5.000	5.218	0.9165747	0.9566115		4.4	20
Naphthalene	A	5.000	4.505	0.9310503	0.8388271		-9.9	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0161002
Lab File ID:	SEQ-ICV1.D	Calibration Date:	06/09/10 14:36
Sequence:	0F16101	Injection Date:	06/10/10
Lab Sample ID:	0F16101-ICV1	Injection Time:	04:59

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Acenaphthene	A	5.000	4.827	0.786274	0.7590863		-3.5	20
Acenaphthylene	A	5.000	5.223	1.21382	1.268044		4.5	20
Anthracene	Q	5.000	4.995	0.8565716	1.001175		-0.09	20
Benzo(a)anthracene	L	5.000	5.440	0.5502005	0.7229815		8.8	20
Benzo(a)pyrene	L	5.000	5.157	0.963022	1.23492		3.1	20
Benzo(b)fluoranthene	L	5.000	4.741	1.109058	1.30343		-5.2	20
Benzo(g,h,i)perylene	L	5.000	4.511	1.144808	1.312552		-9.8	20
Benzo(k)fluoranthene	Q	5.000	4.973	1.244685	1.4313		-0.5	20
Chrysene	L	5.000	5.960	0.6385135	0.7816841		19.2	20
Dibenz(a,h)anthracene	Q	5.000	4.247	0.8922049	1.165855		-15.1	20
Fluoranthene	L	5.000	5.638	0.7487376	0.9784458		12.8	20
Fluorene	L	5.000	5.179	0.7298324	0.8113299		3.6	20
Indeno(1,2,3-cd)pyrene	Q	5.000	4.171	0.899166	1.091454		-16.6	20
1-Methylnaphthalene	A	5.000	4.722	0.8184576	0.7730303		-5.6	20
2-Methylnaphthalene	A	5.000	5.098	0.8899234	0.9073801		2.0	20
Naphthalene	A	5.000	4.618	1.415819	1.307792		-7.6	20
Phenanthrene	A	5.000	5.348	0.9983893	1.067861		7.0	20
Pyrene	Q	5.000	5.054	0.8081301	0.930862		1.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0098001
Lab File ID:	ICV1.D	Calibration Date:	11/12/09 11:02
Sequence:	9L35713	Injection Date:	11/12/09
Lab Sample ID:	9L35713-ICV1	Injection Time:	21:55

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Acenaphthene	A	5.000	5.088	0.7457972	0.7589529		1.8	20
Acenaphthylene	A	5.000	4.650	0.9996575	0.9296487		-7.0	20
Anthracene	A	5.000	5.306	0.9948455	1.055827		6.1	20
Benzo(a)anthracene	A	5.000	5.736	0.7581512	0.8697518		14.7	20
Benzo(a)pyrene	A	5.000	5.183	0.9592349	0.9943783		3.7	20
Benzo(b)fluoranthene	A	5.000	5.289	1.176864	1.244926		5.8	20
Benzo(g,h,i)perylene	A	5.000	4.944	0.8650452	0.8554135		-1.1	20
Benzo(k)fluoranthene	A	5.000	5.441	1.169451	1.272709		8.8	20
Chrysene	A	5.000	5.780	0.7324149	0.8467581		15.6	20
Dibenz(a,h)anthracene	A	5.000	5.176	0.7647294	0.7916294		3.5	20
Fluoranthene	A	5.000	5.472	1.030294	1.127536		9.4	20
Fluorene	A	5.000	5.185	0.7457374	0.7733265		3.7	20
Indeno(1,2,3-cd)pyrene	A	5.000	5.140	0.7715006	0.7930895		2.8	20
1-Methylnaphthalene	A	5.000	4.490	0.7407783	0.6652298		-10.2	20
2-Methylnaphthalene	A	5.000	4.750	0.8009425	0.7609113		-5.0	20
Naphthalene	A	5.000	4.862	1.224033	1.190144		-2.8	20
Phenanthrene	A	5.000	5.149	1.064344	1.096091		3.0	20
Pyrene	A	5.000	5.519	1.038027	1.145716		10.4	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13201	Instrument:	MS-BNA3
Calibration:	0132007		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13201-TUN1	SEQ-TUN1.D	05/10/10 13:38
Cal Standard	0E13201-CAL1	SEQ-CAL1.D	05/10/10 14:34
Cal Standard	0E13201-CAL2	SEQ-CAL2.D	05/10/10 15:11
Cal Standard	0E13201-CAL3	SEQ-CAL3.D	05/10/10 15:47
Cal Standard	0E13201-CAL4	SEQ-CAL4.D	05/10/10 16:23
Cal Standard	0E13201-CAL5	SEQ-CAL5.D	05/10/10 16:59
Cal Standard	0E13201-CAL6	SEQ-CAL6.D	05/10/10 17:35
Cal Standard	0E13201-CAL7	SEQ-CAL7.D	05/10/10 18:12
Cal Standard	0E13201-CAL8	SEQ-CAL8.D	05/10/10 18:48
Cal Standard	0E13201-CAL9	SEQ-CAL9.D	05/10/10 19:24
Cal Standard	0E13201-CALA	SEQ-CALA.D	05/10/10 20:00
Cal Standard	0E13201-CALB	SEQ-CALB.D	05/10/10 20:37
Initial Cal Check	0E13201-ICV1	SEQ-ICV1.D	05/10/10 21:49

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15501	Instrument:	MS-BNA3
Calibration:	0156001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15501-TUN1	SEQ-TUN1.D	06/03/10 10:13
Cal Standard	0F15501-CAL1	SEQ-CAL1.D	06/03/10 10:34
Cal Standard	0F15501-CAL2	SEQ-CAL2.D	06/03/10 11:11
Cal Standard	0F15501-CAL3	SEQ-CAL3.D	06/03/10 11:47
Cal Standard	0F15501-CAL4	SEQ-CAL4.D	06/03/10 12:23
Cal Standard	0F15501-CAL5	SEQ-CAL5.D	06/03/10 13:00
Cal Standard	0F15501-CAL6	SEQ-CAL6.D	06/03/10 13:36
Cal Standard	0F15501-CAL7	SEQ-CAL7.D	06/03/10 14:13
Cal Standard	0F15501-CAL8	SEQ-CAL8.D	06/03/10 14:49
Cal Standard	0F15501-CAL9	SEQ-CAL9.D	06/03/10 15:26
Cal Standard	0F15501-CALA	SEQ-CALA.D	06/03/10 16:03
Cal Standard	0F15501-CALB	SEQ-CALB.D	06/03/10 16:39
Initial Cal Check	0F15501-ICV1	SEQ-ICV1.D	06/03/10 17:16

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15510	Instrument:	MS-BNA3
Calibration:	0132007		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15510-TUN1	SEQ-TUN2.D	05/30/10 02:51
Calibration Check	0F15510-CCV1	SEQ-CCV2.D	05/30/10 03:13
LCS	0E08002-BS1	E08002L1.D	05/30/10 03:49
LCS Dup	0E08002-BSD1	E08002L2.D	05/30/10 04:25
Blank	0E08002-BLK1	E08002B1.D	05/30/10 05:01

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15511	Instrument:	MS-BNA3
Calibration:	0132007		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15511-TUN1	SEQ-TUN3.D	05/30/10 15:26
Calibration Check	0F15511-CCV1	SEQ-CCV3.D	05/30/10 15:47
32GW-03	1004277-01	0427701.D	05/30/10 16:23
32GW-FD042710-01	1004277-02	0427702.D	05/30/10 17:00
32SS-RB042710-01	1004277-03	0427703.D	05/30/10 17:36
32SS-RB042710-02	1004277-04	0427704.D	05/30/10 18:12
32SS-RB042710-03	1004277-05	0427705.D	05/30/10 18:48

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16006	Instrument:	MS-BNA3
Calibration:	0156001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16006-TUN1	SEQ-TUN1.D	06/05/10 17:47
Calibration Check	0F16006-CCV1	SEQ-CCV1.D	06/05/10 18:45
LCS	0E11002-BS1	E11002L1.D	06/05/10 19:24
Blank	0E11002-BLK1	E11002B1.D	06/05/10 20:00
32SS-RB042810-04	1004277-06	0427706.D	06/05/10 20:36

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16101	Instrument:	MS-BNA3
Calibration:	0161002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16101-TUN1	SEQ-TUN1.D	06/09/10 22:00
Cal Standard	0F16101-CAL1	SEQ-CAL1.D	06/09/10 22:21
Cal Standard	0F16101-CAL2	SEQ-CAL2.D	06/09/10 22:57
Cal Standard	0F16101-CAL3	SEQ-CAL3.D	06/09/10 23:33
Cal Standard	0F16101-CAL4	SEQ-CAL4.D	06/10/10 00:10
Cal Standard	0F16101-CAL5	SEQ-CAL5.D	06/10/10 00:46
Cal Standard	0F16101-CAL6	SEQ-CAL6.D	06/10/10 01:22
Cal Standard	0F16101-CAL7	SEQ-CAL7.D	06/10/10 01:58
Cal Standard	0F16101-CAL8	SEQ-CAL8.D	06/10/10 02:34
Cal Standard	0F16101-CAL9	SEQ-CAL9.D	06/10/10 03:10
Cal Standard	0F16101-CALA	SEQ-CALA.D	06/10/10 03:47
Cal Standard	0F16101-CALB	SEQ-CALB.D	06/10/10 04:23
Initial Cal Check	0F16101-ICV1	SEQ-ICV1.D	06/10/10 04:59

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16723	Instrument:	MS-BNA3
Calibration:	0161002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16723-TUN1	SEQ-TUN1.D	06/12/10 11:15
Calibration Check	0F16723-CCV1	SEQ-CCV1.D	06/12/10 11:37
LCS	0E11013-BS1	E11013L1.D	06/12/10 12:13
Blank	0E11013-BLK1	E11013B1.D	06/12/10 12:49
32SS-31-0002	1004277-07	0427707.D	06/12/10 19:27
32SS-38-0002	1004277-11	0427711.D	06/12/10 20:03
32SB-38-0506	1004277-12	0427712.D	06/12/10 20:39
32SS-40-0002	1004277-15	0427715.D	06/12/10 21:15
32SB-40-0506	1004277-16	0427716.D	06/12/10 21:51
32SS-31-0002	0E11013-MS1	0427707M.D	06/12/10 22:27
32SS-31-0002	0E11013-MSD1	0427707S.D	06/12/10 23:04

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16725	Instrument:	MS-BNA3
Calibration:	0161002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16725-TUN1	SEQ-TUN2.D	06/13/10 00:12
Calibration Check	0F16725-CCV1	SEQ-CCV2.D	06/13/10 00:34
32SS-42-0002	1004277-19	0427719.D	06/13/10 02:24
32SB-42-0506	1004277-20	0427720.D	06/13/10 03:00

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16727	Instrument:	MS-BNA4
Calibration:	0098001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16727-TUN1	SEQ-TUN2.D	06/15/10 07:35
Calibration Check	0F16727-CCV1	SEQ-CCV2.D	06/15/10 07:53
32SB-FD042810-05	1004277-24	0427724D.D	06/15/10 12:24
32SS-DW01-0002	1004277-25	0427725D.D	06/15/10 12:59

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16811	Instrument:	MS-BNA4
Calibration:	0098001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16811-TUN1	SEQ-TUN1.D	06/12/10 16:42
Calibration Check	0F16811-CCV1	SEQ-CCV1.D	06/12/10 17:00
LCS	0E12916-BS1	E12916L1.D	06/12/10 17:34
Blank	0E12916-BLK1	E12916B1.D	06/12/10 18:08
32SB-31-0607	1004277-08	0427708.D	06/12/10 18:42
32SS-35-0002	1004277-09	0427709.D	06/12/10 19:16
32SB-35-0507	1004277-10	0427710.D	06/12/10 19:50
32SS-39-0002	1004277-13	0427713.D	06/12/10 20:25
32SB-39-0507	1004277-14	0427714.D	06/12/10 20:59
32SS-41-0002	1004277-17	0427717.D	06/12/10 21:33
32SB-31-0607	0E12916-MS1	0427708M.D	06/12/10 22:07
32SS-35-0002	0E12916-MS2	0427709M.D	06/12/10 22:41
32SB-35-0507	0E12916-MS3	0427710M.D	06/12/10 23:16
32SS-39-0002	0E12916-MS4	0427713M.D	06/12/10 23:50
32SB-39-0507	0E12916-MS5	0427714M.D	06/13/10 00:24
32SS-41-0002	0E12916-MS6	0427717M.D	06/13/10 00:59
32SB-31-0607	0E12916-MSD1	0427708S.D	06/13/10 01:33
32SS-35-0002	0E12916-MSD2	0427709S.D	06/13/10 02:07
32SB-35-0507	0E12916-MSD3	0427710S.D	06/13/10 02:42
32SS-39-0002	0E12916-MSD4	0427713S.D	06/13/10 03:16
32SB-39-0507	0E12916-MSD5	0427714S.D	06/13/10 03:50
32SS-41-0002	0E12916-MSD6	0427717S.D	06/13/10 04:24

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16819	Instrument:	MS-BNA4
Calibration:	0098001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16819-TUN1	SEQ-TUN2.D	06/13/10 05:31
Calibration Check	0F16819-CCV1	SEQ-CCV2.D	06/13/10 05:49
32SS-FD042810-04	1004277-21	0427721.D	06/13/10 06:23
32SS-FD042810-05	1004277-22	0427722.D	06/13/10 06:57
32SB-FD042810-04	1004277-23	0427723.D	06/13/10 07:31
32SB-41-0507	1004277-18	0427718.D	06/13/10 10:56
32SB-DW01-0809	1004277-26	0427726.D	06/13/10 12:39
32SB-41-0507	0E12916-MS7	0427718M.D	06/13/10 13:13
32SB-41-0507	0E12916-MSD7	0427718S.D	06/13/10 13:47

This should be 32SB-41-0506 (See C-O-C).
CCC 7/30/2010

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	9L35713	Instrument:	MS-BNA4
Calibration:	0098001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	9L35713-TUN1	DF1112B1.D	11/12/09 15:24
Cal Standard	9L35713-CAL2	cal2.D	11/12/09 15:43
Cal Standard	9L35713-CAL3	cal3.D	11/12/09 16:16
Cal Standard	9L35713-CAL4	cal4.D	11/12/09 16:50
Cal Standard	9L35713-CAL5	cal5.D	11/12/09 17:24
Cal Standard	9L35713-CAL6	cal6.D	11/12/09 17:58
Cal Standard	9L35713-CAL7	cal7.D	11/12/09 18:32
Cal Standard	9L35713-CAL8	cal8.D	11/12/09 19:06
Cal Standard	9L35713-CAL9	cal9.D	11/12/09 19:40
Cal Standard	9L35713-CALA	cal10.D	11/12/09 20:14
Cal Standard	9L35713-CALB	cal11.D	11/12/09 20:48
Cal Standard	9L35713-CALC	cal12.D	11/12/09 21:22
Initial Cal Check	9L35713-ICV1	ICV1.D	11/12/09 21:55

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0132007
Lab File ID:	SEQ-CCV2.D	Calibration Date:	05/10/10 17:04
Sequence:	0F15510	Injection Date:	05/30/10
Lab Sample ID:	0F15510-CCV1	Injection Time:	03:13

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzo(a)anthracene	L	5.000	5.512	0.6443703	0.8838169		10.2	20
Benzo(a)pyrene	L	5.000	5.984	0.8806429	1.300773		19.7	20
Benzo(b)fluoranthene	L	5.000	6.042	1.02129	1.475218		20.8	20 *
Benzo(k)fluoranthene	A	5.000	6.266	1.114795	1.397182		25.3	20 *
Chrysene	A	5.000	5.802	0.7443354	0.8637374		16.0	20
Dibenz(a,h)anthracene	L	5.000	4.713	0.824039	0.8557802		-5.7	20
Indeno(1,2,3-cd)pyrene	L	5.000	4.972	0.792655	0.9136527		-0.6	20
Naphthalene	A	5.000	4.000	1.28018	1.024196		-20.0	20
2-Fluorobiphenyl	A	5.000	4.793	0.8077998	0.7743325		-4.1	20
Terphenyl-d14	Q	5.000	4.993	0.6178417	0.7576868		-0.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0132007
Lab File ID:	SEQ-CCV3.D	Calibration Date:	05/10/10 17:04
Sequence:	0F15511	Injection Date:	05/30/10
Lab Sample ID:	0F15511-CCV1	Injection Time:	15:47

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzo(a)anthracene	L	5.000	5.409	0.6443703	0.867404		8.2	20
Benzo(a)pyrene	L	5.000	6.212	0.8806429	1.350964		24.2	20 *
Benzo(b)fluoranthene	L	5.000	6.221	1.02129	1.519053		24.4	20 *
Benzo(k)fluoranthene	A	5.000	6.791	1.114795	1.514132		35.8	20 *
Chrysene	A	5.000	5.571	0.7443354	0.8293729		11.4	20
Dibenz(a,h)anthracene	L	5.000	5.072	0.824039	0.9210098		1.4	20
Indeno(1,2,3-cd)pyrene	L	5.000	5.257	0.792655	0.965918		5.1	20
Naphthalene	A	5.000	3.587	1.28018	0.9184132		-28.3	20 *
2-Fluorobiphenyl	A	5.000	4.531	0.8077998	0.7320284		-9.4	20
Terphenyl-d14	Q	5.000	5.135	0.6178417	0.7789615		2.7	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0161002
Lab File ID:	SEQ-CCV1.D	Calibration Date:	06/09/10 14:36
Sequence:	0F16723	Injection Date:	06/12/10
Lab Sample ID:	0F16723-CCV1	Injection Time:	11:37

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.131	0.786274	0.8068446		2.6	20
Acenaphthylene	A	5.000	5.766	1.21382	1.39973		15.3	20
Anthracene	Q	5.000	5.207	0.8565716	1.044179		4.1	20
Benzo(a)anthracene	L	5.000	5.525	0.5502005	0.7357773		10.5	20
Benzo(a)pyrene	L	5.000	5.366	0.963022	1.286212		7.3	20
Benzo(b)fluoranthene	L	5.000	5.696	1.109058	1.573732		13.9	20
Benzo(g,h,i)perylene	L	5.000	4.647	1.144808	1.353563		-7.1	20
Benzo(k)fluoranthene	Q	5.000	5.531	1.244685	1.590188		10.6	20
Chrysene	L	5.000	6.398	0.6385135	0.8396126		28.0	20 *
Dibenz(a,h)anthracene	Q	5.000	4.338	0.8922049	1.192917		-13.2	20
Fluoranthene	L	5.000	5.933	0.7487376	1.029877		18.7	20
Fluorene	L	5.000	5.275	0.7298324	0.8262417		5.5	20
Indeno(1,2,3-cd)pyrene	Q	5.000	4.386	0.899166	1.155885		-12.3	20
1-Methylnaphthalene	A	5.000	5.174	0.8184576	0.8470027		3.5	20
2-Methylnaphthalene	A	5.000	5.320	0.8899234	0.9469168		6.4	20
Naphthalene	A	5.000	4.926	1.415819	1.394951		-1.5	20
Phenanthrene	A	5.000	5.731	0.9983893	1.14429		14.6	20
Pyrene	Q	5.000	5.616	0.8081301	1.039421		12.3	20
2-Fluorobiphenyl	Q	5.000	5.359	0.9931515	1.068672		7.2	20
Terphenyl-d14	L	5.000	5.479	0.5588801	0.7089421		9.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0161002
Lab File ID:	SEQ-CCV2.D	Calibration Date:	06/09/10 14:36
Sequence:	0F16725	Injection Date:	06/13/10
Lab Sample ID:	0F16725-CCV1	Injection Time:	00:34

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	4.334	0.786274	0.6815911		-13.3	20
Acenaphthylene	A	5.000	4.784	1.21382	1.161487		-4.3	20
Anthracene	Q	5.000	5.558	0.8565716	1.115345		11.2	20
Benzo(a)anthracene	L	5.000	5.655	0.5502005	0.7554989		13.1	20
Benzo(a)pyrene	L	5.000	5.094	0.963022	1.219369		1.9	20
Benzo(b)fluoranthene	L	5.000	4.978	1.109058	1.370684		-0.4	20
Benzo(g,h,i)perylene	L	5.000	4.222	1.144808	1.224535		-15.6	20
Benzo(k)fluoranthene	Q	5.000	4.940	1.244685	1.421801		-1.2	20
Chrysene	L	5.000	6.308	0.6385135	0.8277152		26.2	20 *
Dibenz(a,h)anthracene	Q	5.000	3.979	0.8922049	1.085081		-20.4	20 *
Fluoranthene	L	5.000	6.053	0.7487376	1.050948		21.1	20 *
Fluorene	L	5.000	4.948	0.7298324	0.7752496		-1.0	20
Indeno(1,2,3-cd)pyrene	Q	5.000	4.220	0.899166	1.106009		-15.6	20
1-Methylnaphthalene	A	5.000	4.033	0.8184576	0.6602092		-19.3	20
2-Methylnaphthalene	A	5.000	4.177	0.8899234	0.743437		-16.5	20
Naphthalene	A	5.000	4.620	1.415819	1.308271		-7.6	20
Phenanthrene	A	5.000	5.888	0.9983893	1.175609		17.8	20
Pyrene	Q	5.000	5.674	0.8081301	1.050706		13.5	20
2-Fluorobiphenyl	Q	5.000	4.848	0.9931515	0.9701365		-3.0	20
Terphenyl-d14	L	5.000	5.502	0.5588801	0.7120427		10.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0098001
Lab File ID:	SEQ-CCV2.D	Calibration Date:	11/12/09 11:02
Sequence:	0F16727	Injection Date:	06/15/10
Lab Sample ID:	0F16727-CCV1	Injection Time:	07:53

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.251	0.7457972	0.7832217		5.0	20
Acenaphthylene	A	5.000	5.976	0.9996575	1.194766		19.5	20
Anthracene	A	5.000	5.595	0.9948455	1.113208		11.9	20
Benzo(a)anthracene	A	5.000	5.282	0.7581512	0.8009692		5.6	20
Benzo(a)pyrene	A	5.000	6.104	0.9592349	1.171031		22.1	20 *
Benzo(b)fluoranthene	A	5.000	5.973	1.176864	1.405981		19.5	20
Benzo(g,h,i)perylene	A	5.000	4.180	0.8650452	0.7231847		-16.4	20
Benzo(k)fluoranthene	A	5.000	6.728	1.169451	1.573551		34.6	20 *
Chrysene	A	5.000	5.320	0.7324149	0.7792284		6.4	20
Dibenz(a,h)anthracene	A	5.000	4.946	0.7647294	0.756531		-1.1	20
Fluoranthene	A	5.000	5.377	1.030294	1.108019		7.5	20
Fluorene	A	5.000	5.200	0.7457374	0.7756202		4.0	20
Indeno(1,2,3-cd)pyrene	A	5.000	4.870	0.7715006	0.7514128		-2.6	20
1-Methylnaphthalene	A	5.000	4.606	0.7407783	0.6823527		-7.9	20
2-Methylnaphthalene	A	5.000	5.007	0.8009425	0.8020634		0.1	20
Naphthalene	A	5.000	4.812	1.224033	1.177937		-3.8	20
Phenanthrene	A	5.000	5.286	1.064344	1.125294		5.7	20
Pyrene	A	5.000	5.450	1.038027	1.131524		9.0	20
2-Fluorobiphenyl	A	5.000	4.919	0.8655987	0.8515761		-1.6	20
Terphenyl-d14	A	5.000	5.287	0.776943	0.8216071		5.7	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0098001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	11/12/09 11:02
Sequence:	0F16811	Injection Date:	06/12/10
Lab Sample ID:	0F16811-CCV1	Injection Time:	17:00

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.043	0.7457972	0.7522569		0.9	20
Acenaphthylene	A	5.000	5.791	0.9996575	1.157801		15.8	20
Anthracene	A	5.000	5.642	0.9948455	1.122525		12.8	20
Benzo(a)anthracene	A	5.000	5.638	0.7581512	0.8549192		12.8	20
Benzo(a)pyrene	A	5.000	6.082	0.9592349	1.166799		21.6	20 *
Benzo(b)fluoranthene	A	5.000	5.548	1.176864	1.305847		11.0	20
X Benzo(g,h,i)perylene	A	5.000	6.901	0.8650452	1.193916		38.0	20 *
Benzo(k)fluoranthene	A	5.000	5.336	1.169451	1.248142		6.7	20
Chrysene	A	5.000	5.618	0.7324149	0.8230109		12.4	20
✓ Dibenz(a,h)anthracene	A	5.000	7.115	0.7647294	1.088262		42.3	20 *
Fluoranthene	A	5.000	5.511	1.030294	1.135606		10.2	20
Fluorene	A	5.000	5.120	0.7457374	0.763614		2.4	20
✓ Indeno(1,2,3-cd)pyrene	A	5.000	7.330	0.7715006	1.131013		46.6	20 *
1-Methylnaphthalene	A	5.000	4.652	0.7407783	0.6892082		-7.0	20
2-Methylnaphthalene	A	5.000	4.927	0.8009425	0.7893271		-1.5	20
Naphthalene	A	5.000	4.704	1.224033	1.151455		-5.9	20
Phenanthrene	A	5.000	5.280	1.064344	1.123966		5.6	20
Pyrene	A	5.000	5.612	1.038027	1.16513		12.2	20
2-Fluorobiphenyl	A	5.000	4.781	0.8655987	0.8276989		-4.4	20
Terphenyl-d14	A	5.000	5.380	0.776943	0.8360064		7.6	20

not a listed COC

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0098001
Lab File ID:	SEQ-CCV2.D	Calibration Date:	11/12/09 11:02
Sequence:	0F16819	Injection Date:	06/13/10
Lab Sample ID:	0F16819-CCV1	Injection Time:	05:49

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.424	0.7457972	0.8090222		8.5	20
Acenaphthylene	A	5.000	6.090	0.9996575	1.217513		21.8	20 *
Anthracene	A	5.000	5.713	0.9948455	1.136646		14.3	20
Benzo(a)anthracene	A	5.000	6.477	0.7581512	0.9820744		29.5	20 *
Benzo(a)pyrene	A	5.000	6.126	0.9592349	1.175167		22.5	20 *
Benzo(b)fluoranthene	A	5.000	5.572	1.176864	1.31156		11.4	20
Benzo(g,h,i)perylene	A	5.000	6.593	0.8650452	1.140621		31.9	20 *
Benzo(k)fluoranthene	A	5.000	5.763	1.169451	1.348021		15.3	20
Chrysene	A	5.000	6.522	0.7324149	0.9553999		30.4	20 *
Dibenz(a,h)anthracene	A	5.000	6.722	0.7647294	1.028063		34.4	20 *
Fluoranthene	A	5.000	5.761	1.030294	1.187194		15.2	20
Fluorene	A	5.000	5.177	0.7457374	0.7721668		3.5	20
Indeno(1,2,3-cd)pyrene	A	5.000	6.865	0.7715006	1.059279		37.3	20 *
1-Methylnaphthalene	A	5.000	5.023	0.7407783	0.7441617		0.5	20
2-Methylnaphthalene	A	5.000	5.294	0.8009425	0.8480131		5.9	20
Naphthalene	A	5.000	5.208	1.224033	1.274962		4.2	20
Phenanthrene	A	5.000	5.402	1.064344	1.149954		8.0	20
Pyrene	A	5.000	5.955	1.038027	1.236389		19.1	20
2-Fluorobiphenyl	A	5.000	5.223	0.8655987	0.9041852		4.5	20
Terphenyl-d14	A	5.000	5.642	0.776943	0.8767094		12.8	20

Not a listed cpc

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E08002 Batch Matrix: Water

Preparation: EXT_3510

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E08002-BLK1	05/08/10 11:10	1,000.00	1.00
LCS	0E08002-BS1	05/08/10 11:10	1,000.00	1.00
LCS Dup	0E08002-BSD1	05/08/10 11:10	1,000.00	1.00
32GW-03	1004277-01	05/08/10 11:10	1,070.00	1.00
32GW-FD042710-01	1004277-02	05/08/10 11:10	1,070.00	1.00
32SS-RB042710-01	1004277-03	05/08/10 11:10	1,060.00	1.00
32SS-RB042710-02	1004277-04	05/08/10 11:10	1,020.00	1.00
32SS-RB042710-03	1004277-05	05/08/10 11:10	900.00	1.00

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E11002 Batch Matrix: Water Preparation: EXT_3510

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E11002-BLK1	05/11/10 12:00	1,000.00	1.00
LCS	0E11002-BS1	05/11/10 12:00	1,000.00	1.00
32SS-RB042810-04	1004277-06	05/11/10 12:00	1,020.00	1.00

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E11013 Batch Matrix: Solid Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E11013-BLK1	05/20/10 13:40	15.00	1.00
LCS	0E11013-BS1	05/20/10 13:40	15.00	1.00
32SS-31-0002	0E11013-MS1	05/20/10 13:40	15.00	1.00
32SS-31-0002	0E11013-MSD1	05/20/10 13:40	15.00	1.00
32SS-31-0002	1004277-07	05/20/10 13:40	15.00	1.00
32SS-38-0002	1004277-11	05/20/10 13:40	15.00	1.00
32SB-38-0506	1004277-12	05/20/10 13:40	15.00	1.00
32SS-40-0002	1004277-15	05/20/10 13:40	15.00	1.00
32SB-40-0506	1004277-16	05/20/10 13:40	15.00	1.00
32SS-42-0002	1004277-19	05/20/10 13:40	15.00	1.00
32SB-42-0506	1004277-20	05/20/10 13:40	15.00	1.00

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E12916 Batch Matrix: Solid

Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E12916-BLK1	05/12/10 19:30	15.00	1.00
LCS	0E12916-BS1	05/12/10 19:30	15.00	1.00
32SB-31-0607	0E12916-MS1	05/12/10 19:30	15.00	1.00
32SS-35-0002	0E12916-MS2	05/12/10 19:30	15.00	1.00
32SB-35-0507	0E12916-MS3	05/12/10 19:30	15.00	1.00
32SS-39-0002	0E12916-MS4	05/12/10 19:30	15.00	1.00
32SB-39-0507	0E12916-MS5	05/12/10 19:30	15.00	1.00
32SS-41-0002	0E12916-MS6	05/12/10 19:30	15.00	1.00
32SB-41-0507	0E12916-MS7	05/12/10 19:30	15.00	1.00
32SB-31-0607	0E12916-MSD1	05/12/10 19:30	15.00	1.00
32SS-35-0002	0E12916-MSD2	05/12/10 19:30	15.00	1.00
32SB-35-0507	0E12916-MSD3	05/12/10 19:30	15.00	1.00
32SS-39-0002	0E12916-MSD4	05/12/10 19:30	15.00	1.00
32SB-39-0507	0E12916-MSD5	05/12/10 19:30	15.00	1.00
32SS-41-0002	0E12916-MSD6	05/12/10 19:30	15.00	1.00
32SB-41-0507	0E12916-MSD7	05/12/10 19:30	15.00	1.00
32SB-31-0607	1004277-08	05/12/10 19:30	15.00	1.00
32SS-35-0002	1004277-09	05/12/10 19:30	15.00	1.00
32SB-35-0507	1004277-10	05/12/10 19:30	15.00	1.00
32SS-39-0002	1004277-13	05/12/10 19:30	15.00	1.00
32SB-39-0507	1004277-14	05/12/10 19:30	15.00	1.00
32SS-41-0002	1004277-17	05/12/10 19:30	15.00	1.00
32SB-41-0507	1004277-18	05/12/10 19:30	15.00	1.00
32SS-FD042810-04	1004277-21	05/12/10 19:30	15.00	1.00
32SS-FD042810-05	1004277-22	05/12/10 19:30	15.00	1.00
32SB-FD042810-04	1004277-23	05/12/10 19:30	15.00	1.00
32SB-FD042810-05	1004277-24	05/12/10 19:30	15.00	1.00
32SS-DW01-0002	1004277-25	05/12/10 19:30	15.00	1.00
32SB-DW01-0809	1004277-26	05/12/10 19:30	15.00	1.00

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_005
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Matrix:
Laboratory ID: 0E08002-BLK1
File ID: E08002B1.D
Sampled:
Prepared:
Analyzed: 05/30/10 05:01
Solids:
Preparation: EXT_3510
Dilution:
Batch: 0E08002
Sequence: 0F15510
Calibration: 0132007
Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	0.0690	0.0200	0.100	J
50-32-8	Benzo(a)pyrene	0.106	0.0200	0.100	
205-99-2	Benzo(b)fluoranthene	0.0835	0.0200	0.100	X, J
207-08-9	Benzo(k)fluoranthene	0.0792	0.0200	0.100	X, J
218-01-9	Chrysene	0.0930	0.0200	0.100	J
53-70-3	Dibenz(a,h)anthracene	0.0752	0.0200	0.100	J
193-39-5	Indeno(1,2,3-cd)pyrene		0.0200	0.100	U
91-20-3	Naphthalene		0.0200	0.100	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	38.52	77.0	34 - 167	
Terphenyl-d14	50.00	65.57	131	34 - 167	

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SB-31-0607

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E12916

% Solids: 87.13

Source Sample Name: **1004277-08**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	76.51	ND	84.07	110		31 - 146
Benzo(a)pyrene	76.51	ND	74.05	96.8		28 - 128
Benzo(b)fluoranthene	76.51	ND	78.87	103		30 - 139
Benzo(k)fluoranthene	76.51	ND	80.93	106		42 - 129
Chrysene	76.51	ND	84.52	110		39 - 134
Dibenz(a,h)anthracene	76.51	ND	97.42	127		30 - 138
Indeno(1,2,3-cd)pyrene	76.51	ND	104.2	136		17 - 164
Naphthalene	76.51	ND	66.59	87.0		29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzo(a)anthracene	76.51	68.28	89.2	20.7		30	31 - 146
Benzo(a)pyrene	76.51	64.82	84.7	13.3		30	28 - 128
Benzo(b)fluoranthene	76.51	66.58	87.0	16.9		30	30 - 139
Benzo(k)fluoranthene	76.51	68.00	88.9	17.4		30	42 - 129
Chrysene	76.51	68.69	89.8	20.7		30	39 - 134
Dibenz(a,h)anthracene	76.51	83.37	109	15.5		30	30 - 138
Indeno(1,2,3-cd)pyrene	76.51	87.23	114	17.7		30	17 - 164
Naphthalene	76.51	48.39	63.2	31.7	*	30	29 - 106

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SB-39-0507

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E12916

% Solids: 81.93

Source Sample Name: **1004277-14**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	81.37	ND	107.4	132		31 - 146
Benzo(a)pyrene	81.37	ND	81.62	100		28 - 128
Benzo(b)fluoranthene	81.37	ND	86.04	106		30 - 139
Benzo(k)fluoranthene	81.37	ND	87.16	107		42 - 129
Chrysene	81.37	ND	109.6	135	*	39 - 134
Dibenz(a,h)anthracene	81.37	ND	102.6	126		30 - 138
Indeno(1,2,3-cd)pyrene	81.37	ND	109.6	135		17 - 164
Naphthalene	81.37	ND	79.94	98.2		29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS	
						RPD	REC.
Benzo(a)anthracene	81.37	90.65	111	16.9		30	31 - 146
Benzo(a)pyrene	81.37	81.24	99.8	0.458		30	28 - 128
Benzo(b)fluoranthene	81.37	85.21	105	0.970		30	30 - 139
Benzo(k)fluoranthene	81.37	87.50	108	0.396		30	42 - 129
Chrysene	81.37	92.90	114	16.5		30	39 - 134
Dibenz(a,h)anthracene	81.37	102.4	126	0.237		30	30 - 138
Indeno(1,2,3-cd)pyrene	81.37	104.3	128	5.01		30	17 - 164
Naphthalene	81.37	67.23	82.6	17.3		30	29 - 106

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E08002-BLK1 File ID: E08002B1.D

Sampled: Prepared: Analyzed: 05/30/10 05:01

Solids: Preparation: EXT_3510 Dilution:

Batch: 0E08002 Sequence: 0F15510 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	0.0690	0.0200	0.100	J
50-32-8	Benzo(a)pyrene	0.106	0.0200	0.100	
205-99-2	Benzo(b)fluoranthene	0.0835	0.0200	0.100	X, J
207-08-9	Benzo(k)fluoranthene	0.0792	0.0200	0.100	X, J
218-01-9	Chrysene	0.0930	0.0200	0.100	J
53-70-3	Dibenz(a,h)anthracene	0.0752	0.0200	0.100	J
193-39-5	Indeno(1,2,3-cd)pyrene		0.0200	0.100	U
91-20-3	Naphthalene		0.0200	0.100	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	38.52	77.0	34 - 167	
Terphenyl-d14	50.00	65.57	131	34 - 167	

ANALYSIS DATA SHEET

LCS

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E08002-BS1	File ID:	E08002L1.D
Sampled:		Prepared:		Analyzed:	05/30/10 03:49
Solids:		Preparation:	EXT_3510	Dilution:	

Batch:	0E08002	Sequence:	0F15510	Calibration:	0132007	Instrument:	MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	0.9804	0.0200	0.100	B
50-32-8	Benzo(a)pyrene	1.072	0.0200	0.100	B
205-99-2	Benzo(b)fluoranthene	1.122	0.0200	0.100	X, B
207-08-9	Benzo(k)fluoranthene	1.205	0.0200	0.100	X, B
218-01-9	Chrysene	1.162	0.0200	0.100	B
53-70-3	Dibenz(a,h)anthracene	0.9237	0.0200	0.100	B
193-39-5	Indeno(1,2,3-cd)pyrene	0.9592	0.0200	0.100	
91-20-3	Naphthalene	0.5755	0.0200	0.100	

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	29.25	58.5	34 - 167	
Terphenyl-d14	50.00	54.96	110	34 - 167	

ANALYSIS DATA SHEET

LCS Dup

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E08002-BSD1 File ID: E08002L2.D

Sampled: Prepared: Analyzed: 05/30/10 04:25

Solids: Preparation: EXT_3510 Dilution:

Batch: 0E08002 Sequence: 0F15510 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	1.097	0.0200	0.100	B
50-32-8	Benzo(a)pyrene	1.081	0.0200	0.100	B
205-99-2	Benzo(b)fluoranthene	1.110	0.0200	0.100	X, B
207-08-9	Benzo(k)fluoranthene	1.294	0.0200	0.100	X, B
218-01-9	Chrysene	1.270	0.0200	0.100	B
53-70-3	Dibenz(a,h)anthracene	0.8860	0.0200	0.100	B
193-39-5	Indeno(1,2,3-cd)pyrene	0.9608	0.0200	0.100	
91-20-3	Naphthalene	0.6921	0.0200	0.100	

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	35.29	70.6	34 - 167	
Terphenyl-d14	50.00	52.74	105	34 - 167	

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E11002-BLK1	File ID:	E11002B1.D
Sampled:		Prepared:		Analyzed:	06/05/10 20:00
Solids:		Preparation:	EXT_3510	Dilution:	

Batch:	0E11002	Sequence:	0F16006	Calibration:	0156001	Instrument:	MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0200	0.100	U
50-32-8	Benzo(a)pyrene		0.0200	0.100	U
205-99-2	Benzo(b)fluoranthene		0.0200	0.100	U
207-08-9	Benzo(k)fluoranthene		0.0200	0.100	U
218-01-9	Chrysene		0.0200	0.100	U
53-70-3	Dibenz(a,h)anthracene		0.0200	0.100	U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0200	0.100	U
91-20-3	Naphthalene		0.0200	0.100	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	44.51	89.0	34 - 167	
Terphenyl-d14	50.00	55.39	111	34 - 167	

ANALYSIS DATA SHEET

LCS

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_005
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Matrix:
Laboratory ID: 0E11002-BS1
File ID: E11002L1.D
Sampled:
Prepared:
Analyzed: 06/05/10 19:24
Solids:
Preparation: EXT_3510
Dilution:
Batch: 0E11002
Sequence: 0F16006
Calibration: 0156001
Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	0.9606	0.0200	0.100	
50-32-8	Benzo(a)pyrene	0.9083	0.0200	0.100	
205-99-2	Benzo(b)fluoranthene	0.9114	0.0200	0.100	
207-08-9	Benzo(k)fluoranthene	1.111	0.0200	0.100	
218-01-9	Chrysene	1.020	0.0200	0.100	
53-70-3	Dibenz(a,h)anthracene	0.8398	0.0200	0.100	
193-39-5	Indeno(1,2,3-cd)pyrene	0.7920	0.0200	0.100	
91-20-3	Naphthalene	0.9360	0.0200	0.100	

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	44.13	88.3	34 - 167	
Terphenyl-d14	50.00	52.57	105	34 - 167	

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E11013-BLK1 File ID: E11013B1.D

Sampled: Prepared: Analyzed: 06/12/10 12:49

Solids: Preparation: EXT_3546 Dilution:

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.33	6.67	U
50-32-8	Benzo(a)pyrene		1.33	5.00	U
205-99-2	Benzo(b)fluoranthene		1.33	6.67	U
207-08-9	Benzo(k)fluoranthene		1.33	6.67	U
218-01-9	Chrysene		1.33	6.67	X, U
53-70-3	Dibenz(a,h)anthracene		1.33	5.00	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.33	6.67	U
91-20-3	Naphthalene		1.33	5.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	4213	126	14 - 129	
Terphenyl-d14	3333	3454	104	14 - 129	

ANALYSIS DATA SHEET

LCS

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E11013-BS1	File ID:	E11013L1.D
Sampled:		Prepared:		Analyzed:	06/12/10 12:13
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	86.89	1.33	6.67	
50-32-8	Benzo(a)pyrene	53.72	1.33	5.00	
205-99-2	Benzo(b)fluoranthene	63.69	1.33	6.67	
207-08-9	Benzo(k)fluoranthene	68.37	1.33	6.67	
218-01-9	Chrysene	73.56	1.33	6.67	X
53-70-3	Dibenz(a,h)anthracene	85.92	1.33	5.00	
193-39-5	Indeno(1,2,3-cd)pyrene	88.70	1.33	6.67	
91-20-3	Naphthalene	57.05	1.33	5.00	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	3237	97.1	14 - 129	
Terphenyl-d14	3333	2878	86.4	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E11013-MS1	File ID:	0427707M.D
Sampled:		Prepared:		Analyzed:	06/12/10 22:27
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E11013 Sequence: 0F16723 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	104.6	1.55	7.75	
50-32-8	Benzo(a)pyrene	63.34	1.55	5.81	
205-99-2	Benzo(b)fluoranthene	64.68	1.55	7.75	
207-08-9	Benzo(k)fluoranthene	62.72	1.55	7.75	
218-01-9	Chrysene	68.42	1.55	7.75	X
53-70-3	Dibenz(a,h)anthracene	82.22	1.55	5.81	
193-39-5	Indeno(1,2,3-cd)pyrene	91.85	1.55	7.75	
91-20-3	Naphthalene	57.36	1.55	5.81	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3875	3327	85.9	14 - 129	
Terphenyl-d14	3875	2293	59.2	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike Dup

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E11013-MSD1	File ID:	0427707S.D
Sampled:		Prepared:		Analyzed:	06/12/10 23:04
Solids:		Preparation:	EXT_3546	Dilution:	

Batch:	0E11013	Sequence:	0F16723	Calibration:	0161002	Instrument:	MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	96.03	1.55	7.75	
50-32-8	Benzo(a)pyrene	63.60	1.55	5.81	
205-99-2	Benzo(b)fluoranthene	58.14	1.55	7.75	
207-08-9	Benzo(k)fluoranthene	60.52	1.55	7.75	
218-01-9	Chrysene	61.06	1.55	7.75	X
53-70-3	Dibenz(a,h)anthracene	83.31	1.55	5.81	
193-39-5	Indeno(1,2,3-cd)pyrene	88.27	1.55	7.75	
91-20-3	Naphthalene	55.21	1.55	5.81	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3875	3269	84.4	14 - 129	
Terphenyl-d14	3875	2010	51.9	14 - 129	

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E12916-BLK1 File ID: E12916B1.D

Sampled: Prepared: Analyzed: 06/12/10 18:08

Solids: Preparation: EXT_3546 Dilution:

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.33	6.67	U
50-32-8	Benzo(a)pyrene		1.33	5.00	X, U
205-99-2	Benzo(b)fluoranthene		1.33	6.67	U
207-08-9	Benzo(k)fluoranthene		1.33	6.67	U
218-01-9	Chrysene		1.33	6.67	U
53-70-3	Dibenz(a,h)anthracene		1.33	5.00	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.33	6.67	X, U
91-20-3	Naphthalene		1.33	5.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	2650	79.5	14 - 129	
Terphenyl-d14	3333	2390	71.7	14 - 129	

ANALYSIS DATA SHEET

LCS

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_005
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Matrix:
Laboratory ID: 0E12916-BS1
File ID: E12916L1.D
Sampled:
Prepared:
Analyzed: 06/12/10 17:34
Solids:
Preparation: EXT_3546
Dilution:
Batch: 0E12916
Sequence: 0F16811
Calibration: 0098001
Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	58.89	1.33	6.67	
50-32-8	Benzo(a)pyrene	52.35	1.33	5.00	X
205-99-2	Benzo(b)fluoranthene	54.21	1.33	6.67	
207-08-9	Benzo(k)fluoranthene	55.37	1.33	6.67	
218-01-9	Chrysene	59.67	1.33	6.67	
53-70-3	Dibenz(a,h)anthracene	65.76	1.33	5.00	X
193-39-5	Indeno(1,2,3-cd)pyrene	69.64	1.33	6.67	X
91-20-3	Naphthalene	51.94	1.33	5.00	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	2600	78.0	14 - 129	
Terphenyl-d14	3333	2318	69.5	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E12916-MS1	File ID:	0427708M.D
Sampled:		Prepared:		Analyzed:	06/12/10 22:07
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	84.07	1.53	7.66	
50-32-8	Benzo(a)pyrene	74.05	1.53	5.74	X
205-99-2	Benzo(b)fluoranthene	78.87	1.53	7.66	
207-08-9	Benzo(k)fluoranthene	80.93	1.53	7.66	
218-01-9	Chrysene	84.52	1.53	7.66	
53-70-3	Dibenz(a,h)anthracene	97.42	1.53	5.74	X
193-39-5	Indeno(1,2,3-cd)pyrene	104.2	1.53	7.66	X
91-20-3	Naphthalene	66.59	1.53	5.74	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3826	3446	90.1	14 - 129	
Terphenyl-d14	3826	2990	78.2	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E12916-MS2	File ID:	0427709M.D
Sampled:		Prepared:		Analyzed:	06/12/10 22:41
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	83.43	1.55	7.75	
50-32-8	Benzo(a)pyrene	74.61	1.55	5.81	X
205-99-2	Benzo(b)fluoranthene	81.73	1.55	7.75	
207-08-9	Benzo(k)fluoranthene	82.62	1.55	7.75	
218-01-9	Chrysene	82.97	1.55	7.75	
53-70-3	Dibenz(a,h)anthracene	97.91	1.55	5.81	X
193-39-5	Indeno(1,2,3-cd)pyrene	105.8	1.55	7.75	X
91-20-3	Naphthalene	63.76	1.55	5.81	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3875	3273	84.5	14 - 129	
Terphenyl-d14	3875	3050	78.7	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E12916-MS3	File ID:	0427710M.D
Sampled:		Prepared:		Analyzed:	06/12/10 23:16
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	83.67	1.55	7.79	
50-32-8	Benzo(a)pyrene	74.02	1.55	5.84	X
205-99-2	Benzo(b)fluoranthene	77.75	1.55	7.79	
207-08-9	Benzo(k)fluoranthene	79.41	1.55	7.79	
218-01-9	Chrysene	83.05	1.55	7.79	
53-70-3	Dibenz(a,h)anthracene	92.23	1.55	5.84	X
193-39-5	Indeno(1,2,3-cd)pyrene	99.27	1.55	7.79	X
91-20-3	Naphthalene	70.54	1.55	5.84	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3892	3631	93.3	14 - 129	
Terphenyl-d14	3892	3080	79.1	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E12916-MS4	File ID:	0427713M.D
Sampled:		Prepared:		Analyzed:	06/12/10 23:50
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	97.49	1.55	7.76	
50-32-8	Benzo(a)pyrene	74.58	1.55	5.82	X
205-99-2	Benzo(b)fluoranthene	78.62	1.55	7.76	
207-08-9	Benzo(k)fluoranthene	76.21	1.55	7.76	
218-01-9	Chrysene	96.13	1.55	7.76	
53-70-3	Dibenz(a,h)anthracene	89.33	1.55	5.82	X
193-39-5	Indeno(1,2,3-cd)pyrene	95.56	1.55	7.76	X
91-20-3	Naphthalene	74.34	1.55	5.82	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3880	3741	96.4	14 - 129	
Terphenyl-d14	3880	3352	86.4	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E12916-MS5	File ID:	0427714M.D
Sampled:		Prepared:		Analyzed:	06/13/10 00:24
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	107.4	1.62	8.14	
50-32-8	Benzo(a)pyrene	81.62	1.62	6.10	X
205-99-2	Benzo(b)fluoranthene	86.04	1.62	8.14	
207-08-9	Benzo(k)fluoranthene	87.16	1.62	8.14	
218-01-9	Chrysene	109.6	1.62	8.14	
53-70-3	Dibenz(a,h)anthracene	102.6	1.62	6.10	X
193-39-5	Indeno(1,2,3-cd)pyrene	109.6	1.62	8.14	X
91-20-3	Naphthalene	79.94	1.62	6.10	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4069	4109	101	14 - 129	
Terphenyl-d14	4069	3806	93.5	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E12916-MS6	File ID:	0427717M.D
Sampled:		Prepared:		Analyzed:	06/13/10 00:59
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	68.37	1.55	7.75	
50-32-8	Benzo(a)pyrene	70.60	1.55	5.81	X
205-99-2	Benzo(b)fluoranthene	75.90	1.55	7.75	
207-08-9	Benzo(k)fluoranthene	75.85	1.55	7.75	
218-01-9	Chrysene	69.72	1.55	7.75	
53-70-3	Dibenz(a,h)anthracene	86.75	1.55	5.81	X
193-39-5	Indeno(1,2,3-cd)pyrene	95.74	1.55	7.75	X
91-20-3	Naphthalene	61.16	1.55	5.81	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3873	3068	79.2	14 - 129	
Terphenyl-d14	3873	2974	76.8	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E12916-MS7	File ID:	0427718M.D
Sampled:		Prepared:		Analyzed:	06/13/10 13:13
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	101.3	1.55	7.76	X
50-32-8	Benzo(a)pyrene	74.92	1.55	5.82	X
205-99-2	Benzo(b)fluoranthene	80.34	1.55	7.76	
207-08-9	Benzo(k)fluoranthene	79.07	1.55	7.76	
218-01-9	Chrysene	101.4	1.55	7.76	X
53-70-3	Dibenz(a,h)anthracene	89.01	1.55	5.82	X
193-39-5	Indeno(1,2,3-cd)pyrene	92.23	1.55	7.76	X
91-20-3	Naphthalene	70.88	1.55	5.82	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3879	3631	93.6	14 - 129	
Terphenyl-d14	3879	3740	96.4	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike Dup

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E12916-MSD1	File ID:	0427708S.D
Sampled:		Prepared:		Analyzed:	06/13/10 01:33
Solids:		Preparation:	EXT_3546	Dilution:	

Batch:	0E12916	Sequence:	0F16811	Calibration:	0098001	Instrument:	MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	68.28	1.53	7.66	
50-32-8	Benzo(a)pyrene	64.82	1.53	5.74	X
205-99-2	Benzo(b)fluoranthene	66.58	1.53	7.66	
207-08-9	Benzo(k)fluoranthene	68.00	1.53	7.66	
218-01-9	Chrysene	68.69	1.53	7.66	
53-70-3	Dibenz(a,h)anthracene	83.37	1.53	5.74	X
193-39-5	Indeno(1,2,3-cd)pyrene	87.23	1.53	7.66	X
91-20-3	Naphthalene	48.39	1.53	5.74	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3826	2507	65.5	14 - 129	
Terphenyl-d14	3826	2460	64.3	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike Dup

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E12916-MSD2	File ID:	0427709S.D
Sampled:		Prepared:		Analyzed:	06/13/10 02:07
Solids:		Preparation:	EXT_3546	Dilution:	

Batch:	0E12916	Sequence:	0F16811	Calibration:	0098001	Instrument:	MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	67.77	1.55	7.75	
50-32-8	Benzo(a)pyrene	67.29	1.55	5.81	X
205-99-2	Benzo(b)fluoranthene	71.82	1.55	7.75	
207-08-9	Benzo(k)fluoranthene	74.13	1.55	7.75	
218-01-9	Chrysene	68.69	1.55	7.75	
53-70-3	Dibenz(a,h)anthracene	82.72	1.55	5.81	X
193-39-5	Indeno(1,2,3-cd)pyrene	87.19	1.55	7.75	X
91-20-3	Naphthalene	57.74	1.55	5.81	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3875	2995	77.3	14 - 129	
Terphenyl-d14	3875	2818	72.7	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike Dup

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E12916-MSD3	File ID:	0427710S.D
Sampled:		Prepared:		Analyzed:	06/13/10 02:42
Solids:		Preparation:	EXT_3546	Dilution:	

Batch:	0E12916	Sequence:	0F16811	Calibration:	0098001	Instrument:	MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	79.47	1.55	7.79	
50-32-8	Benzo(a)pyrene	71.29	1.55	5.84	X
205-99-2	Benzo(b)fluoranthene	73.64	1.55	7.79	
207-08-9	Benzo(k)fluoranthene	76.47	1.55	7.79	
218-01-9	Chrysene	79.99	1.55	7.79	
53-70-3	Dibenz(a,h)anthracene	91.74	1.55	5.84	X
193-39-5	Indeno(1,2,3-cd)pyrene	96.16	1.55	7.79	X
91-20-3	Naphthalene	67.39	1.55	5.84	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3892	3300	84.8	14 - 129	
Terphenyl-d14	3892	2945	75.7	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike Dup

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E12916-MSD4	File ID:	0427713S.D
Sampled:		Prepared:		Analyzed:	06/13/10 03:16
Solids:		Preparation:	EXT_3546	Dilution:	

Batch:	0E12916	Sequence:	0F16811	Calibration:	0098001	Instrument:	MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	74.12	1.55	7.76	
50-32-8	Benzo(a)pyrene	68.32	1.55	5.82	X
205-99-2	Benzo(b)fluoranthene	71.03	1.55	7.76	
207-08-9	Benzo(k)fluoranthene	72.67	1.55	7.76	
218-01-9	Chrysene	74.89	1.55	7.76	
53-70-3	Dibenz(a,h)anthracene	76.43	1.55	5.82	X
193-39-5	Indeno(1,2,3-cd)pyrene	83.26	1.55	7.76	X
91-20-3	Naphthalene	56.78	1.55	5.82	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3880	2917	75.2	14 - 129	
Terphenyl-d14	3880	3023	77.9	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike Dup

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E12916-MSD5	File ID:	0427714S.D
Sampled:		Prepared:		Analyzed:	06/13/10 03:50
Solids:		Preparation:	EXT_3546	Dilution:	

Batch:	0E12916	Sequence:	0F16811	Calibration:	0098001	Instrument:	MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	90.65	1.62	8.14	
50-32-8	Benzo(a)pyrene	81.24	1.62	6.10	X
205-99-2	Benzo(b)fluoranthene	85.21	1.62	8.14	
207-08-9	Benzo(k)fluoranthene	87.50	1.62	8.14	
218-01-9	Chrysene	92.90	1.62	8.14	
53-70-3	Dibenz(a,h)anthracene	102.4	1.62	6.10	X
193-39-5	Indeno(1,2,3-cd)pyrene	104.3	1.62	8.14	X
91-20-3	Naphthalene	67.23	1.62	6.10	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4069	3405	83.7	14 - 129	
Terphenyl-d14	4069	3536	86.9	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike Dup

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E12916-MSD6	File ID:	0427717S.D
Sampled:		Prepared:		Analyzed:	06/13/10 04:24
Solids:		Preparation:	EXT_3546	Dilution:	

Batch:	0E12916	Sequence:	0F16811	Calibration:	0098001	Instrument:	MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	81.70	1.55	7.75	
50-32-8	Benzo(a)pyrene	65.09	1.55	5.81	X
205-99-2	Benzo(b)fluoranthene	64.80	1.55	7.75	
207-08-9	Benzo(k)fluoranthene	69.07	1.55	7.75	
218-01-9	Chrysene	80.52	1.55	7.75	
53-70-3	Dibenz(a,h)anthracene	105.1	1.55	5.81	X
193-39-5	Indeno(1,2,3-cd)pyrene	81.64	1.55	7.75	X
91-20-3	Naphthalene	63.60	1.55	5.81	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3873	3240	83.7	14 - 129	
Terphenyl-d14	3873	2952	76.2	14 - 129	

ANALYSIS DATA SHEET

Matrix Spike Dup

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_005
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E12916-MSD7	File ID:	0427718S.D
Sampled:		Prepared:		Analyzed:	06/13/10 13:47
Solids:		Preparation:	EXT_3546	Dilution:	

Batch:	0E12916	Sequence:	0F16819	Calibration:	0098001	Instrument:	MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	84.79	1.55	7.76	X
50-32-8	Benzo(a)pyrene	76.83	1.55	5.82	X
205-99-2	Benzo(b)fluoranthene	79.82	1.55	7.76	
207-08-9	Benzo(k)fluoranthene	79.48	1.55	7.76	
218-01-9	Chrysene	88.45	1.55	7.76	X
53-70-3	Dibenz(a,h)anthracene	97.00	1.55	5.82	X
193-39-5	Indeno(1,2,3-cd)pyrene	102.6	1.55	7.76	X
91-20-3	Naphthalene	61.37	1.55	5.82	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3879	3343	86.2	14 - 129	
Terphenyl-d14	3879	3158	81.4	14 - 129	

HOLDING TIME SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32GW-03	04/27/10 16:42	04/29/10 08:30	05/08/10 11:10	10.77	7.00	05/30/10 16:23	22.22	40.00	*
32GW-FD042710-01	04/27/10 00:00	04/29/10 08:30	05/08/10 11:10	11.47	7.00	05/30/10 17:00	22.24	40.00	*
32SS-RB042710-01	04/27/10 08:10	04/29/10 08:30	05/08/10 11:10	11.13	7.00	05/30/10 17:36	22.27	40.00	*
32SS-RB042710-02	04/27/10 11:50	04/29/10 08:30	05/08/10 11:10	10.97	7.00	05/30/10 18:12	22.29	40.00	*
32SS-RB042710-03	04/27/10 15:10	04/29/10 08:30	05/08/10 11:10	10.83	7.00	05/30/10 18:48	22.32	40.00	*
32SS-RB042810-04	04/27/10 11:16	04/29/10 08:30	05/11/10 12:00	14.03	7.00	06/05/10 20:36	25.36	40.00	*
32SS-31-0002	04/28/10 10:10	04/29/10 08:30	05/20/10 13:40	22.15	14.00	06/12/10 19:27	23.24	40.00	*
32SB-31-0607	04/28/10 10:10	04/29/10 08:30	05/12/10 19:30	14.39	14.00	06/12/10 18:42	30.97	40.00	
32SS-35-0002	04/28/10 10:25	04/29/10 08:30	05/12/10 19:30	14.38	14.00	06/12/10 19:16	30.99	40.00	
32SB-35-0507	04/28/10 10:25	04/29/10 08:30	05/12/10 19:30	14.38	14.00	06/12/10 19:50	31.01	40.00	
32SS-38-0002	04/27/10 08:50	04/29/10 08:30	05/20/10 13:40	23.20	14.00	06/12/10 20:03	23.27	40.00	*
32SB-38-0506	04/27/10 08:50	04/29/10 08:30	05/20/10 13:40	23.20	14.00	06/12/10 20:39	23.29	40.00	*
32SS-39-0002	04/28/10 10:45	04/29/10 08:30	05/12/10 19:30	14.36	14.00	06/12/10 20:25	31.04	40.00	
32SB-39-0507	04/28/10 10:45	04/29/10 08:30	05/12/10 19:30	14.36	14.00	06/12/10 20:59	31.06	40.00	
32SS-40-0002	04/27/10 09:00	04/29/10 08:30	05/20/10 13:40	23.19	14.00	06/12/10 21:15	23.32	40.00	*
32SB-40-0506	04/27/10 09:00	04/29/10 08:30	05/20/10 13:40	23.19	14.00	06/12/10 21:51	23.34	40.00	*
32SS-41-0002	04/28/10 09:20	04/29/10 08:30	05/12/10 19:30	14.42	14.00	06/12/10 21:33	31.09	40.00	
32SB-41-0507	04/28/10 09:20	04/29/10 08:30	05/12/10 19:30	14.42	14.00	06/13/10 10:56	31.64	40.00	
32SS-42-0002	04/27/10 09:30	04/29/10 08:30	05/20/10 13:40	23.17	14.00	06/13/10 02:24	23.53	40.00	*
32SB-42-0506	04/27/10 09:30	04/29/10 08:30	05/20/10 13:40	23.17	14.00	06/13/10 03:00	23.56	40.00	*
32SS-FD042810-04	04/28/10 00:00	04/29/10 08:30	05/12/10 19:30	14.81	14.00	06/13/10 06:23	31.45	40.00	
32SS-FD042810-05	04/28/10 00:00	04/29/10 08:30	05/12/10 19:30	14.81	14.00	06/13/10 06:57	31.48	40.00	
32SB-FD042810-04	04/28/10 00:00	04/29/10 08:30	05/12/10 19:30	14.81	14.00	06/13/10 07:31	31.50	40.00	
32SB-FD042810-05	04/28/10 00:00	04/29/10 08:30	05/12/10 19:30	14.81	14.00	06/15/10 12:24	33.70	40.00	

HOLDING TIME SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SS-DW01-0002	04/28/10 12:54	04/29/10 08:30	05/12/10 19:30	14.28	14.00	06/15/10 12:59	33.73	40.00	
32SB-DW01-0809	04/28/10 12:54	04/29/10 08:30	05/12/10 19:30	14.28	14.00	06/13/10 12:39	31.71	40.00	

FIELD PRECISION
CTOF273, NAVAL AIR STATION CRANE, INDIANA

SAMPLE ID	COC	Sample Result	Duplicate Sample Result	RPD	Difference	Qualifier
32GW-03 and 32GW-03-dup	Benzo(a)anthracene	0.18UJ	0.187 UJ	0	0	A
	Benzo(a)pyrene	0.18UJ	0.187 UJ	0	0	A
	Benzo(b)fluoranthene	0.18UJ	0.187 UJ	0	0	A
	Benzo(k)fluoranthene	0.18UJ	0.187 UJ	0	0	A
	Chrysene	0.18UJ	0.187 UJ	0	0	A
	Dibenzo(a,h)anthracene	0.18UJ	0.187 UJ	0	0	A
	Indeno(1,2,3-cd)pyrene	0.18UJ	0.187 UJ	0	0	A
	Naphthalene	0.18UJ	0.187 UJ	0	0	A
32SB-42-0506 and 32SB-42-0506-dup	Benzo(a)anthracene	1.51 UJ	6.41 J	NA	<2RL	A
	Benzo(a)pyrene	1.51 UJ	4.36 J	NA	<2RL	A
	Benzo(b)fluoranthene	1.51 UJ	4.72 J	NA	<2RL	A
	Benzo(k)fluoranthene	1.51 UJ	4.93 J	NA	<2RL	A
	Chrysene	1.51 UJ	5.99 J	NA	<2RL	A
	Dibenzo(a,h)anthracene	1.51 UJ	5.97 J	NA	<2RL	A
	Indeno(1,2,3-cd)pyrene	1.51 UJ	5.64 J	NA	<2RL	A
	Naphthalene	1.51 UJ	3.84 J	NA	<2RL	A
32SS-42-0002 and 32SS-42-0002-dup	Benzo(a)anthracene	1.55 UJ	1.51 UJ	0	0	A
	Benzo(a)pyrene	1.55 UJ	1.51 U	0	0	A
	Benzo(b)fluoranthene	1.55 UJ	1.51 U	0	0	A
	Benzo(k)fluoranthene	1.55 UJ	1.51 U	0	0	A
	Chrysene	1.55 UJ	1.51 UJ	0	0	A
	Dibenzo(a,h)anthracene	1.55 UJ	1.51 UJ	0	0	A
	Indeno(1,2,3-cd)pyrene	1.55 UJ	1.51 UJ	0	0	A
	Naphthalene	1.55 UJ	1.51 U	0	0	A
32SS-DW01-0002 and 32SS-DW01-0002-dup	Benzo(a)anthracene	16.3 U	1.53 UJ	0	0	A
	Benzo(a)pyrene	16.3 U	1.53 U	0	0	A
	Benzo(b)fluoranthene	16.3 U	1.53 U	0	0	A
	Benzo(k)fluoranthene	16.3 UJ	1.53 U	0	0	A
	Chrysene	16.3 U	1.53 UJ	0	0	A
	Dibenzo(a,h)anthracene	16.3 U	1.53 UJ	0	0	A
	Indeno(1,2,3-cd)pyrene	16.3 U	1.53 UJ	0	0	A
	Naphthalene	16.3 U	1.53 U	0	0	A
32SB-DW01-0809 and 32SB-DW01-0809-dup	Benzo(a)anthracene	9.44 J	16.7 U	NA	<2RL	A
	Benzo(a)pyrene	7.43	16.7 U	NA	<2RL	A
	Benzo(b)fluoranthene	7.78	16.7 U	NA	<2RL	A
	Benzo(k)fluoranthene	9.45	16.7 UJ	NA	<2RL	A
	Chrysene	15.3 J	16.7 U	NA	<2RL	A
	Dibenzo(a,h)anthracene	6.23 J	16.7 U	NA	<2RL	A
	Indeno(1,2,3-cd)pyrene	7.05 J	16.7 U	NA	<2RL	A
	Naphthalene	1.54 U	16.7 U	0	0	A

Note:
U – nondetect result A – acceptable NA – not applicable
UJ – estimated nondetect due to QC noncompliance
J – estimated value due to QC noncompliance or result below reporting limit

MEMO TO: TONY KLIMEK- PAGE 7
DATE: JULY 30, 2010

FIELD PRECISION
CTOF273, NAVAL AIR STATION CRANE, INDIANA

SAMPLE ID	COC	Sample Result	Duplicate Sample Result	RPD	Difference	Qualifier
32GW-03 and 32GW-03-dup	Benzene	0.14 U	0.14 U	0	0	A
	Ethylbenzene	0.15 U	0.15 U	0	0	A
	Toluene	0.19 U	0.19 U	0	0	A
	Xylenes (total)	0.22 U	0.22 U	0	0	A
32SB-42-0506 and 32SB-42-0506-dup	Benzene	0.486 UJ	0.456 U	0	0	A
	Ethylbenzene	0.776 UJ	0.728 U	0	0	A
	Toluene	0.889 UJ	0.835 U	0	0	A
	Xylenes (total)	0.724 UJ	0.68 U	0	0	A
32SB-DW01-0809 and 32SB-DW01-0809-dup	Benzene	0.522 UJ	0.527 U	0	0	A
	Ethylbenzene	0.833 UJ	0.841 U	0	0	A
	Toluene	0.955 UJ	0.964 U	0	0	A
	Xylenes (total)	0.777 UJ	0.785 U	0	0	A

Note:
U – nondetect result A – acceptable NA – not applicable
UJ – estimated nondetect due to QC noncompliance
J – estimated value due to QC noncompliance or result below reporting limit

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**T. KLIMEK**	**DATE:**	**AUGUST 6, 2010**
FROM:	**A. COGNETTI**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION- SELECT VOCs/SELECT PAHs**
FULL REVIEW
CTO F273, NSWC CRANE
SAMPLE DELIVERY GROUP (SDG) CTOF273_006

SAMPLES: 3/Solid/Select VOCs

32SB-DW02-0506 32SB-DW03-0304 32SB-ST01-0203

1/Aqueous/Select VOCs

Trip Blank #7852

5/Solid/Select PAHs

32SB-DW02-0506 32SB-DW03-0304 32SB-ST01-0203
32SS-DW02-0002 32SS-DW03-0002

OVERVIEW

The sample set for NSWC CRANE, CTOF273, SDG CTOF273_006, consists of three (3) solid environmental samples and one aqueous (1) trip blank analyzed for select volatile organic compounds (VOCs). The select VOCs include the following: benzene, ethylbenzene, toluene and total xylenes. This SDG also consists of five (5) solid environmental samples analyzed for select polycyclic aromatic hydrocarbons (PAH). The select PAHs include the following: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene and naphthalene. There are no field duplicate pairs contained within this SDG.

The samples were collected by Tetra Tech NUS on April 28, 2010 and analyzed by Empirical Laboratory. All analyses were conducted in accordance with SW-846 Method 8260B for VOCs and Method 8270C for PAH

The data contained in this SDG were validated with regard to the following parameters:

* • Data Completeness
* • Holding Times
* • GC/MS Tuning
• Initial/Continuing Calibrations
* • Laboratory Method/Field Blank Results
* • Surrogate Recoveries
* • Blank Spike/Blank Spike Duplicate Results
* • Matrix Spike/Matrix Spike Duplicate Results
* • Compound Quantitation
* • Compound Identification
* • Detection Limits

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data

quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

PAH

The continuing calibration of instrument MS-BNA4 on June 13, 2010 @ 5:49, benzo(a)anthracene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene had percent differences (%Ds) greater than the 25% quality control limit. The nondetected results for benzo(a)anthracene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene were qualified as estimated (UJ) in all of the samples.

Notes

Trip blank #7852 was not included on the chain of custody.

EXECUTIVE SUMMARY

Laboratory Performance Issues: The continuing calibration percent difference exceeded quality control limits for several PAHs resulting in the qualification of data.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (10/99), and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006).

The text of this report has been formulated to address only those problem areas affecting data quality.

Ann Cognetti
Tetra Tech NUS
Ann Cognetti
Chemist/Data Validator

TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Appendix A

Qualified Analytical Results

Data Validation Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can be any number of issues; e.g. poor chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 02111	NSAMPLE	32SB-DW02-0506			32SB-DW03-0304			32SB-ST01-0203		
SDG: CTOF273_006	LAB_ID	1004278-02			1004278-04			1004278-05		
FRACTION: OV	SAMP_DATE	4/28/2010			4/28/2010			4/28/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	78.3			82.7			83.1		
	DUP_OF									
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.593	U		0.503	U		0.482	U	
ETHYLBENZENE		0.946	U		0.803	U		0.77	U	
TOLUENE		1.09	U		0.92	U		0.883	U	
TOTAL XYLENES		0.883	U		0.749	U		0.718	U	

PROJ_NO: 02111	NSAMPLE	Trip Blank #7852		
SDG: CTOF273_006	LAB_ID	1004278-06		
FRACTION: OV	SAMP_DATE	4/28/2010		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
BENZENE		0.14	U	
ETHYLBENZENE		0.15	U	
TOLUENE		0.19	U	
TOTAL XYLENES		0.22	U	

PROJ_NO: 02111 SDG: CTOF273_006 FRACTION: PAH MEDIA: SOIL	NSAMPLE	32SB-DW02-0506			32SB-DW03-0304			32SB-ST01-0203			32SS-DW02-0002		
	LAB_ID	1004278-02			1004278-04			1004278-05			1004278-01		
	SAMP_DATE	4/28/2010			4/28/2010			4/28/2010			4/28/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	78.3			82.7			83.1			80.7		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.7	UJ	C	1.61	UJ	C	1.6	UJ	C	1.65	UJ	C
BENZO(A)PYRENE		1.7	U		1.61	U		1.6	U		1.65	U	
BENZO(B)FLUORANTHENE		1.7	U		1.61	U		1.6	U		1.65	U	
BENZO(K)FLUORANTHENE		1.7	U		1.61	U		1.6	U		1.65	U	
CHRYSENE		1.7	UJ	C	1.61	UJ	C	1.6	UJ	C	1.65	UJ	C
DIBENZO(A,H)ANTHRACENE		1.7	UJ	C	1.61	UJ	C	1.6	UJ	C	1.65	UJ	C
INDENO(1,2,3-CD)PYRENE		1.7	UJ	C	1.61	UJ	C	1.6	UJ	C	1.65	UJ	C
NAPHTHALENE		1.7	U		1.61	U		1.6	U		1.65	U	

PROJ_NO: 02111	NSAMPLE	32SS-DW03-0002
SDG: CTOF273_006	LAB_ID	1004278-03
FRACTION: PAH	SAMP_DATE	4/28/2010
MEDIA: SOIL	QC_TYPE	NM
	UNITS	UG/KG
	PCT_SOLIDS	78.8
	DUP_OF	

PARAMETER	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE	1.69	UJ	C
BENZO(A)PYRENE	1.69	U	
BENZO(B)FLUORANTHENE	1.69	U	
BENZO(K)FLUORANTHENE	1.69	U	
CHRYSENE	1.69	UJ	C
DIBENZO(A,H)ANTHRACENE	1.69	UJ	C
INDENO(1,2,3-CD)PYRENE	1.69	UJ	C
NAPHTHALENE	1.69	U	

Appendix B

Results as Reported by the Laboratory

ANALYSIS DATA SHEET

32SB-DW02-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004278-02	File ID:	0427802.D
Sampled:	04/28/10 13:41	Prepared:	05/11/10 15:28	Analyzed:	05/12/10 04:27
Solids:	78.32	Preparation:	5035	Dilution:	1

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.593	5.05	U
100-41-4	Ethylbenzene		0.946	12.6	U, Y
108-88-3	Toluene		1.09	12.6	U, Y
1330-20-7	Xylenes (total)		0.883	12.6	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	37.85	41.34	109	85 - 120	
Dibromofluoromethane	37.85	40.85	108	80 - 125	
1,2-Dichloroethane-d4	37.85	35.34	93.4	75 - 140	
Toluene-d8	37.85	39.17	103	85 - 115	

ANALYSIS DATA SHEET

32SB-DW03-0304

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004278-04	File ID:	0427804.D
Sampled:	04/28/10 14:30	Prepared:	05/11/10 15:28	Analyzed:	05/12/10 04:58
Solids:	82.68	Preparation:	5035	Dilution:	1

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.503	5.00	U
100-41-4	Ethylbenzene		0.803	10.7	U, Y
108-88-3	Toluene		0.920	10.7	U, Y
1330-20-7	Xylenes (total)		0.749	10.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	32.11	36.25	113	85 - 120	
Dibromofluoromethane	32.11	34.98	109	80 - 125	
1,2-Dichloroethane-d4	32.11	30.54	95.1	75 - 140	
Toluene-d8	32.11	34.71	108	85 - 115	

ANALYSIS DATA SHEET

32SB-ST01-0203

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004278-05	File ID:	0427805.D
Sampled:	04/28/10 12:05	Prepared:	05/11/10 15:28	Analyzed:	05/12/10 05:29
Solids:	83.13	Preparation:	5035	Dilution:	1

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.482	5.00	U
100-41-4	Ethylbenzene		0.770	10.3	U, Y
108-88-3	Toluene		0.883	10.3	U, Y
1330-20-7	Xylenes (total)		0.718	10.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.79	34.53	112	85 - 120	
Dibromofluoromethane	30.79	33.30	108	80 - 125	
1,2-Dichloroethane-d4	30.79	29.84	96.9	75 - 140	
Toluene-d8	30.79	32.03	104	85 - 115	

ANALYSIS DATA SHEET

Trip Blank #7852

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004278-06	File ID:	0427806.D
Sampled:	04/28/10 00:00	Prepared:	05/11/10 00:00	Analyzed:	05/11/10 18:42
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E11046 Sequence: 0E13320 Calibration: 0124001 Instrument: MS-VOA5

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U, X
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.46	105	75 - 120	
Dibromofluoromethane	30.00	31.53	105	85 - 115	
1,2-Dichloroethane-d4	30.00	31.67	106	70 - 120	
Toluene-d8	30.00	33.51	112	85 - 120	

ANALYSIS DATA SHEET

32SB-DW02-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004278-02	File ID:	0427802.D
Sampled:	04/28/10 13:41	Prepared:	05/12/10 19:30	Analyzed:	06/13/10 08:40
Solids:	78.32	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.70	8.52	X, U
50-32-8	Benzo(a)pyrene		1.70	6.38	X, U
205-99-2	Benzo(b)fluoranthene		1.70	8.52	U
207-08-9	Benzo(k)fluoranthene		1.70	8.52	U
218-01-9	Chrysene		1.70	8.52	X, U
53-70-3	Dibenz(a,h)anthracene		1.70	6.38	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.70	8.52	X, U
91-20-3	Naphthalene		1.70	6.38	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4256	3391	79.7	14 - 129	
Terphenyl-d14	4256	3741	87.9	14 - 129	

ANALYSIS DATA SHEET

32SB-DW03-0304

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004278-04	File ID:	0427804.D
Sampled:	04/28/10 14:30	Prepared:	05/12/10 19:30	Analyzed:	06/13/10 09:48
Solids:	82.68	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.61	8.07	X, U
50-32-8	Benzo(a)pyrene		1.61	6.05	X, U
205-99-2	Benzo(b)fluoranthene		1.61	8.07	U
207-08-9	Benzo(k)fluoranthene		1.61	8.07	U
218-01-9	Chrysene		1.61	8.07	X, U
53-70-3	Dibenz(a,h)anthracene		1.61	6.05	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.61	8.07	X, U
91-20-3	Naphthalene		1.61	6.05	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4031	3605	89.4	14 - 129	
Terphenyl-d14	4031	3544	87.9	14 - 129	

ANALYSIS DATA SHEET

32SB-ST01-0203

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004278-05	File ID:	0427805.D
Sampled:	04/28/10 12:05	Prepared:	05/12/10 19:30	Analyzed:	06/13/10 10:22
Solids:	83.13	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.60	8.02	X, U
50-32-8	Benzo(a)pyrene		1.60	6.01	X, U
205-99-2	Benzo(b)fluoranthene		1.60	8.02	U
207-08-9	Benzo(k)fluoranthene		1.60	8.02	U
218-01-9	Chrysene		1.60	8.02	X, U
53-70-3	Dibenz(a,h)anthracene		1.60	6.01	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.60	8.02	X, U
91-20-3	Naphthalene		1.60	6.01	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4010	3383	84.4	14 - 129	
Terphenyl-d14	4010	3314	82.7	14 - 129	

ANALYSIS DATA SHEET

32SS-DW02-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004278-01	File ID:	0427801.D
Sampled:	04/28/10 13:41	Prepared:	05/12/10 19:30	Analyzed:	06/13/10 08:06
Solids:	80.70	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.65	8.27	X, U
50-32-8	Benzo(a)pyrene		1.65	6.20	X, U
205-99-2	Benzo(b)fluoranthene		1.65	8.27	U
207-08-9	Benzo(k)fluoranthene		1.65	8.27	U
218-01-9	Chrysene		1.65	8.27	X, U
53-70-3	Dibenz(a,h)anthracene		1.65	6.20	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.65	8.27	X, U
91-20-3	Naphthalene		1.65	6.20	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4131	3542	85.8	14 - 129	
Terphenyl-d14	4131	3584	86.8	14 - 129	

ANALYSIS DATA SHEET

32SS-DW03-0002

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_006	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1004278-03	File ID:	0427803.D
Sampled:	04/28/10 14:30	Prepared:	05/12/10 19:30	Analyzed:	06/13/10 09:14
Solids:	78.76	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12916 Sequence: 0F16819 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.69	8.47	X, U
50-32-8	Benzo(a)pyrene		1.69	6.35	X, U
205-99-2	Benzo(b)fluoranthene		1.69	8.47	U
207-08-9	Benzo(k)fluoranthene		1.69	8.47	U
218-01-9	Chrysene		1.69	8.47	X, U
53-70-3	Dibenz(a,h)anthracene		1.69	6.35	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.69	8.47	X, U
91-20-3	Naphthalene		1.69	6.35	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4232	3278	77.4	14 - 129	
Terphenyl-d14	4232	3223	76.2	14 - 129	

Appendix C

Support Documentation

Sample Delivery Group Case Narrative

Receipt Information

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision

This is an original submittal of the final report package.

Analytical Information

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. The following information is provided specific to individual methods:

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.
B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.
C: The peak was manually integrated to correct the baseline from the original chromatogram.
D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

SW8260B:

The continuing calibration standards failed criteria in 0E13517-CCV1 for Ethylbenzene and Toluene and in 0E13320-CCV1 for Benzene.

No additional anomalies or deviations are noted and the data is properly qualified.

SW8270C PAHs:

The continuing calibration standard failed criteria in 0F16819-CCV1 for Benzo(a)anthracene, Benzo(a)pyrene, Chrysene, Dibenz(a,h)anthracene, and Indeno!1,2,3)pyrene).

TETRA TECH NUS, INC.

CHAIN OF CUSTODY | NUMBER | PAGE 5 OF 5

PROJECT NO: 112G-02111

SITE NAME: SWMU 32

SAMPLERS (SIGNATURE): Betsy Collins

PROJECT MANAGER AND PHONE NUMBER: Tony Klinek 573-557-5057

FIELD OPERATIONS LEADER AND PHONE NUMBER: George Ten Eyck

CARRIER/WAYBILL NUMBER:

LABORATORY NAME AND CONTACT: Kim Rostzer - Empirical Labs

ADDRESS: 621 Mainstream Drive, Suite 270

CITY, STATE: Nashville, TN 37228

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G P

PRESERVATIVE USED: 4°C 4°C HCl

TYPE OF ANALYSIS: PAHs, BTEX

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	BTEX							COMMENTS
4/28	0930	32SB-42-0506	SB	G	1	X							-20	1004277
	0000	32SS-FD042810-04	SS	G	1	X							-21	
	0000	32SS-FD042810-05	SS	G	1	X							-22	
	0000	32SB-FD042810-04	SB	G	1	X							-23	
	0000	32SB-FD042810-05	SB	G	1	X							-24	
	1254	32SS-DW01-0002	SS	G	1	X							-25	
	1254	32SB-DW01-0809	SB	G	1	X							-26	
	1341	32SS-DW02-0002	SS	G	1	X							-01	1004278
	1341	32SB-DW02-0506	SB	G	1	X							-02	
	1430	32SS-DW03-0002	SS	G	1	X							-03	
	1430	32SB-DW03-0304	SB	G	1	X							-04	
	1205	32SB-ST01-0203	SB	G	1	X							-05	
	1010	32SB-31-0607	SB	G	12		X					1004277	-08	MS/MSD

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Betsy Collins	042810	1525	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	4/29/10	08:30

COMMENTS: 0.3°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC.

CHAIN OF CUSTODY | NUMBER

PROJECT NO: 112G02111

SITE NAME: SWMU 32

PROJECT MANAGER AND PHONE NUMBER: Tony Klimek 573-557-5057

LABORATORY NAME AND CONTACT: Kim Kostzer Empirical Labs

SAMPLERS (SIGNATURE): Betsy Colley

FIELD OPERATIONS LEADER AND PHONE NUMBER: George Ten Eyck

ADDRESS: 621 Mainstream Drive, Suite 270

CARRIER/WAYBILL NUMBER

CITY, STATE: Nashville, TN 37228

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): P

PRESERVATIVE USED: 4°C HCl

TYPE OF ANALYSIS: BTEX

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	BTEX							COMMENTS
4/28	1015	32SB-35-0507	SB	G	12	X						-10	MS/MSD -20
	0850	32SB-38-0506			3 12	X						-12	-21
	1045	32SB-39-0507			12	X						-14	MS/MSD -22
	0900	32SB-40-0506			3	X						-16	-23
	0920	32SB-41-0506			12	X						-18	MS/MSD -24
	0930	32SB-42-0506			3	X						-20	-25
	0000	32SB-FD042810-04			3	X						-23	-26
	0000	32SB-FD042810-05			3	X						-24	
	1254	32SB-DW01-0809			3	X						-26	
	1341	32SB-DW02-0506			3	X						-02	1004278
	1430	32SB-DW03-0304			3	X						-04	
	1205	32SB-ST01-0203			3	X						-05	

1004277 ws 4/29/10

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Betsy Colley	042810	1525	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY: [signature]	4/29/10	08:30

COMMENTS: 0.3°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004276, 1004277, 1004278 Number of Coolers: 1 of 4

Client: JTNUDS Project: SWMU32

Date/Time Received: 4/29/10 08:30 Date cooler(s) opened: 4/29/10

Opened By (print): Will Schwab (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered
EL Courier Other: _____

If applicable, enter airbill number here: 3376

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 2 Seal date: 4/28/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival?	Yes	No	N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler?	Yes	No	N/A
5. Were custody papers filled out properly (ink, signed, etc.)?	Yes	No	N/A
6. Did you sign custody papers in the appropriate place for acceptance?	Yes	No	N/A
7. Was project identifiable from custody papers?	Yes	No	N/A
8. If required, was enough ice present in the cooler(s)?	Yes	No	N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 0-3 °C

Dates samples were logged-in: 4/29/10

9. Initial this form to acknowledge login of sample(s): (Name): Will Schwab (Initial): WS

10. Were all bottle lids intact and sealed tightly?	Yes	No	N/A
11. Did all bottles arrive unbroken?	Yes	No	N/A
12. Was all required bottle label information complete?	Yes	No	N/A
13. Did all bottle labels agree with custody papers? WS 4/29/10	Yes	No *	N/A
14. Were correct containers used for the analyses indicated?	Yes	No	N/A
15. Were preservative levels correct in all applicable sample containers?	Yes	No	N/A
16. Was residual chlorine present in any applicable sample containers?	Yes	No	N/A
17. Was sufficient amount of sample sent for the analyses required?	Yes	No	N/A
18. Was headspace present in any included VOA vials?	Yes	No	N/A

If Non-Conformance issues were present, list by sample ID: _____

* On WO 1004277 - Sample 32SS-RB042710-01 CAR#: _____
on COC says collected at 08:05, however container labels say 08:10!

1004278 - Trip Blank rec'd & not on COC. Tagged as -06!

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004277, 1004278 Number of Coolers: 2 of 4

Client: TTNUS Project: SWMU32

Date/Time Received: 4/29/10 08:30 Date cooler(s) opened: 4/29/10

Opened By (print): Will Schwat (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered
   EL Courier Other: _____

If applicable, enter airbill number here: 3365

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 2 Seal date: 4/28/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival?	Yes	No	N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler?	Yes	No	N/A
5. Were custody papers filled out properly (ink, signed, etc.)?	Yes	No	N/A
6. Did you sign custody papers in the appropriate place for acceptance?	Yes	No	N/A
7. Was project identifiable from custody papers?	Yes	No	N/A
8. If required, was enough ice present in the cooler(s)?	Yes	No	N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 0-2 °C

Dates samples were logged-in: 4/29/10

9. Initial this form to acknowledge login of sample(s): (Name): _____ (Initial): _____

10. Were all bottle lids intact and sealed tightly?	Yes	No	N/A
11. Did all bottles arrive unbroken?	Yes	No	N/A
12. Was all required bottle label information complete?	Yes	No	N/A
13. Did all bottle labels agree with custody papers?	Yes	No	N/A
14. Were correct containers used for the analyses indicated?	Yes	No	N/A
15. Were preservative levels correct in all applicable sample containers?	Yes	No	N/A
16. Was residual chlorine present in any applicable sample containers?	Yes	No	N/A
17. Was sufficient amount of sample sent for the analyses required?	Yes	No	N/A
18. Was headspace present in any included VOA vials?	Yes	No	N/A

See page 1 of 4

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004277, 1004278 Number of Coolers: 3 of 4

Client: TTNUS Project: SWMU32

Date/Time Received: 4/29/10 08:30 Date cooler(s) opened: 4/29/10

Opened By (print): Will Schwab (signature): [illegible]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered
   EL Courier Other: _____

If applicable, enter airbill number here: 3398

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 2 Seal date: 4/28/10 Seal Initials: _____

3. Were custody seals unbroken and intact at the date and time of arrival?	Yes	No	N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler?	Yes	No	N/A
5. Were custody papers filled out properly (ink, signed, etc.)?	Yes	No	N/A
6. Did you sign custody papers in the appropriate place for acceptance?	Yes	No	N/A
7. Was project identifiable from custody papers?	Yes	No	N/A
8. If required, was enough ice present in the cooler(s)?	Yes	No	N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 0.1 °C

~~Dates samples were logged-in: 4/29/10~~

9. Initial this form to acknowledge login of sample(s): (Name): _____ (Initial): _____

10. Were all bottle lids intact and sealed tightly?	Yes	No	N/A
11. Did all bottles arrive unbroken?	Yes	No	N/A
12. Was all required bottle label information complete?	Yes	No	N/A
13. Did all bottle labels agree with custody papers?	Yes	No	N/A
14. Were correct containers used for the analyses indicated?	Yes	No	N/A
15. Were preservative levels correct in all applicable sample containers?	Yes	No	N/A
16. Was residual chlorine present in any applicable sample containers?	Yes	No	N/A
17. Was sufficient amount of sample sent for the analyses required?	Yes	No	N/A
18. Was headspace present in any included VOA vials?	Yes	No	N/A

See page 1 of 4

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004277, 1004278 Number of Coolers: 4 of 4

Client: TTNUS Project: SWMU32

Date/Time Received: **4/29/10** **08:30** Date cooler(s) opened: **4/29/10**

Opened By (print): Will Schwab (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 3387

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 2 Seal date: 4/28/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 6.7 °C

Dates samples were logged-in: 4/29/10

9. Initial this form to acknowledge login of sample(s): (Name): _____ (Initial): _____
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

See page 1 of 4

CASE DATE

SDG CTOF273_006

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV	UG/KG	32SB-ST01-0203	1004278-05	NM	04/28/2010	05/11/2010	05/12/2010	13	1	14
OV	UG/KG	32SB-DW03-0304	1004278-04	NM	04/28/2010	05/11/2010	05/12/2010	13	1	14
OV	UG/KG	32SB-DW02-0506	1004278-02	NM	04/28/2010	05/11/2010	05/12/2010	13	1	14
OV	UG/L	Trip Blank #7852	1004278-06	NM	04/28/2010	05/11/2010	05/11/2010	13	0	13
SIM	UG/KG	32SS-DW03-0002	1004278-03	NM	04/28/2010	05/12/2010	06/13/2010	14	32	46
SIM	UG/KG	32SS-DW02-0002	1004278-01	NM	04/28/2010	05/12/2010	06/13/2010	14	32	46
SIM	UG/KG	32SB-ST01-0203	1004278-05	NM	04/28/2010	05/12/2010	06/13/2010	14	32	46
SIM	UG/KG	32SB-DW03-0304	1004278-04	NM	04/28/2010	05/12/2010	06/13/2010	14	32	46
SIM	UG/KG	32SB-DW02-0506	1004278-02	NM	04/28/2010	05/12/2010	06/13/2010	14	32	46

ANALYSIS SEQUENCE SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E12301	Instrument:	MS-VOA5
Calibration:	0124001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E12301-TUN1	SEQ-TUN2.D	04/27/10 19:28
Cal Standard	0E12301-CAL1	SEQ-CAL1.D	04/27/10 19:58
Cal Standard	0E12301-CAL2	SEQ-CAL2.D	04/27/10 20:28
Cal Standard	0E12301-CAL3	SEQ-CAL3.D	04/27/10 20:58
Cal Standard	0E12301-CAL4	SEQ-CAL4.D	04/27/10 21:28
Cal Standard	0E12301-CAL5	SEQ-CAL5.D	04/27/10 21:57
Cal Standard	0E12301-CAL6	SEQ-CAL6.D	04/27/10 22:27
Cal Standard	0E12301-CAL7	SEQ-CAL7.D	04/27/10 22:57
Cal Standard	0E12301-CAL8	SEQ-CAL8.D	04/27/10 23:27
Cal Standard	0E12301-CAL9	SEQ-CAL9.D	04/27/10 23:57
Initial Cal Check	0E12301-ICV1	SEQ-ICV1.D	04/28/10 00:26
Cal Standard	0E12301-CALA	SEQ-CALA.D	04/28/10 00:56
Cal Standard	0E12301-CALB	SEQ-CALB.D	04/28/10 01:26
Cal Standard	0E12301-CALC	SEQ-CALC.D	04/28/10 01:56
Cal Standard	0E12301-CALD	SEQ-CALD.D	04/28/10 02:26
Cal Standard	0E12301-CALE	SEQ-CALE.D	04/28/10 02:56
Cal Standard	0E12301-CALF	SEQ-CALF.D	04/28/10 03:26
Cal Standard	0E12301-CALG	SEQ-CALG.D	04/28/10 03:55
Cal Standard	0E12301-CALH	SEQ-CALH.D	04/28/10 04:25
Cal Standard	0E12301-CALI	SEQ-CALI.D	04/28/10 04:55
MS Tune	0E12301-TUN2	SEQ-TUN3.D	04/28/10 05:55
Cal Standard	0E12301-CALJ	SEQ-CALJ.D	04/28/10 06:25
Cal Standard	0E12301-CALK	SEQ-CALK.D	04/28/10 06:54
Cal Standard	0E12301-CALL	SEQ-CALL.D	04/28/10 07:24
Cal Standard	0E12301-CALM	SEQ-CALM.D	04/28/10 07:54
Cal Standard	0E12301-CALN	SEQ-CALN.D	04/28/10 08:24
Cal Standard	0E12301-CALO	SEQ-CALO.D	04/28/10 08:54
Cal Standard	0E12301-CALP	SEQ-CALP.D	04/28/10 09:23
Cal Standard	0E12301-CALQ	SEQ-CALQ.D	04/28/10 09:53
Cal Standard	0E12301-CALR	SEQ-CALR.D	04/28/10 10:23
MS Tune	0E12301-TUN3	SEQ-TUN4.D	04/28/10 11:57

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	04/27/10
Instrument ID:	MS-VOA5	Injection Time:	19:28
Sequence:	0E12301	Lab Sample ID:	0E12301-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	19.1	PASS
75	30 - 60% of 95	43.6	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.75	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	99	PASS
175	5 - 9% of 174	7.36	PASS
176	95 - 101% of 174	97.4	PASS
177	5 - 9% of 176	6.48	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN3.D	Injection Date:	04/28/10
Instrument ID:	MS-VOA5	Injection Time:	05:55
Sequence:	0E12301	Lab Sample ID:	0E12301-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	15.7	PASS
75	30 - 60% of 95	39.3	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	5.85	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	109	PASS
175	5 - 9% of 174	7.18	PASS
176	95 - 101% of 174	97.2	PASS
177	5 - 9% of 176	6.58	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN4.D	Injection Date:	04/28/10
Instrument ID:	MS-VOA5	Injection Time:	11:57
Sequence:	0E12301	Lab Sample ID:	0E12301-TUN3

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	19.2	PASS
75	30 - 60% of 95	45	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.25	PASS
173	Less than 2% of 174	0.082	PASS
174	50 - 200% of 95	96.4	PASS
175	5 - 9% of 174	7.73	PASS
176	95 - 101% of 174	97.5	PASS
177	5 - 9% of 176	6.62	PASS

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0124001	Instrument:	MS-VOA5
Matrix:	Water	Calibration Date:	4/27/2010 2:57:31PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	1.011151	13.26352	11.61511	4.651777E-02			15	
Bromofluorobenzene	0.9225182	10.25934	16.56867	3.517329E-02			15	
Ethylbenzene	2.514251	20.63088	15.814	4.736159E-02		0.9994923	CCC (20)	*
Naphthalene	1.606211	40.69968	19.39867	0.2072638	0.9994093		0.995	
Methyl t-Butyl Ether	0.429816	13.94177	6.8475	9.011803E-02			15	
Toluene	1.565078	9.597961	14.37167	3.932145E-02			CCC (20)	
m,p-Xylene	1.96361	21.36604	15.96829	3.543356E-02	0.9979168		0.995	
o-Xylene	2.27224	13.91525	16.27186	3.300099E-02			15	
Xylenes (total)	2.048936	19.78577	0	0	0.9974428		0.995	
Dibromofluoromethane	0.3514244	2.749082	9.175111	5.866589E-02			15	
1,2-Dichloroethane-d4	5.911631E-02	6.756312	10.48044	5.353255E-02			15	
Toluene-d8	2.166186	8.705916	14.30067	4.648887E-02			15	

INITIAL CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA5	Calibration:	0124001
Lab File ID:	SEQ-ICV1.D	Calibration Date:	04/27/10 14:57
Sequence:	0E12301	Injection Date:	04/28/10
Lab Sample ID:	0E12301-ICV1	Injection Time:	00:26

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzene	A	100.0	123.5	1.011151	1.248634		23.5	20 *
Ethylbenzene	Q	100.0	98.90	2.514251	2.881736		-1.1	20
Toluene	A	100.0	96.04	1.565078	1.503069		-4.0	20
Xylenes (total)	L	300.0	273.0	2.048936	2.0676		-9.0	20
Bromofluorobenzene	A	30.00	26.35	0.9225182	0.8103458		-12.2	20
Dibromofluoromethane	A	30.00	29.88	0.3514244	0.3500698		-0.4	20
1,2-Dichloroethane-d4	A	30.00	28.71	5.911631E-02	0.0565719		-4.3	20
Toluene-d8	A	30.00	26.19	2.166186	1.89081		-12.7	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13320	Instrument:	MS-VOA5
Calibration:	0124001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13320-TUN1	SEQ-TUN1.D	05/11/10 14:06
Calibration Check	0E13320-CCV1	SEQ-CCV1.D	05/11/10 14:36
LCS	0E11046-BS1	V5-LCS1.D	05/11/10 15:54
Blank	0E11046-BLK1	V5-BLK4.D	05/11/10 18:10
Trip Blank #7852	1004278-06	0427806.D	05/11/10 18:42

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/11/10
Instrument ID:	MS-VOA5	Injection Time:	14:06
Sequence:	0E13320	Lab Sample ID:	0E13320-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	23.3	PASS
75	30 - 60% of 95	47	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	8.39	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	61.7	PASS
175	5 - 9% of 174	8.19	PASS
176	95 - 101% of 174	97.5	PASS
177	5 - 9% of 176	7.07	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA5	Calibration:	0124001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	04/27/10 14:57
Sequence:	0E13320	Injection Date:	05/11/10
Lab Sample ID:	0E13320-CCV1	Injection Time:	14:36

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	96.56	1.011151	1.204294		19.1	20
Ethylbenzene	Q	100.0	88.77	2.514251	2.973183		-11.2	20
Toluene	A	100.0	92.10	1.565078	1.708553		9.2	20
Xylenes (total)	L	300.0	280.8	2.048936	2.357243		-6.4	20
Bromofluorobenzene	A	30.00	28.09	0.9225182	0.7742593		-16.1	20
Dibromofluoromethane	A	30.00	30.10	0.3514244	0.3133484		-10.8	20
1,2-Dichloroethane-d4	A	30.00	28.32	5.911631E-02	5.713796E-02		-3.3	20
Toluene-d8	A	30.00	27.85	2.166186	1.977126		-8.7	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_006

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E11046 Batch Matrix: Water Preparation: 5030B

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E11046-BLK1	05/11/10 00:00	5.00	5.00
LCS	0E11046-BS1	05/11/10 00:00	5.00	5.00
Trip Blank #7852	1004278-06	05/11/10 00:00	5.00	5.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_006	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E11046-BLK1	File ID:	V5-BLK4.D
Sampled:		Prepared:		Analyzed:	05/11/10 18:10
Solids:		Preparation:	5030B	Dilution:	

Batch: 0E11046 Sequence: 0E13320 Calibration: 0124001 Instrument: MS-VOA5

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U, X
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.94	103	75 - 120	
Dibromofluoromethane	30.00	31.37	105	85 - 115	
1,2-Dichloroethane-d4	30.00	31.38	105	70 - 120	
Toluene-d8	30.00	33.31	111	85 - 120	

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13002	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13002-TUN1	SEQ-TUN1.D	05/07/10 18:43
Cal Standard	0E13002-CAL1	SEQ-CAL1.D	05/07/10 19:17
Cal Standard	0E13002-CAL2	SEQ-CAL2.D	05/07/10 19:47
Cal Standard	0E13002-CAL3	SEQ-CAL3.D	05/07/10 20:18
Cal Standard	0E13002-CAL4	SEQ-CAL4.D	05/07/10 20:49
Cal Standard	0E13002-CAL5	SEQ-CAL5.D	05/07/10 21:20
Cal Standard	0E13002-CAL6	SEQ-CAL6.D	05/07/10 21:51
Cal Standard	0E13002-CAL7	SEQ-CAL7.D	05/07/10 22:21
Cal Standard	0E13002-CAL8	SEQ-CAL8.D	05/07/10 22:52
Initial Cal Check	0E13002-ICV1	SEQ-ICV1.D	05/07/10 23:22
Cal Standard	0E13002-CAL9	SEQ-CAL9.D	05/07/10 23:53
Cal Standard	0E13002-CALA	SEQ-CALA.D	05/08/10 00:24
Cal Standard	0E13002-CALB	SEQ-CALB.D	05/08/10 00:55
Cal Standard	0E13002-CALC	SEQ-CALC.D	05/08/10 01:25
Cal Standard	0E13002-CALD	SEQ-CALD.D	05/08/10 01:56
Cal Standard	0E13002-CALE	SEQ-CALE.D	05/08/10 02:27
Cal Standard	0E13002-CALF	SEQ-CALF.D	05/08/10 02:57
Cal Standard	0E13002-CALG	SEQ-CALG.D	05/08/10 03:28
MS Tune	0E13002-TUN2	SEQ-TUN2.D	05/08/10 04:29
Cal Standard	0E13002-CALH	SEQ-CALH.D	05/08/10 04:59
Cal Standard	0E13002-CALI	SEQ-CALI.D	05/08/10 05:30
Cal Standard	0E13002-CALJ	SEQ-CALJ.D	05/08/10 06:01
Cal Standard	0E13002-CALK	SEQ-CALK.D	05/08/10 06:31
Cal Standard	0E13002-CALL	SEQ-CALL.D	05/08/10 07:02
Cal Standard	0E13002-CALM	SEQ-CALM.D	05/08/10 07:32
Cal Standard	0E13002-CALN	SEQ-CALN.D	05/08/10 08:03
Cal Standard	0E13002-CALO	SEQ-CALO.D	05/08/10 08:34

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/07/10
Instrument ID:	MS-VOA4	Injection Time:	18:43
Sequence:	0E13002	Lab Sample ID:	0E13002-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	32.2	PASS
75	30 - 60% of 95	50.5	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.01	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	70.3	PASS
175	5 - 9% of 174	7.68	PASS
176	95 - 101% of 174	95.1	PASS
177	5 - 9% of 176	5.92	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/08/10
Instrument ID:	MS-VOA4	Injection Time:	04:29
Sequence:	0E13002	Lab Sample ID:	0E13002-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	25.2	PASS
75	30 - 60% of 95	44.3	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.93	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	72	PASS
175	5 - 9% of 174	8.06	PASS
176	95 - 101% of 174	95.2	PASS
177	5 - 9% of 176	6.4	PASS

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0130002	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/7/2010 9:01:33AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	1.072069	4.777662	13.77363	2.989758E-02			15	
Bromofluorobenzene	0.8397075	6.434109	18.2985	2.305661E-02			15	
Ethylbenzene	2.911353	12.32509	17.49371	7.889913E-03			CCC (20)	
Naphthalene	1.929638	13.77676	21.93187	8.914289E-03			15	
Methyl t-Butyl Ether	0.7656045	3.435099	10.40713	4.151465E-02			15	
Toluene	1.422543	12.62549	16.10688	1.093417E-02			CCC (20)	
m,p-Xylene	2.139192	17.90708	17.64143	1.326399E-02		0.9998704	0.99	
o-Xylene	2.105664	14.8487	17.96983	3.930673E-03			15	
Xylenes (total)	2.150116	17.06447	0	0		0.9998992	0.99	
Dibromofluoromethane	0.3074291	2.04296	12.30138	4.654776E-02			15	
1,2-Dichloroethane-d4	6.679317E-02	3.711545	12.98763	2.467597E-02			15	
Toluene-d8	2.047687	4.711146	16.03913	1.096841E-02			15	

INITIAL CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-ICV1.D	Calibration Date:	05/07/10 09:01
Sequence:	0E13002	Injection Date:	05/07/10
Lab Sample ID:	0E13002-ICV1	Injection Time:	23:22

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzene	A	100.0	99.09	1.072069	1.062337		-0.9	20
Ethylbenzene	A	100.0	86.70	2.911353	2.524206		-13.3	20
Toluene	A	100.0	89.48	1.422543	1.27282		-10.5	20
Xylenes (total)	Q	300.0	284.2	2.150116	1.761576		-5.3	20
Bromofluorobenzene	A	30.00	29.24	0.8397075	0.8183789		-2.5	20
Dibromofluoromethane	A	30.00	30.33	0.3074291	0.3108571		1.1	20
1,2-Dichloroethane-d4	A	30.00	30.54	6.679317E-02	6.799794E-02		1.8	20
Toluene-d8	A	30.00	29.08	2.047687	1.984594		-3.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-CCV3.D	Calibration Date:	05/07/10 09:01
Sequence:	0E13517	Injection Date:	05/11/10
Lab Sample ID:	0E13517-CCV1	Injection Time:	23:21

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	93.58	1.072069	1.003261		-6.4	20
Ethylbenzene	A	100.0	75.57	2.911353	2.200046		-24.4	20 *
Toluene	A	100.0	79.31	1.422543	1.128231		-20.7	20 *
Xylenes (total)	Q	300.0	246.6	2.150116	1.565743		-17.8	20
Bromofluorobenzene	A	30.00	27.04	0.8397075	0.7567183		-9.9	20
Dibromofluoromethane	A	30.00	31.88	0.3074291	0.3266856		6.3	20
1,2-Dichloroethane-d4	A	30.00	29.08	6.679317E-02	6.474074E-02		-3.1	20
Toluene-d8	A	30.00	29.90	2.047687	2.041125		-0.3	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13517	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13517-TUN1	SEQ-TUNE.D	05/11/10 22:50
Calibration Check	0E13517-CCV1	SEQ-CCV3.D	05/11/10 23:21
LCS	0E11031-BS1	V4LCS03.D	05/11/10 23:51
Blank	0E11031-BLK1	V4BLK02.D	05/12/10 00:53
32SB-DW02-0506	1004278-02	0427802.D	05/12/10 04:27
32SB-DW03-0304	1004278-04	0427804.D	05/12/10 04:58
32SB-ST01-0203	1004278-05	0427805.D	05/12/10 05:29

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUNE.D	Injection Date:	05/11/10
Instrument ID:	MS-VOA4	Injection Time:	22:50
Sequence:	0E13517	Lab Sample ID:	0E13517-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	30.9	PASS
75	30 - 60% of 95	51.6	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.95	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	80.4	PASS
175	5 - 9% of 174	8.38	PASS
176	95 - 101% of 174	95.5	PASS
177	5 - 9% of 176	6.66	PASS

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_006

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E11031 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E11031-BLK1	05/11/10 15:49	5.00	5.00
LCS	0E11031-BS1	05/11/10 15:49	5.00	5.00
32SB-DW02-0506	1004278-02	05/11/10 15:28	5.06	5.00
32SB-DW03-0304	1004278-04	05/11/10 15:28	5.65	5.00
32SB-ST01-0203	1004278-05	05/11/10 15:28	5.86	5.00

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_006

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Matrix: Laboratory ID: 0E11031-BLK1 File ID: V4BLK02.D

Sampled: Prepared: Analyzed: 05/12/10 00:53

Solids: Preparation: 5035 Dilution:

Batch: 0E11031 Sequence: 0E13517 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	Y, U
108-88-3	Toluene		0.860	10.0	Y, U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	34.40	115	85 - 120	
Dibromofluoromethane	30.00	34.06	114	80 - 125	
1,2-Dichloroethane-d4	30.00	34.24	114	75 - 140	
Toluene-d8	30.00	31.60	105	85 - 115	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13320	Instrument:	MS-VOA5
		Calibration:	0124001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E13320-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/11/10 14:36		
Bromofluorobenzene	30.00	93.6	80 - 120	18.207	18.207	0.0000	+/-1.000	
Dibromofluoromethane	30.00	100	80 - 120	12.265	12.265	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	94.4	80 - 120	12.964	12.964	0.0000	+/-1.000	
Toluene-d8	30.00	92.8	80 - 120	16.014	16.014	0.0000	+/-1.000	
LCS (0E11046-BS1) ug/L				Lab File ID: V5-LCS1.D		Analyzed: 05/11/10 15:54		
Bromofluorobenzene	30.00	100	75 - 120	18.211	18.207	0.0040	+/-1.000	
Dibromofluoromethane	30.00	106	85 - 115	12.259	12.265	-0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	102	70 - 120	12.958	12.964	-0.0060	+/-1.000	
Toluene-d8	30.00	98.7	85 - 120	16.007	16.014	-0.0070	+/-1.000	
Blank (0E11046-BLK1) ug/L				Lab File ID: V5-BLK4.D		Analyzed: 05/11/10 18:10		
Bromofluorobenzene	30.00	103	75 - 120	18.206	18.207	-0.0010	+/-1.000	
Dibromofluoromethane	30.00	105	85 - 115	12.254	12.265	-0.0110	+/-1.000	
1,2-Dichloroethane-d4	30.00	105	70 - 120	12.953	12.964	-0.0110	+/-1.000	
Toluene-d8	30.00	111	85 - 120	16.003	16.014	-0.0110	+/-1.000	
Trip Blank #7852 (1004278-06) ug/L				Lab File ID: 0427806.D		Analyzed: 05/11/10 18:42		
Bromofluorobenzene	30.00	105	75 - 120	18.197	18.207	-0.0100	+/-1.000	
Dibromofluoromethane	30.00	105	85 - 115	12.255	12.265	-0.0100	+/-1.000	
1,2-Dichloroethane-d4	30.00	106	70 - 120	12.944	12.964	-0.0200	+/-1.000	
Toluene-d8	30.00	112	85 - 120	16.003	16.014	-0.0110	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13517	Instrument:	MS-VOA4
		Calibration:	0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E13517-CCV1) ug/L				Lab File ID: SEQ-CCV3.D		Analyzed: 05/11/10 23:21		
Bromofluorobenzene	30.00	90.1	80 - 120	18.291	18.291	0.0000	+/-1.000	
Dibromofluoromethane	30.00	106	80 - 120	12.298	12.298	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	96.9	80 - 120	12.977	12.977	0.0000	+/-1.000	
Toluene-d8	30.00	99.7	80 - 120	16.037	16.037	0.0000	+/-1.000	
LCS (0E11031-BS1) ug/Kg wet				Lab File ID: V4LCS03.D		Analyzed: 05/11/10 23:51		
Bromofluorobenzene	30.00	99.6	85 - 120	18.291	18.291	0.0000	+/-1.000	
Dibromofluoromethane	30.00	108	80 - 125	12.298	12.298	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	100	75 - 140	12.987	12.977	0.0100	+/-1.000	
Toluene-d8	30.00	99.9	85 - 115	16.037	16.037	0.0000	+/-1.000	
Blank (0E11031-BLK1) ug/Kg wet				Lab File ID: V4BLK02.D		Analyzed: 05/12/10 00:53		
Bromofluorobenzene	30.00	115	85 - 120	18.298	18.291	0.0070	+/-1.000	
Dibromofluoromethane	30.00	114	80 - 125	12.296	12.298	-0.0020	+/-1.000	
1,2-Dichloroethane-d4	30.00	114	75 - 140	12.985	12.977	0.0080	+/-1.000	
Toluene-d8	30.00	105	85 - 115	16.035	16.037	-0.0020	+/-1.000	
32SB-DW02-0506 (1004278-02) ug/Kg dry				Lab File ID: 0427802.D		Analyzed: 05/12/10 04:27		
Bromofluorobenzene	37.85	109	85 - 120	18.298	18.291	0.0070	+/-1.000	
Dibromofluoromethane	37.85	108	80 - 125	12.306	12.298	0.0080	+/-1.000	
1,2-Dichloroethane-d4	37.85	93.4	75 - 140	12.985	12.977	0.0080	+/-1.000	
Toluene-d8	37.85	103	85 - 115	16.035	16.037	-0.0020	+/-1.000	
32SB-DW03-0304 (1004278-04) ug/Kg dry				Lab File ID: 0427804.D		Analyzed: 05/12/10 04:58		
Bromofluorobenzene	32.11	113	85 - 120	18.295	18.291	0.0040	+/-1.000	
Dibromofluoromethane	32.11	109	80 - 125	12.303	12.298	0.0050	+/-1.000	
1,2-Dichloroethane-d4	32.11	95.1	75 - 140	12.992	12.977	0.0150	+/-1.000	
Toluene-d8	32.11	108	85 - 115	16.042	16.037	0.0050	+/-1.000	
32SB-ST01-0203 (1004278-05) ug/Kg dry				Lab File ID: 0427805.D		Analyzed: 05/12/10 05:29		
Bromofluorobenzene	30.79	112	85 - 120	18.297	18.291	0.0060	+/-1.000	
Dibromofluoromethane	30.79	108	80 - 125	12.295	12.298	-0.0030	+/-1.000	
1,2-Dichloroethane-d4	30.79	96.9	75 - 140	12.983	12.977	0.0060	+/-1.000	
Toluene-d8	30.79	104	85 - 115	16.034	16.037	-0.0030	+/-1.000	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E11031	Laboratory ID:	0E11031-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	48.87	97.7	75 - 125
Ethylbenzene	50.00	43.35	86.7	75 - 125
Toluene	50.00	44.68	89.4	70 - 125
Xylenes (total)	150.0	130.0	86.6	75 - 125

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Water		
Batch:	0E11046	Laboratory ID:	0E11046-BS1
Preparation:	5030B	Initial/Final:	5 mL / 5 mL

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	51.1	102	80 - 120
Ethylbenzene	50.00	49.4	98.8	75 - 125
Toluene	50.00	49.0	97.9	75 - 120
Xylenes (total)	150.0	156	104	75 - 130

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13320	Instrument:	MS-VOA5
		Calibration:	0124001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E13320-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/11/10 14:36			
Fluorobenzene	944696	14.046	695352	12.023	136	50 - 200	2.0230	+/-0.50	
Chlorobenzene-d5	401372	17.263	278722	15.624	144	50 - 200	1.6390	+/-0.50	
1,4-Dichlorobenzene-d4	391606	19.25	348853	17.483	112	50 - 200	1.7670	+/-0.50	
LCS (0E11046-BS1)			Lab File ID: V5-LCS1.D			Analyzed: 05/11/10 15:54			
Fluorobenzene	848093	14.04	944696	14.046	90	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	347998	17.257	401372	17.263	87	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	352478	19.244	391606	19.25	90	50 - 200	-0.0060	+/-0.50	
Blank (0E11046-BLK1)			Lab File ID: V5-BLK4.D			Analyzed: 05/11/10 18:10			
Fluorobenzene	795780	14.035	944696	14.046	84	50 - 200	-0.0110	+/-0.50	
Chlorobenzene-d5	297192	17.252	401372	17.263	74	50 - 200	-0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	280031	19.249	391606	19.25	72	50 - 200	-0.0010	+/-0.50	
Trip Blank #7852 (1004278-06)			Lab File ID: 0427806.D			Analyzed: 05/11/10 18:42			
Fluorobenzene	792531	14.026	944696	14.046	84	50 - 200	-0.0200	+/-0.50	
Chlorobenzene-d5	292126	17.253	401372	17.263	73	50 - 200	-0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	278291	19.24	391606	19.25	71	50 - 200	-0.0100	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13517	Instrument:	MS-VOA4
		Calibration:	0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E13517-CCV1)			Lab File ID: SEQ-CCV3.D			Analyzed: 05/11/10 23:21			
Fluorobenzene	468484	14.05	672772	14.056	70	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	241095	17.316	278531	17.313	87	50 - 200	0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	174163	19.373	217185	19.369	80	50 - 200	0.0040	+/-0.50	
LCS (0E11031-BS1)			Lab File ID: V4LCS03.D			Analyzed: 05/11/10 23:51			
Fluorobenzene	465286	14.05	468484	14.05	99	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	236420	17.316	241095	17.316	98	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	189130	19.373	174163	19.373	109	50 - 200	0.0000	+/-0.50	
Blank (0E11031-BLK1)			Lab File ID: V4BLK02.D			Analyzed: 05/12/10 00:53			
Fluorobenzene	511755	14.047	468484	14.05	109	50 - 200	-0.0030	+/-0.50	
Chlorobenzene-d5	240713	17.314	241095	17.316	100	50 - 200	-0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	241226	19.371	174163	19.373	139	50 - 200	-0.0020	+/-0.50	
32SB-DW02-0506 (1004278-02)			Lab File ID: 0427802.D			Analyzed: 05/12/10 04:27			
Fluorobenzene	503248	14.058	468484	14.05	107	50 - 200	0.0080	+/-0.50	
Chlorobenzene-d5	226066	17.314	241095	17.316	94	50 - 200	-0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	227403	19.371	174163	19.373	131	50 - 200	-0.0020	+/-0.50	
32SB-DW03-0304 (1004278-04)			Lab File ID: 0427804.D			Analyzed: 05/12/10 04:58			
Fluorobenzene	514936	14.054	468484	14.05	110	50 - 200	0.0040	+/-0.50	
Chlorobenzene-d5	234553	17.321	241095	17.316	97	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	225176	19.378	174163	19.373	129	50 - 200	0.0050	+/-0.50	
32SB-ST01-0203 (1004278-05)			Lab File ID: 0427805.D			Analyzed: 05/12/10 05:29			
Fluorobenzene	505521	14.056	468484	14.05	108	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	226412	17.313	241095	17.316	94	50 - 200	-0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	234217	19.369	174163	19.373	134	50 - 200	-0.0040	+/-0.50	

HOLDING TIME SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_006

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SB-DW02-0506	04/28/10 13:41	04/29/10 08:30	05/11/10 15:28	N/A	14.00	05/12/10 04:27	13.62	14.00	
32SB-DW03-0304	04/28/10 14:30	04/29/10 08:30	05/11/10 15:28	N/A	14.00	05/12/10 04:58	13.60	14.00	
32SB-ST01-0203	04/28/10 12:05	04/29/10 08:30	05/11/10 15:28	N/A	14.00	05/12/10 05:29	13.73	14.00	
Trip Blank #7852	04/28/10 00:00	04/29/10 08:30	05/11/10 00:00	N/A	14.00	05/11/10 18:42	13.78	14.00	

ANALYSIS SEQUENCE SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	9L35713	Instrument:	MS-BNA4
Calibration:	0098001		

Sample Name	Lab Sample ID	Lab File ID.	Analysis Date/Time
MS Tune	9L35713-TUN1	DF1112B1.D	11/12/09 15:24
Cal Standard	9L35713-CAL2	cal2.D	11/12/09 15:43
Cal Standard	9L35713-CAL3	cal3.D	11/12/09 16:16
Cal Standard	9L35713-CAL4	cal4.D	11/12/09 16:50
Cal Standard	9L35713-CAL5	cal5.D	11/12/09 17:24
Cal Standard	9L35713-CAL6	cal6.D	11/12/09 17:58
Cal Standard	9L35713-CAL7	cal7.D	11/12/09 18:32
Cal Standard	9L35713-CAL8	cal8.D	11/12/09 19:06
Cal Standard	9L35713-CAL9	cal9.D	11/12/09 19:40
Cal Standard	9L35713-CALA	cal10.D	11/12/09 20:14
Cal Standard	9L35713-CALB	cal11.D	11/12/09 20:48
Cal Standard	9L35713-CALC	cal12.D	11/12/09 21:22
Initial Cal Check	9L35713-ICV1	ICV1.D	11/12/09 21:55

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	DF1112B1.D	Injection Date:	11/12/09
Instrument ID:	MS-BNA4	Injection Time:	15:24
Sequence:	9L35713	Lab Sample ID:	9L35713-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	42.1	PASS
68	Less than 2% of 69	1.55	PASS
69	Less than 200% of 198	48.6	PASS
70	Less than 2% of 69	0.491	PASS
127	40 - 60% of 198	54.8	PASS
197	Less than 1% of 198	0.528	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.05	PASS
275	10 - 30% of 198	21.8	PASS
365	1 - 200% of 198	2.27	PASS
441	0.001 - 100% of 443	77.8	PASS
442	40 - 200% of 198	60.7	PASS
443	17 - 23% of 442	20.7	PASS

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0098001	Instrument:	MS-BNA4
Matrix:	Water	Calibration Date:	11/12/2009 11:02:39AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.7457972	3.344503	9.800818	0.1353256			CCC (30)	
Acenaphthylene	0.9996575	4.521048	9.399819	0.1010786			15	
Anthracene	0.9948455	3.948054	13.76409	0.1121442			15	
Benzo(a)anthracene	0.7581512	9.598749	21.23564	8.644244E-02			15	
Benzo(a)pyrene	0.9592349	4.958823	25.12336	4.929242E-02			CCC (30)	
Benzo(b)fluoranthene	1.176864	5.852981	24.48764	8.052193E-02			15	
Benzo(g,h,i)perylene	0.8650452	8.212902	27.60627	8.125964E-02			15	
Benzo(k)fluoranthene	1.169451	7.140033	24.55273	7.841296E-02			15	
Chrysene	0.7324149	6.693602	21.33455	9.451961E-02			15	
Dibenz(a,h)anthracene	0.7647294	14.42237	27.17082	6.002815E-02			15	
Fluoranthene	1.030294	4.044356	17.02718	8.925874E-02			CCC (30)	
Fluorene	0.7457374	2.820772	11.06573	0.1195426			15	
2-Fluorobiphenyl	0.8655987	4.501562	8.293182	0.1186146			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	0.7715006	14.30866	27.10836	7.208997E-02			15	
1-Methylnaphthalene	0.7407783	4.834185	7.780455	0.1110235			15	
2-Methylnaphthalene	0.8009425	4.585363	7.604364	0.1026839			15	
Naphthalene	1.224033	6.200049	6.526273	0.1202152			15	
Nitrobenzene-d5							15	
Phenanthrene	1.064344	3.658701	13.61682	0.1199225			15	
Phenol-d6							15	
Pyrene	1.038027	4.119068	17.66	9.533415E-02			15	
Terphenyl-d14	0.776943	6.066613	18.31836	7.278378E-02			15	
2,4,6-Tribromophenol	0.1486418	13.96698	11.68556	0.1738714			15	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0098001
Lab File ID:	ICV1.D	Calibration Date:	11/12/09 11:02
Sequence:	9L35713	Injection Date:	11/12/09
Lab Sample ID:	9L35713-ICV1	Injection Time:	21:55

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Acenaphthene	A	5.000	5.088	0.7457972	0.7589529		1.8	20
Acenaphthylene	A	5.000	4.650	0.9996575	0.9296487		-7.0	20
Anthracene	A	5.000	5.306	0.9948455	1.055827		6.1	20
Benzo(a)anthracene	A	5.000	5.736	0.7581512	0.8697518		14.7	20
Benzo(a)pyrene	A	5.000	5.183	0.9592349	0.9943783		3.7	20
Benzo(b)fluoranthene	A	5.000	5.289	1.176864	1.244926		5.8	20
Benzo(g,h,i)perylene	A	5.000	4.944	0.8650452	0.8554135		-1.1	20
Benzo(k)fluoranthene	A	5.000	5.441	1.169451	1.272709		8.8	20
Chrysene	A	5.000	5.780	0.7324149	0.8467581		15.6	20
Dibenz(a,h)anthracene	A	5.000	5.176	0.7647294	0.7916294		3.5	20
Fluoranthene	A	5.000	5.472	1.030294	1.127536		9.4	20
Fluorene	A	5.000	5.185	0.7457374	0.7733265		3.7	20
Indeno(1,2,3-cd)pyrene	A	5.000	5.140	0.7715006	0.7930895		2.8	20
1-Methylnaphthalene	A	5.000	4.490	0.7407783	0.6652298		-10.2	20
2-Methylnaphthalene	A	5.000	4.750	0.8009425	0.7609113		-5.0	20
Naphthalene	A	5.000	4.862	1.224033	1.190144		-2.8	20
Phenanthrene	A	5.000	5.149	1.064344	1.096091		3.0	20
Pyrene	A	5.000	5.519	1.038027	1.145716		10.4	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16811	Instrument:	MS-BNA4
Calibration:	0098001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16811-TUN1	SEQ-TUN1.D	06/12/10 16:42
Calibration Check	0F16811-CCV1	SEQ-CCV1.D	06/12/10 17:00
LCS	0E12916-BS1	E12916L1.D	06/12/10 17:34
Blank	0E12916-BLK1	E12916B1.D	06/12/10 18:08

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/12/10
Instrument ID:	MS-BNA4	Injection Time:	16:42
Sequence:	0F16811	Lab Sample ID:	0F16811-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	45.4	PASS
68	Less than 2% of 69	1.51	PASS
69	Less than 200% of 198	45.6	PASS
70	Less than 2% of 69	0.454	PASS
127	40 - 60% of 198	53.4	PASS
197	Less than 1% of 198	0.91	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.82	PASS
275	10 - 30% of 198	25.5	PASS
365	1 - 200% of 198	3.42	PASS
441	0.001 - 100% of 443	80.2	PASS
442	40 - 200% of 198	110	PASS
443	17 - 23% of 442	20.3	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0098001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	11/12/09 11:02
Sequence:	0F16811	Injection Date:	06/12/10
Lab Sample ID:	0F16811-CCV1	Injection Time:	17:00

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.043	0.7457972	0.7522569		0.9	20
Acenaphthylene	A	5.000	5.791	0.9996575	1.157801		15.8	20
Anthracene	A	5.000	5.642	0.9948455	1.122525		12.8	20
Benzo(a)anthracene	A	5.000	5.638	0.7581512	0.8549192		12.8	20
Benzo(a)pyrene	A	5.000	6.082	0.9592349	1.166799		21.6	20 *
Benzo(b)fluoranthene	A	5.000	5.548	1.176864	1.305847		11.0	20
Benzo(g,h,i)perylene	A	5.000	6.901	0.8650452	1.193916		38.0	20 *
Benzo(k)fluoranthene	A	5.000	5.336	1.169451	1.248142		6.7	20
Chrysene	A	5.000	5.618	0.7324149	0.8230109		12.4	20
Dibenz(a,h)anthracene	A	5.000	7.115	0.7647294	1.088262		42.3	20 *
Fluoranthene	A	5.000	5.511	1.030294	1.135606		10.2	20
Fluorene	A	5.000	5.120	0.7457374	0.763614		2.4	20
Indeno(1,2,3-cd)pyrene	A	5.000	7.330	0.7715006	1.131013		46.6	20 *
1-Methylnaphthalene	A	5.000	4.652	0.7407783	0.6892082		-7.0	20
2-Methylnaphthalene	A	5.000	4.927	0.8009425	0.7893271		-1.5	20
Naphthalene	A	5.000	4.704	1.224033	1.151455		-5.9	20
Phenanthrene	A	5.000	5.280	1.064344	1.123966		5.6	20
Pyrene	A	5.000	5.612	1.038027	1.16513		12.2	20
2-Fluorobiphenyl	A	5.000	4.781	0.8655987	0.8276989		-4.4	20
Terphenyl-d14	A	5.000	5.380	0.776943	0.8360064		7.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16819	Instrument:	MS-BNA4
Calibration:	0098001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16819-TUN1	SEQ-TUN2.D	06/13/10 05:31
Calibration Check	0F16819-CCV1	SEQ-CCV2.D	06/13/10 05:49
32SS-DW02-0002	1004278-01	0427801.D	06/13/10 08:06
32SB-DW02-0506	1004278-02	0427802.D	06/13/10 08:40
32SS-DW03-0002	1004278-03	0427803.D	06/13/10 09:14
32SB-DW03-0304	1004278-04	0427804.D	06/13/10 09:48
32SB-ST01-0203	1004278-05	0427805.D	06/13/10 10:22

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	06/13/10
Instrument ID:	MS-BNA4	Injection Time:	05:31
Sequence:	0F16819	Lab Sample ID:	0F16819-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	55.2	PASS
68	Less than 2% of 69	1.63	PASS
69	Less than 200% of 198	53.6	PASS
70	Less than 2% of 69	0.425	PASS
127	40 - 60% of 198	57.8	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.95	PASS
275	10 - 30% of 198	24.7	PASS
365	1 - 200% of 198	3.16	PASS
441	0.001 - 100% of 443	81.6	PASS
442	40 - 200% of 198	94.6	PASS
443	17 - 23% of 442	20.2	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0098001
Lab File ID:	SEQ-CCV2.D	Calibration Date:	11/12/09 11:02
Sequence:	0F16819	Injection Date:	06/13/10
Lab Sample ID:	0F16819-CCV1	Injection Time:	05:49

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.424	0.7457972	0.8090222		8.5	20
Acenaphthylene	A	5.000	6.090	0.9996575	1.217513		21.8	20 *
Anthracene	A	5.000	5.713	0.9948455	1.136646		14.3	20
Benzo(a)anthracene	A	5.000	6.477	0.7581512	0.9820744		29.5	20 *
Benzo(a)pyrene	A	5.000	6.126	0.9592349	1.175167		22.5	20 *
Benzo(b)fluoranthene	A	5.000	5.572	1.176864	1.31156		11.4	20
Benzo(g,h,i)perylene	A	5.000	6.593	0.8650452	1.140621		31.9	20 *
Benzo(k)fluoranthene	A	5.000	5.763	1.169451	1.348021		15.3	20
Chrysene	A	5.000	6.522	0.7324149	0.9553999		30.4	20 *
Dibenz(a,h)anthracene	A	5.000	6.722	0.7647294	1.028063		34.4	20 *
Fluoranthene	A	5.000	5.761	1.030294	1.187194		15.2	20
Fluorene	A	5.000	5.177	0.7457374	0.7721668		3.5	20
Indeno(1,2,3-cd)pyrene	A	5.000	6.865	0.7715006	1.059279		37.3	20 *
1-Methylnaphthalene	A	5.000	5.023	0.7407783	0.7441617		0.5	20
2-Methylnaphthalene	A	5.000	5.294	0.8009425	0.8480131		5.9	20
Naphthalene	A	5.000	5.208	1.224033	1.274962		4.2	20
Phenanthrene	A	5.000	5.402	1.064344	1.149954		8.0	20
Pyrene	A	5.000	5.955	1.038027	1.236389		19.1	20
2-Fluorobiphenyl	A	5.000	5.223	0.8655987	0.9041852		4.5	20
Terphenyl-d14	A	5.000	5.642	0.776943	0.8767094		12.8	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_006

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E12916 Batch Matrix: Solid Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E12916-BLK1	05/12/10 19:30	15.00	1.00
LCS	0E12916-BS1	05/12/10 19:30	15.00	1.00
32SS-DW02-0002	1004278-01	05/12/10 19:30	15.00	1.00
32SB-DW02-0506	1004278-02	05/12/10 19:30	15.00	1.00
32SS-DW03-0002	1004278-03	05/12/10 19:30	15.00	1.00
32SB-DW03-0304	1004278-04	05/12/10 19:30	15.00	1.00
32SB-ST01-0203	1004278-05	05/12/10 19:30	15.00	1.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E12916-BLK1	File ID:	E12916B1.D
Sampled:		Prepared:		Analyzed:	06/12/10 18:08
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E12916 Sequence: 0F16811 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.33	6.67	U
50-32-8	Benzo(a)pyrene		1.33	5.00	X, U
205-99-2	Benzo(b)fluoranthene		1.33	6.67	U
207-08-9	Benzo(k)fluoranthene		1.33	6.67	U
218-01-9	Chrysene		1.33	6.67	U
53-70-3	Dibenz(a,h)anthracene		1.33	5.00	X, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.33	6.67	X, U
91-20-3	Naphthalene		1.33	5.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	2650	79.5	14 - 129	
Terphenyl-d14	3333	2390	71.7	14 - 129	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16811	Instrument:	MS-BNA4
		Calibration:	0098001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16811-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 06/12/10 17:00		
2-Fluorobiphenyl	5.000	95.6	80 - 120	7.865	7.865	0.0000	+/-0.500	
Terphenyl-d14	5.000	108	80 - 120	17.765	17.765	0.0000	+/-0.500	
LCS (0E12916-BS1) ug/Kg wet				Lab File ID: E12916L1.D		Analyzed: 06/12/10 17:34		
2-Fluorobiphenyl	3333	78.0	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3333	69.5	14 - 129	17.775	17.765	0.0100	+/-0.500	
Blank (0E12916-BLK1) ug/Kg wet				Lab File ID: E12916B1.D		Analyzed: 06/12/10 18:08		
2-Fluorobiphenyl	3333	79.5	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	3333	71.7	14 - 129	17.784	17.765	0.0190	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16819	Instrument:	MS-BNA4
		Calibration:	0098001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16819-CCV1) ug/mL				Lab File ID: SEQ-CCV2.D		Analyzed: 06/13/10 05:49		
2-Fluorobiphenyl	5.000	104	80 - 120	7.865	7.865	0.0000	+/-0.500	
Terphenyl-d14	5.000	113	80 - 120	17.756	17.756	0.0000	+/-0.500	
32SS-DW02-0002 (1004278-01) ug/Kg dry				Lab File ID: 0427801.D		Analyzed: 06/13/10 08:06		
2-Fluorobiphenyl	4131	85.8	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	4131	86.8	14 - 129	17.775	17.756	0.0190	+/-0.500	
32SB-DW02-0506 (1004278-02) ug/Kg dry				Lab File ID: 0427802.D		Analyzed: 06/13/10 08:40		
2-Fluorobiphenyl	4256	79.7	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	4256	87.9	14 - 129	17.784	17.756	0.0280	+/-0.500	
32SS-DW03-0002 (1004278-03) ug/Kg dry				Lab File ID: 0427803.D		Analyzed: 06/13/10 09:14		
2-Fluorobiphenyl	4232	77.4	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	4232	76.2	14 - 129	17.775	17.756	0.0190	+/-0.500	
32SB-DW03-0304 (1004278-04) ug/Kg dry				Lab File ID: 0427804.D		Analyzed: 06/13/10 09:48		
2-Fluorobiphenyl	4031	89.4	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	4031	87.9	14 - 129	17.784	17.756	0.0280	+/-0.500	
32SB-ST01-0203 (1004278-05) ug/Kg dry				Lab File ID: 0427805.D		Analyzed: 06/13/10 10:22		
2-Fluorobiphenyl	4010	84.4	14 - 129	7.874	7.865	0.0090	+/-0.500	
Terphenyl-d14	4010	82.7	14 - 129	17.775	17.756	0.0190	+/-0.500	

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E12916	Laboratory ID:	0E12916-BS1
Preparation:	EXT_3546	Initial/Final:	15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.67	58.89	88.3	31 - 146
Benzo(a)pyrene	66.67	52.35	78.5	28 - 128
Benzo(b)fluoranthene	66.67	54.21	81.3	30 - 139
Benzo(k)fluoranthene	66.67	55.37	83.1	42 - 129
Chrysene	66.67	59.67	89.5	39 - 134
Dibenz(a,h)anthracene	66.67	65.76	98.6	30 - 138
Indeno(1,2,3-cd)pyrene	66.67	69.64	104	17 - 164
Naphthalene	66.67	51.94	77.9	29 - 106

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0F16811

SDG: CTOF273_006
Project: CTOF273 NSA Crane SMU32
Instrument: MS-BNA4
Calibration: 0098001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16811-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 06/12/10 17:00			
Phenanthrene-d10	210196	13.015	196258	13.55	107	50 - 200	-0.5350	+/-0.50	
Perylene-d12	141123	24.821	108221	25.217	130	50 - 200	-0.3960	+/-0.50	
LCS (0E12916-BS1)			Lab File ID: E12916L1.D			Analyzed: 06/12/10 17:34			
Phenanthrene-d10	137078	13.015	210196	13.015	65	50 - 200	0.0000	+/-0.50	
Perylene-d12	101741	24.821	141123	24.821	72	50 - 200	0.0000	+/-0.50	
Blank (0E12916-BLK1)			Lab File ID: E12916B1.D			Analyzed: 06/12/10 18:08			
Phenanthrene-d10	162612	13.015	210196	13.015	77	50 - 200	0.0000	+/-0.50	
Perylene-d12	105994	24.821	141123	24.821	75	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_006
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16819	Instrument:	MS-BNA4
		Calibration:	0098001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16819-CCV1)			Lab File ID: SEQ-CCV2.D			Analyzed: 06/13/10 05:49			
Phenanthrene-d10	161735	13.005	196258	13.55	82	50 - 200	-0.5450	+/-0.50	
Perylene-d12	125566	24.812	108221	25.217	116	50 - 200	-0.4050	+/-0.50	
32SS-DW02-0002 (1004278-01)			Lab File ID: 0427801.D			Analyzed: 06/13/10 08:06			
Phenanthrene-d10	159480	13.024	161735	13.005	99	50 - 200	0.0190	+/-0.50	
Perylene-d12	138158	24.84	125566	24.812	110	50 - 200	0.0280	+/-0.50	
32SB-DW02-0506 (1004278-02)			Lab File ID: 0427802.D			Analyzed: 06/13/10 08:40			
Phenanthrene-d10	191108	13.034	161735	13.005	118	50 - 200	0.0290	+/-0.50	
Perylene-d12	138982	24.84	125566	24.812	111	50 - 200	0.0280	+/-0.50	
32SS-DW03-0002 (1004278-03)			Lab File ID: 0427803.D			Analyzed: 06/13/10 09:14			
Phenanthrene-d10	166442	13.033	161735	13.005	103	50 - 200	0.0280	+/-0.50	
Perylene-d12	137132	24.84	125566	24.812	109	50 - 200	0.0280	+/-0.50	
32SB-DW03-0304 (1004278-04)			Lab File ID: 0427804.D			Analyzed: 06/13/10 09:48			
Phenanthrene-d10	158989	13.033	161735	13.005	98	50 - 200	0.0280	+/-0.50	
Perylene-d12	136701	24.84	125566	24.812	109	50 - 200	0.0280	+/-0.50	
32SB-ST01-0203 (1004278-05)			Lab File ID: 0427805.D			Analyzed: 06/13/10 10:22			
Phenanthrene-d10	146545	13.024	161735	13.005	91	50 - 200	0.0190	+/-0.50	
Perylene-d12	133239	24.84	125566	24.812	106	50 - 200	0.0280	+/-0.50	

HOLDING TIME SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_006

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SS-DW02-0002	04/28/10 13:41	04/29/10 08:30	05/12/10 19:30	14.24	14.00	06/13/10 08:06	31.53	40.00	
32SB-DW02-0506	04/28/10 13:41	04/29/10 08:30	05/12/10 19:30	14.24	14.00	06/13/10 08:40	31.55	40.00	
32SS-DW03-0002	04/28/10 14:30	04/29/10 08:30	05/12/10 19:30	14.21	14.00	06/13/10 09:14	31.57	40.00	
32SB-DW03-0304	04/28/10 14:30	04/29/10 08:30	05/12/10 19:30	14.21	14.00	06/13/10 09:48	31.60	40.00	
32SB-ST01-0203	04/28/10 12:05	04/29/10 08:30	05/12/10 19:30	14.31	14.00	06/13/10 10:22	31.62	40.00	

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**T. KLIMEK**	**DATE:**	**AUGUST 10, 2010**
FROM:	**JOSEPH KALINYAK**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION: VOC / PAH**
NSWC CRANE, CTO F273
SDG CTOF273_007

SAMPLES: 14 / Soil / VOC (benzene, ethyl benzene, toluene, total xylenes)

32SB-43-0506	32SB-44-0506	32SB-45-0607
32SB-46-0304	32SB-47-0506	32SB-48-0405
32SB-49-0405	32SB-50-0607	32SB-51-0708
32SB-51-1415	32SB-52-0809	32SB-52-1415
32SB-53-0910	32SB-FD042910-05	

26 / Soil / PAH

32SB-43-0506	32SB-44-0506	32SB-45-0607
32SB-46-0304	32SB-47-0506	32SB-48-0405
32SB-49-0405	32SB-50-0607	32SB-51-0708
32SB-51-1415	32SB-52-0809	32SB-52-1415
32SB-53-0910	32SB-FD042910-05	32SS-43-0002
32SS-44-0002	32SS-45-0002	32SS-46-0002
32SS-47-0002	32SS-48-0002	32SS-49-0002
32SS-50-0002	32SS-51-0002	32SS-52-0002
32SS-53-0002	32SS-FD042910-05	

OVERVIEW

The sample set for NSWC Crane, CTO F273, SDG CTOF273_007 consisted of twenty-six (26) soil samples including two (2) field duplicate samples. Fourteen (14) samples were analyzed for a short list of four (4) volatile organic compounds (VOC), benzene, ethyl benzene, toluene, and total xylenes, and all twenty-six (26) samples were analyzed for a list of eight (8) polynuclear aromatic hydrocarbons (PAH), benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene. The two (2) field duplicate pairs included in this sample delivery group (SDG) were: 32SB-FD042910-05 / 32SB-50-0607 and 32SS-FD042910-05 / 32SS-50-0002.

The samples were collected by TetraTech NUS on April 29, 2010 and analyzed by Empirical Laboratories, LLC. All analyses were conducted using USEPA SW-846 Methods 8260B and 8270C analytical and reporting protocols.

The data contained in this SDG were fully validated with regard to the following parameters:

- Data Completeness
- Holding Times
- * GC/MS Tuning
- Initial and Continuing Calibration
- * Laboratory Blank Analyses
- Surrogate Recoveries
- * Blank Spike/Blank Spike Duplicate Results
- Internal Standard Recoveries
- Field Duplicate Results

* • Compound Quantitation
* • Compound Identification
* • Detection Limits

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

VOC

The CCV percent difference (%D) for benzene was greater than the 25% quality control limit for instrument MS-VOA1 on 05/23/10 @ 08:16 affecting sample 32SB-51-1415. The non-detected benzene results for the aforementioned sample was qualified estimated, (UJ).

The sample to analysis hold time quality control limit of 14 days was exceeded by <2X for all soil samples analyzed for VOCs. All positive and non-detected VOC analytes for the soil samples were qualified estimated, (J) and (UJ), respectively.

The initial analysis of sample 32SB-44-0506 had percent recoveries (%R) for two internal standards less than the quality control limit (and >45%). The sample was not re-analyzed by the laboratory and all analytes of interest were quantitated with these two internal standards. The positive and non-detected VOC results for sample 32SB-44-0506 were qualified estimated, (J) and (UJ), respectively.

The surrogate %R was greater than the quality control limit for bromofluorobenzene for samples 32SB-44-0506 and 32SB-45-0607. The aforementioned sample positive VOC results for the samples were qualified estimated, (J), and the non-detected VOC results were not qualified.

The surrogate %Rs were greater than the quality control limit for bromofluorobenzene and toluene-d8 for sample 32SB-50-0607. The aforementioned sample positive VOC results for the sample was qualified estimated, (J), and the non-detected VOC results were not qualified.

The surrogate %Rs were greater than the quality control limit for bromofluorobenzene and toluene-d8 for sample 32SB-51-0708. The non-detected results were not qualified.

The surrogate %R was greater than the quality control limit for bromofluorobenzene for samples 32SB-52-0809, 32SB-48-0405, and 32SB-51-0708 (50X dilution). All results for the samples were non-detected which were not qualified.

The surrogate %R was less than the quality control limit for 1,2-dichloroethane-d4 for CCV 0F15210-CCV1. No action was taken for this issue.

Samples 32SB-43-0506, 32SB-44-0506, 32SB-45-0607, 32SB-46-0304, 32SB-47-0506, 32SB-48-0405, 32SB-49-0405, 32SB-50-0607, 32SB-51-0708, 32SB-51-1415, 32SB-53-0910, and 32SB-FD042910-05 were diluted 50X for the VOC analysis. This resulted in the sample non-detected results exceeding the Project Quantitation Limit Goals (PQL) for benzene and ethyl benzene. The laboratory provided no explanation for the necessity to dilute the samples for the analysis of non-detected VOCs.

The surrogate recovery for 1,2-dichloroethane-d4 was not included by the laboratory on the Surrogate Standard Recovery and Retention Time Summary Form for a continuing calibration verification (CCV) 0E14205-CCV1. The laboratory raw data was reviewed and the result was manually entered on to the form.

PAH

The sample to extraction hold time of 14 days was exceeded for samples 32SB-FD042910-05 and 32SS-FD042910-05 by more than half a day but <2X the hold time. The non-detected results for the aforementioned samples were qualified estimated, (UJ).

The CCV percent difference (%D) for benzo(k)fluoranthene was greater than the 25% quality control limit for instrument MS-BNA3 on 05/24/10 @ 09:29 affecting samples 32SB-51-1415, 32SS-52-0002, 32SB-52-0809, 32SB-52-1415, 32SS-53-0002, and 32SB-53-0910. The positive and non-detected benzo(k)fluoranthene results for the aforementioned samples were qualified estimated, (J) and (UJ).

The CCV percent difference (%D) for chrysene was greater than the 25% quality control limit for instrument MS-BNA3 on 06/13/10 @ 00:34 affecting samples 32SB-FD042910-05, 32SS-43-0002, 32SB-43-0506, 32SS-44-0002, 32SB-44-0506, 32SS-45-0002, 32SB-45-0607, 32SS-47-0002, 32SB-47-0506, 32SS-48-0002, 32SB-48-0405, 32SB-49-0405, 32SS-50-0002, 32SS-51-0002, and 32SS-49-0002. The positive and non-detected chrysene results for the aforementioned samples were qualified estimated, (J) and (UJ), respectively.

The CCV percent difference (%D) for dibenzo(a,h)anthracene was greater than the 25% quality control limit for instrument MS-BNA3 on 06/13/10 @ 13:34 affecting samples 32SB-46-0304 and 32SS-46-0002. The non-detected dibenzo(a,h)anthracene results for the aforementioned samples were qualified estimated, (UJ).

The %R for the internal standard phenanthrene-d10 was less than the quality control limit (and . 49%) for sample 32SB-50-0607. No re-analysis of the sample was performed. The positive and non-detected PAH results for the analytes associated with this internal standard, benzo(a)anthracene, naphthalene, and chrysene, were qualified estimated, (J) and (UJ), respectively.

Sample 32SS-FD042919-05 was analyzed at a 50X dilution, resulting in elevated reporting limits and minimum detection limits for the non-detected analytes. As a result of the elevated reporting limits the aforementioned samples 32SS-FD042919-05 non-detected dibenzo(a,h)anthracene and benzo(a)pyrene results was greater than the project quantitation level (PQL) listed in the Statement of Work (SOW).

Samples 32SB-46-0304 and 32SS-46-0002 were analyzed at a 5X dilution resulting in elevated reporting limits and minimum detection limits for the non-detected analytes. Sample 32SS-46-0002 benzo(a)pyrene and dibenzo(a,h)anthracene non-detected results were greater than the PQL goals listed in the SOW. Samples 32SB-46-0304 naphthalene non-detected results were greater than the PQL goals listed in the SOW.

Samples 32SB-50-0607, 32SB-51-0708, 32SB-52-0809, and 32SB-53-0910 were analyzed at a 10X dilution resulting in elevated reporting limits and minimum detection limits for the non-detected analytes. The sample 32SB-53-0910 non-detected naphthalene results were greater than the PQL goals listed in the SOW.

The relative percent difference (RPD) for naphthalene for the field duplicate samples 32SB-FD042910-05 and 32SB-50-0607 was greater than the 50% field duplicate quality control limit. The positive and non-detected naphthalene results for the aforementioned samples were qualified estimated, (J) and (UJ), respectively.

ADDITIONAL COMMENTS

Positive results less than the reporting limit (RL) were qualified as estimated, (J), due to uncertainty near the detection limit.

EXECUTIVE SUMMARY

Laboratory Performance Issues: The sample 32SB-51-1415 non-detected benzene result was qualified due to a continuing calibration verification quality control limit exceedance. The sample to analysis hold time was exceeded for all samples for the VOC analysis resulting in the qualification of all VOC sample results. Sample 32SB-44-0506 VOC results were qualified due to internal standard percent recoveries less than the quality control limit. Sample VOC positive and non-detected results were qualified due to surrogate percent recoveries greater than the quality control limit. Samples 32SB-FD042910-05 and 32SS-FD042910-05 PAH results were qualified due to exceeding the sample to extraction hold time. PAH continuing calibration verification quality control limit exceedances resulted in the qualification of sample positive and non-detected PAH results. Sample 32SB-50-0607 PAH results for benzo(a)anthracene, naphthalene, and chrysene were qualified due to the %R for an internal standard less than the quality control limit.

Other factors affecting data quality: Positive results less than the reporting limit (RL) were qualified estimated, (J), due to uncertainty near the detection limit. Dilution of samples for both the VOC and PAH analyses resulted in elevated minimum detection and reporting limits. Some of these VOC and PAH dilution analyses non-detected results exceeded the PQLs listed in the SOW. Samples 32SB-FD042910-05 and 32SB-50-0607 naphthalene results were qualified due to field duplicate RPD imprecision.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999) and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006). The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech NUS
Joseph Kalinyak
Chemist/Data Validator

TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Value Qualifier Key (Val Qual)

J – The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

UJ – The result is an estimated non-detected quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

U - Value is a non-detect as reported by the laboratory.

UR – Non-detected result is considered rejected, (UR), as a result of technical non-compliances.

DATA QUALIFICATION CODE (QUAL CODE)

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's r < 0.995 / ICP PDS Recovery Noncompliance
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; e.g. chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient r < 0.995
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 02111	NSAMPLE	32SB-43-0506			32SB-44-0506			32SB-45-0607			32SB-46-0304		
SDG: CTOF273_007	LAB_ID	1004294-04			1004294-06			1004294-08			1004294-10		
FRACTION: OV	SAMP_DATE	4/29/2010			4/29/2010			4/29/2010			4/29/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	83.3			81.4			82.5			87.4		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		23.2	UJ	H	25.3	UJ	HN	46.9	J	HPR	23.7	UJ	H
ETHYLBENZENE		37	UJ	H	40.3	UJ	HN	304	J	HPR	37.8	UJ	H
TOLUENE		42.4	UJ	H	46.2	UJ	HN	46.8	UJ	H	43.3	UJ	H
TOTAL XYLENES		34.5	UJ	H	91.2	J	HNPR	1200	J	HR	35.3	UJ	H

PROJ_NO: 02111	NSAMPLE	32SB-47-0506			32SB-48-0405			32SB-49-0405			32SB-50-0607		
SDG: CTOF273_007	LAB_ID	1004294-12			1004294-14			1004294-16			1004294-18		
FRACTION: OV	SAMP_DATE	4/29/2010			4/29/2010			4/29/2010			4/29/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	84.9			86.2			83.2			91.6		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		22.5	UJ	H	21.4	UJ	H	327	J	H	27.4	UJ	H
ETHYLBENZENE		35.9	UJ	H	34.2	UJ	H	114	J	HP	87.5	J	HPR
TOLUENE		41.2	UJ	H	39.2	UJ	H	64.4	J	HP	50.1	UJ	H
TOTAL XYLENES		77	J	HP	31.9	UJ	H	608	J	H	803	J	HP

PROJ_NO: 02111	NSAMPLE	32SB-51-0708RE			32SB-51-1415			32SB-52-0809			32SB-52-1415		
SDG: CTOF273_007	LAB_ID	1004294-20RE1			1004294-21RE2			1004294-23			1004294-24RE1		
FRACTION: OV	SAMP_DATE	4/29/2010			4/29/2010			4/29/2010			4/29/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	91.6			88.4			84.5			85.5		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.488	UJ	H	23.2	UJ	CH	0.556	UJ	H	0.482	UJ	H
ETHYLBENZENE		0.778	UJ	H	37	UJ	H	0.887	UJ	H	0.769	UJ	H
TOLUENE		0.893	UJ	H	42.4	UJ	H	1.02	UJ	H	0.882	UJ	H
TOTAL XYLENES		0.726	UJ	H	34.5	UJ	H	0.828	UJ	H	0.718	UJ	H

PROJ_NO: 02111	NSAMPLE	32SB-53-0910			32SB-FD042910-05		
SDG: CTOF273_007	LAB_ID	1004294-26			1004294-02		
FRACTION: OV	SAMP_DATE	4/29/2010			4/29/2010		
MEDIA: SOIL	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	85.0			87.9		
	DUP_OF				32SB-50-0607		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.553	UJ	H	23.7	UJ	H
ETHYLBENZENE		0.882	UJ	H	37.8	UJ	H
TOLUENE		1.01	UJ	H	43.4	UJ	H
TOTAL XYLENES		0.824	UJ	H	289	J	HP

PROJ_NO: 02111	NSAMPLE	32SB-43-0506			32SB-44-0506			32SB-45-0607			32SB-46-0304		
SDG: CTOF273_007	LAB_ID	1004294-04			1004294-06			1004294-08			1004294-10		
FRACTION: PAH	SAMP_DATE	4/29/2010			4/29/2010			4/29/2010			4/29/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	83.3			81.4			82.5			87.4		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.6	U		1.63	U		1.61	U		7.61	U	
BENZO(A)PYRENE		1.6	U		1.63	U		21.3			7.61	U	
BENZO(B)FLUORANTHENE		1.6	U		1.63	U		22.2			7.61	U	
BENZO(K)FLUORANTHENE		1.6	U		1.63	U		1.61	U		7.61	U	
CHRYSENE		1.6	UJ	C	1.63	UJ	C	1.61	UJ	C	7.61	U	
DIBENZO(A,H)ANTHRACENE		1.6	U		1.63	U		1.61	U		7.61	UJ	C
INDENO(1,2,3-CD)PYRENE		1.6	U		1.63	U		1.61	U		7.61	U	
NAPHTHALENE		1.6	U		1.63	U		1.61	U		7.61	U	

PROJ_NO: 02111	NSAMPLE	32SB-47-0506			32SB-48-0405			32SB-49-0405			32SB-50-0607		
SDG: CTOF273_007	LAB_ID	1004294-12			1004294-14			1004294-16			1004294-18		
FRACTION: PAH	SAMP_DATE	4/29/2010			4/29/2010			4/29/2010			4/29/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	84.9			86.2			83.2			91.6		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.57	U		1.54	U		1.6	U		14.5	UJ	N
BENZO(A)PYRENE		1.57	U		1.54	U		1.6	U		14.5	U	
BENZO(B)FLUORANTHENE		1.57	U		1.54	U		1.6	U		14.5	U	
BENZO(K)FLUORANTHENE		1.57	U		1.54	U		1.6	U		14.5	U	
CHRYSENE		1.57	UJ	C	1.54	UJ	C	1.6	UJ	C	14.5	UJ	N
DIBENZO(A,H)ANTHRACENE		1.57	U		1.54	U		1.6	U		14.5	U	
INDENO(1,2,3-CD)PYRENE		1.57	U		1.54	U		1.6	U		14.5	U	
NAPHTHALENE		103			1.54	U		1.6	U		1360	J	GN

PROJ_NO: 02111 SDG: CTOF273_007 FRACTION: PAH MEDIA: SOIL	NSAMPLE	32SB-51-0708			32SB-51-1415			32SB-52-0809			32SB-52-1415		
	LAB_ID	1004294-20			1004294-21			1004294-23			1004294-24		
	SAMP_DATE	4/29/2010			4/29/2010			4/29/2010			4/29/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	91.6			88.4			84.5			85.5		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		14.5	U		3.77	J	P	15.7	U		1.55	U	
BENZO(A)PYRENE		14.5	U		9.57			15.7	U		1.55	U	
BENZO(B)FLUORANTHENE		14.5	U		9.47			15.7	U		1.55	U	
BENZO(K)FLUORANTHENE		14.5	U		4.37	J	CP	15.7	UJ	C	1.55	UJ	C
CHRYSENE		14.5	U		5	J	P	15.7	U		1.55	U	
DIBENZO(A,H)ANTHRACENE		14.5	U		1.5	U		15.7	U		1.55	U	
INDENO(1,2,3-CD)PYRENE		14.5	U		1.5	U		15.7	U		1.55	U	
NAPHTHALENE		1560			1.5	U		305			1.55	U	

PROJ_NO: 02111	NSAMPLE	32SB-53-0910			32SB-FD042910-05			32SS-43-0002			32SS-44-0002		
SDG: CTOF273_007	LAB_ID	1004294-26			1004294-02			1004294-03			1004294-05		
FRACTION: PAH	SAMP_DATE	4/29/2010			4/29/2010			4/29/2010			4/29/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	85.0			87.9			81.9			84.2		
	DUP_OF				32SB-50-0607								
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		15.6	U		1.51	UJ	H	1.62	U		63.5		
BENZO(A)PYRENE		15.6	U		1.51	UJ	H	13.6			15.3		
BENZO(B)FLUORANTHENE		15.6	U		1.51	UJ	H	13.8			16.8		
BENZO(K)FLUORANTHENE		15.6	UJ	C	1.51	UJ	H	1.62	U		1.58	U	
CHRYSENE		15.6	U		1.51	UJ	CH	1.62	UJ	C	16.6	J	C
DIBENZO(A,H)ANTHRACENE		15.6	U		1.51	UJ	H	1.62	U		1.58	U	
INDENO(1,2,3-CD)PYRENE		15.6	U		1.51	UJ	H	1.62	U		1.58	U	
NAPHTHALENE		15.6	U		1.51	UJ	GH	1.62	U		1.58	U	

PROJ_NO: 02111	NSAMPLE	32SS-45-0002			32SS-46-0002			32SS-47-0002			32SS-48-0002		
SDG: CTOF273_007	LAB_ID	1004294-07			1004294-09			1004294-11			1004294-13		
FRACTION: PAH	SAMP_DATE	4/29/2010			4/29/2010			4/29/2010			4/29/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	80.8			87.3			86.6			92.5		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		78.2			7.62	U		1.54	U		1.44	U	
BENZO(A)PYRENE		25.9			7.62	U		1.54	U		1.44	U	
BENZO(B)FLUORANTHENE		24.8			7.62	U		1.54	U		1.44	U	
BENZO(K)FLUORANTHENE		1.65	U		7.62	U		1.54	U		1.44	U	
CHRYSENE		57.4	J	C	7.62	U		1.54	UJ	C	1.44	UJ	C
DIBENZO(A,H)ANTHRACENE		1.65	U		7.62	UJ	C	1.54	U		1.44	U	
INDENO(1,2,3-CD)PYRENE		1.65	U		7.62	U		1.54	U		1.44	U	
NAPHTHALENE		1.65	U		31.4			6			1.44	U	

PROJ_NO: 02111 SDG: CTOF273_007 FRACTION: PAH MEDIA: SOIL	NSAMPLE	32SS-49-0002			32SS-50-0002			32SS-51-0002			32SS-52-0002		
	LAB_ID	1004294-15			1004294-17			1004294-19			1004294-22		
	SAMP_DATE	4/29/2010			4/29/2010			4/29/2010			4/29/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	89.9			84.8			85.2			90.7		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		61.5			1.57	U		1.56	U		1.47	U	
BENZO(A)PYRENE		1.48	U		1.57	U		1.56	U		1.47	U	
BENZO(B)FLUORANTHENE		1.48	U		1.57	U		1.56	U		1.47	U	
BENZO(K)FLUORANTHENE		1.48	U		1.57	U		1.56	U		1.47	UJ	C
CHRYSENE		18.9	J	C	1.57	UJ	C	1.56	UJ	C	1.47	U	
DIBENZO(A,H)ANTHRACENE		1.48	U		1.57	U		1.56	U		1.47	U	
INDENO(1,2,3-CD)PYRENE		1.48	U		1.57	U		1.56	U		1.47	U	
NAPHTHALENE		273			1.57	U		1.56	U		1.47	U	

PROJ_NO: 02111	NSAMPLE	32SS-53-0002			32SS-FD042910-05		
SDG: CTOF273_007	LAB_ID	1004294-25			1004294-01		
FRACTION: PAH	SAMP_DATE	4/29/2010			4/29/2010		
MEDIA: SOIL	QC_TYPE	NM			NM		
	UNITS	UG/KG			UG/KG		
	PCT_SOLIDS	89.2			89.3		
	DUP_OF				32SS-50-0002		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.49	U		74.5	UJ	H
BENZO(A)PYRENE		1.49	U		74.5	UJ	H
BENZO(B)FLUORANTHENE		1.49	U		74.5	UJ	H
BENZO(K)FLUORANTHENE		1.49	UJ	C	74.5	UJ	H
CHRYSENE		1.49	U		74.5	UJ	H
DIBENZO(A,H)ANTHRACENE		1.49	U		74.5	UJ	H
INDENO(1,2,3-CD)PYRENE		1.49	U		74.5	UJ	H
NAPHTHALENE		1.49	U		74.5	UJ	H

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

ANALYSIS DATA SHEET

32SB-43-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-04	File ID:	0429404.D
Sampled:	04/29/10 09:10	Prepared:	05/16/10 00:00	Analyzed:	05/16/10 20:54
Solids:	83.31	Preparation:	5035	Dilution:	50

Batch: 0E16003 Sequence: 0F15201 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		23.2	197	H1, U
100-41-4	Ethylbenzene		37.0	494	H1, U
108-88-3	Toluene		42.4	494	H1, U
1330-20-7	Xylenes (total)		34.5	494	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.61	31.95	108	85 - 120	
Dibromofluoromethane	29.61	29.90	101	80 - 125	
1,2-Dichloroethane-d4	29.61	32.84	111	75 - 140	
Toluene-d8	29.61	29.25	98.8	85 - 115	

ANALYSIS DATA SHEET

32SB-44-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-06	File ID:	0429406.D
Sampled:	04/29/10 09:26	Prepared:	05/16/10 00:00	Analyzed:	05/16/10 21:24
Solids:	81.42	Preparation:	5035	Dilution:	50

Batch: 0E16003 Sequence: 0F15201 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		25.3	215	H1, S, U
100-41-4	Ethylbenzene		40.3	538	H1, S, U
108-88-3	Toluene		46.2	538	H1, S, U
1330-20-7	Xylenes (total)	91.2	37.6	538	H1, S, J, D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	32.26	43.63	135	85 - 120	*
Dibromofluoromethane	32.26	32.39	100	80 - 125	
1,2-Dichloroethane-d4	32.26	35.44	110	75 - 140	
Toluene-d8	32.26	31.58	97.9	85 - 115	

ANALYSIS DATA SHEET

32SB-45-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-08	File ID:	0429408.D
Sampled:	04/29/10 09:55	Prepared:	05/16/10 00:00	Analyzed:	05/16/10 21:55
Solids:	82.54	Preparation:	5035	Dilution:	50

Batch: 0E16003 Sequence: 0F15201 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene	46.9	25.6	218	H1, J, D
100-41-4	Ethylbenzene	304	40.9	545	H1, J, D
108-88-3	Toluene		46.8	545	H1, U
1330-20-7	Xylenes (total)	1200	38.1	545	H1, D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	32.68	39.52	121	85 - 120	*
Dibromofluoromethane	32.68	34.24	105	80 - 125	
1,2-Dichloroethane-d4	32.68	35.97	110	75 - 140	
Toluene-d8	32.68	32.35	99.0	85 - 115	

ANALYSIS DATA SHEET

32SB-46-0304

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-10	File ID:	0429410.D
Sampled:	04/29/10 10:16	Prepared:	05/16/10 00:00	Analyzed:	05/16/10 22:26
Solids:	87.37	Preparation:	5035	Dilution:	50

Batch: 0E16003 Sequence: 0F15201 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		23.7	201	H1, U
100-41-4	Ethylbenzene		37.8	504	H1, U
108-88-3	Toluene		43.3	504	H1, U
1330-20-7	Xylenes (total)		35.3	504	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.22	32.82	109	85 - 120	
Dibromofluoromethane	30.22	30.61	101	80 - 125	
1,2-Dichloroethane-d4	30.22	31.51	104	75 - 140	
Toluene-d8	30.22	30.03	99.4	85 - 115	

ANALYSIS DATA SHEET

32SB-47-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-12	File ID:	0429412.D
Sampled:	04/29/10 10:40	Prepared:	05/16/10 00:00	Analyzed:	05/16/10 22:56
Solids:	84.95	Preparation:	5035	Dilution:	50

Batch: 0E16003 Sequence: 0F15201 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		22.5	191	H1, U
100-41-4	Ethylbenzene		35.9	479	H1, U
108-88-3	Toluene		41.2	479	H1, U
1330-20-7	Xylenes (total)	77.0	33.5	479	H1, J, D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	28.71	31.11	108	85 - 120	
Dibromofluoromethane	28.71	27.82	96.9	80 - 125	
1,2-Dichloroethane-d4	28.71	30.87	108	75 - 140	
Toluene-d8	28.71	27.43	95.5	85 - 115	

ANALYSIS DATA SHEET

32SB-48-0405

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-14	File ID:	0429414.D
Sampled:	04/29/10 10:54	Prepared:	05/16/10 00:00	Analyzed:	05/16/10 23:27
Solids:	86.24	Preparation:	5035	Dilution:	50

Batch: 0E16003 Sequence: 0F15201 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		21.4	182	H1, U
100-41-4	Ethylbenzene		34.2	456	H1, U
108-88-3	Toluene		39.2	456	H1, U
1330-20-7	Xylenes (total)		31.9	456	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	27.35	35.61	130	85 - 120	*
Dibromofluoromethane	27.35	27.17	99.4	80 - 125	
1,2-Dichloroethane-d4	27.35	27.52	101	75 - 140	
Toluene-d8	27.35	27.53	101	85 - 115	

ANALYSIS DATA SHEET

32SB-49-0405

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-16	File ID:	0429416.D
Sampled:	04/29/10 11:18	Prepared:	05/16/10 00:00	Analyzed:	05/16/10 23:58
Solids:	83.16	Preparation:	5035	Dilution:	50

Batch: 0E16003 Sequence: 0F15201 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene	327	24.7	210	H1, D
100-41-4	Ethylbenzene	114	39.3	525	H1, J, D
108-88-3	Toluene	64.4	45.1	525	H1, J, D
1330-20-7	Xylenes (total)	608	36.7	525	H1, D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	31.48	34.95	111	85 - 120	
Dibromofluoromethane	31.48	29.98	95.2	80 - 125	
1,2-Dichloroethane-d4	31.48	31.65	101	75 - 140	
Toluene-d8	31.48	32.61	104	85 - 115	

ANALYSIS DATA SHEET

32SB-50-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-18	File ID:	0429418.D
Sampled:	04/29/10 11:45	Prepared:	05/16/10 00:00	Analyzed:	05/17/10 00:28
Solids:	91.62	Preparation:	5035	Dilution:	50

Batch: 0E16003 Sequence: 0F15201 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		27.4	233	H1, U
100-41-4	Ethylbenzene	87.5	43.7	583	H1, J, D
108-88-3	Toluene		50.1	583	H1, U
1330-20-7	Xylenes (total)	803	40.8	583	H1, D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	34.98	109.4	313	85 - 120	*
Dibromofluoromethane	34.98	35.82	102	80 - 125	
1,2-Dichloroethane-d4	34.98	37.29	107	75 - 140	
Toluene-d8	34.98	51.76	148	85 - 115	*

ANALYSIS DATA SHEET

32SB-51-0708

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-20RE1	File ID:	0429420.D
Sampled:	04/29/10 13:42	Prepared:	05/19/10 00:00	Analyzed:	05/19/10 18:09
Solids:	91.59	Preparation:	5035	Dilution:	1

Batch: 0E19018 Sequence: 0E14205 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.488	5.00	H1, U
100-41-4	Ethylbenzene		0.778	10.4	H1, U
108-88-3	Toluene		0.893	10.4	H1, U
1330-20-7	Xylenes (total)		0.726	10.4	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	31.13	61.46	197	85 - 120	*
Dibromofluoromethane	31.13	32.57	105	80 - 125	
1,2-Dichloroethane-d4	31.13	30.71	98.6	75 - 140	
Toluene-d8	31.13	42.74	137	85 - 115	*

ANALYSIS DATA SHEET

32SB-51-0708

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-20RE2	File ID:	0429420D.D
Sampled:	04/29/10 13:42	Prepared:	05/21/10 00:00	Analyzed:	05/21/10 23:04
Solids:	91.59	Preparation:	5035	Dilution:	50

Batch: 0E21026 Sequence: 0F15210 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		23.5	200	H1, U
100-41-4	Ethylbenzene		37.4	499	H1, U
108-88-3	Toluene		42.9	499	H1, U
1330-20-7	Xylenes (total)		34.9	499	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.94	41.44	138	85 - 120	*
Dibromofluoromethane	29.94	28.37	94.8	80 - 125	
1,2-Dichloroethane-d4	29.94	25.86	86.4	75 - 140	
Toluene-d8	29.94	31.94	107	85 - 115	

ANALYSIS DATA SHEET

32SB-51-1415

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-21RE2	File ID:	0429421D.D
Sampled:	04/29/10 13:42	Prepared:	05/22/10 18:57	Analyzed:	05/23/10 11:32
Solids:	88.44	Preparation:	5035	Dilution:	50

Batch: 0E22011 Sequence: 0E14710 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		23.2	197	X, H1, U
100-41-4	Ethylbenzene		37.0	493	H1, U
108-88-3	Toluene		42.4	493	H1, U
1330-20-7	Xylenes (total)		34.5	493	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	29.60	31.34	106	85 - 120	
Dibromofluoromethane	29.60	28.39	95.9	80 - 125	
1,2-Dichloroethane-d4	29.60	25.30	85.5	75 - 140	
Toluene-d8	29.60	30.50	103	85 - 115	

ANALYSIS DATA SHEET

32SB-52-0809

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-23	File ID:	0429423.D
Sampled:	04/29/10 14:20	Prepared:	05/17/10 00:00	Analyzed:	05/18/10 01:49
Solids:	84.54	Preparation:	5035	Dilution:	1

Batch: 0E17026 Sequence: 0E14108 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.556	5.00	H1, U
100-41-4	Ethylbenzene		0.887	11.8	H1, U
108-88-3	Toluene		1.02	11.8	H1, U
1330-20-7	Xylenes (total)		0.828	11.8	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	35.48	44.23	125	85 - 120	*
Dibromofluoromethane	35.48	36.41	103	80 - 125	
1,2-Dichloroethane-d4	35.48	32.11	90.5	75 - 140	
Toluene-d8	35.48	39.21	111	85 - 115	

ANALYSIS DATA SHEET

32SB-52-1415

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-24RE1	File ID:	0429424.D
Sampled:	04/29/10 14:20	Prepared:	05/19/10 00:00	Analyzed:	05/19/10 17:38
Solids:	85.54	Preparation:	5035	Dilution:	1

Batch: 0E19018 Sequence: 0E14205 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.482	5.00	H1, U
100-41-4	Ethylbenzene		0.769	10.3	H1, U
108-88-3	Toluene		0.882	10.3	H1, U
1330-20-7	Xylenes (total)		0.718	10.3	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.76	33.30	108	85 - 120	
Dibromofluoromethane	30.76	30.08	97.8	80 - 125	
1,2-Dichloroethane-d4	30.76	28.04	91.1	75 - 140	
Toluene-d8	30.76	34.48	112	85 - 115	

ANALYSIS DATA SHEET

32SB-53-0910

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-26	File ID:	0429426.D
Sampled:	04/29/10 15:15	Prepared:	05/17/10 00:00	Analyzed:	05/18/10 00:48
Solids:	84.99	Preparation:	5035	Dilution:	1

Batch: 0E17026 Sequence: 0E14108 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.553	5.00	H1, U
100-41-4	Ethylbenzene		0.882	11.8	H1, U
108-88-3	Toluene		1.01	11.8	H1, U
1330-20-7	Xylenes (total)		0.824	11.8	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	35.30	37.89	107	85 - 120	
Dibromofluoromethane	35.30	35.05	99.3	80 - 125	
1,2-Dichloroethane-d4	35.30	33.29	94.3	75 - 140	
Toluene-d8	35.30	38.67	110	85 - 115	

ANALYSIS DATA SHEET

32SB-53-0910

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-26RE1	File ID:	0429426D.D
Sampled:	04/29/10 15:15	Prepared:	05/21/10 00:00	Analyzed:	05/21/10 21:45
Solids:	84.99	Preparation:	5035	Dilution:	50

Batch: 0E21026 Sequence: 0F15210 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		24.3	207	H1, U
100-41-4	Ethylbenzene		38.8	518	H1, U
108-88-3	Toluene		44.5	518	H1, U
1330-20-7	Xylenes (total)		36.3	518	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	31.07	32.74	105	85 - 120	
Dibromofluoromethane	31.07	30.63	98.6	80 - 125	
1,2-Dichloroethane-d4	31.07	27.58	88.8	75 - 140	
Toluene-d8	31.07	32.51	105	85 - 115	

ANALYSIS DATA SHEET

32SB-FD042910-05

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-02	File ID:	0429402.D
Sampled:	04/29/10 00:00	Prepared:	05/16/10 00:00	Analyzed:	05/16/10 20:23
Solids:	87.91	Preparation:	5035	Dilution:	50

Batch: 0E16003 Sequence: 0F15201 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		23.7	202	H1, U
100-41-4	Ethylbenzene		37.8	504	H1, U
108-88-3	Toluene		43.4	504	H1, U
1330-20-7	Xylenes (total)	289	35.3	504	H1, J, D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.25	27.00	89.2	85 - 120	
Dibromofluoromethane	30.25	30.71	102	80 - 125	
1,2-Dichloroethane-d4	30.25	33.35	110	75 - 140	
Toluene-d8	30.25	34.45	114	85 - 115	

ANALYSIS DATA SHEET

32SB-43-0506

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_007	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Soil	Laboratory ID:	1004294-04	File ID:	0429404.D
Sampled:	04/29/10 09:10	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 04:49
Solids:	83.31	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.60	8.01	U
50-32-8	Benzo(a)pyrene		1.60	6.00	U
205-99-2	Benzo(b)fluoranthene		1.60	8.01	U
207-08-9	Benzo(k)fluoranthene		1.60	8.01	U
218-01-9	Chrysene		1.60	8.01	X, U
53-70-3	Dibenz(a,h)anthracene		1.60	6.00	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.60	8.01	U
91-20-3	Naphthalene		1.60	6.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4001	3562	89.0	14 - 129	
Terphenyl-d14	4001	2486	62.1	14 - 129	

ANALYSIS DATA SHEET

32SB-44-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-06	File ID:	0429406.D
Sampled:	04/29/10 09:26	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 06:02
Solids:	81.42	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.63	8.19	U
50-32-8	Benzo(a)pyrene		1.63	6.14	U
205-99-2	Benzo(b)fluoranthene		1.63	8.19	U
207-08-9	Benzo(k)fluoranthene		1.63	8.19	U
218-01-9	Chrysene		1.63	8.19	X, U
53-70-3	Dibenz(a,h)anthracene		1.63	6.14	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.63	8.19	U
91-20-3	Naphthalene		1.63	6.14	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4094	3656	89.3	14 - 129	
Terphenyl-d14	4094	2741	66.9	14 - 129	

ANALYSIS DATA SHEET

32SB-45-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-08	File ID:	0429408.D
Sampled:	04/29/10 09:55	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 07:14
Solids:	82.54	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.61	8.08	U
50-32-8	Benzo(a)pyrene	21.3	1.61	6.06	
205-99-2	Benzo(b)fluoranthene	22.2	1.61	8.08	
207-08-9	Benzo(k)fluoranthene		1.61	8.08	U
218-01-9	Chrysene		1.61	8.08	X, U
53-70-3	Dibenz(a,h)anthracene		1.61	6.06	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.61	8.08	U
91-20-3	Naphthalene		1.61	6.06	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4038	3588	88.8	14 - 129	
Terphenyl-d14	4038	2703	66.9	14 - 129	

ANALYSIS DATA SHEET

32SB-46-0304

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-10	File ID:	0429410D.D
Sampled:	04/29/10 10:16	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 17:47
Solids:	87.37	Preparation:	EXT_3546	Dilution:	5

Batch: 0E12947 Sequence: 0F16739 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		7.61	38.2	U
50-32-8	Benzo(a)pyrene		7.61	28.6	U
205-99-2	Benzo(b)fluoranthene		7.61	38.2	U
207-08-9	Benzo(k)fluoranthene		7.61	38.2	U
218-01-9	Chrysene		7.61	38.2	X, U
53-70-3	Dibenz(a,h)anthracene		7.61	28.6	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		7.61	38.2	Y, U
91-20-3	Naphthalene		7.61	28.6	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3815	2842	74.5	14 - 129	
Terphenyl-d14	3815	2942	77.1	14 - 129	

ANALYSIS DATA SHEET

32SB-47-0506

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-12	File ID:	0429412.D
Sampled:	04/29/10 10:40	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 08:27
Solids:	84.95	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.57	7.85	U
50-32-8	Benzo(a)pyrene		1.57	5.89	U
205-99-2	Benzo(b)fluoranthene		1.57	7.85	U
207-08-9	Benzo(k)fluoranthene		1.57	7.85	U
218-01-9	Chrysene		1.57	7.85	X, U
53-70-3	Dibenz(a,h)anthracene		1.57	5.89	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.57	7.85	U
91-20-3	Naphthalene	103	1.57	5.89	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3924	2093	53.3	14 - 129	
Terphenyl-d14	3924	1725	44.0	14 - 129	

ANALYSIS DATA SHEET

32SB-48-0405

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_007	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Soil	Laboratory ID:	1004294-14	File ID:	0429414.D
Sampled:	04/29/10 10:54	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 09:39
Solids:	86.24	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.54	7.73	U
50-32-8	Benzo(a)pyrene		1.54	5.80	U
205-99-2	Benzo(b)fluoranthene		1.54	7.73	U
207-08-9	Benzo(k)fluoranthene		1.54	7.73	U
218-01-9	Chrysene		1.54	7.73	X, U
53-70-3	Dibenz(a,h)anthracene		1.54	5.80	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.54	7.73	U
91-20-3	Naphthalene		1.54	5.80	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3865	3246	84.0	14 - 129	
Terphenyl-d14	3865	2334	60.4	14 - 129	

ANALYSIS DATA SHEET

32SB-49-0405

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-16	File ID:	0429416.D
Sampled:	04/29/10 11:18	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 10:16
Solids:	83.16	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.60	8.02	U
50-32-8	Benzo(a)pyrene		1.60	6.01	U
205-99-2	Benzo(b)fluoranthene		1.60	8.02	U
207-08-9	Benzo(k)fluoranthene		1.60	8.02	U
218-01-9	Chrysene		1.60	8.02	X, U
53-70-3	Dibenz(a,h)anthracene		1.60	6.01	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.60	8.02	U
91-20-3	Naphthalene		1.60	6.01	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4008	3709	92.5	14 - 129	
Terphenyl-d14	4008	2873	71.7	14 - 129	

ANALYSIS DATA SHEET

32SB-50-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-18	File ID:	0429418D.D
Sampled:	04/29/10 11:45	Prepared:	05/13/10 17:55	Analyzed:	06/17/10 08:57
Solids:	91.62	Preparation:	EXT_3546	Dilution:	10

Batch: 0E12947 Sequence: 0F16802 Calibration: 0166002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		14.5	72.8	S, U
50-32-8	Benzo(a)pyrene		14.5	54.6	U
205-99-2	Benzo(b)fluoranthene		14.5	72.8	U
207-08-9	Benzo(k)fluoranthene		14.5	72.8	U
218-01-9	Chrysene		14.5	72.8	S, U
53-70-3	Dibenz(a,h)anthracene		14.5	54.6	U
193-39-5	Indeno(1,2,3-cd)pyrene		14.5	72.8	U
91-20-3	Naphthalene	1360	14.5	54.6	S, D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3638	3918	108	14 - 129	
Terphenyl-d14	3638	2988	82.1	14 - 129	

ANALYSIS DATA SHEET

32SB-51-0708

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-20	File ID:	0429420D.D
Sampled:	04/29/10 13:42	Prepared:	05/13/10 17:55	Analyzed:	06/17/10 05:21
Solids:	91.59	Preparation:	EXT_3546	Dilution:	10

Batch: 0E12947 Sequence: 0F16802 Calibration: 0I66002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		14.5	72.8	U
50-32-8	Benzo(a)pyrene		14.5	54.6	U
205-99-2	Benzo(b)fluoranthene		14.5	72.8	U
207-08-9	Benzo(k)fluoranthene		14.5	72.8	U
218-01-9	Chrysene		14.5	72.8	U
53-70-3	Dibenz(a,h)anthracene		14.5	54.6	U
193-39-5	Indeno(1,2,3-cd)pyrene		14.5	72.8	U
91-20-3	Naphthalene	1560	14.5	54.6	D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3639	3553	97.6	14 - 129	
Terphenyl-d14	3639	3023	83.1	14 - 129	

ANALYSIS DATA SHEET

32SB-51-1415

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-21	File ID:	0429421.D
Sampled:	04/29/10 13:42	Prepared:	05/13/10 15:20	Analyzed:	05/24/10 11:54
Solids:	88.44	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12948 Sequence: 0F15503 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	3.77	1.50	7.54	J
50-32-8	Benzo(a)pyrene	9.57	1.50	5.65	
205-99-2	Benzo(b)fluoranthene	9.47	1.50	7.54	
207-08-9	Benzo(k)fluoranthene	4.37	1.50	7.54	X, J
218-01-9	Chrysene	5.00	1.50	7.54	J
53-70-3	Dibenz(a,h)anthracene		1.50	5.65	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.50	7.54	U
91-20-3	Naphthalene		1.50	5.65	Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3769	2642	70.1	14 - 129	
Terphenyl-d14	3769	2196	58.3	14 - 129	

ANALYSIS DATA SHEET

32SB-52-0809

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-23	File ID:	0429423D.D
Sampled:	04/29/10 14:20	Prepared:	05/13/10 15:20	Analyzed:	05/24/10 13:06
Solids:	84.54	Preparation:	EXT_3546	Dilution:	10

Batch: 0E12948 Sequence: 0F15503 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		15.7	78.9	U
50-32-8	Benzo(a)pyrene		15.7	59.1	U
205-99-2	Benzo(b)fluoranthene		15.7	78.9	U
207-08-9	Benzo(k)fluoranthene		15.7	78.9	X, U
218-01-9	Chrysene		15.7	78.9	U
53-70-3	Dibenz(a,h)anthracene		15.7	59.1	U
193-39-5	Indeno(1,2,3-cd)pyrene		15.7	78.9	U
91-20-3	Naphthalene	305	15.7	59.1	Y, D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3943	3325	84.3	14 - 129	
Terphenyl-d14	3943	2713	68.8	14 - 129	

ANALYSIS DATA SHEET

32SB-52-1415

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_007	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Soil	Laboratory ID:	1004294-24	File ID:	0429424.D
Sampled:	04/29/10 14:20	Prepared:	05/13/10 15:20	Analyzed:	05/24/10 13:42
Solids:	85.54	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12948 Sequence: 0F15503 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.80	U
50-32-8	Benzo(a)pyrene		1.55	5.85	U
205-99-2	Benzo(b)fluoranthene		1.55	7.80	U
207-08-9	Benzo(k)fluoranthene		1.55	7.80	X, U
218-01-9	Chrysene		1.55	7.80	U
53-70-3	Dibenz(a,h)anthracene		1.55	5.85	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.80	U
91-20-3	Naphthalene		1.55	5.85	Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3897	2993	76.8	14 - 129	
Terphenyl-d14	3897	3154	80.9	14 - 129	

ANALYSIS DATA SHEET

32SB-53-0910

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-26	File ID:	0429426D.D
Sampled:	04/29/10 15:15	Prepared:	05/13/10 15:20	Analyzed:	05/24/10 14:55
Solids:	84.99	Preparation:	EXT_3546	Dilution:	10

Batch: 0E12948 Sequence: 0F15503 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		15.6	78.5	U
50-32-8	Benzo(a)pyrene		15.6	58.8	U
205-99-2	Benzo(b)fluoranthene		15.6	78.5	U
207-08-9	Benzo(k)fluoranthene		15.6	78.5	X, U
218-01-9	Chrysene		15.6	78.5	U
53-70-3	Dibenz(a,h)anthracene		15.6	58.8	U
193-39-5	Indeno(1,2,3-cd)pyrene		15.6	78.5	U
91-20-3	Naphthalene		15.6	58.8	Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3922	3131	79.8	14 - 129	
Terphenyl-d14	3922	2886	73.6	14 - 129	

ANALYSIS DATA SHEET

32SB-FD042910-05

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-02	File ID:	0429402.D
Sampled:	04/29/10 00:00	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 03:37
Solids:	87.91	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.51	7.59	U
50-32-8	Benzo(a)pyrene		1.51	5.69	U
205-99-2	Benzo(b)fluoranthene		1.51	7.59	U
207-08-9	Benzo(k)fluoranthene		1.51	7.59	U
218-01-9	Chrysene		1.51	7.59	X, U
53-70-3	Dibenz(a,h)anthracene		1.51	5.69	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.51	7.59	U
91-20-3	Naphthalene		1.51	5.69	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3792	3488	92.0	14 - 129	
Terphenyl-d14	3792	2158	56.9	14 - 129	

ANALYSIS DATA SHEET

32SS-43-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004294-03	File ID:	0429403.D
Sampled:	04/29/10 09:15	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 04:13
Solids:	81.89	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.62	8.15	U
50-32-8	Benzo(a)pyrene	13.6	1.62	6.11	
205-99-2	Benzo(b)fluoranthene	13.8	1.62	8.15	
207-08-9	Benzo(k)fluoranthene		1.62	8.15	U
218-01-9	Chrysene		1.62	8.15	X, U
53-70-3	Dibenz(a,h)anthracene		1.62	6.11	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.62	8.15	U
91-20-3	Naphthalene		1.62	6.11	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4071	3660	89.9	14 - 129	
Terphenyl-d14	4071	2626	64.5	14 - 129	

ANALYSIS DATA SHEET

32SS-44-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004294-05	File ID:	0429405.D
Sampled:	04/29/10 09:26	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 05:25
Solids:	84.17	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	63.5	1.58	7.92	
50-32-8	Benzo(a)pyrene	15.3	1.58	5.94	
205-99-2	Benzo(b)fluoranthene	16.8	1.58	7.92	
207-08-9	Benzo(k)fluoranthene		1.58	7.92	U
218-01-9	Chrysene	16.6	1.58	7.92	X
53-70-3	Dibenz(a,h)anthracene		1.58	5.94	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.58	7.92	U
91-20-3	Naphthalene		1.58	5.94	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3960	3772	95.2	14 - 129	
Terphenyl-d14	3960	2624	66.3	14 - 129	

ANALYSIS DATA SHEET

32SS-45-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004294-07	File ID:	0429407.D
Sampled:	04/29/10 09:55	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 06:38
Solids:	80.84	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	78.2	1.65	8.25	
50-32-8	Benzo(a)pyrene	25.9	1.65	6.19	
205-99-2	Benzo(b)fluoranthene	24.8	1.65	8.25	
207-08-9	Benzo(k)fluoranthene		1.65	8.25	U
218-01-9	Chrysene	57.4	1.65	8.25	X
53-70-3	Dibenz(a,h)anthracene		1.65	6.19	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.65	8.25	U
91-20-3	Naphthalene		1.65	6.19	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4123	3309	80.3	14 - 129	
Terphenyl-d14	4123	2544	61.7	14 - 129	

ANALYSIS DATA SHEET

32SS-46-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004294-09	File ID:	0429409D.D
Sampled:	04/29/10 10:16	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 17:11
Solids:	87.29	Preparation:	EXT_3546	Dilution:	5

Batch: 0E12947 Sequence: 0F16739 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		7.62	38.2	U
50-32-8	Benzo(a)pyrene		7.62	28.6	U
205-99-2	Benzo(b)fluoranthene		7.62	38.2	U
207-08-9	Benzo(k)fluoranthene		7.62	38.2	U
218-01-9	Chrysene		7.62	38.2	X, U
53-70-3	Dibenz(a,h)anthracene		7.62	28.6	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		7.62	38.2	Y, U
91-20-3	Naphthalene	31.4	7.62	28.6	D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3819	2779	72.8	14 - 129	
Terphenyl-d14	3819	2653	69.5	14 - 129	

ANALYSIS DATA SHEET

32SS-47-0002

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_007	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1004294-11	File ID:	0429411.D
Sampled:	04/29/10 10:40	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 07:50
Solids:	86.59	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.54	7.70	U
50-32-8	Benzo(a)pyrene		1.54	5.77	U
205-99-2	Benzo(b)fluoranthene		1.54	7.70	U
207-08-9	Benzo(k)fluoranthene		1.54	7.70	U
218-01-9	Chrysene		1.54	7.70	X, U
53-70-3	Dibenz(a,h)anthracene		1.54	5.77	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.54	7.70	U
91-20-3	Naphthalene	6.00	1.54	5.77	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3849	3818	99.2	14 - 129	
Terphenyl-d14	3849	2672	69.4	14 - 129	

ANALYSIS DATA SHEET

32SS-48-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004294-13	File ID:	0429413.D
Sampled:	04/29/10 10:54	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 09:03
Solids:	92.54	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.44	7.21	U
50-32-8	Benzo(a)pyrene		1.44	5.40	U
205-99-2	Benzo(b)fluoranthene		1.44	7.21	U
207-08-9	Benzo(k)fluoranthene		1.44	7.21	U
218-01-9	Chrysene		1.44	7.21	X, U
53-70-3	Dibenz(a,h)anthracene		1.44	5.40	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.44	7.21	U
91-20-3	Naphthalene		1.44	5.40	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3602	2569	71.3	14 - 129	
Terphenyl-d14	3602	1903	52.8	14 - 129	

ANALYSIS DATA SHEET

32SS-49-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004294-15	File ID:	0429415.D
Sampled:	04/29/10 11:18	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 12:04
Solids:	89.89	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	61.5	1.48	7.42	
50-32-8	Benzo(a)pyrene		1.48	5.56	U
205-99-2	Benzo(b)fluoranthene		1.48	7.42	U
207-08-9	Benzo(k)fluoranthene		1.48	7.42	U
218-01-9	Chrysene	18.9	1.48	7.42	X
53-70-3	Dibenz(a,h)anthracene		1.48	5.56	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.48	7.42	U
91-20-3	Naphthalene	273	1.48	5.56	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3708	2991	80.7	14 - 129	
Terphenyl-d14	3708	2415	65.1	14 - 129	

ANALYSIS DATA SHEET

32SS-50-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004294-17	File ID:	0429417.D
Sampled:	04/29/10 11:45	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 10:52
Solids:	84.79	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.57	7.87	U
50-32-8	Benzo(a)pyrene		1.57	5.90	U
205-99-2	Benzo(b)fluoranthene		1.57	7.87	U
207-08-9	Benzo(k)fluoranthene		1.57	7.87	U
218-01-9	Chrysene		1.57	7.87	X, U
53-70-3	Dibenz(a,h)anthracene		1.57	5.90	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.57	7.87	U
91-20-3	Naphthalene		1.57	5.90	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3931	2613	66.5	14 - 129	
Terphenyl-d14	3931	2298	58.4	14 - 129	

ANALYSIS DATA SHEET

32SS-51-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004294-19	File ID:	0429419.D
Sampled:	04/29/10 13:42	Prepared:	05/13/10 17:55	Analyzed:	06/13/10 11:28
Solids:	85.18	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.56	7.83	U
50-32-8	Benzo(a)pyrene		1.56	5.87	U
205-99-2	Benzo(b)fluoranthene		1.56	7.83	U
207-08-9	Benzo(k)fluoranthene		1.56	7.83	U
218-01-9	Chrysene		1.56	7.83	X, U
53-70-3	Dibenz(a,h)anthracene		1.56	5.87	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.56	7.83	U
91-20-3	Naphthalene		1.56	5.87	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3913	3316	84.7	14 - 129	
Terphenyl-d14	3913	2380	60.8	14 - 129	

ANALYSIS DATA SHEET

32SS-52-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004294-22	File ID:	0429422.D
Sampled:	04/29/10 14:20	Prepared:	05/13/10 15:20	Analyzed:	05/24/10 12:30
Solids:	90.72	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12948 Sequence: 0F15503 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.47	7.35	U
50-32-8	Benzo(a)pyrene		1.47	5.51	U
205-99-2	Benzo(b)fluoranthene		1.47	7.35	U
207-08-9	Benzo(k)fluoranthene		1.47	7.35	X, U
218-01-9	Chrysene		1.47	7.35	U
53-70-3	Dibenz(a,h)anthracene		1.47	5.51	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.47	7.35	U
91-20-3	Naphthalene		1.47	5.51	Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3674	2688	73.2	14 - 129	
Terphenyl-d14	3674	2473	67.3	14 - 129	

ANALYSIS DATA SHEET

32SS-53-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1004294-25	File ID:	0429425.D
Sampled:	04/29/10 15:15	Prepared:	05/13/10 15:20	Analyzed:	05/24/10 14:19
Solids:	89.24	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12948 Sequence: 0F15503 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.49	7.47	U
50-32-8	Benzo(a)pyrene		1.49	5.60	U
205-99-2	Benzo(b)fluoranthene		1.49	7.47	U
207-08-9	Benzo(k)fluoranthene		1.49	7.47	X, U
218-01-9	Chrysene		1.49	7.47	U
53-70-3	Dibenz(a,h)anthracene		1.49	5.60	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.49	7.47	U
91-20-3	Naphthalene		1.49	5.60	Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3735	2583	69.2	14 - 129	
Terphenyl-d14	3735	2497	66.8	14 - 129	

ANALYSIS DATA SHEET

32SS-FD042910-05

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-01	File ID:	429401D2.D
Sampled:	04/29/10 00:00	Prepared:	05/13/10 17:55	Analyzed:	06/17/10 05:56
Solids:	89.32	Preparation:	EXT_3546	Dilution:	50

Batch: 0E12947 Sequence: 0F16802 Calibration: 0166002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		74.5	373	U
50-32-8	Benzo(a)pyrene		74.5	280	U
205-99-2	Benzo(b)fluoranthene		74.5	373	U
207-08-9	Benzo(k)fluoranthene		74.5	373	U
218-01-9	Chrysene		74.5	373	U
53-70-3	Dibenz(a,h)anthracene		74.5	280	U
193-39-5	Indeno(1,2,3-cd)pyrene		74.5	373	U
91-20-3	Naphthalene		74.5	280	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3732	4065	109	14 - 129	D
Terphenyl-d14	3732	2748	73.6	14 - 129	D

APPENDIX C

SUPPORT DOCUMENTATION

HOLDTIME

SDG CTOF273_007

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV	UG/KG	32SB-51-0708	1004294-20RE2	NM	04/29/2010	05/21/2010	05/21/2010	22	0	22
OV	UG/KG	32SB-43-0506	1004294-04	NM	04/29/2010	05/16/2010	05/16/2010	17	0	17
OV	UG/KG	32SB-FD042910-05	1004294-02	NM	04/29/2010	05/16/2010	05/16/2010	17	0	17
OV	UG/KG	32SB-53-0910	1004294-26RE1	NM	04/29/2010	05/21/2010	05/21/2010	22	0	22
OV	UG/KG	32SB-53-0910	1004294-26	NM	04/29/2010	05/17/2010	05/18/2010	18	1	19
OV	UG/KG	32SB-52-1415	1004294-24RE1	NM	04/29/2010	05/19/2010	05/19/2010	20	0	20
OV	UG/KG	32SB-51-1415	1004294-21RE2	NM	04/29/2010	05/22/2010	05/23/2010	23	1	24
OV	UG/KG	32SB-51-0708	1004294-20RE1	NM	04/29/2010	05/19/2010	05/19/2010	20	0	20
OV	UG/KG	32SB-50-0607	1004294-18	NM	04/29/2010	05/16/2010	05/17/2010	17	1	18
OV	UG/KG	32SB-49-0405	1004294-16	NM	04/29/2010	05/16/2010	05/16/2010	17	0	17
OV	UG/KG	32SB-48-0405	1004294-14	NM	04/29/2010	05/16/2010	05/16/2010	17	0	17
OV	UG/KG	32SB-47-0506	1004294-12	NM	04/29/2010	05/16/2010	05/16/2010	17	0	17
OV	UG/KG	32SB-46-0304	1004294-10	NM	04/29/2010	05/16/2010	05/16/2010	17	0	17
OV	UG/KG	32SB-45-0607	1004294-08	NM	04/29/2010	05/16/2010	05/16/2010	17	0	17
OV	UG/KG	32SB-44-0506	1004294-06	NM	04/29/2010	05/16/2010	05/16/2010	17	0	17

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV	UG/KG	32SB-52-0809	1004294-23	NM	04/29/2010	05/17/2010	05/18/2010	18	1	19
SIM	UG/KG	32SB-48-0405	1004294-14	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SB-47-0506	1004294-12	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SB-43-0506	1004294-04	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SB-44-0506	1004294-06	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SB-45-0607	1004294-08	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SS-43-0002	1004294-03	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SS-53-0002	1004294-25	NM	04/29/2010	05/13/2010	05/24/2010	14	11	25
SIM	UG/KG	32SS-52-0002	1004294-22	NM	04/29/2010	05/13/2010	05/24/2010	14	11	25
SIM	UG/KG	32SS-51-0002	1004294-19	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SS-50-0002	1004294-17	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SS-49-0002	1004294-15	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SS-48-0002	1004294-13	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SS-47-0002	1004294-11	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SS-46-0002	1004294-09	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SB-46-0304	1004294-10	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SS-44-0002	1004294-05	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SS-FD042910-05	1004294-01	NM	04/29/2010	05/13/2010	06/17/2010	14	35	49

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
SIM	UG/KG	32SB-FD042910-05	1004294-02	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SB-53-0910	1004294-26	NM	04/29/2010	05/13/2010	05/24/2010	14	11	25
SIM	UG/KG	32SB-52-1415	1004294-24	NM	04/29/2010	05/13/2010	05/24/2010	14	11	25
SIM	UG/KG	32SB-52-0809	1004294-23	NM	04/29/2010	05/13/2010	05/24/2010	14	11	25
SIM	UG/KG	32SB-51-1415	1004294-21	NM	04/29/2010	05/13/2010	05/24/2010	14	11	25
SIM	UG/KG	32SB-51-0708	1004294-20	NM	04/29/2010	05/13/2010	06/17/2010	14	35	49
SIM	UG/KG	32SB-50-0607	1004294-18	NM	04/29/2010	05/13/2010	06/17/2010	14	35	49
SIM	UG/KG	32SB-49-0405	1004294-16	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45
SIM	UG/KG	32SS-45-0002	1004294-07	NM	04/29/2010	05/13/2010	06/13/2010	14	31	45

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 4

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G02111	F273	Tony Klimek 513-251-2730	Empirical - Kim Kostzer
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George TenEyck 513-251-2730	ADDRESS: 621 Mainstream Dr. Suite 270
		CARRIER/WAYBILL NUMBER: FEDEX	CITY, STATE: Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	BTEX							COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	G							
PRESERVATIVE USED						4°C	4°C HCl							
4/28	1208	32GW-02	GW	G	6	X								MS/MSD
	1208	32GW-02	GW	G	9		X							MS/MSD
	1550	32GW-01	GW	G	2	X								
	1550	32GW-01	GW	G	3		X							
4/29	0000	32SS-FD042910-05	SS	G	1	X				1604294				-01
	0000	32SB-FD042910-05	SB	G	1	X								-02
	0915	32SS-43-0002	SS	G	1	X								-03
	0910	32SB-43-0506	SB	G	1	X								-04
	0926	32SS-44-0002	SS	G	1	X								-05
	0926	32SB-44-0506	SB	G	1	X								-06
	0955	32SS-45-0002	SS	G	1	X								-07
	0955	32SB-45-0607	SB	G	1	X								-08
	1016	32SS-46-0002	SS	G	1	X								-09

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/30/10	1700	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	4/30/10	08:30

COMMENTS: 1.1°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 2 OF 4

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112602111	F273	Tony Klimek 513-251-2730	Empirical - Kim Kostzer
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
		George TenEych 513-251-2730	621 Mainstream Dr. Suite 270
		CARRIER/WAYBILL NUMBER	CITY, STATE
		FedEx	Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G P
PRESERVATIVE USED: 4C 4C

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	BTEX							COMMENTS 1004294
4/29	1016	32SB-46-0304	SB	G	1	X								-10
	1040	32SS-47-0002	SS	G	1	X								-11
	1040	32SB-47-0506	SB	G	1	X								-12
	1054	32SS-48-0002	SS	G	1	X								-13
	1054	32SB-48-0405	SB	G	1	X								-14
	1118	32SS-49-0002	SS	G	1	X								-15
	1118	32SB-49-0405	SB	G	1	X								-16
	1145	32SS-50-0002	SS	G	1	X								-17
	1145	32SB-50-0607	SB	G	1	X								-18
	0000	32SB-FD042910-05	SB	G	3		X							-02
	0910	32SB-43-0506	SB	G	3		X							-04
	0920	32SB-44-0506	SB	G	3		X							-06
	0955	32SB-45-0607	SB	G	3		X							-08

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/29/10	1700	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	4/30/10	08:30

COMMENTS 1.1°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 3 OF 4

PROJECT NO: 112G02111	SITE NAME: F273
PROJECT MANAGER AND PHONE NUMBER	Tony Klimek 513-251-2730
LABORATORY NAME AND CONTACT:	Empirical - Kim Kostzer
SAMPLERS (SIGNATURE)	
FIELD OPERATIONS LEADER AND PHONE NUMBER	George TenEyck 513-251-2730
ADDRESS	621 Mainstream Dr., Suite 270
CARRIER/WAYBILL NUMBER	FEDEX
CITY, STATE	Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	BTEX							COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	P							
PRESERVATIVE USED						4C	4C							
4/28	1016	32SB-46-0304	SB	G	3		X							-10
	1040	32SB-47-0506	SB	G	3		X							-12
	1054	32SB-48-0405	SB	G	3		X							-14
	1118	32SB-49-0405	SB	G	3		X							-16
	1145	32SB-50-0607	SB	G	3		X							-18
	1342	32SS-51-0002	SS	G	1	X								-19
	1342	32SB-51-0708	SB	G	1	X								-20
	1342	32SB-51-1415	SB	G	1	X								-21
	1420	32SS-52-0002	SS	G	1	X								-22
	1420	32SB-52-0809	SB	G	1	X								-23
	1420	32SB-52-1415	SB	G	1	X								-24
	1515	32SS-53-0002	SS	G	1	X								-25
	1515	32SB-53-0910	SB	G	1	X								-26

1004294

1. RELINQUISHED BY	DATE 4/29/10	TIME 1700	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE 4/30/10	TIME 08:30

COMMENTS 1.10C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 4 OF 4

PROJECT NO: 112G02111	SITE NAME: F273
PROJECT MANAGER AND PHONE NUMBER	Tony Klimek 513-251-2730
LABORATORY NAME AND CONTACT:	Empirical - Kim Kaster
SAMPLERS (SIGNATURE)	
FIELD OPERATIONS LEADER AND PHONE NUMBER	George Ten Eyck 513-251-2730
ADDRESS	621 Mainstream Dr. Suite 270
CARRIER/WAYBILL NUMBER	FedEx
CITY, STATE	Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	BTEX							COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	P							
PRESERVATIVE USED						4°C	4°C							
4/27	1515	32SB-53-1415	SB	G	1	X								~~-01~~
	1342	32SB-51-0708	SB	G	3		X					1004294		-20
	1342	32SB-51-1415	SB	G	3		X							-21
	1420	32SB-52-0809	SB	G	3		X							-22
	1420	32SB-52-1415	SB	G	3		X							-24
	1515	32SB-53-0910	SB	G	3		X							-26
	1515	32SB-53-1415	SB	G	3		X							-

WS 4/30/10

1. RELINQUISHED BY	DATE 4/28/10	TIME 1700	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE 4/30/10	TIME 08:30

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

12

CTOF273_007 Summ Package

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004294 Number of Coolers: 1 of 2

Client: TTNUS Project: F273

Date/Time Received: **4/30/10** **08:30** Date cooler(s) opened: **4/30/10**

Opened By (print): Will Schwab (signature): [illegible]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 5343

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 1 Seal date: 4/29/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival?	Yes	No	N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler?	Yes	No	N/A
5. Were custody papers filled out properly (ink, signed, etc.)?	Yes	No	N/A
6. Did you sign custody papers in the appropriate place for acceptance?	Yes	No	N/A
7. Was project identifiable from custody papers?	Yes	No	N/A
8. If required, was enough ice present in the cooler(s)?	Yes	No	N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 2.6 °C

Dates samples were logged-in: **4/30/10**

9. Initial this form to acknowledge login of sample(s): (Name): Will Schwab (Initial): WS

10. Were all bottle lids intact and sealed tightly?	Yes	No	N/A
11. Did all bottles arrive unbroken?	Yes	No	N/A
12. Was all required bottle label information complete?	Yes	No	N/A
13. Did all bottle labels agree with custody papers?	Yes	No	N/A
14. Were correct containers used for the analyses indicated?	Yes	No	N/A
15. Were preservative levels correct in all applicable sample containers?	Yes	No	N/A
16. Was residual chlorine present in any applicable sample containers?	Yes	No	N/A
17. Was sufficient amount of sample sent for the analyses required?	Yes	No	N/A
18. Was headspace present in any included VOA vials?	Yes	No	N/A

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004294 Number of Coolers: 2 of 2

Client: TTNUS Project: F273

Date/Time Received: **4/30/10** **08:30** Date cooler(s) opened: **4/30/10**

Opened By (print): Will Schwab (signature): [illegible]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 3354

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 1 Seal date: 4/29/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 1-1 °C

~~Dates samples were logged-in:~~ 4/30/10

9. Initial this form to acknowledge login of sample(s): (Name): _____ (Initial): _____
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

See page 1 of 2

Sample Delivery Group Case Narrative

Receipt Information

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision

This is an original submittal of the final report package.

Analytical Information

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. The following information is provided specific to individual methods:

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.
B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.
C: The peak was manually integrated to correct the baseline from the original chromatogram.
D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

SW8260B:

Samples 1004294-02, 04, 06, 08, 10, 12, 16, 18, 20RE1, 20RE2, 21RE2, 23, 24RE1, 26, 26RE1 were analyzed outside the method holding time; however, the samples were analyzed within a 2X of the holding time.

Sample 1004294-20 and 21 were analyzed prior to the analysis that was reported; however, the first runs were not reported due to poor sample purges causing less than 10% recovery of internal standards.

Sample 1004294-06 had failure with the internal standards and the associated analytes are qualified. Samples 1004294-06, 08, 14, 20RE2, and 23 failed surrogate criteria for Bromoflurobenzene. Samples 1004294-18, 1004294-20RE1 failed surrogate criteria for Bromoflurobenzene and Toluene-d8.

The continuing calibration standard failed criteria in 0E14710-CCV1 for Benzene. No additional anomalies or deviations are noted and the data is properly qualified.

SW8270C PAHs:
The continuing calibration standard failed criteria in 0F16725-CCV1 for Chrysene, Dibenz(a,h)anthracene, in 0F16739-CCV1 for Chrysene, Dibenz(a,h)anthracene, and Indeno!1,2,3)pyrene, in 0F15503-CCV1 for Benzo(k)fluoranthene and Naphthalene.

There were internal standard failures on sample 1004294-18 and the associated analytes are flagged. No additional anomalies or deviations are noted and the data is properly qualified.

Data for SW8260B Forms

HOLDING TIME SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_007

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SB-FD042910-05	04/29/10 00:00	04/30/10 08:30	05/16/10 00:00	N/A	14.00	05/16/10 20:23	17.85	14.00	*
32SB-43-0506	04/29/10 09:10	04/30/10 08:30	05/16/10 00:00	N/A	14.00	05/16/10 20:54	17.49	14.00	*
32SB-44-0506	04/29/10 09:26	04/30/10 08:30	05/16/10 00:00	N/A	14.00	05/16/10 21:24	17.50	14.00	*
32SB-45-0607	04/29/10 09:55	04/30/10 08:30	05/16/10 00:00	N/A	14.00	05/16/10 21:55	17.50	14.00	*
32SB-46-0304	04/29/10 10:16	04/30/10 08:30	05/16/10 00:00	N/A	14.00	05/16/10 22:26	17.51	14.00	*
32SB-47-0506	04/29/10 10:40	04/30/10 08:30	05/16/10 00:00	N/A	14.00	05/16/10 22:56	17.51	14.00	*
32SB-48-0405	04/29/10 10:54	04/30/10 08:30	05/16/10 00:00	N/A	14.00	05/16/10 23:27	17.52	14.00	*
32SB-49-0405	04/29/10 11:18	04/30/10 08:30	05/16/10 00:00	N/A	14.00	05/16/10 23:58	17.53	14.00	*
32SB-50-0607	04/29/10 11:45	04/30/10 08:30	05/16/10 00:00	N/A	14.00	05/17/10 00:28	17.53	14.00	*
32SB-51-0708	04/29/10 13:42	04/30/10 08:30	05/19/10 00:00	N/A	14.00	05/19/10 18:09	20.19	14.00	*
32SB-51-0708	04/29/10 13:42	04/30/10 08:30	05/21/10 00:00	N/A	14.00	05/21/10 23:04	22.39	14.00	*
32SB-51-1415	04/29/10 13:42	04/30/10 08:30	05/22/10 18:57	N/A	14.00	05/23/10 11:32	23.91	14.00	*
32SB-52-0809	04/29/10 14:20	04/30/10 08:30	05/17/10 00:00	N/A	14.00	05/18/10 01:49	18.48	14.00	*
32SB-52-1415	04/29/10 14:20	04/30/10 08:30	05/19/10 00:00	N/A	14.00	05/19/10 17:38	20.14	14.00	*
32SB-53-0910	04/29/10 15:15	04/30/10 08:30	05/17/10 00:00	N/A	14.00	05/18/10 00:48	18.40	14.00	*
32SB-53-0910	04/29/10 15:15	04/30/10 08:30	05/21/10 00:00	N/A	14.00	05/21/10 21:45	22.27	14.00	*

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13909	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13909-TUN1	SEQ-TUN1.D	05/16/10 13:42
Cal Standard	0E13909-CAL1	SEQ-CAL1.D	05/16/10 14:17
Cal Standard	0E13909-CAL2	SEQ-CAL2.D	05/16/10 14:57
Cal Standard	0E13909-CAL3	SEQ-CAL3.D	05/16/10 15:36
Cal Standard	0E13909-CAL4	SEQ-CAL4.D	05/16/10 16:15
Cal Standard	0E13909-CAL5	SEQ-CAL5.D	05/16/10 16:54
Cal Standard	0E13909-CAL6	SEQ-CAL6.D	05/16/10 17:34
Cal Standard	0E13909-CAL7	SEQ-CAL7.D	05/16/10 18:13
Cal Standard	0E13909-CAL8	SEQ-CAL8.D	05/16/10 18:52
Initial Cal Check	0E13909-ICV1	SEQ-ICV1.D	05/16/10 19:31

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/16/10
Instrument ID:	MS-VOA1	Injection Time:	13:42
Sequence:	0E13909	Lab Sample ID:	0E13909-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	21.1	PASS
75	30 - 60% of 95	47.2	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.37	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	67.1	PASS
175	5 - 9% of 174	7.31	PASS
176	95 - 101% of 174	95.7	PASS
177	5 - 9% of 176	6.29	PASS

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0141001	Instrument:	MS-VOA1
Matrix:	Water	Calibration Date:	5/16/2010 5:53:49AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	0.9538096	3.675415	14.21375	4.186609E-02			15	
Bromofluorobenzene	0.806614	6.33105	22.47137	1.987755E-02			15	
Ethylbenzene	2.625901	8.273184	20.69738	1.993286E-02			CCC (20)	
Naphthalene	1.42045	7.973596	29.36488	1.155791E-02			15	
Methyl t-Butyl Ether	0.4789501	5.76918	10.66088	8.608269E-02			15	
Toluene	1.306087	5.445475	17.8805	2.681495E-02			CCC (20)	
m,p-Xylene	1.994748	13.5635	21.01925	2.161043E-02			15	
o-Xylene	1.962043	8.658804	21.74325	2.516958E-02			15	
Xylenes (total)	1.983846	11.91374	0	0			15	
Dibromofluoromethane	0.2558456	1.002136	12.42088	3.528492E-02			15	
1,2-Dichloroethane-d4	6.111453E-02	2.620876	13.20788	4.616384E-02			15	
Toluene-d8	2.151044	5.303775	17.753	2.907062E-02			15	

INITIAL CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA1	Calibration:	0141001
Lab File ID:	SEQ-ICV1.D	Calibration Date:	05/16/10 05:53
Sequence:	0E13909	Injection Date:	05/16/10
Lab Sample ID:	0E13909-ICV1	Injection Time:	19:31

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzene	A	100.0	96.63	0.9538096	0.921635		-3.4	20
Ethylbenzene	A	100.0	96.92	2.625901	2.54502		-3.1	20
Naphthalene	A	100.0	113.1	1.42045	1.606474		13.1	20
Methyl t-Butyl Ether	A	100.0	102.9	0.4789501	0.4929269		2.9	20
Toluene	A	100.0	97.59	1.306087	1.274644		-2.4	20
m,p-Xylene	A	200.0	186.8	1.994748	1.862811		-6.6	20
o-Xylene	A	100.0	96.98	1.962043	1.90286		-3.0	20
Xylenes (total)	A	300.0	283.8	1.983846	1.876161		-5.4	20
Bromofluorobenzene	A	30.00	29.29	0.806614	0.7875346		-2.4	20
Dibromofluoromethane	A	30.00	29.65	0.2558456	0.2528796		-1.2	20
1,2-Dichloroethane-d4	A	30.00	29.22	6.111453E-02	5.952883E-02		-2.6	20
Toluene-d8	A	30.00	30.17	2.151044	2.163585		0.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15210	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15210-TUN1	SEQ-TUN1.D	05/21/10 15:57
Calibration Check	0F15210-CCV1	SEQ-CCV1.D	05/21/10 16:29
LCS	0E21026-BS1	V1LCS1.D	05/21/10 17:08
Blank	0E21026-BLK2	V1MBLK1.D	05/21/10 19:08
32SB-53-0910	1004294-26RE1	0429426D.D	05/21/10 21:45
32SB-51-0708	1004294-20RE2	0429420D.D	05/21/10 23:04

50x
50x

NOT USED for VALIDATION

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/21/10
Instrument ID:	MS-VOA1	Injection Time:	15:57
Sequence:	0F15210	Lab Sample ID:	0F15210-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	23.5	PASS
75	30 - 60% of 95	46.8	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.56	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	55.5	PASS
175	5 - 9% of 174	7.52	PASS
176	95 - 101% of 174	96	PASS
177	5 - 9% of 176	6.52	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA1	Calibration:	0141001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/16/10 05:53
Sequence:	0F15210	Injection Date:	05/21/10
Lab Sample ID:	0F15210-CCV1	Injection Time:	16:29

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	96.53	0.9538096	0.9207242		-3.5	20
Ethylbenzene	A	100.0	92.24	2.625901	2.422007		-7.8	20
Naphthalene	A	100.0	78.18	1.42045	1.110565		-21.8	20 *
Methyl t-Butyl Ether	A	100.0	154.2	0.4789501	0.7384538		54.2	20 * NOT TARGET
Toluene	A	100.0	94.46	1.306087	1.233704		-5.5	20
m,p-Xylene	A	200.0	178.8	1.994748	1.783541		-10.6	20
o-Xylene	A	100.0	90.52	1.962043	1.775968		-9.5	20
Xylenes (total)	A	300.0	269.3	1.983846	1.781017		-10.2	20
Bromofluorobenzene	A	30.00	28.69	0.806614	0.7713755		-4.4	20
Dibromofluoromethane	A	30.00	28.25	0.2558456	0.2409428		-5.8	20
1,2-Dichloroethane-d4	A	30.00	23.73	6.111453E-02	4.833412E-02		-20.9	20 *
Toluene-d8	A	30.00	29.70	2.151044	2.129762		-1.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15210	Instrument:	MS-VOA1
		Calibration:	0141001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15210-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/21/10 16:29		
Bromofluorobenzene	30.00	95.6	80 - 120	22.476	22.476	0.0000	+/-1.000	
Dibromofluoromethane	30.00	94.2	80 - 120	12.43	12.43	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	79.1	80 - 120	13.213	13.213	0.0000	+/-1.000	*
Toluene-d8	30.00	99.0	80 - 120	17.755	17.755	0.0000	+/-1.000	
LCS (0E21026-BS1) ug/Kg wet				Lab File ID: V1LCS1.D		Analyzed: 05/21/10 17:08		
Bromofluorobenzene	30.00	94.5	85 - 120	22.467	22.476	-0.0090	+/-1.000	
Dibromofluoromethane	30.00	94.0	80 - 125	12.419	12.43	-0.0110	+/-1.000	
1,2-Dichloroethane-d4	30.00	81.6	75 - 140	13.218	13.213	0.0050	+/-1.000	
Toluene-d8	30.00	101	85 - 115	17.76	17.755	0.0050	+/-1.000	
Blank (0E21026-BLK2) ug/Kg wet				Lab File ID: V1MBLK1.D		Analyzed: 05/21/10 19:08		
Bromofluorobenzene	30.00	104	85 - 120	22.47	22.476	-0.0060	+/-1.000	
Dibromofluoromethane	30.00	90.3	80 - 125	12.407	12.43	-0.0230	+/-1.000	
1,2-Dichloroethane-d4	30.00	105	75 - 140	13.189	13.213	-0.0240	+/-1.000	
Toluene-d8	30.00	101	85 - 115	17.748	17.755	-0.0070	+/-1.000	
32SB-53-0910 (1004294-26RE1) ug/Kg dry				Lab File ID: 0429426D.D		Analyzed: 05/21/10 21:45		
Bromofluorobenzene	31.07	105	85 - 120	22.459	22.476	-0.0170	+/-1.000	
Dibromofluoromethane	31.07	98.6	80 - 125	12.405	12.43	-0.0250	+/-1.000	
1,2-Dichloroethane-d4	31.07	88.8	75 - 140	13.204	13.213	-0.0090	+/-1.000	
Toluene-d8	31.07	105	85 - 115	17.744	17.755	-0.0110	+/-1.000	
32SB-51-0708 (1004294-20RE2) ug/Kg dry				Lab File ID: 0429420D.D		Analyzed: 05/21/10 23:04		
Bromofluorobenzene	29.94	138	85 - 120	22.462	22.476	-0.0140	+/-1.000	*
Dibromofluoromethane	29.94	94.8	80 - 125	12.412	12.43	-0.0180	+/-1.000	
1,2-Dichloroethane-d4	29.94	86.4	75 - 140	13.209	13.213	-0.0040	+/-1.000	
Toluene-d8	29.94	107	85 - 115	17.752	17.755	-0.0030	+/-1.000	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15210	Instrument:	MS-VOA1
		Calibration:	0141001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15210-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/21/10 16:29			
Fluorobenzene	2662943	14.59	2403751	14.57	111	50 - 200	0.0200	+/-0.50	
Chlorobenzene-d5	1157308	20.342	960429	20.321	120	50 - 200	0.0210	+/-0.50	
1,4-Dichlorobenzene-d4	837707	24.832	805672	24.823	104	50 - 200	0.0090	+/-0.50	
LCS (0E21026-BS1)			Lab File ID: V1LCS1.D			Analyzed: 05/21/10 17:08			
Fluorobenzene	2759485	14.58	2662943	14.59	104	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	1150251	20.335	1157308	20.342	99	50 - 200	-0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	841774	24.822	837707	24.832	100	50 - 200	-0.0100	+/-0.50	
Blank (0E21026-BLK2)			Lab File ID: V1MBLK1.D			Analyzed: 05/21/10 19:08			
Fluorobenzene	2551659	14.551	2662943	14.59	96	50 - 200	-0.0390	+/-0.50	
Chlorobenzene-d5	1070031	20.321	1157308	20.342	92	50 - 200	-0.0210	+/-0.50	
1,4-Dichlorobenzene-d4	852037	24.824	837707	24.832	102	50 - 200	-0.0080	+/-0.50	
32SB-53-0910 (1004294-26RE1)			Lab File ID: 0429426D.D			Analyzed: 05/21/10 21:45			
Fluorobenzene	2754783	14.578	2662943	14.59	103	50 - 200	-0.0120	+/-0.50	
Chlorobenzene-d5	1074132	20.321	1157308	20.342	93	50 - 200	-0.0210	+/-0.50	
1,4-Dichlorobenzene-d4	899292	24.816	837707	24.832	107	50 - 200	-0.0160	+/-0.50	
32SB-51-0708 (1004294-20RE2)			Lab File ID: 0429420D.D			Analyzed: 05/21/10 23:04			
Fluorobenzene	2820936	14.571	2662943	14.59	106	50 - 200	-0.0190	+/-0.50	
Chlorobenzene-d5	1115365	20.326	1157308	20.342	96	50 - 200	-0.0160	+/-0.50	
1,4-Dichlorobenzene-d4	867440	24.81	837707	24.832	104	50 - 200	-0.0220	+/-0.50	

Data File: \\BC\TARGET\chem\voa4.i\051310V4.b\SEQ-CAL1.D
Report Date: 14-May-2010 10:28

Empirical Laboratories, LLC

Data file : \\BC\TARGET\chem\voa4.i\051310V4.b\SEQ-CAL1.D
Lab Smp Id: SEQ-CAL1 Client Smp ID: SEQ-CAL1
Inj Date : 13-MAY-2010 14:27 MS Autotune Date: 07-MAY-2010 17:53
Operator : ADM Inst ID: voa4.i
Smp Info : SEQ-CAL1;;;;; 2.0PPB
Misc Info : ;;;;;gmall-k.sub;
Comment :
Method : \\BC\TARGET\chem\voa4.i\051310V4.b\VSOIL4.m
Meth Date : 14-May-2010 10:28 jeh Quant Type: ISTD
Cal Date : 07-MAY-2010 22:52 Cal File: SEQ-CAL8.D
Als bottle: 1 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: gmall-k.sub
Target Version: 4.04
Processing Host: NSH-LAPTOP2

5-14-10 5/21/10

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/Kg)	ON-COL (ug/Kg)
* 59 Fluorobenzene	96	14.049	14.049	(1.000)	925532	30.0000	
1 Dichlorodifluoromethane	85	4.789	4.789	(0.341)	13752	2.00000	4.652
4 Chloromethane	50	5.094	5.094	(0.363)	15821	2.00000	4.649
5 Vinyl chloride	62	5.360	5.360	(0.382)	11352	2.00000	3.584
6 Bromomethane	94	5.990	5.990	(0.426)	10595	2.00000	2.201
7 Chloroethane	64	6.206	6.206	(0.442)	14974	2.00000	1.886
9 Trichlorofluoromethane	101	7.171	7.171	(0.510)	25950	2.00000	1.791
24 t-Butyl alcohol	59	8.233	8.233	(0.586)	10759	10.0000	21.48
21 Trichlorotrifluoroethane	101	8.637	8.637	(0.615)	15854	2.00000	1.818
8 Acrolein	56	7.112	7.112	(0.506)	8075	10.0000	20.35
15 1,1-Dichloroethene	96	8.214	8.214	(0.585)	11703	2.00000	1.625
16 Iodomethane	142	8.253	8.253	(0.587)	16027	2.00000	5.311
25 Carbon disulfide	76	8.981	8.981	(0.639)	50138	2.00000	1.901
20 Methylene chloride	84	8.489	8.489	(0.604)	107760	2.00000	4.108
17 Acrylonitrile	53	8.282	8.282	(0.590)	27736	10.0000	10.05
27 trans-1,2-Dichloroethene	96	10.083	10.083	(0.718)	15838	2.00000	1.856
29 MTBE	73	10.428	10.428	(0.742)	43695	2.00000	1.949
30 1,1-Dichloroethane	63	10.683	10.683	(0.760)	32218	2.00000	1.866
32 Vinyl acetate	43	10.949	10.949	(0.779)	87078	4.00000	3.891
40 Di-isopropyl ether	45	11.618	11.618	(0.827)	73860	2.00000	2.036
38 cis-1,2-Dichloroethene	96	11.785	11.785	(0.839)	17387	2.00000	1.908
M 18 1,2-Dichloroethene(total)	96				33225	4.00000	3.764
42 Bromochloromethane	128	12.031	12.031	(0.856)	7403	2.00000	1.748
49 Tetrahydrofuran	42	12.651	12.651	(0.901)	7624	2.00000	2.468
43 Chloroform	83	12.110	12.110	(0.862)	34766	2.00000	2.230
22 Methyl acetate	43	8.578	8.578	(0.611)	15024	2.00000	1.979

Data File: \\BC\TARGET\chem\voa4.i\051310V4.b\SEQ-CAL1.D
Report Date: 14-May-2010 10:28

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/Kg)	AMOUNTS ON-COL (ug/Kg)
$	46 Dibromofluoromethane	111	12.297	12.297	(0.875)	252946	30.0000	28.55
	52 1,1,1-Trichloroethane	97	13.252	13.252	(0.943)	23678	2.00000	1.847
	44 ETBE	59	12.277	12.277	(0.874)	54358	2.00000	1.876
	54 Cyclohexane	56	13.645	13.645	(0.971)	33780	2.00000	2.070
	55 Carbon tetrachloride	117	13.734	13.734	(0.978)	21327	2.00000	1.788
$	50 1,2-Dichloroethane-d4	102	12.986	12.986	(0.924)	62383	30.0000	29.90
	56 Benzene	78	13.763	13.763	(0.980)	63946	2.00000	1.985
	51 1,2-Dichloroethane	62	13.094	13.094	(0.932)	22728	2.00000	1.832
	45 2,2-Dichloropropane	77	12.258	12.258	(0.873)	24018	2.00000	1.869
	53 1,1-Dichloropropene	75	13.517	13.517	(0.962)	23482	2.00000	1.982
	58 tert-Amyl Methyl Ether	73	14.029	14.029	(0.999)	61852	2.00000	2.555
	63 Trichloroethene	95	14.570	14.570	(1.037)	15515	2.00000	1.825
	62 1,2-Dichloropropane	63	14.511	14.511	(1.033)	19271	2.00000	1.986
	61 Dibromomethane	93	14.462	14.462	(1.029)	11176	2.00000	2.034
	65 Methyl methacrylate	41	14.796	14.796	(1.053)	14881	2.00000	4.014
	64 Bromodichloromethane	83	14.609	14.609	(1.040)	21703	2.00000	1.899
	68 2-Chloroethyl vinyl ether	63	15.092	15.092	(1.074)	15892	4.00000	4.473
	72 cis-1,3-Dichloropropene	75	15.338	15.338	(1.092)	25200	2.00000	1.868
$	77 Toluene-d8	98	16.026	16.026	(0.926)	787846	30.0000	31.00
	78 Toluene	92	16.095	16.095	(0.930)	37719	2.00000	2.203
	75 trans-1,3-Dichloropropene	75	15.770	15.770	(0.911)	21254	2.00000	2.027
	79 Ethyl methacrylate	69	16.174	16.174	(0.935)	22794	2.00000	2.287
	76 1,1,2-Trichloroethane	83	15.918	15.918	(0.920)	11076	2.00000	2.080
	84 Tetrachloroethene	166	16.774	16.774	(0.969)	18412	2.00000	2.260
	82 Dibromochloromethane	129	16.390	16.390	(0.947)	15485	2.00000	1.943
	83 1,2-Dibromoethane	107	16.607	16.607	(0.960)	14088	2.00000	2.072
	69 Methyl cyclohexane	83	15.160	15.160	(1.079)	25672	2.00000	1.990
*	87 Chlorobenzene-d5	82	17.305	17.305	(1.000)	386681	30.0000	
	88 Chlorobenzene	112	17.335	17.335	(1.002)	42182	2.00000	2.168
	85 1,1,1,2-Tetrachloroethane	131	17.276	17.276	(0.998)	14785	2.00000	2.013
	86 1-Chlorohexane	91	17.256	17.256	(0.997)	26095	2.00000	2.254
	89 Ethylbenzene	91	17.473	17.473	(1.010)	81024	2.00000	2.329
	90 m,p-Xylene	91	17.630	17.630	(1.019)	129250	4.00000	4.529
M	96 Xylene(total)	91				188756	6.00000	6.863
	94 o-Xylene	91	17.955	17.955	(1.038)	59506	2.00000	2.334
	93 Styrene	104	17.896	17.896	(1.034)	41773	2.00000	2.090
	92 Bromoform	173	17.748	17.748	(1.026)	10894	2.00000	2.036
	100 Isopropylbenzene	105	18.240	18.240	(1.054)	59180	2.00000	2.185
$	101 Bromofluorobenzene	95	18.280	18.280	(1.056)	349372	30.0000	31.75
	95 1,1,2,2-Tetrachloroethane	83	17.965	17.965	(0.928)	17639	2.00000	2.222
	80 1,3-Dichloropropane	76	16.154	16.154	(0.933)	25227	2.00000	2.316
	97 1,2,3-Trichloropropane	110	18.073	18.073	(1.044)	5643	2.00000	2.332
	103 n-Propylbenzene	91	18.585	18.585	(0.960)	84691	2.00000	2.218
	106 1,3,5-Trimethylbenzene	105	18.781	18.781	(0.970)	56965	2.00000	2.217
	109 1,2,4-Trimethylbenzene	105	19.116	19.116	(0.987)	56906	2.00000	2.196
	110 sec-Butylbenzene	105	19.224	19.224	(0.993)	74695	2.00000	2.200
	108 tert-Butylbenzene	119	19.047	19.047	(0.984)	46996	2.00000	2.140

Data File: \\BC\TARGET\chem\voa4.i\051310V4.b\SEQ-CAL1.D
Report Date: 14-May-2010 10:28

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/Kg)	AMOUNTS ON-COL (ug/Kg)
111 1,3-Dichlorobenzene	146	19.332	19.332	(0.998)	28694	2.00000	2.059
* 112 1,4-Dichlorobenzene-d4	152	19.362	19.362	(1.000)	298332	30.0000	
114 1,4-Dichlorobenzene	146	19.382	19.382	(1.001)	33559	2.00000	2.302
116 n-Butylbenzene	91	19.706	19.706	(1.018)	57715	2.00000	2.237
115 1,2-Dichlorobenzene	146	19.716	19.716	(1.018)	27666	2.00000	2.193
117 1,2-Dibromo-3-chloropropane	157	20.139	20.139	(1.040)	2869	2.00000	4.760
102 Bromobenzene	156	18.476	18.476	(0.954)	17966	2.00000	2.091
104 2-Chlorotoluene	91	18.693	18.693	(0.965)	51670	2.00000	2.164
105 4-Chlorotoluene	91	18.742	18.742	(0.968)	59674	2.00000	2.172
118 1,2,4-Trichlorobenzene	180	21.586	21.586	(1.115)	18800	2.00000	1.932
119 Naphthalene	128	21.910	21.910	(1.132)	41337	2.00000	2.082
113 p-Isopropyltoluene	119	19.352	19.352	(0.999)	52693	2.00000	2.077
120 Hexachlorobutadiene	225	21.940	21.940	(1.133)	10158	2.00000	1.818
121 1,2,3-Trichlorobenzene	180	22.196	22.196	(1.146)	19596	2.00000	2.200

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14710	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14710-TUN1	TUNE-E.D	05/23/10 07:44
Calibration Check	0E14710-CCV1	CCV1E.D	05/23/10 08:16
LCS	0E22011-BS1	V1LCSE1.D	05/23/10 08:55
Blank	0E22011-BLK2	V1MBLKE.D	05/23/10 10:53
32SB-51-1415	1004294-21RE2	0429421D.D	05/23/10 11:32
LCS Dup	0E22011-BSD1	V1LCSDE1.D	05/23/10 17:28

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MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	TUNE-E.D	Injection Date:	05/23/10
Instrument ID:	MS-VOA1	Injection Time:	07:44
Sequence:	0E14710	Lab Sample ID:	0E14710-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	24.6	PASS
75	30 - 60% of 95	49.3	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.24	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	54.8	PASS
175	5 - 9% of 174	7.05	PASS
176	95 - 101% of 174	97.1	PASS
177	5 - 9% of 176	6.81	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA1	Calibration:	0141001
Lab File ID:	CCV1E.D	Calibration Date:	05/16/10 05:53
Sequence:	0E14710	Injection Date:	05/23/10
Lab Sample ID:	0E14710-CCV1	Injection Time:	08:16

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT		
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
Benzene	A	100.0	133.2	0.9538096	1.270343		33.2	20	*
Ethylbenzene	A	100.0	116.5	2.625901	3.059216		16.5	20	
Naphthalene	A	100.0	115.4	1.42045	1.639498		15.4	20	
Methyl t-Butyl Ether	A	100.0	226.1	0.4789501	1.082906		126	20	* NOT TARGET
Toluene	A	100.0	119.4	1.306087	1.559782		19.4	20	
m,p-Xylene	A	200.0	223.8	1.994748	2.231685		11.9	20	
o-Xylene	A	100.0	115.6	1.962043	2.26908		15.6	20	
Xylenes (total)	A	300.0	339.4	1.983846	2.244151		13.1	20	
Bromofluorobenzene	A	30.00	27.63	0.806614	0.7429562		-7.9	20	
Dibromofluoromethane	A	30.00	28.81	0.2558456	0.2457023		-4.0	20	
1,2-Dichloroethane-d4	A	30.00	26.63	6.111453E-02	5.425931E-02		-11.2	20	
Toluene-d8	A	30.00	27.47	2.151044	1.969785		-8.4	20	

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14710	Instrument:	MS-VOA1
		Calibration:	0141001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E14710-CCV1) ug/L				Lab File ID: CCV1E.D		Analyzed: 05/23/10 08:16		
Bromofluorobenzene	30.00	92.1	80 - 120	22.448	22.448	0.0000	+/-1.000	
Dibromofluoromethane	30.00	96.0	80 - 120	12.402	12.402	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	88.8	80 - 120	13.185	13.185	0.0000	+/-1.000	
Toluene-d8	30.00	91.6	80 - 120	17.741	17.741	0.0000	+/-1.000	
LCS (0E22011-BS1) ug/Kg wet				Lab File ID: V1LCSE1.D		Analyzed: 05/23/10 08:55		
Bromofluorobenzene	30.00	98.7	85 - 120	22.442	22.448	-0.0060	+/-1.000	
Dibromofluoromethane	30.00	97.5	80 - 125	12.397	12.402	-0.0050	+/-1.000	
1,2-Dichloroethane-d4	30.00	90.6	75 - 140	13.179	13.185	-0.0060	+/-1.000	
Toluene-d8	30.00	98.3	85 - 115	17.72	17.741	-0.0210	+/-1.000	
Blank (0E22011-BLK2) ug/Kg wet				Lab File ID: V1MBLKE.D		Analyzed: 05/23/10 10:53		
Bromofluorobenzene	30.00	105	85 - 120	22.446	22.448	-0.0020	+/-1.000	
Dibromofluoromethane	30.00	90.6	80 - 125	12.355	12.402	-0.0470	+/-1.000	
1,2-Dichloroethane-d4	30.00	99.6	75 - 140	13.154	13.185	-0.0310	+/-1.000	
Toluene-d8	30.00	102	85 - 115	17.71	17.741	-0.0310	+/-1.000	
32SB-51-1415 (1004294-21RE2) ug/Kg dry				Lab File ID: 0429421D.D		Analyzed: 05/23/10 11:32		
Bromofluorobenzene	29.60	106	85 - 120	22.441	22.448	-0.0070	+/-1.000	
Dibromofluoromethane	29.60	95.9	80 - 125	12.383	12.402	-0.0190	+/-1.000	
1,2-Dichloroethane-d4	29.60	85.5	75 - 140	13.181	13.185	-0.0040	+/-1.000	
Toluene-d8	29.60	103	85 - 115	17.736	17.741	-0.0050	+/-1.000	
LCS Dup (0E22011-BSD1) ug/Kg wet				Lab File ID: V1LCSDE1.D		Analyzed: 05/23/10 17:28		
Bromofluorobenzene	30.00	98.5	85 - 120	22.454	22.448	0.0060	+/-1.000	
Dibromofluoromethane	30.00	98.1	80 - 125	12.406	12.402	0.0040	+/-1.000	
1,2-Dichloroethane-d4	30.00	94.5	75 - 140	13.205	13.185	0.0200	+/-1.000	
Toluene-d8	30.00	99.1	85 - 115	17.747	17.741	0.0060	+/-1.000	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14710	Instrument:	MS-VOA1
		Calibration:	0141001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E14710-CCV1)			Lab File ID: CCV1E.D			Analyzed: 05/23/10 08:16			
Fluorobenzene	2550143	14.562	2403751	14.57	106	50 - 200	-0.0080	+/-0.50	
Chlorobenzene-d5	1218411	20.299	960429	20.321	127	50 - 200	-0.0220	+/-0.50	
1,4-Dichlorobenzene-d4	850039	24.804	805672	24.823	106	50 - 200	-0.0190	+/-0.50	
LCS (0E22011-BS1)			Lab File ID: V1LCSE1.D			Analyzed: 05/23/10 08:55			
Fluorobenzene	2718661	14.557	2550143	14.562	107	50 - 200	-0.0050	+/-0.50	
Chlorobenzene-d5	1187121	20.292	1218411	20.299	97	50 - 200	-0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	882421	24.797	850039	24.804	104	50 - 200	-0.0070	+/-0.50	
Blank (0E22011-BLK2)			Lab File ID: V1MBLKE.D			Analyzed: 05/23/10 10:53			
Fluorobenzene	2392559	14.516	2550143	14.562	94	50 - 200	-0.0460	+/-0.50	
Chlorobenzene-d5	969185	20.297	1218411	20.299	80	50 - 200	-0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	805772	24.8	850039	24.804	95	50 - 200	-0.0040	+/-0.50	
32SB-51-1415 (1004294-21RE2)			Lab File ID: 0429421D.D			Analyzed: 05/23/10 11:32			
Fluorobenzene	2612116	14.558	2550143	14.562	102	50 - 200	-0.0040	+/-0.50	
Chlorobenzene-d5	1071388	20.308	1218411	20.299	88	50 - 200	0.0090	+/-0.50	
1,4-Dichlorobenzene-d4	889469	24.794	850039	24.804	105	50 - 200	-0.0100	+/-0.50	
LCS Dup (0E22011-BSD1)			Lab File ID: V1LCSDE1.D			Analyzed: 05/23/10 17:28			
Fluorobenzene	2795530	14.567	2550143	14.562	110	50 - 200	0.0050	+/-0.50	
Chlorobenzene-d5	1206945	20.32	1218411	20.299	99	50 - 200	0.0210	+/-0.50	
1,4-Dichlorobenzene-d4	921156	24.807	850039	24.804	108	50 - 200	0.0030	+/-0.50	

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13002	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13002-TUN1	SEQ-TUN1.D	05/07/10 18:43
Cal Standard	0E13002-CAL1	SEQ-CAL1.D	05/07/10 19:17
Cal Standard	0E13002-CAL2	SEQ-CAL2.D	05/07/10 19:47
Cal Standard	0E13002-CAL3	SEQ-CAL3.D	05/07/10 20:18
Cal Standard	0E13002-CAL4	SEQ-CAL4.D	05/07/10 20:49
Cal Standard	0E13002-CAL5	SEQ-CAL5.D	05/07/10 21:20
Cal Standard	0E13002-CAL6	SEQ-CAL6.D	05/07/10 21:51
Cal Standard	0E13002-CAL7	SEQ-CAL7.D	05/07/10 22:21
Cal Standard	0E13002-CAL8	SEQ-CAL8.D	05/07/10 22:52
Initial Cal Check	0E13002-ICV1	SEQ-ICV1.D	05/07/10 23:22
Cal Standard	0E13002-CAL9	SEQ-CAL9.D	05/07/10 23:53
Cal Standard	0E13002-CALA	SEQ-CALA.D	05/08/10 00:24
Cal Standard	0E13002-CALB	SEQ-CALB.D	05/08/10 00:55
Cal Standard	0E13002-CALC	SEQ-CALC.D	05/08/10 01:25
Cal Standard	0E13002-CALD	SEQ-CALD.D	05/08/10 01:56
Cal Standard	0E13002-CALE	SEQ-CALE.D	05/08/10 02:27
Cal Standard	0E13002-CALF	SEQ-CALF.D	05/08/10 02:57
Cal Standard	0E13002-CALG	SEQ-CALG.D	05/08/10 03:28
MS Tune	0E13002-TUN2	SEQ-TUN2.D	05/08/10 04:29
Cal Standard	0E13002-CALH	SEQ-CALH.D	05/08/10 04:59
Cal Standard	0E13002-CALI	SEQ-CALI.D	05/08/10 05:30
Cal Standard	0E13002-CALJ	SEQ-CALJ.D	05/08/10 06:01
Cal Standard	0E13002-CALK	SEQ-CALK.D	05/08/10 06:31
Cal Standard	0E13002-CALL	SEQ-CALL.D	05/08/10 07:02
Cal Standard	0E13002-CALM	SEQ-CALM.D	05/08/10 07:32
Cal Standard	0E13002-CALN	SEQ-CALN.D	05/08/10 08:03
Cal Standard	0E13002-CALO	SEQ-CALO.D	05/08/10 08:34

NOT USED

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/07/10
Instrument ID:	MS-VOA4	Injection Time:	18:43
Sequence:	0E13002	Lab Sample ID:	0E13002-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	32.2	PASS
75	30 - 60% of 95	50.5	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.01	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	70.3	PASS
175	5 - 9% of 174	7.68	PASS
176	95 - 101% of 174	95.1	PASS
177	5 - 9% of 176	5.92	PASS

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0130002	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/7/2010 9:01:33AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	1.072069	4.777662	13.77363	2.989758E-02			15	
Bromofluorobenzene	0.8397075	6.434109	18.2985	2.305661E-02			15	
Ethylbenzene	2.911353	12.32509	17.49371	7.889913E-03			CCC (20)	
Naphthalene	1.929638	13.77676	21.93187	8.914289E-03			15	
Methyl t-Butyl Ether	0.7656045	3.435099	10.40713	4.151465E-02			15	
Toluene	1.422543	12.62549	16.10688	1.093417E-02			CCC (20)	
m,p-Xylene	2.139192	17.90708	17.64143	1.326399E-02		0.9998704	0.99	
o-Xylene	2.105664	14.8487	17.96983	3.930673E-03			15	
Xylenes (total)	2.150116	17.06447	0	0		0.9998992	0.99	
Dibromofluoromethane	0.3074291	2.04296	12.30138	4.654776E-02			15	
1,2-Dichloroethane-d4	6.679317E-02	3.711545	12.98763	2.467597E-02			15	
Toluene-d8	2.047687	4.711146	16.03913	1.096841E-02			15	

INITIAL CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-ICV1.D	Calibration Date:	05/07/10 09:01
Sequence:	0E13002	Injection Date:	05/07/10
Lab Sample ID:	0E13002-ICV1	Injection Time:	23:22

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzene	A	100.0	99.09	1.072069	1.062337		-0.9	20
Ethylbenzene	A	100.0	86.70	2.911353	2.524206		-13.3	20
Toluene	A	100.0	89.48	1.422543	1.27282		-10.5	20
Xylenes (total)	Q	300.0	284.2	2.150116	1.761576		-5.3	20
Bromofluorobenzene	A	30.00	29.24	0.8397075	0.8183789		-2.5	20
Dibromofluoromethane	A	30.00	30.33	0.3074291	0.3108571		1.1	20
1,2-Dichloroethane-d4	A	30.00	30.54	6.679317E-02	6.799794E-02		1.8	20
Toluene-d8	A	30.00	29.08	2.047687	1.984594		-3.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/08/10
Instrument ID:	MS-VOA4	Injection Time:	04:29
Sequence:	0E13002	Lab Sample ID:	0E13002-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	25.2	PASS
75	30 - 60% of 95	44.3	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.93	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	72	PASS
175	5 - 9% of 174	8.06	PASS
176	95 - 101% of 174	95.2	PASS
177	5 - 9% of 176	6.4	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/13/10
Instrument ID:	MS-VOA4	Injection Time:	23:42
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	27.6	PASS
75	30 - 60% of 95	49	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.84	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	50.2	PASS
175	5 - 9% of 174	7.16	PASS
176	95 - 101% of 174	95.8	PASS
177	5 - 9% of 176	7.75	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1A.D	Injection Date:	05/14/10
Instrument ID:	MS-VOA4	Injection Time:	11:07
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN3

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	25.5	PASS
75	30 - 60% of 95	48.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.2	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	62.6	PASS
175	5 - 9% of 174	8.21	PASS
176	95 - 101% of 174	95.7	PASS
177	5 - 9% of 176	6.95	PASS

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14024	Instrument:	MS-VOA4
Calibration:	0144005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14024-TUN1	SEQ-TUN1.D	05/13/10 13:56
Cal Standard	0E14024-CAL1	SEQ-CAL1.D	05/13/10 14:27
Cal Standard	0E14024-CAL2	SEQ-CAL2.D	05/13/10 14:58
Cal Standard	0E14024-CAL3	SEQ-CAL3.D	05/13/10 15:29
Cal Standard	0E14024-CAL4	SEQ-CAL4.D	05/13/10 16:00
Cal Standard	0E14024-CAL5	SEQ-CAL5.D	05/13/10 16:31
Cal Standard	0E14024-CAL6	SEQ-CAL6.D	05/13/10 17:02
Cal Standard	0E14024-CAL7	SEQ-CAL7.D	05/13/10 17:33
Cal Standard	0E14024-CAL8	SEQ-CAL8.D	05/13/10 18:03
Cal Standard	0E14024-CAL9	SEQ-CAL9.D	05/13/10 19:05
Cal Standard	0E14024-CALA	SEQ-CALA.D	05/13/10 19:36
Cal Standard	0E14024-CALB	SEQ-CALB.D	05/13/10 20:07
Cal Standard	0E14024-CALC	SEQ-CALC.D	05/13/10 20:38
Cal Standard	0E14024-CALD	SEQ-CALD.D	05/13/10 21:09
Cal Standard	0E14024-CALE	SEQ-CALE.D	05/13/10 21:39
Cal Standard	0E14024-CALF	SEQ-CALF.D	05/13/10 22:10
Cal Standard	0E14024-CALG	SEQ-CALG.D	05/13/10 22:41
MS Tune	0E14024-TUN2	SEQ-TUN2.D	05/13/10 23:42
Cal Standard	0E14024-CALH	SEQ-CALH.D	05/14/10 00:13
Cal Standard	0E14024-CALI	SEQ-CALI.D	05/14/10 00:44
Cal Standard	0E14024-CALJ	SEQ-CALJ.D	05/14/10 01:14
Cal Standard	0E14024-CALK	SEQ-CALK.D	05/14/10 01:45
Cal Standard	0E14024-CALL	SEQ-CALL.D	05/14/10 02:16
Cal Standard	0E14024-CALM	SEQ-CALM.D	05/14/10 02:46
Cal Standard	0E14024-CALN	SEQ-CALN.D	05/14/10 03:17
Cal Standard	0E14024-CALO	SEQ-CALO.D	05/14/10 03:48
MS Tune	0E14024-TUN3	SEQ-TUN1A.D	05/14/10 11:07
Initial Cal Check	0E14024-ICV4	SEQ-ICV4.D	05/14/10 11:37

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/13/10
Instrument ID:	MS-VOA4	Injection Time:	13:56
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	24.2	PASS
75	30 - 60% of 95	46.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.6	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	72.9	PASS
175	5 - 9% of 174	8.01	PASS
176	95 - 101% of 174	97.4	PASS
177	5 - 9% of 176	6.63	PASS

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0144005	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/13/2010_12:58:00PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	1.044291	4.652266	13.76237	3.391041E-02			15	
Bromofluorobenzene	0.8537608	7.34618	18.281	8.410647E-03			15	
Ethylbenzene	2.698668	13.33057	17.47429	6.927592E-03			CCC (20)	
Naphthalene	1.996388	5.075341	21.90313	1.378937E-02			15	
Methyl t-Butyl Ether	0.7267424	7.117503	10.3995	0.1372416			15	
Toluene	1.328513	13.22851	16.0955	5.342824E-03			CCC (20)	
m,p-Xylene	2.002384	18.89119	17.62343	2.237986E-02		0.9993129	0.99	
o-Xylene	1.977768	14.16671	17.947	1.172407E-02			15	
Xylenes (total)	2.00992	17.15348	0	0		0.9991333	0.99	
Dibromofluoromethane	0.2871282	2.648676	12.29125	3.601698E-02			15	
1,2-Dichloroethane-d4	6.763165E-02	4.751393	12.97875	3.193036E-02			15	
Toluene-d8	1.971808	5.830891	16.02787	1.491481E-02			15	

INITIAL CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0144005
Lab File ID:	SEQ-ICV4.D	Calibration Date:	05/13/10 12:58
Sequence:	0E14024	Injection Date:	05/14/10
Lab Sample ID:	0E14024-ICV4	Injection Time:	11:37

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzene	A	100.0	99.51	1.044291	1.039213		-0.5	20
Ethylbenzene	A	100.0	94.40	2.698668	2.547461		-5.6	20
Toluene	A	100.0	95.86	1.328513	1.27348		-4.1	20
Xylenes (total)	Q	300.0	298.4	2.00992	1.719716		-0.5	20
Bromofluorobenzene	A	30.00	30.32	0.8537608	0.8627737		1.1	20
Dibromofluoromethane	A	30.00	31.96	0.2871282	0.3058803		6.5	20
1,2-Dichloroethane-d4	A	30.00	27.56	6.763165E-02	6.213989E-02		-8.1	20
Toluene-d8	A	30.00	31.03	1.971808	2.039809		3.4	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15201	Instrument:	MS-VOA4
Calibration:	0144005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15201-TUN1	SEQ-TUN2.D	05/16/10 14:05
Calibration Check	0F15201-CCV1	SEQ-CCV2.D	05/16/10 14:36
LCS	0E16003-BS1	V4LCS01.D	05/16/10 15:38
Blank	0E16003-BLK1	V4BLK01.D	05/16/10 19:22
32SB-FD042910-05 50X	1004294-02	0429402.D	05/16/10 20:23 ✓
32SB-43-0506 50X	1004294-04	0429404.D	05/16/10 20:54
32SB-44-0506 50X	1004294-06	0429406.D	05/16/10 21:24
32SB-45-0607 50X	1004294-08	0429408.D	05/16/10 21:55
32SB-46-0304 50X	1004294-10	0429410.D	05/16/10 22:26
32SB-47-0506 50X	1004294-12	0429412.D	05/16/10 22:56
32SB-48-0405 50X	1004294-14	0429414.D	05/16/10 23:27
32SB-49-0405 50X	1004294-16	0429416.D	05/16/10 23:58
32SB-50-0607 50X	1004294-18	0429418.D	05/17/10 00:28
LCS Dup	0E16003-BSD1	V4LCS03.D	05/17/10 04:03 — out of 12 hr

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MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/16/10
Instrument ID:	MS-VOA4	Injection Time:	14:05
Sequence:	0F15201	Lab Sample ID:	0F15201-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	25.2	PASS
75	30 - 60% of 95	47	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	57.7	PASS
175	5 - 9% of 174	8.16	PASS
176	95 - 101% of 174	96.3	PASS
177	5 - 9% of 176	6.56	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0144005
Lab File ID:	SEQ-CCV2.D	Calibration Date:	05/13/10 12:58
Sequence:	0F15201	Injection Date:	05/16/10
Lab Sample ID:	0F15201-CCV1	Injection Time:	14:36

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	104.0	1.044291	1.043547		-0.07	20
Ethylbenzene	A	100.0	89.52	2.698668	2.315105		-14.2	20
Naphthalene	A	100.0	96.26	1.996388	1.557661		-22.0	20 *
Methyl t-Butyl Ether	A	100.0	97.78	0.7267424	0.6618533		-8.9	20
Toluene	A	100.0	91.55	1.328513	1.275345		-4.0	20
m,p-Xylene	Q	200.0	162.4	2.002384	1.600583		-18.8	20
o-Xylene	A	100.0	88.12	1.977768	1.735437		-12.3	20
Xylenes (total)	Q	300.0	250.5	2.00992	1.645534		-16.5	20
Bromofluorobenzene	A	30.00	29.66	0.8537608	0.8148329		-4.6	20
Dibromofluoromethane	A	30.00	30.65	0.2871282	0.2935067		2.2	20
1,2-Dichloroethane-d4	A	30.00	29.34	6.763165E-02	5.996744E-02		-11.3	20
Toluene-d8	A	30.00	28.89	1.971808	2.01542		2.2	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15201	Instrument:	MS-VOA4
		Calibration:	0144005

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15201-CCV1) ug/L				Lab File ID: SEQ-CCV2.D		Analyzed: 05/16/10 14:36		
Bromofluorobenzene	30.00	98.9	80 - 120	18.305	18.305	0.0000	+/-1.000	
Dibromofluoromethane	30.00	102	80 - 120	12.342	12.342	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	97.8	80 - 120	13.021	13.021	0.0000	+/-1.000	
Toluene-d8	30.00	96.3	80 - 120	16.052	16.052	0.0000	+/-1.000	
LCS (0E16003-BS1) ug/Kg wet				Lab File ID: V4LCS01.D		Analyzed: 05/16/10 15:38		
Bromofluorobenzene	30.00	101	85 - 120	18.301	18.305	-0.0040	+/-1.000	
Dibromofluoromethane	30.00	99.0	80 - 125	12.328	12.342	-0.0140	+/-1.000	
1,2-Dichloroethane-d4	30.00	92.0	75 - 140	13.017	13.021	-0.0040	+/-1.000	
Toluene-d8	30.00	98.6	85 - 115	16.048	16.052	-0.0040	+/-1.000	
Blank (0E16003-BLK1) ug/Kg wet				Lab File ID: V4BLK01.D		Analyzed: 05/16/10 19:22		
Bromofluorobenzene	30.00	110	85 - 120	18.314	18.305	0.0090	+/-1.000	
Dibromofluoromethane	30.00	105	80 - 125	12.342	12.342	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	114	75 - 140	13.02	13.021	-0.0010	+/-1.000	
Toluene-d8	30.00	99.0	85 - 115	16.061	16.052	0.0090	+/-1.000	
32SB-FD042910-05 (1004294-02) ug/Kg dry				Lab File ID: 0429402.D		Analyzed: 05/16/10 20:23		
Bromofluorobenzene	30.25	89.2	85 - 120	18.31	18.305	0.0050	+/-1.000	
Dibromofluoromethane	30.25	102	80 - 125	12.337	12.342	-0.0050	+/-1.000	
1,2-Dichloroethane-d4	30.25	110	75 - 140	13.016	13.021	-0.0050	+/-1.000	
Toluene-d8	30.25	114	85 - 115	16.056	16.052	0.0040	+/-1.000	
32SB-43-0506 (1004294-04) ug/Kg dry				Lab File ID: 0429404.D		Analyzed: 05/16/10 20:54		
Bromofluorobenzene	29.61	108	85 - 120	18.31	18.305	0.0050	+/-1.000	
Dibromofluoromethane	29.61	101	80 - 125	12.338	12.342	-0.0040	+/-1.000	
1,2-Dichloroethane-d4	29.61	111	75 - 140	13.017	13.021	-0.0040	+/-1.000	
Toluene-d8	29.61	98.8	85 - 115	16.057	16.052	0.0050	+/-1.000	
32SB-44-0506 (1004294-06) ug/Kg dry				Lab File ID: 0429406.D		Analyzed: 05/16/10 21:24		
Bromofluorobenzene	32.26	135	85 - 120	18.305	18.305	0.0000	+/-1.000	*
Dibromofluoromethane	32.26	100	80 - 125	12.333	12.342	-0.0090	+/-1.000	
1,2-Dichloroethane-d4	32.26	110	75 - 140	13.012	13.021	-0.0090	+/-1.000	
Toluene-d8	32.26	97.9	85 - 115	16.052	16.052	0.0000	+/-1.000	
32SB-45-0607 (1004294-08) ug/Kg dry				Lab File ID: 0429408.D		Analyzed: 05/16/10 21:55		
Bromofluorobenzene	32.68	121	85 - 120	18.306	18.305	0.0010	+/-1.000	*
Dibromofluoromethane	32.68	105	80 - 125	12.334	12.342	-0.0080	+/-1.000	
1,2-Dichloroethane-d4	32.68	110	75 - 140	13.013	13.021	-0.0080	+/-1.000	
Toluene-d8	32.68	99.0	85 - 115	16.053	16.052	0.0010	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15201	Instrument:	MS-VOA4
		Calibration:	0144005

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
32SB-46-0304 (1004294-10) ug/Kg dry				Lab File ID: 0429410.D		Analyzed: 05/16/10 22:26		
Bromofluorobenzene	30.22	109	85 - 120	18.305	18.305	0.0000	+/-1.000	
Dibromofluoromethane	30.22	101	80 - 125	12.332	12.342	-0.0100	+/-1.000	
1,2-Dichloroethane-d4	30.22	104	75 - 140	13.021	13.021	0.0000	+/-1.000	
Toluene-d8	30.22	99.4	85 - 115	16.052	16.052	0.0000	+/-1.000	
32SB-47-0506 (1004294-12) ug/Kg dry				Lab File ID: 0429412.D		Analyzed: 05/16/10 22:56		
Bromofluorobenzene	28.71	108	85 - 120	18.307	18.305	0.0020	+/-1.000	
Dibromofluoromethane	28.71	96.9	80 - 125	12.334	12.342	-0.0080	+/-1.000	
1,2-Dichloroethane-d4	28.71	108	75 - 140	13.023	13.021	0.0020	+/-1.000	
Toluene-d8	28.71	95.5	85 - 115	16.053	16.052	0.0010	+/-1.000	
32SB-48-0405 (1004294-14) ug/Kg dry				Lab File ID: 0429414.D		Analyzed: 05/16/10 23:27		
Bromofluorobenzene	27.35	130	85 - 120	18.304	18.305	-0.0010	+/-1.000	*
Dibromofluoromethane	27.35	99.4	80 - 125	12.341	12.342	-0.0010	+/-1.000	
1,2-Dichloroethane-d4	27.35	101	75 - 140	13.02	13.021	-0.0010	+/-1.000	
Toluene-d8	27.35	101	85 - 115	16.05	16.052	-0.0020	+/-1.000	
32SB-49-0405 (1004294-16) ug/Kg dry				Lab File ID: 0429416.D		Analyzed: 05/16/10 23:58		
Bromofluorobenzene	31.48	111	85 - 120	18.31	18.305	0.0050	+/-1.000	
Dibromofluoromethane	31.48	95.2	80 - 125	12.337	12.342	-0.0050	+/-1.000	
1,2-Dichloroethane-d4	31.48	101	75 - 140	13.016	13.021	-0.0050	+/-1.000	
Toluene-d8	31.48	104	85 - 115	16.056	16.052	0.0040	+/-1.000	
32SB-50-0607 (1004294-18) ug/Kg dry				Lab File ID: 0429418.D		Analyzed: 05/17/10 00:28		
Bromofluorobenzene	34.98	313	85 - 120	18.275	18.305	-0.0300	+/-1.000	*
Dibromofluoromethane	34.98	102	80 - 125	12.342	12.342	0.0000	+/-1.000	
1,2-Dichloroethane-d4	34.98	107	75 - 140	13.021	13.021	0.0000	+/-1.000	
Toluene-d8	34.98	148	85 - 115	16.052	16.052	0.0000	+/-1.000	*
LCS Dup (0E16003-BSD1) ug/Kg wet				Lab File ID: V4LCS03.D		Analyzed: 05/17/10 04:03		
Bromofluorobenzene	30.00	98.6	85 - 120	18.31	18.305	0.0050	+/-1.000	
Dibromofluoromethane	30.00	98.5	80 - 125	12.338	12.342	-0.0040	+/-1.000	
1,2-Dichloroethane-d4	30.00	98.0	75 - 140	13.017	13.021	-0.0040	+/-1.000	
Toluene-d8	30.00	96.2	85 - 115	16.057	16.052	0.0050	+/-1.000	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15201	Instrument:	MS-VOA4
		Calibration:	0144005

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15201-CCV1)			Lab File ID: SEQ-CCV2.D			Analyzed: 05/16/10 14:36			
Fluorobenzene	925202	14.084	822611	14.04	112	50 - 200	0.0440	+/-0.50	
Chlorobenzene-d5	417828	17.331	341417	17.297	122	50 - 200	0.0340	+/-0.50	
1,4-Dichlorobenzene-d4	267587	19.388	297455	19.354	90	50 - 200	0.0340	+/-0.50	
LCS (0E16003-BS1)			Lab File ID: V4LCS01.D			Analyzed: 05/16/10 15:38			
Fluorobenzene	884637	14.07	925202	14.084	96	50 - 200	-0.0140	+/-0.50	
Chlorobenzene-d5	383134	17.327	417828	17.331	92	50 - 200	-0.0040	+/-0.50	
1,4-Dichlorobenzene-d4	271102	19.383	267587	19.388	101	50 - 200	-0.0050	+/-0.50	
Blank (0E16003-BLK1)			Lab File ID: V4BLK01.D			Analyzed: 05/16/10 19:22			
Fluorobenzene	1115327	14.083	925202	14.084	121	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	461218	17.33	417828	17.331	110	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	381418	19.387	267587	19.388	143	50 - 200	-0.0010	+/-0.50	
32SB-FD042910-05 (1004294-02)			Lab File ID: 0429402.D			Analyzed: 05/16/10 20:23			
Fluorobenzene	993617	14.079	925202	14.084	107	50 - 200	-0.0050	+/-0.50	
Chlorobenzene-d5	326718	17.326	417828	17.331	78	50 - 200	-0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	220072	19.392	267587	19.388	82	50 - 200	0.0040	+/-0.50	
32SB-43-0506 (1004294-04)			Lab File ID: 0429404.D			Analyzed: 05/16/10 20:54			
Fluorobenzene	959905	14.079	925202	14.084	104	50 - 200	-0.0050	+/-0.50	
Chlorobenzene-d5	417621	17.326	417828	17.331	100	50 - 200	-0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	363752	19.383	267587	19.388	136	50 - 200	-0.0050	+/-0.50	
32SB-44-0506 (1004294-06)			Lab File ID: 0429406.D			Analyzed: 05/16/10 21:24			
Fluorobenzene	445012	14.074	925202	14.084	48	50 - 200	-0.0100	+/-0.50	*
Chlorobenzene-d5	191595	17.331	417828	17.331	46	50 - 200	0.0000	+/-0.50	*
1,4-Dichlorobenzene-d4	147663	19.388	267587	19.388	55	50 - 200	0.0000	+/-0.50	
32SB-45-0607 (1004294-08)			Lab File ID: 0429408.D			Analyzed: 05/16/10 21:55			
Fluorobenzene	950116	14.075	925202	14.084	103	50 - 200	-0.0090	+/-0.50	
Chlorobenzene-d5	383646	17.332	417828	17.331	92	50 - 200	0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	253900	19.379	267587	19.388	95	50 - 200	-0.0090	+/-0.50	
32SB-46-0304 (1004294-10)			Lab File ID: 0429410.D			Analyzed: 05/16/10 22:26			
Fluorobenzene	1003429	14.074	925202	14.084	108	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	415278	17.331	417828	17.331	99	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	374196	19.378	267587	19.388	140	50 - 200	-0.0100	+/-0.50	
32SB-47-0506 (1004294-12)			Lab File ID: 0429412.D			Analyzed: 05/16/10 22:56			
Fluorobenzene	729837	14.076	925202	14.084	79	50 - 200	-0.0080	+/-0.50	
Chlorobenzene-d5	313791	17.333	417828	17.331	75	50 - 200	0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	267999	19.379	267587	19.388	100	50 - 200	-0.0090	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0F15201

SDG: CTOF273_007
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0144005

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
32SB-48-0405 (1004294-14)			Lab File ID: 0429414.D			Analyzed: 05/16/10 23:27			
Fluorobenzene	1014085	14.083	925202	14.084	110	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	407444	17.33	417828	17.331	98	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	322082	19.386	267587	19.388	120	50 - 200	-0.0020	+/-0.50	
32SB-49-0405 (1004294-16)			Lab File ID: 0429416.D			Analyzed: 05/16/10 23:58			
Fluorobenzene	791221	14.079	925202	14.084	86	50 - 200	-0.0050	+/-0.50	
Chlorobenzene-d5	317993	17.326	417828	17.331	76	50 - 200	-0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	224349	19.382	267587	19.388	84	50 - 200	-0.0060	+/-0.50	
32SB-50-0607 (1004294-18)			Lab File ID: 0429418.D			Analyzed: 05/17/10 00:28			
Fluorobenzene	913733	14.084	925202	14.084	99	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	242199	17.331	417828	17.331	58	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	155868	19.387	267587	19.388	58	50 - 200	-0.0010	+/-0.50	
LCS Dup (0E16003-BSD1)			Lab File ID: V4LCS03.D			Analyzed: 05/17/10 04:03			
Fluorobenzene	933978	14.079	925202	14.084	101	50 - 200	-0.0050	+/-0.50	
Chlorobenzene-d5	408258	17.326	417828	17.331	98	50 - 200	-0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	276365	19.383	267587	19.388	103	50 - 200	-0.0050	+/-0.50	

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14108	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14108-TUN1	SEQ-TUN1.D	05/17/10 16:36
Calibration Check	0E14108-CCV1	SEQ-CCV1.D	05/17/10 17:07
LCS	0E17026-BS1	V4LCS01.D	05/17/10 18:08
Blank	0E17026-BLK1	V4BLK01.D	05/17/10 19:41
32SB-53-0910	1004294-26	0429426.D	05/18/10 00:48
32SB-52-0809	1004294-23	0429423.D	05/18/10 01:49

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MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/17/10
Instrument ID:	MS-VOA4	Injection Time:	16:36
Sequence:	0E14108	Lab Sample ID:	0E14108-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	22.4	PASS
75	30 - 60% of 95	44.5	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.98	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	65.6	PASS
175	5 - 9% of 174	8.03	PASS
176	95 - 101% of 174	95.8	PASS
177	5 - 9% of 176	6.46	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/07/10 09:01
Sequence:	0E14108	Injection Date:	05/17/10
Lab Sample ID:	0E14108-CCV1	Injection Time:	17:07

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	99.73	1.072069	1.041494		-2.9	20
Ethylbenzene	A	100.0	89.48	2.911353	2.414685		-17.1	20
Naphthalene	A	100.0	85.20	1.929638	1.700831		-11.9	20
Methyl t-Butyl Ether	A	100.0	81.58	0.7656045	0.5928919		-22.6	20 *
Toluene	A	100.0	93.80	1.422543	1.246217		-12.4	20
m,p-Xylene	Q	200.0	194.6	2.139192	1.596457		-2.7	20
o-Xylene	A	100.0	85.07	2.105664	1.682421		-20.1	20 *
Xylenes (total)	Q	300.0	279.6	2.150116	1.625112		-6.8	20
Bromofluorobenzene	A	30.00	27.09	0.8397075	0.7709404		-8.2	20
Dibromofluoromethane	A	30.00	28.83	0.3074291	0.275916		-10.3	20
1,2-Dichloroethane-d4	A	30.00	26.42	6.679317E-02	5.957216E-02		-10.8	20
Toluene-d8	A	30.00	29.40	2.047687	1.932668		-5.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14108	Instrument:	MS-VOA4
		Calibration:	0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E14108-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/17/10 17:07		
Bromofluorobenzene	30.00	90.3	80 - 120	18.296	18.296	0.0000	+/-1.000	
Dibromofluoromethane	30.00	96.1	80 - 120	12.323	12.323	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	88.1	80 - 120	13.012	13.012	0.0000	+/-1.000	
Toluene-d8	30.00	98.0	80 - 120	16.043	16.043	0.0000	+/-1.000	
LCS (0E17026-BS1) ug/Kg wet				Lab File ID: V4LCS01.D		Analyzed: 05/17/10 18:08		
Bromofluorobenzene	30.00	97.1	85 - 120	18.307	18.296	0.0110	+/-1.000	
Dibromofluoromethane	30.00	97.9	80 - 125	12.334	12.323	0.0110	+/-1.000	
1,2-Dichloroethane-d4	30.00	86.4	75 - 140	13.013	13.012	0.0010	+/-1.000	
Toluene-d8	30.00	104	85 - 115	16.054	16.043	0.0110	+/-1.000	
Blank (0E17026-BLK1) ug/Kg wet				Lab File ID: V4BLK01.D		Analyzed: 05/17/10 19:41		
Bromofluorobenzene	30.00	104	85 - 120	18.304	18.296	0.0080	+/-1.000	
Dibromofluoromethane	30.00	102	80 - 125	12.331	12.323	0.0080	+/-1.000	
1,2-Dichloroethane-d4	30.00	98.8	75 - 140	13.01	13.012	-0.0020	+/-1.000	
Toluene-d8	30.00	101	85 - 115	16.051	16.043	0.0080	+/-1.000	
32SB-53-0910 (1004294-26) ug/Kg dry				Lab File ID: 0429426.D		Analyzed: 05/18/10 00:48		
Bromofluorobenzene	35.30	107	85 - 120	18.314	18.296	0.0180	+/-1.000	
Dibromofluoromethane	35.30	99.3	80 - 125	12.351	12.323	0.0280	+/-1.000	
1,2-Dichloroethane-d4	35.30	94.3	75 - 140	13.03	13.012	0.0180	+/-1.000	
Toluene-d8	35.30	110	85 - 115	16.061	16.043	0.0180	+/-1.000	
32SB-52-0809 (1004294-23) ug/Kg dry				Lab File ID: 0429423.D		Analyzed: 05/18/10 01:49		
Bromofluorobenzene	35.48	125	85 - 120	18.319	18.296	0.0230	+/-1.000	*
Dibromofluoromethane	35.48	103	80 - 125	12.346	12.323	0.0230	+/-1.000	
1,2-Dichloroethane-d4	35.48	90.5	75 - 140	13.035	13.012	0.0230	+/-1.000	
Toluene-d8	35.48	111	85 - 115	16.066	16.043	0.0230	+/-1.000	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14108	Instrument:	MS-VOA4
		Calibration:	0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E14108-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/17/10 17:07			
Fluorobenzene	845076	14.065	672772	14.056	126	50 - 200	0.0090	+/-0.50	
Chlorobenzene-d5	392339	17.322	278531	17.313	141	50 - 200	0.0090	+/-0.50	
1,4-Dichlorobenzene-d4	238381	19.378	217185	19.369	110	50 - 200	0.0090	+/-0.50	
LCS (0E17026-BS1)			Lab File ID: V4LCS01.D			Analyzed: 05/17/10 18:08			
Fluorobenzene	872018	14.076	845076	14.065	103	50 - 200	0.0110	+/-0.50	
Chlorobenzene-d5	385543	17.323	392339	17.322	98	50 - 200	0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	263077	19.379	238381	19.378	110	50 - 200	0.0010	+/-0.50	
Blank (0E17026-BLK1)			Lab File ID: V4BLK01.D			Analyzed: 05/17/10 19:41			
Fluorobenzene	947957	14.073	845076	14.065	112	50 - 200	0.0080	+/-0.50	
Chlorobenzene-d5	407224	17.33	392339	17.322	104	50 - 200	0.0080	+/-0.50	
1,4-Dichlorobenzene-d4	333312	19.387	238381	19.378	140	50 - 200	0.0090	+/-0.50	
32SB-53-0910 (1004294-26)			Lab File ID: 0429426.D			Analyzed: 05/18/10 00:48			
Fluorobenzene	775745	14.083	845076	14.065	92	50 - 200	0.0180	+/-0.50	
Chlorobenzene-d5	302285	17.33	392339	17.322	77	50 - 200	0.0080	+/-0.50	
1,4-Dichlorobenzene-d4	240120	19.387	238381	19.378	101	50 - 200	0.0090	+/-0.50	
32SB-52-0809 (1004294-23)			Lab File ID: 0429423.D			Analyzed: 05/18/10 01:49			
Fluorobenzene	991163	14.088	845076	14.065	117	50 - 200	0.0230	+/-0.50	
Chlorobenzene-d5	385757	17.345	392339	17.322	98	50 - 200	0.0230	+/-0.50	
1,4-Dichlorobenzene-d4	291440	19.401	238381	19.378	122	50 - 200	0.0230	+/-0.50	

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14205	Instrument:	MS-VOA4
Calibration:	0130002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14205-TUN1	SEQ-TUN1.D	05/19/10 11:18
Calibration Check	0E14205-CCV1	SEQ-CCV1.D	05/19/10 11:49
LCS	0E19018-BS1	V4LCS01.D	05/19/10 12:51
Blank	0E19018-BLK1	V4BLK01.D	05/19/10 14:23
32SB-52-1415 unbiased	1004294-24RE1	0429424.D	05/19/10 17:38
32SB-51-0708 (unbiased)	1004294-20RE1	0429420.D	05/19/10 18:09

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MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/19/10
Instrument ID:	MS-VOA4	Injection Time:	11:18
Sequence:	0E14205	Lab Sample ID:	0E14205-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	26.7	PASS
75	30 - 60% of 95	46.6	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.84	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	53	PASS
175	5 - 9% of 174	8.31	PASS
176	95 - 101% of 174	96.9	PASS
177	5 - 9% of 176	7.34	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0130002
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/07/10 09:01
Sequence:	0E14205	Injection Date:	05/19/10
Lab Sample ID:	0E14205-CCV1	Injection Time:	11:49

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	99.35	1.072069	1.037548		-3.2	20
Ethylbenzene	A	100.0	90.24	2.911353	2.435308		-16.4	20
Naphthalene	A	100.0	86.56	1.929638	1.728039		-10.4	20
Methyl t-Butyl Ether	A	100.0	96.98	0.7656045	0.7047863		-7.9	20
Toluene	A	100.0	95.43	1.422543	1.26781		-10.9	20
m,p-Xylene	Q	200.0	203.4	2.139192	1.652673		1.7	20
o-Xylene	A	100.0	89.04	2.105664	1.760994		-16.4	20
Xylenes (total)	Q	300.0	292.5	2.150116	1.68878		-2.5	20
Bromofluorobenzene	A	30.00	29.40	0.8397075	0.8367534		-0.4	20
Dibromofluoromethane	A	30.00	31.17	0.3074291	0.2983109		-3.0	20
Toluene-d8	A	30.00	30.13	2.047687	1.980156		-3.3	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14205	Instrument:	MS-VOA4
		Calibration:	0130002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E14205-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/19/10 11:49		
Bromofluorobenzene	30.00	98.0	80 - 120	18.31	18.31	0.0000	+/-1.000	
Dibromofluoromethane	30.00	104	80 - 120	12.337	12.337	0.0000	+/-1.000	
1,2 dichloroethane-d4	30	97.1	80-120	13.016	13.016			
Toluene-d8	30.00	100	80 - 120	16.057	16.057	0.0000	+/-1.000	
LCS (0E19018-BS1) ug/Kg wet				Lab File ID: V4LCS01.D		Analyzed: 05/19/10 12:51		
Bromofluorobenzene	30.00	100	85 - 120	18.304	18.31	-0.0060	+/-1.000	
Dibromofluoromethane	30.00	101	80 - 125	12.331	12.337	-0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	90.5	75 - 140	13.01	13.016	~~13.0100~~ -0.0060	+/-1.000	*
Toluene-d8	30.00	106	85 - 115	16.051	16.057	-0.0060	+/-1.000	
Blank (0E19018-BLK1) ug/Kg wet				Lab File ID: V4BLK01.D		Analyzed: 05/19/10 14:23		
Bromofluorobenzene	30.00	116	85 - 120	18.306	18.31	-0.0040	+/-1.000	
Dibromofluoromethane	30.00	103	80 - 125	12.323	12.337	-0.0140	+/-1.000	
1,2-Dichloroethane-d4	30.00	105	75 - 140	13.012	13.016	~~13.0120~~ -0.0040	+/-1.000	*
Toluene-d8	30.00	113	85 - 115	16.052	16.057	-0.0050	+/-1.000	
32SB-52-1415 (1004294-24RE1) ug/Kg dry				Lab File ID: 0429424.D		Analyzed: 05/19/10 17:38		
Bromofluorobenzene	30.76	108	85 - 120	18.297	18.31	-0.0130	+/-1.000	
Dibromofluoromethane	30.76	97.8	80 - 125	12.324	12.337	-0.0130	+/-1.000	
1,2-Dichloroethane-d4	30.76	91.1	75 - 140	13.013	13.016	~~13.0130~~ -0.0030	+/-1.000	*
Toluene-d8	30.76	112	85 - 115	16.044	16.057	-0.0130	+/-1.000	
32SB-51-0708 (1004294-20RE1) ug/Kg dry				Lab File ID: 0429420.D		Analyzed: 05/19/10 18:09		
Bromofluorobenzene	31.13	197	85 - 120	18.27	18.31	-0.0400	+/-1.000	*
Dibromofluoromethane	31.13	105	80 - 125	12.326	12.337	-0.0110	+/-1.000	
1,2-Dichloroethane-d4	31.13	98.6	75 - 140	13.005	13.016	~~13.0050~~ -0.0110	+/-1.000	*
Toluene-d8	31.13	137	85 - 115	16.046	16.057	-0.0110	+/-1.000	*

7/28/10

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14205	Instrument:	MS-VOA4
		Calibration:	0130002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E14205-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/19/10 11:49			
Fluorobenzene	930955	14.079	672772	14.056	138	50 - 200	0.0230	+/-0.50	
Chlorobenzene-d5	432885	17.326	278531	17.313	155	50 - 200	0.0130	+/-0.50	
1,4-Dichlorobenzene-d4	280019	19.383	217185	19.369	129	50 - 200	0.0140	+/-0.50	
LCS (0E19018-BS1)			Lab File ID: V4LCS01.D			Analyzed: 05/19/10 12:51			
Fluorobenzene	911067	14.073	930955	14.079	98	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	393967	17.33	432885	17.326	91	50 - 200	0.0040	+/-0.50	
1,4-Dichlorobenzene-d4	291100	19.377	280019	19.383	104	50 - 200	-0.0060	+/-0.50	
Blank (0E19018-BLK1)			Lab File ID: V4BLK01.D			Analyzed: 05/19/10 14:23			
Fluorobenzene	902953	14.074	930955	14.079	97	50 - 200	-0.0050	+/-0.50	
Chlorobenzene-d5	361072	17.322	432885	17.326	83	50 - 200	-0.0040	+/-0.50	
1,4-Dichlorobenzene-d4	339569	19.378	280019	19.383	121	50 - 200	-0.0050	+/-0.50	
32SB-52-1415 (1004294-24RE1)			Lab File ID: 0429424.D			Analyzed: 05/19/10 17:38			
Fluorobenzene	969595	14.066	930955	14.079	104	50 - 200	-0.0130	+/-0.50	
Chlorobenzene-d5	381382	17.323	432885	17.326	88	50 - 200	-0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	326875	19.379	280019	19.383	117	50 - 200	-0.0040	+/-0.50	
32SB-51-0708 (1004294-20RE1)			Lab File ID: 0429420.D			Analyzed: 05/19/10 18:09			
Fluorobenzene	901577	14.068	930955	14.079	97	50 - 200	-0.0110	+/-0.50	
Chlorobenzene-d5	287961	17.325	432885	17.326	67	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	175220	19.381	280019	19.383	63	50 - 200	-0.0020	+/-0.50	

Data File: \\ELABNSH05\TARGET\chem\voa4.i\051910V4.b\SEQ-CCV1.D
Report Date: 22-May-2010 06:00

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/Kg)	AMOUNTS ON-COL (ug/Kg)
	44 ETBE	59	12.308	12.308	(0.874)	2899665	100.000	99.50
	45 2,2-Dichloropropane	77	12.298	12.298	(0.874)	1290644	100.000	99.87
$	46 Dibromofluoromethane	111	12.337	12.337	(0.876)	277714	30.0000	31.17
	22 Methyl acetate	43	8.628	8.628	(0.613)	732150	100.000	95.89
	49 Tetrahydrofuran	42	12.682	12.682	(0.901)	256258	100.000	82.46
	54 Cyclohexane	56	13.676	13.676	(0.971)	1738434	100.000	105.9
$	50 1,2-Dichloroethane-d4	102	13.016	13.016	(0.925)	61142	30.0000	29.13
	51 1,2-Dichloroethane	62	13.125	13.125	(0.932)	1099241	100.000	88.10
	52 1,1,1-Trichloroethane	97	13.292	13.292	(0.944)	1266236	100.000	98.20
	53 1,1-Dichloropropene	75	13.548	13.548	(0.962)	1171498	100.000	98.30
	55 Carbon tetrachloride	117	13.764	13.764	(0.978)	1136611	100.000	94.74
	56 Benzene	78	13.794	13.794	(0.980)	3219703	100.000	99.35
	58 tert-Amyl Methyl Ether	73	14.050	14.050	(0.998)	2117821	100.000	86.97
	61 Dibromomethane	93	14.492	14.492	(1.029)	506854	100.000	91.70
	62 1,2-Dichloropropane	63	14.532	14.532	(1.032)	947182	100.000	97.06
	63 Trichloroethene	95	14.601	14.601	(1.037)	862974	100.000	100.9
	64 Bromodichloromethane	83	14.640	14.640	(1.040)	1127118	100.000	98.03
	65 Methyl methacrylate	41	14.827	14.827	(1.053)	852572	100.000	84.06
	68 2-Chloroethyl vinyl ether	63	15.122	15.122	(1.074)	702454	200.000	162.9
	72 cis-1,3-Dichloropropene	75	15.358	15.358	(1.091)	1340959	100.000	98.84
	74 4-Methyl-2-pentanone	43	15.476	15.476	(1.099)	1895632	200.000	178.3
	75 trans-1,3-Dichloropropene	75	15.791	15.791	(0.911)	1090654	100.000	92.92
	76 1,1,2-Trichloroethane	83	15.949	15.949	(0.920)	533211	100.000	89.43
$	77 Toluene-d8	98	16.057	16.057	(0.927)	857180	30.0000	30.13
	78 Toluene	92	16.116	16.116	(0.930)	1829387	100.000	95.43
	80 1,3-Dichloropropane	76	16.175	16.175	(0.934)	1070645	100.000	87.79
	79 Ethyl methacrylate	69	16.195	16.195	(0.935)	1032610	100.000	92.54
	81 2-Hexanone	43	16.313	16.313	(0.942)	1366822	200.000	160.1
	82 Dibromochloromethane	129	16.421	16.421	(0.948)	792442	100.000	88.82
	83 1,2-Dibromoethane	107	16.637	16.637	(0.960)	667756	100.000	87.75
	69 Methyl cyclohexane	83	15.191	15.191	(1.079)	1376603	100.000	106.1
	84 Tetrachloroethene	166	16.795	16.795	(0.969)	840795	100.000	92.17
	85 1,1,1,2-Tetrachloroethane	131	17.297	17.297	(0.998)	739893	100.000	89.99
	86 1-Chlorohexane	91	17.287	17.287	(0.998)	1193244	100.000	92.06
*	87 Chlorobenzene-d5	82	17.326	17.326	(1.000)	432885	30.0000	
	88 Chlorobenzene	112	17.356	17.356	(1.002)	2063800	100.000	94.76
	92 Bromoform	173	17.779	17.779	(1.026)	514743	100.000	85.94
	89 Ethylbenzene	91	17.503	17.503	(1.010)	3514028	100.000	90.24
	90 m,p-Xylene	91	17.651	17.651	(1.019)	4769450	200.000	203.4
M	96 Xylene(total)	91				7310477	300.000	292.5
	94 o-Xylene	91	17.976	17.976	(1.037)	2541027	100.000	89.04
	93 Styrene	104	17.917	17.917	(1.034)	2124537	100.000	94.97
	95 1,1,2,2-Tetrachloroethane	83	17.985	17.985	(0.928)	645059	100.000	86.58
	97 1,2,3-Trichloropropane	110	18.094	18.094	(1.044)	228806	100.000	84.46
	100 Isopropylbenzene	105	18.261	18.261	(1.054)	2861209	100.000	94.37
$	101 Bromofluorobenzene	95	18.310	18.310	(1.057)	362218	30.0000	29.40
	102 Bromobenzene	156	18.497	18.497	(0.954)	851366	100.000	105.6

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_007

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E16003 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E16003-BLK1	05/16/10 00:00	5.00	5.00
LCS	0E16003-BS1	05/16/10 00:00	5.00	5.00
LCS Dup	0E16003-BSD1	05/16/10 00:00	5.00	5.00
32SB-FD042910-05	1004294-02	05/16/10 00:00	5.64	5.00
32SB-43-0506	1004294-04	05/16/10 00:00	6.08	5.00
32SB-44-0506	1004294-06	05/16/10 00:00	5.71	5.00
32SB-45-0607	1004294-08	05/16/10 00:00	5.56	5.00
32SB-46-0304	1004294-10	05/16/10 00:00	5.68	5.00
32SB-47-0506	1004294-12	05/16/10 00:00	6.15	5.00
32SB-48-0405	1004294-14	05/16/10 00:00	6.36	5.00
32SB-49-0405	1004294-16	05/16/10 00:00	5.73	5.00
32SB-50-0607	1004294-18	05/16/10 00:00	4.68	5.00

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E16003	Laboratory ID:	0E16003-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	43.17	86.3	75 - 125
Ethylbenzene	50.00	44.55	89.1	75 - 125
Toluene	50.00	42.30	84.6	70 - 125
Xylenes (total)	150.0	127.7	85.1	75 - 125

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzene	50.00	55.69	111	25.3	30	75 - 125
Ethylbenzene	50.00	56.40	113	23.5	30	75 - 125
Toluene	50.00	54.55	109	25.3	30	70 - 125
Xylenes (total)	150.0	159.5	106	22.1	30	75 - 125

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E16003-BLK1	File ID:	V4BLK01.D
Sampled:		Prepared:		Analyzed:	05/16/10 19:22
Solids:		Preparation:	5035	Dilution:	

Batch: 0E16003 Sequence: 0F15201 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	33.11	110	85 - 120	
Dibromofluoromethane	30.00	31.44	105	80 - 125	
1,2-Dichloroethane-d4	30.00	34.27	114	75 - 140	
Toluene-d8	30.00	29.71	99.0	85 - 115	

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_007

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E17026 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E17026-BLK1	05/17/10 00:00	5.00	5.00
LCS	0E17026-BS1	05/17/10 00:00	5.00	5.00
32SB-52-0809	1004294-23	05/17/10 00:00	5.00	5.00
32SB-53-0910	1004294-26	05/17/10 00:00	5.00	5.00

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E17026	Laboratory ID:	0E17026-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	47.06	94.1	75 - 125
Ethylbenzene	50.00	47.12	94.2	75 - 125
Toluene	50.00	50.56	101	70 - 125
Xylenes (total)	150.0	145.4	96.9	75 - 125

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E17026-BLK1	File ID:	V4BLK01.D
Sampled:		Prepared:		Analyzed:	05/17/10 19:41
Solids:		Preparation:	5035	Dilution:	

Batch: 0E17026 Sequence: 0E14108 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.17	104	85 - 120	
Dibromofluoromethane	30.00	30.62	102	80 - 125	
1,2-Dichloroethane-d4	30.00	29.63	98.8	75 - 140	
Toluene-d8	30.00	30.39	101	85 - 115	

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_007

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E19018 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E19018-BLK1	05/19/10 00:00	5.00	5.00
LCS	0E19018-BS1	05/19/10 00:00	5.00	5.00
32SB-51-0708	1004294-20RE1	05/19/10 00:00	5.26	5.00
32SB-52-1415	1004294-24RE1	05/19/10 00:00	5.70	5.00

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E19018	Laboratory ID:	0E19018-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	46.31	92.6	75 - 125
Ethylbenzene	50.00	46.96	93.9	75 - 125
Toluene	50.00	48.88	97.8	70 - 125
Xylenes (total)	150.0	145.4	96.9	75 - 125

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_007	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E19018-BLK1	File ID:	V4BLK01.D
Sampled:		Prepared:		Analyzed:	05/19/10 14:23
Solids:		Preparation:	5035	Dilution:	

Batch: 0E19018 Sequence: 0E14205 Calibration: 0130002 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	34.71	116	85 - 120	
Dibromofluoromethane	30.00	31.00	103	80 - 125	
1,2-Dichloroethane-d4	30.00	31.64	105	75 - 140	
Toluene-d8	30.00	33.89	113	85 - 115	

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_007

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E21026 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E21026-BLK2	05/21/10 00:00	5.00	5.00
LCS	0E21026-BS1	05/21/10 00:00	5.00	5.00
32SB-51-0708	1004294-20RE2	05/21/10 00:00	5.47	5.00
32SB-53-0910	1004294-26RE1	05/21/10 00:00	5.68	5.00

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E21026	Laboratory ID:	0E21026-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	48.79	97.6	75 - 125
Ethylbenzene	50.00	49.68	99.4	75 - 125
Toluene	50.00	49.63	99.3	70 - 125
Xylenes (total)	150.0	145.0	96.6	75 - 125

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E21026-BLK2	File ID:	V1MBLK1.D
Sampled:		Prepared:		Analyzed:	05/21/10 19:08
Solids:		Preparation:	5035	Dilution:	

Batch:	0E21026	Sequence:	0F15210	Calibration:	0141001	Instrument:	MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		23.5	200	U
100-41-4	Ethylbenzene		37.5	500	U
108-88-3	Toluene		43.0	500	U
1330-20-7	Xylenes (total)		35.0	500	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.19	104	85 - 120	
Dibromofluoromethane	30.00	27.08	90.3	80 - 125	
1,2-Dichloroethane-d4	30.00	31.55	105	75 - 140	
Toluene-d8	30.00	30.36	101	85 - 115	

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_007

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E22011 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E22011-BLK2	05/22/10 18:57	5.00	5.00
LCS	0E22011-BS1	05/22/10 18:57	5.00	5.00
LCS Dup	0E22011-BSD1	05/22/10 18:57	5.00	5.00
32SB-51-1415	1004294-21RE2	05/22/10 18:57	5.73	5.00

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E22011	Laboratory ID:	0E22011-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	48.33	96.7	75 - 125
Ethylbenzene	50.00	46.68	93.4	75 - 125
Toluene	50.00	46.54	93.1	70 - 125
Xylenes (total)	150.0	138.4	92.3	75 - 125

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzene	50.00	40.85	81.7	16.8	30	75 - 125
Ethylbenzene	50.00	40.60	81.2	13.9	30	75 - 125
Toluene	50.00	39.90	79.8	15.4	30	70 - 125
Xylenes (total)	150.0	118.3	78.9	15.6	30	75 - 125

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0E22011-BLK2	File ID:	V1MBLKE.D
Sampled:		Prepared:		Analyzed:	05/23/10 10:53
Solids:		Preparation:	5035	Dilution:	

Batch:	0E22011	Sequence:	0E14710	Calibration:	0141001	Instrument:	MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		23.5	200	X, U
100-41-4	Ethylbenzene		37.5	500	U
108-88-3	Toluene		43.0	500	U
1330-20-7	Xylenes (total)		35.0	500	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.65	105	85 - 120	
Dibromofluoromethane	30.00	27.19	90.6	80 - 125	
1,2-Dichloroethane-d4	30.00	29.89	99.6	75 - 140	
Toluene-d8	30.00	30.68	102	85 - 115	

HOLDING TIME SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_007

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SS-FD042910-05	04/29/10 00:00	04/30/10 08:30	05/13/10 17:55	14.75	14.00	06/17/10 05:56	34.50	40.00	
32SB-FD042910-05	04/29/10 00:00	04/30/10 08:30	05/13/10 17:55	14.75	14.00	06/13/10 03:37	30.40	40.00	
32SS-43-0002	04/29/10 09:15	04/30/10 08:30	05/13/10 17:55	14.36	14.00	06/13/10 04:13	30.43	40.00	
32SB-43-0506	04/29/10 09:10	04/30/10 08:30	05/13/10 17:55	14.36	14.00	06/13/10 04:49	30.45	40.00	
32SS-44-0002	04/29/10 09:26	04/30/10 08:30	05/13/10 17:55	14.35	14.00	06/13/10 05:25	30.48	40.00	
32SB-44-0506	04/29/10 09:26	04/30/10 08:30	05/13/10 17:55	14.35	14.00	06/13/10 06:02	30.50	40.00	
32SS-45-0002	04/29/10 09:55	04/30/10 08:30	05/13/10 17:55	14.33	14.00	06/13/10 06:38	30.53	40.00	
32SB-45-0607	04/29/10 09:55	04/30/10 08:30	05/13/10 17:55	14.33	14.00	06/13/10 07:14	30.55	40.00	
32SS-46-0002	04/29/10 10:16	04/30/10 08:30	05/13/10 17:55	14.32	14.00	06/13/10 17:11	30.97	40.00	
32SB-46-0304	04/29/10 10:16	04/30/10 08:30	05/13/10 17:55	14.32	14.00	06/13/10 17:47	30.99	40.00	
32SS-47-0002	04/29/10 10:40	04/30/10 08:30	05/13/10 17:55	14.30	14.00	06/13/10 07:50	30.58	40.00	
32SB-47-0506	04/29/10 10:40	04/30/10 08:30	05/13/10 17:55	14.30	14.00	06/13/10 08:27	30.61	40.00	
32SS-48-0002	04/29/10 10:54	04/30/10 08:30	05/13/10 17:55	14.29	14.00	06/13/10 09:03	30.63	40.00	
32SB-48-0405	04/29/10 10:54	04/30/10 08:30	05/13/10 17:55	14.29	14.00	06/13/10 09:39	30.66	40.00	
32SS-49-0002	04/29/10 11:18	04/30/10 08:30	05/13/10 17:55	14.28	14.00	06/13/10 12:04	30.76	40.00	
32SB-49-0405	04/29/10 11:18	04/30/10 08:30	05/13/10 17:55	14.28	14.00	06/13/10 10:16	30.68	40.00	
32SS-50-0002	04/29/10 11:45	04/30/10 08:30	05/13/10 17:55	14.26	14.00	06/13/10 10:52	30.71	40.00	
32SB-50-0607	04/29/10 11:45	04/30/10 08:30	05/13/10 17:55	14.26	14.00	06/17/10 08:57	34.63	40.00	
32SS-51-0002	04/29/10 13:42	04/30/10 08:30	05/13/10 17:55	14.18	14.00	06/13/10 11:28	30.73	40.00	
32SB-51-0708	04/29/10 13:42	04/30/10 08:30	05/13/10 17:55	14.18	14.00	06/17/10 05:21	34.48	40.00	
32SB-51-1415	04/29/10 13:42	04/30/10 08:30	05/13/10 15:20	14.07	14.00	05/24/10 11:54	10.86	40.00	
32SS-52-0002	04/29/10 14:20	04/30/10 08:30	05/13/10 15:20	14.04	14.00	05/24/10 12:30	10.88	40.00	
32SB-52-0809	04/29/10 14:20	04/30/10 08:30	05/13/10 15:20	14.04	14.00	05/24/10 13:06	10.91	40.00	
32SB-52-1415	04/29/10 14:20	04/30/10 08:30	05/13/10 15:20	14.04	14.00	05/24/10 13:42	10.93	40.00	

HOLDING TIME SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_007

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SS-53-0002	04/29/10 15:15	04/30/10 08:30	05/13/10 15:20	14.00	14.00	05/24/10 14:19	10.96	40.00	
32SB-53-0910	04/29/10 15:15	04/30/10 08:30	05/13/10 15:20	14.00	14.00	05/24/10 14:55	10.98	40.00	

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13201	Instrument:	MS-BNA3
Calibration:	0132007		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13201-TUN1	SEQ-TUN1.D	05/10/10 13:38
Cal Standard	0E13201-CAL1	SEQ-CAL1.D	05/10/10 14:34
Cal Standard	0E13201-CAL2	SEQ-CAL2.D	05/10/10 15:11
Cal Standard	0E13201-CAL3	SEQ-CAL3.D	05/10/10 15:47
Cal Standard	0E13201-CAL4	SEQ-CAL4.D	05/10/10 16:23
Cal Standard	0E13201-CAL5	SEQ-CAL5.D	05/10/10 16:59
Cal Standard	0E13201-CAL6	SEQ-CAL6.D	05/10/10 17:35
Cal Standard	0E13201-CAL7	SEQ-CAL7.D	05/10/10 18:12
Cal Standard	0E13201-CAL8	SEQ-CAL8.D	05/10/10 18:48
Cal Standard	0E13201-CAL9	SEQ-CAL9.D	05/10/10 19:24
Cal Standard	0E13201-CALA	SEQ-CALA.D	05/10/10 20:00
Cal Standard	0E13201-CALB	SEQ-CALB.D	05/10/10 20:37
Initial Cal Check	0E13201-ICV1	SEQ-ICV1.D	05/10/10 21:49

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/10/10
Instrument ID:	MS-BNA3	Injection Time:	13:38
Sequence:	0E13201	Lab Sample ID:	0E13201-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	44.5	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	44.9	PASS
70	Less than 2% of 69	0.457	PASS
127	40 - 60% of 198	57.3	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.04	PASS
275	10 - 30% of 198	20.5	PASS
365	1 - 200% of 198	1.8	PASS
441	0.001 - 100% of 443	75.7	PASS
442	40 - 200% of 198	47.8	PASS
443	17 - 23% of 442	20.1	PASS

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0132007	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	5/10/2010 5:04:48PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.5449914	6.188575	9.529636	0.1288221			CCC (30)	
Acenaphthylene	0.837393	14.91185	9.133091	0.1088431			15	
Anthracene	0.8127224	21.57029	13.491	6.203524E-02	0.998714		0.995	
Benzo(a)anthracene	0.6443703	28.8539	21.02345	9.171847E-02	0.998062		0.995	
Benzo(a)pyrene	0.8806429	26.16793	24.98811	3.640226E-02	0.9996956		CCC (30)	
Benzo(b)fluoranthene	1.02129	23.35663	24.31167	4.129969E-02	0.9996703		0.995	
Benzo(g,h,i)perylene	0.9507735	13.57635	27.44509	0.1091032			15	
Benzo(k)fluoranthene	1.114795	14.88106	24.39082	0.1031939			15	
Chrysene	0.7443354	14.17831	21.12218	0.1213313			15	
Dibenz(a,h)anthracene	0.824039	16.76544	27.019	3.953226E-02	0.9994966		0.995	
Fluoranthene	0.8561351	22.44759	16.77187	3.955482E-02	0.9998072		CCC (30)	
Fluorene	0.6319282	10.45895	10.79218	0.1358297			15	
2-Fluorobiphenyl	0.8077998	12.16042	8.0446	8.697962E-02			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	0.792655	20.05219	26.95882	8.628932E-02	0.99938		0.995	
1-Methylnaphthalene	0.6312687	12.32071	7.535364	0.1087572			15	
2-Methylnaphthalene	0.7281161	12.31812	7.365818	0.1013574			15	
Naphthalene	1.28018	11.75289	6.309889	7.265111E-02			15	
Nitrobenzene-d5							15	
Phenanthrene	0.9899291	10.43171	13.35291	0.1258165			15	
Phenol-d6							15	
Pyrene	0.8735304	20.55353	17.40789	5.106602E-02	0.9989986		0.995	
Terphenyl-d14	0.6178417	16.24808	18.09664	8.671295E-02		0.9998644	0.99	
2,4,6-Tribromophenol	6.106927E-02	34.78759	11.40991	0.1459834	0.9995088		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0132007
Lab File ID:	SEQ-ICV1.D	Calibration Date:	05/10/10 17:04
Sequence:	0E13201	Injection Date:	05/10/10
Lab Sample ID:	0E13201-ICV1	Injection Time:	21:49

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Acenaphthene	A	5.000	5.487	0.5449914	0.5980619		9.7	20
Acenaphthylene	A	5.000	5.881	0.837393	0.9849436		17.6	20
Anthracene	L	5.000	5.185	0.8127224	0.9913835		3.7	20
Benzo(a)anthracene	L	5.000	4.798	0.6443703	0.7694452		-4.0	20
Benzo(a)pyrene	L	5.000	5.058	0.8806429	1.097758		1.2	20
Benzo(b)fluoranthene	L	5.000	5.112	1.02129	1.247038		2.2	20
Benzo(g,h,i)perylene	A	5.000	5.423	0.9507735	1.031177		8.5	20
Benzo(k)fluoranthene	A	5.000	5.888	1.114795	1.312769		17.8	20
Chrysene	A	5.000	5.580	0.7443354	0.8306387		11.6	20
Dibenz(a,h)anthracene	L	5.000	4.856	0.824039	0.8818608		-2.9	20
Fluoranthene	L	5.000	5.011	0.8561351	1.050939		0.2	20
Fluorene	A	5.000	5.550	0.6319282	0.7013998		11.0	20
Indeno(1,2,3-cd)pyrene	L	5.000	5.009	0.792655	0.9204299		0.2	20
1-Methylnaphthalene	A	5.000	5.139	0.6312687	0.6488054		2.8	20
2-Methylnaphthalene	A	5.000	5.160	0.7281161	0.7514322		3.2	20
Naphthalene	A	5.000	4.558	1.28018	1.167106		-8.8	20
Phenanthrene	A	5.000	5.359	0.9899291	1.061057		7.2	20
Pyrene	L	5.000	5.189	0.8735304	1.0611		3.8	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15503	Instrument:	MS-BNA3
Calibration:	0132007		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15503-TUN1	SEQ-TUN1.D	05/24/10 09:07
Calibration Check	0F15503-CCV1	SEQ-CCV1.D	05/24/10 09:29
Blank	0E12948-BLK1	E12948B1.D	05/24/10 10:41
LCS	0E12948-BS1	E12948L1.D	05/24/10 11:17
32SB-51-1415	1004294-21	0429421.D	05/24/10 11:54
32SS-52-0002	1004294-22	0429422.D	05/24/10 12:30
32SB-52-0809	1004294-23	0429423D.D	05/24/10 13:06
32SB-52-1415	1004294-24	0429424.D	05/24/10 13:42
32SS-53-0002	1004294-25	0429425.D	05/24/10 14:19
32SB-53-0910	1004294-26	0429426D.D	05/24/10 14:55

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/24/10
Instrument ID:	MS-BNA3	Injection Time:	09:07
Sequence:	0F15503	Lab Sample ID:	0F15503-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	54.7	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	53.3	PASS
70	Less than 2% of 69	0.471	PASS
127	40 - 60% of 198	54.9	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.1	PASS
275	10 - 30% of 198	21.3	PASS
365	1 - 200% of 198	2.12	PASS
441	0.001 - 100% of 443	75.6	PASS
442	40 - 200% of 198	42.4	PASS
443	17 - 23% of 442	20.3	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0132007
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/10/10 17:04
Sequence:	0F15503	Injection Date:	05/24/10
Lab Sample ID:	0F15503-CCV1	Injection Time:	09:29

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.742	0.5449914	0.6259238		14.9	20
Acenaphthylene	A	5.000	6.085	0.837393	1.01909		21.7	20 *
Anthracene	L	5.000	5.201	0.8127224	0.9944774		4.0	20
Benzo(a)anthracene	L	5.000	5.040	0.6443703	0.8082341		0.8	20
Benzo(a)pyrene	L	5.000	5.702	0.8806429	1.238924		14.0	20
Benzo(b)fluoranthene	L	5.000	5.726	1.02129	1.397748		14.5	20
Benzo(g,h,i)perylene	A	5.000	4.718	0.9507735	0.8972353		-5.6	20
Benzo(k)fluoranthene	A	5.000	6.283	1.114795	1.400948		25.7	20 *
Chrysene	A	5.000	5.245	0.7443354	0.7807943		4.9	20
Dibenz(a,h)anthracene	L	5.000	4.329	0.824039	0.7860953		-13.4	20
Fluoranthene	L	5.000	5.025	0.8561351	1.053995		0.5	20
Fluorene	A	5.000	5.472	0.6319282	0.6916229		9.4	20
Indeno(1,2,3-cd)pyrene	L	5.000	4.578	0.792655	0.8411974		-8.4	20
1-Methylnaphthalene	A	5.000	4.693	0.6312687	0.5925542		-6.1	20
2-Methylnaphthalene	A	5.000	4.692	0.7281161	0.6832465		-6.2	20
Naphthalene	A	5.000	3.961	1.28018	1.01409		-20.8	20 *
Phenanthrene	A	5.000	5.241	0.9899291	1.037708		4.8	20
Pyrene	L	5.000	5.325	0.8735304	1.088951		6.5	20
2-Fluorobiphenyl	A	5.000	4.750	0.8077998	0.7674694		-5.0	20
Terphenyl-d14	Q	5.000	4.576	0.6178417	0.6946107		-8.5	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16101	Instrument:	MS-BNA3
Calibration:	0161002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16101-TUN1	SEQ-TUN1.D	06/09/10 22:00
Cal Standard	0F16101-CAL1	SEQ-CAL1.D	06/09/10 22:21
Cal Standard	0F16101-CAL2	SEQ-CAL2.D	06/09/10 22:57
Cal Standard	0F16101-CAL3	SEQ-CAL3.D	06/09/10 23:33
Cal Standard	0F16101-CAL4	SEQ-CAL4.D	06/10/10 00:10
Cal Standard	0F16101-CAL5	SEQ-CAL5.D	06/10/10 00:46
Cal Standard	0F16101-CAL6	SEQ-CAL6.D	06/10/10 01:22
Cal Standard	0F16101-CAL7	SEQ-CAL7.D	06/10/10 01:58
Cal Standard	0F16101-CAL8	SEQ-CAL8.D	06/10/10 02:34
Cal Standard	0F16101-CAL9	SEQ-CAL9.D	06/10/10 03:10
Cal Standard	0F16101-CALA	SEQ-CALA.D	06/10/10 03:47
Cal Standard	0F16101-CALB	SEQ-CALB.D	06/10/10 04:23
Initial Cal Check	0F16101-ICV1	SEQ-ICV1.D	06/10/10 04:59

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/09/10
Instrument ID:	MS-BNA3	Injection Time:	22:00
Sequence:	0F16101	Lab Sample ID:	0F16101-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	41	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	46.6	PASS
70	Less than 2% of 69	0.373	PASS
127	40 - 60% of 198	52.1	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.88	PASS
275	10 - 30% of 198	25.8	PASS
365	1 - 200% of 198	3.06	PASS
441	0.001 - 100% of 443	73	PASS
442	40 - 200% of 198	76.4	PASS
443	17 - 23% of 442	19.9	PASS

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0161002	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	6/9/2010 2:36:40PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.786274	9.577482	8.827818	8.701544E-02			CCC (30)	
Acenaphthylene	1.21382	13.93835	8.448273	8.020422E-02			15	
Anthracene	0.8565716	13.35312	12.68555	0.0437723		0.9965319	0.99	
Benzo(a)anthracene	0.5502005	25.35066	20.14791	3.724692E-02	0.9971164		0.995	
Benzo(a)pyrene	0.963022	29.14946	24.25627	0.0396758	0.9978688		CCC (30)	
Benzo(b)fluoranthene	1.109058	29.03611	23.311	5.698884E-02	0.9977015		0.995	
Benzo(g,h,i)perylene	1.144808	17.70931	26.6111	2.691288E-02	0.9940619	NOT TARGET	0.995	*
Benzo(k)fluoranthene	1.244685	13.47436	23.40864	6.974615E-02		0.9990568	0.99	
Chrysene	0.6385135	11.86689	20.24573	0.046851	0.999541		0.995	
Dibenz(a,h)anthracene	0.8922049	25.66608	26.25891	2.493493E-02		0.9956229	0.99	
Fluoranthene	0.7487376	20.49171	15.92809	5.045146E-02	0.9993594		CCC (30)	
Fluorene	0.7298324	15.00874	10.04655	8.243873E-02	0.9991819		0.995	
2-Fluorobiphenyl	0.9931515	15.39381	7.432	8.333368E-02		0.997918	0.99	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	0.899166	24.90014	26.19636	3.894349E-02		0.9952191	0.99	
1-Methylnaphthalene	0.8184576	14.6224	6.947636	5.542856E-02			15	
2-Methylnaphthalene	0.8899234	13.70893	6.790546	0.0599914			15	
Naphthalene	1.415819	14.97382	5.818455	9.857723E-02			15	
Nitrobenzene-d5							15	
Phenanthrene	0.9983893	7.84061	12.53873	6.340399E-02			15	
Phenol-d6							15	
Pyrene	0.8081301	15.14012	16.55264	5.656614E-02		0.9951965	0.99	
Terphenyl-d14	0.5588801	18.64392	17.26073	2.669893E-02	0.9989362		0.995	
2,4,6-Tribromophenol	6.258919E-02	34.34367	10.65255	8.128201E-02	0.9982302		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0161002
Lab File ID:	SEQ-ICV1.D	Calibration Date:	06/09/10 14:36
Sequence:	0F16101	Injection Date:	06/10/10
Lab Sample ID:	0F16101-ICV1	Injection Time:	04:59

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Acenaphthene	A	5.000	4.827	0.786274	0.7590863		-3.5	20
Acenaphthylene	A	5.000	5.223	1.21382	1.268044		4.5	20
Anthracene	Q	5.000	4.995	0.8565716	1.001175		-0.09	20
Benzo(a)anthracene	L	5.000	5.440	0.5502005	0.7229815		8.8	20
Benzo(a)pyrene	L	5.000	5.157	0.963022	1.23492		3.1	20
Benzo(b)fluoranthene	L	5.000	4.741	1.109058	1.30343		-5.2	20
Benzo(g,h,i)perylene	L	5.000	4.511	1.144808	1.312552		-9.8	20
Benzo(k)fluoranthene	Q	5.000	4.973	1.244685	1.4313		-0.5	20
Chrysene	L	5.000	5.960	0.6385135	0.7816841		19.2	20
Dibenz(a,h)anthracene	Q	5.000	4.247	0.8922049	1.165855		-15.1	20
Fluoranthene	L	5.000	5.638	0.7487376	0.9784458		12.8	20
Fluorene	L	5.000	5.179	0.7298324	0.8113299		3.6	20
Indeno(1,2,3-cd)pyrene	Q	5.000	4.171	0.899166	1.091454		-16.6	20
1-Methylnaphthalene	A	5.000	4.722	0.8184576	0.7730303		-5.6	20
2-Methylnaphthalene	A	5.000	5.098	0.8899234	0.9073801		2.0	20
Naphthalene	A	5.000	4.618	1.415819	1.307792		-7.6	20
Phenanthrene	A	5.000	5.348	0.9983893	1.067861		7.0	20
Pyrene	Q	5.000	5.054	0.8081301	0.930862		1.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16725	Instrument:	MS-BNA3
Calibration:	0161002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16725-TUN1	SEQ-TUN2.D	06/13/10 00:12
Calibration Check	0F16725-CCV1	SEQ-CCV2.D	06/13/10 00:34
LCS	0E12947-BS1	E12947L1.D	06/13/10 01:11
Blank	0E12947-BLK1	E12947B1.D	06/13/10 01:47
32SB-FD042910-05	1004294-02	0429402.D	06/13/10 03:37
32SS-43-0002	1004294-03	0429403.D	06/13/10 04:13
32SB-43-0506	1004294-04	0429404.D	06/13/10 04:49
32SS-44-0002	1004294-05	0429405.D	06/13/10 05:25
32SB-44-0506	1004294-06	0429406.D	06/13/10 06:02
32SS-45-0002	1004294-07	0429407.D	06/13/10 06:38
32SB-45-0607	1004294-08	0429408.D	06/13/10 07:14
32SS-47-0002	1004294-11	0429411.D	06/13/10 07:50
32SB-47-0506	1004294-12	0429412.D	06/13/10 08:27
32SS-48-0002	1004294-13	0429413.D	06/13/10 09:03
32SB-48-0405	1004294-14	0429414.D	06/13/10 09:39
32SB-49-0405	1004294-16	0429416.D	06/13/10 10:16
32SS-50-0002	1004294-17	0429417.D	06/13/10 10:52
32SS-51-0002	1004294-19	0429419.D	06/13/10 11:28
32SS-49-0002	1004294-15	0429415.D	06/13/10 12:04

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	06/13/10
Instrument ID:	MS-BNA3	Injection Time:	00:12
Sequence:	0F16725	Lab Sample ID:	0F16725-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	37.2	PASS
68	Less than 2% of 69	0.021	PASS
69	Less than 200% of 198	43	PASS
70	Less than 2% of 69	0.483	PASS
127	40 - 60% of 198	50.2	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.86	PASS
275	10 - 30% of 198	27.5	PASS
365	1 - 200% of 198	3.16	PASS
441	0.001 - 100% of 443	76.2	PASS
442	40 - 200% of 198	92.2	PASS
443	17 - 23% of 442	19.1	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0161002
Lab File ID:	SEQ-CCV2.D	Calibration Date:	06/09/10 14:36
Sequence:	0F16725	Injection Date:	06/13/10
Lab Sample ID:	0F16725-CCV1	Injection Time:	00:34

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	4.334	0.786274	0.6815911		-13.3	20
Acenaphthylene	A	5.000	4.784	1.21382	1.161487		-4.3	20
Anthracene	Q	5.000	5.558	0.8565716	1.115345		11.2	20
Benzo(a)anthracene	L	5.000	5.655	0.5502005	0.7554989		13.1	20
Benzo(a)pyrene	L	5.000	5.094	0.963022	1.219369		1.9	20
Benzo(b)fluoranthene	L	5.000	4.978	1.109058	1.370684		-0.4	20
Benzo(g,h,i)perylene	L	5.000	4.222	1.144808	1.224535		-15.6	20
Benzo(k)fluoranthene	Q	5.000	4.940	1.244685	1.421801		-1.2	20
Chrysene	L	5.000	6.308	0.6385135	0.8277152		26.2	20 *
Dibenz(a,h)anthracene	Q	5.000	3.979	0.8922049	1.085081		-20.4	20 *
Fluoranthene	L	5.000	6.053	0.7487376	1.050948		21.1	20 *
Fluorene	L	5.000	4.948	0.7298324	0.7752496		-1.0	20
Indeno(1,2,3-cd)pyrene	Q	5.000	4.220	0.899166	1.106009		-15.6	20
1-Methylnaphthalene	A	5.000	4.033	0.8184576	0.6602092		-19.3	20
2-Methylnaphthalene	A	5.000	4.177	0.8899234	0.743437		-16.5	20
Naphthalene	A	5.000	4.620	1.415819	1.308271		-7.6	20
Phenanthrene	A	5.000	5.888	0.9983893	1.175609		17.8	20
Pyrene	Q	5.000	5.674	0.8081301	1.050706		13.5	20
2-Fluorobiphenyl	Q	5.000	4.848	0.9931515	0.9701365		-3.0	20
Terphenyl-d14	L	5.000	5.502	0.5588801	0.7120427		10.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16739	Instrument:	MS-BNA3
Calibration:	0161002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16739-TUN1	SEQ-TUN3.D	06/13/10 13:13
Calibration Check	0F16739-CCV1	SEQ-CCV3.D	06/13/10 13:34
32SS-46-0002	1004294-09	0429409D.D	06/13/10 17:11
32SB-46-0304	1004294-10	0429410D.D	06/13/10 17:47

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN3.D	Injection Date:	06/13/10
Instrument ID:	MS-BNA3	Injection Time:	13:13
Sequence:	0F16739	Lab Sample ID:	0F16739-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	39.5	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	44.9	PASS
70	Less than 2% of 69	0.488	PASS
127	40 - 60% of 198	51.8	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.18	PASS
275	10 - 30% of 198	27	PASS
365	1 - 200% of 198	3.11	PASS
441	0.001 - 100% of 443	76.6	PASS
442	40 - 200% of 198	79.1	PASS
443	17 - 23% of 442	19.2	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0161002
Lab File ID:	SEQ-CCV3.D	Calibration Date:	06/09/10 14:36
Sequence:	0F16739	Injection Date:	06/13/10
Lab Sample ID:	0F16739-CCV1	Injection Time:	13:34

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	4.763	0.786274	0.748976		-4.7	20
Acenaphthylene	A	5.000	4.971	1.21382	1.20678		-0.6	20
Anthracene	Q	5.000	5.422	0.8565716	1.087791		8.4	20
Benzo(a)anthracene	L	5.000	5.929	0.5502005	0.7967444		18.6	20
Benzo(a)pyrene	L	5.000	5.413	0.963022	1.297762		8.3	20
Benzo(b)fluoranthene	L	5.000	5.143	1.109058	1.417192		2.9	20
Benzo(g,h,i)perylene	L	5.000	3.792	1.144808	1.092656		-24.2	20 *
Benzo(k)fluoranthene	Q	5.000	5.148	1.244685	1.481171		3.0	20
Chrysene	L	5.000	6.192	0.6385135	0.8124695		23.8	20 *
Dibenz(a,h)anthracene	Q	5.000	3.687	0.8922049	0.9964661		-26.3	20 *
Fluoranthene	L	5.000	5.923	0.7487376	1.02817		18.5	20
Fluorene	L	5.000	5.360	0.7298324	0.8394757		7.2	20
Indeno(1,2,3-cd)pyrene	Q	5.000	3.935	0.899166	1.020001		-21.3	20 *
1-Methylnaphthalene	A	5.000	4.510	0.8184576	0.7382772		-9.8	20
2-Methylnaphthalene	A	5.000	4.665	0.8899234	0.8303672		-6.7	20
Naphthalene	A	5.000	4.144	1.415819	1.173544		-17.1	20
Phenanthrene	A	5.000	5.607	0.9983893	1.119545		12.1	20
Pyrene	Q	5.000	5.576	0.8081301	1.031791		11.5	20
2-Fluorobiphenyl	Q	5.000	4.625	0.9931515	0.9269473		-7.5	20
Terphenyl-d14	L	5.000	5.767	0.5588801	0.7483787		15.3	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16601	Instrument:	MS-BNA3
Calibration:	0166002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16601-TUN1	SEQ-TUN1.D	06/14/10 18:14
Cal Standard	0F16601-CAL1	SEQ-CAL1.D	06/14/10 18:35
Cal Standard	0F16601-CAL2	SEQ-CAL2.D	06/14/10 19:11
Cal Standard	0F16601-CAL3	SEQ-CAL3.D	06/14/10 19:47
Cal Standard	0F16601-CAL4	SEQ-CAL4.D	06/14/10 20:23
Cal Standard	0F16601-CAL5	SEQ-CAL5.D	06/14/10 20:59
Cal Standard	0F16601-CAL6	SEQ-CAL6.D	06/14/10 21:36
Cal Standard	0F16601-CAL7	SEQ-CAL7.D	06/14/10 22:12
Cal Standard	0F16601-CAL8	SEQ-CAL8.D	06/14/10 22:48
Cal Standard	0F16601-CAL9	SEQ-CAL9.D	06/14/10 23:24
Cal Standard	0F16601-CALA	SEQ-CALA.D	06/15/10 00:01
Cal Standard	0F16601-CALB	SEQ-CALB.D	06/15/10 00:37
Initial Cal Check	0F16601-ICV1	SEQ-ICV1.D	06/15/10 01:14

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/14/10
Instrument ID:	MS-BNA3	Injection Time:	18:14
Sequence:	0F16601	Lab Sample ID:	0F16601-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	35.8	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	41	PASS
70	Less than 2% of 69	0.509	PASS
127	40 - 60% of 198	49.5	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.89	PASS
275	10 - 30% of 198	26	PASS
365	1 - 200% of 198	2.95	PASS
441	0.001 - 100% of 443	76.5	PASS
442	40 - 200% of 198	68.6	PASS
443	17 - 23% of 442	19.6	PASS

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0166002	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	6/14/2010 8:37:42AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.5759334	6.843643	8.789273	0.1180775			CCC (30)	
Acenaphthylene	0.8862413	10.78656	8.409273	0.1206638			15	
Anthracene	0.8796794	12.25255	12.644	7.881189E-02		0.9999834	0.99	
Benzo(a)anthracene	0.7312705	12.87846	20.11418	8.061002E-02	0.9996344		0.995	
Benzo(a)pyrene	1.024378	19.64783	24.22509	8.907375E-02	0.9999047		CCC (30)	
Benzo(b)fluoranthene	1.133161	20.83536	23.26873	0.1233329	0.9999251		0.995	
Benzo(g,h,i)perylene	0.9845462	9.244988	26.589	0.0860449			15	
Benzo(k)fluoranthene	1.131548	14.28025	23.36909	0.1394498		0.9997905	0.99	
Chrysene	0.7777575	8.879564	20.20964	0.105788			15	
Dibenz(a,h)anthracene	0.9130164	12.41587	26.23455	6.697439E-02	0.9977354		0.995	
Fluoranthene	0.9029326	13.49547	15.8903	8.529481E-02		0.9999455	CCC (30)	
Fluorene	0.6592235	6.023891	10.00773	0.1146014			15	
2-Fluorobiphenyl	0.6864928	10.2306	7.396727	0.1133288			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	0.9144048	22.95585	26.17209	0.0766041	0.9968194		0.995	
1-Methylnaphthalene	0.5645472	5.78391	6.913909	0.1191425			15	
2-Methylnaphthalene	0.6182619	9.008746	6.759364	0.1036488			15	
Naphthalene	0.9092969	5.851495	5.787909	8.530285E-02			15	
Nitrobenzene-d5							15	
Phenanthrene	0.9561455	6.269873	12.50164	0.1259348			15	
Phenol-d6							15	
Pyrene	0.9363681	12.16765	16.5123	6.957564E-02		0.9999769	0.99	
Terphenyl-d14	0.6571782	9.5382	17.22191	5.915118E-02			15	
2,4,6-Tribromophenol	7.302336E-02	22.65438	10.61973	0.1630677	0.9999499		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0166002
Lab File ID:	SEQ-ICV1.D	Calibration Date:	06/14/10 08:37
Sequence:	0F16601	Injection Date:	06/15/10
Lab Sample ID:	0F16601-ICV1	Injection Time:	01:14

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Acenaphthene	A	5.000	5.120	0.5759334	0.5897508		2.4	20
Acenaphthylene	A	5.000	5.390	0.8862413	0.955395		7.8	20
Anthracene	Q	5.000	4.893	0.8796794	0.9674926		-2.1	20
Benzo(a)anthracene	L	5.000	4.764	0.7312705	0.7642179		-4.7	20
Benzo(a)pyrene	L	5.000	4.639	1.024378	1.10205		-7.2	20
Benzo(b)fluoranthene	L	5.000	4.596	1.133161	1.208924		-8.1	20
Benzo(g,h,i)perylene	A	5.000	5.078	0.9845462	0.9999033		1.6	20
Benzo(k)fluoranthene	Q	5.000	4.958	1.131548	1.2422		-0.8	20
Chrysene	A	5.000	4.715	0.7777575	0.7333502		-5.7	20
Dibenz(a,h)anthracene	L	5.000	4.389	0.9130164	0.8673373		-12.2	20
Fluoranthene	Q	5.000	4.869	0.9029326	0.9909541		-2.6	20
Fluorene	A	5.000	5.102	0.6592235	0.6726773		2.0	20
Indeno(1,2,3-cd)pyrene	L	5.000	4.598	0.9144048	0.9740172		-8.0	20
1-Methylnaphthalene	A	5.000	4.951	0.5645472	0.5590001		-1.0	20
2-Methylnaphthalene	A	5.000	5.223	0.6182619	0.6458209		4.5	20
Naphthalene	A	5.000	4.893	0.9092969	0.8898726		-2.1	20
Phenanthrene	A	5.000	5.137	0.9561455	0.9823114		2.7	20
Pyrene	Q	5.000	4.856	0.9363681	1.014656		-2.9	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16802	Instrument:	MS-BNA3
Calibration:	0166002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F16802-TUN1	SEQ-TUN2.D	06/16/10 23:12
Calibration Check	0F16802-CCV1	SEQ-CCV2.D	06/16/10 23:33
32SB-51-0708	1004294-20	0429420D.D	06/17/10 05:21
32SS-FD042910-05	1004294-01	429401D2.D	06/17/10 05:56
32SB-50-0607	1004294-18	0429418D.D	06/17/10 08:57

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	06/16/10
Instrument ID:	MS-BNA3	Injection Time:	23:12
Sequence:	0F16802	Lab Sample ID:	0F16802-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	37.4	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	43.2	PASS
70	Less than 2% of 69	0.556	PASS
127	40 - 60% of 198	53	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.18	PASS
275	10 - 30% of 198	22.9	PASS
365	1 - 200% of 198	2.27	PASS
441	0.001 - 100% of 443	76.2	PASS
442	40 - 200% of 198	43	PASS
443	17 - 23% of 442	20.4	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0166002
Lab File ID:	SEQ-CCV2.D	Calibration Date:	06/14/10 08:37
Sequence:	0F16802	Injection Date:	06/16/10
Lab Sample ID:	0F16802-CCV1	Injection Time:	23:33

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.596	0.5759334	0.6445926		11.9	20
Acenaphthylene	A	5.000	5.832	0.8862413	1.033702		16.6	20
Anthracene	Q	5.000	5.307	0.8796794	1.048178		6.1	20
Benzo(a)anthracene	L	5.000	5.144	0.7312705	0.8273745		2.9	20
Benzo(a)pyrene	L	5.000	4.947	1.024378	1.177353		-1.1	20
Benzo(b)fluoranthene	L	5.000	5.338	1.133161	1.410121		6.8	20
Benzo(g,h,i)perylene	A	5.000	4.484	0.9845462	0.8829721		-10.3	20
Benzo(k)fluoranthene	Q	5.000	5.326	1.131548	1.333276		6.5	20
Chrysene	A	5.000	5.105	0.7777575	0.7941646		2.1	20
Dibenz(a,h)anthracene	L	5.000	4.054	0.9130164	0.7977024		-18.9	20
Fluoranthene	Q	5.000	5.412	0.9029326	1.100136		8.2	20
Fluorene	A	5.000	5.720	0.6592235	0.7542295		14.4	20
Indeno(1,2,3-cd)pyrene	L	5.000	4.046	0.9144048	0.8483661		-19.1	20
1-Methylnaphthalene	A	5.000	5.243	0.5645472	0.5919419		4.9	20
2-Methylnaphthalene	A	5.000	5.506	0.6182619	0.6808812		10.1	20
Naphthalene	A	5.000	5.128	0.9092969	0.9325588		2.6	20
Phenanthrene	A	5.000	5.704	0.9561455	1.090768		14.1	20
Pyrene	Q	5.000	5.388	0.9363681	1.123684		7.8	20
2-Fluorobiphenyl	A	5.000	5.529	0.6864928	0.7591021		10.6	20
Terphenyl-d14	A	5.000	5.867	0.6571782	0.7710906		17.3	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_007

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E12947 Batch Matrix: Solid Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E12947-BLK1	05/13/10 17:55	15.00	1.00
LCS	0E12947-BS1	05/13/10 17:55	15.00	1.00
32SS-FD042910-05	1004294-01	05/13/10 17:55	15.00	1.00
32SB-FD042910-05	1004294-02	05/13/10 17:55	15.00	1.00
32SS-43-0002	1004294-03	05/13/10 17:55	15.00	1.00
32SB-43-0506	1004294-04	05/13/10 17:55	15.00	1.00
32SS-44-0002	1004294-05	05/13/10 17:55	15.00	1.00
32SB-44-0506	1004294-06	05/13/10 17:55	15.00	1.00
32SS-45-0002	1004294-07	05/13/10 17:55	15.00	1.00
32SB-45-0607	1004294-08	05/13/10 17:55	15.00	1.00
32SS-46-0002	1004294-09	05/13/10 17:55	15.00	1.00
32SB-46-0304	1004294-10	05/13/10 17:55	15.00	1.00
32SS-47-0002	1004294-11	05/13/10 17:55	15.00	1.00
32SB-47-0506	1004294-12	05/13/10 17:55	15.00	1.00
32SS-48-0002	1004294-13	05/13/10 17:55	15.00	1.00
32SB-48-0405	1004294-14	05/13/10 17:55	15.00	1.00
32SS-49-0002	1004294-15	05/13/10 17:55	15.00	1.00
32SB-49-0405	1004294-16	05/13/10 17:55	15.00	1.00
32SS-50-0002	1004294-17	05/13/10 17:55	15.00	1.00
32SB-50-0607	1004294-18	05/13/10 17:55	15.00	1.00
32SS-51-0002	1004294-19	05/13/10 17:55	15.00	1.00
32SB-51-0708	1004294-20	05/13/10 17:55	15.00	1.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_007	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E12947-BLK1	File ID:	E12947B1.D
Sampled:		Prepared:		Analyzed:	06/13/10 01:47
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E12947 Sequence: 0F16725 Calibration: 0161002 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.33	6.67	U
50-32-8	Benzo(a)pyrene		1.33	5.00	U
205-99-2	Benzo(b)fluoranthene		1.33	6.67	U
207-08-9	Benzo(k)fluoranthene		1.33	6.67	U
218-01-9	Chrysene		1.33	6.67	X, U
53-70-3	Dibenz(a,h)anthracene		1.33	5.00	Y, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.33	6.67	U
91-20-3	Naphthalene		1.33	5.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	3565	107	14 - 129	
Terphenyl-d14	3333	3029	90.9	14 - 129	

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E12947	Laboratory ID:	0E12947-BS1
Preparation:	EXT_3546	Initial/Final:	15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.67	85.22	128	31 - 146
Benzo(a)pyrene	66.67	54.53	81.8	28 - 128
Benzo(b)fluoranthene	66.67	60.64	91.0	30 - 139
Benzo(k)fluoranthene	66.67	55.01	82.5	42 - 129
Chrysene	66.67	61.86	92.8	39 - 134
Dibenz(a,h)anthracene	66.67	75.51	113	30 - 138
Indeno(1,2,3-cd)pyrene	66.67	81.74	123	17 - 164
Naphthalene	66.67	43.97	65.9	29 - 106

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_007

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E12948 Batch Matrix: Solid Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E12948-BLK1	05/13/10 15:20	15.00	1.00
LCS	0E12948-BS1	05/13/10 15:20	15.00	1.00
32SB-51-1415	1004294-21	05/13/10 15:20	15.00	1.00
32SS-52-0002	1004294-22	05/13/10 15:20	15.00	1.00
32SB-52-0809	1004294-23	05/13/10 15:20	15.00	1.00
32SB-52-1415	1004294-24	05/13/10 15:20	15.00	1.00
32SS-53-0002	1004294-25	05/13/10 15:20	15.00	1.00
32SB-53-0910	1004294-26	05/13/10 15:20	15.00	1.00

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E12948	Laboratory ID:	0E12948-BS1
Preparation:	EXT_3546	Initial/Final:	15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.67	49.81	74.7	31 - 146
Benzo(a)pyrene	66.67	58.48	87.7	28 - 128
Benzo(b)fluoranthene	66.67	57.72	86.6	30 - 139
Benzo(k)fluoranthene	66.67	69.46	104	42 - 129
Chrysene	66.67	57.84	86.8	39 - 134
Dibenz(a,h)anthracene	66.67	49.28	73.9	30 - 138
Indeno(1,2,3-cd)pyrene	66.67	49.27	73.9	17 - 164
Naphthalene	66.67	35.55	53.3	29 - 106

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_007	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E12948-BLK1	File ID:	E12948B1.D
Sampled:		Prepared:		Analyzed:	05/24/10 10:41
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E12948 Sequence: 0F15503 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.33	6.67	U
50-32-8	Benzo(a)pyrene		1.33	5.00	U
205-99-2	Benzo(b)fluoranthene		1.33	6.67	U
207-08-9	Benzo(k)fluoranthene		1.33	6.67	X, U
218-01-9	Chrysene		1.33	6.67	U
53-70-3	Dibenz(a,h)anthracene		1.33	5.00	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.33	6.67	U
91-20-3	Naphthalene		1.33	5.00	Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	2514	75.4	14 - 129	
Terphenyl-d14	3333	3155	94.6	14 - 129	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15503	Instrument:	MS-BNA3
		Calibration:	0132007

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15503-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 05/24/10 09:29		
2-Fluorobiphenyl	5.000	95.0	80 - 120	7.855	7.855	0.0000	+/-0.500	
Terphenyl-d14	5.000	91.5	80 - 120	17.844	17.844	0.0000	+/-0.500	
Blank (0E12948-BLK1) ug/Kg wet				Lab File ID: E12948B1.D		Analyzed: 05/24/10 10:41		
2-Fluorobiphenyl	3333	75.4	14 - 129	7.857	7.855	0.0020	+/-0.500	
Terphenyl-d14	3333	94.6	14 - 129	17.856	17.844	0.0120	+/-0.500	
LCS (0E12948-BS1) ug/Kg wet				Lab File ID: E12948L1.D		Analyzed: 05/24/10 11:17		
2-Fluorobiphenyl	3333	64.4	14 - 129	7.864	7.855	0.0090	+/-0.500	
Terphenyl-d14	3333	82.3	14 - 129	17.862	17.844	0.0180	+/-0.500	
32SB-51-1415 (1004294-21) ug/Kg dry				Lab File ID: 0429421.D		Analyzed: 05/24/10 11:54		
2-Fluorobiphenyl	3769	70.1	14 - 129	7.864	7.855	0.0090	+/-0.500	
Terphenyl-d14	3769	58.3	14 - 129	17.862	17.844	0.0180	+/-0.500	
32SS-52-0002 (1004294-22) ug/Kg dry				Lab File ID: 0429422.D		Analyzed: 05/24/10 12:30		
2-Fluorobiphenyl	3674	73.2	14 - 129	7.865	7.855	0.0100	+/-0.500	
Terphenyl-d14	3674	67.3	14 - 129	17.863	17.844	0.0190	+/-0.500	
32SB-52-0809 (1004294-23) ug/Kg dry				Lab File ID: 0429423D.D		Analyzed: 05/24/10 13:06		
2-Fluorobiphenyl	3943	84.3	14 - 129	7.854	7.855	-0.0010	+/-0.500	
Terphenyl-d14	3943	68.8	14 - 129	17.853	17.844	0.0090	+/-0.500	
32SB-52-1415 (1004294-24) ug/Kg dry				Lab File ID: 0429424.D		Analyzed: 05/24/10 13:42		
2-Fluorobiphenyl	3897	76.8	14 - 129	7.873	7.855	0.0180	+/-0.500	
Terphenyl-d14	3897	80.9	14 - 129	17.881	17.844	0.0370	+/-0.500	
32SS-53-0002 (1004294-25) ug/Kg dry				Lab File ID: 0429425.D		Analyzed: 05/24/10 14:19		
2-Fluorobiphenyl	3735	69.2	14 - 129	7.865	7.855	0.0100	+/-0.500	
Terphenyl-d14	3735	66.8	14 - 129	17.872	17.844	0.0280	+/-0.500	
32SB-53-0910 (1004294-26) ug/Kg dry				Lab File ID: 0429426D.D		Analyzed: 05/24/10 14:55		
2-Fluorobiphenyl	3922	79.8	14 - 129	7.858	7.855	0.0030	+/-0.500	
Terphenyl-d14	3922	73.6	14 - 129	17.847	17.844	0.0030	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16725	Instrument:	MS-BNA3
		Calibration:	0161002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16725-CCV1) ug/mL				Lab File ID: SEQ-CCV2.D		Analyzed: 06/13/10 00:34		
2-Fluorobiphenyl	5.000	97.0	80 - 120	7.419	7.419	0.0000	+/-0.500	
Terphenyl-d14	5.000	110	80 - 120	17.241	17.241	0.0000	+/-0.500	
LCS (0E12947-BS1) ug/Kg wet				Lab File ID: E12947L1.D		Analyzed: 06/13/10 01:11		
2-Fluorobiphenyl	3333	85.2	14 - 129	7.42	7.419	0.0010	+/-0.500	
Terphenyl-d14	3333	73.3	14 - 129	17.252	17.241	0.0110	+/-0.500	
Blank (0E12947-BLK1) ug/Kg wet				Lab File ID: E12947B1.D		Analyzed: 06/13/10 01:47		
2-Fluorobiphenyl	3333	107	14 - 129	7.428	7.419	0.0090	+/-0.500	
Terphenyl-d14	3333	90.9	14 - 129	17.25	17.241	0.0090	+/-0.500	
32SB-FD042910-05 (1004294-02) ug/Kg dry				Lab File ID: 0429402.D		Analyzed: 06/13/10 03:37		
2-Fluorobiphenyl	3792	92.0	14 - 129	7.42	7.419	0.0010	+/-0.500	
Terphenyl-d14	3792	56.9	14 - 129	17.251	17.241	0.0100	+/-0.500	
32SS-43-0002 (1004294-03) ug/Kg dry				Lab File ID: 0429403.D		Analyzed: 06/13/10 04:13		
2-Fluorobiphenyl	4071	89.9	14 - 129	7.429	7.419	0.0100	+/-0.500	
Terphenyl-d14	4071	64.5	14 - 129	17.251	17.241	0.0100	+/-0.500	
32SB-43-0506 (1004294-04) ug/Kg dry				Lab File ID: 0429404.D		Analyzed: 06/13/10 04:49		
2-Fluorobiphenyl	4001	89.0	14 - 129	7.427	7.419	0.0080	+/-0.500	
Terphenyl-d14	4001	62.1	14 - 129	17.249	17.241	0.0080	+/-0.500	
32SS-44-0002 (1004294-05) ug/Kg dry				Lab File ID: 0429405.D		Analyzed: 06/13/10 05:25		
2-Fluorobiphenyl	3960	95.2	14 - 129	7.421	7.419	0.0020	+/-0.500	
Terphenyl-d14	3960	66.3	14 - 129	17.252	17.241	0.0110	+/-0.500	
32SB-44-0506 (1004294-06) ug/Kg dry				Lab File ID: 0429406.D		Analyzed: 06/13/10 06:02		
2-Fluorobiphenyl	4094	89.3	14 - 129	7.438	7.419	0.0190	+/-0.500	
Terphenyl-d14	4094	66.9	14 - 129	17.279	17.241	0.0380	+/-0.500	
32SS-45-0002 (1004294-07) ug/Kg dry				Lab File ID: 0429407.D		Analyzed: 06/13/10 06:38		
2-Fluorobiphenyl	4123	80.3	14 - 129	7.438	7.419	0.0190	+/-0.500	
Terphenyl-d14	4123	61.7	14 - 129	17.27	17.241	0.0290	+/-0.500	
32SB-45-0607 (1004294-08) ug/Kg dry				Lab File ID: 0429408.D		Analyzed: 06/13/10 07:14		
2-Fluorobiphenyl	4038	88.8	14 - 129	7.439	7.419	0.0200	+/-0.500	
Terphenyl-d14	4038	66.9	14 - 129	17.27	17.241	0.0290	+/-0.500	
32SS-47-0002 (1004294-11) ug/Kg dry				Lab File ID: 0429411.D		Analyzed: 06/13/10 07:50		
2-Fluorobiphenyl	3849	99.2	14 - 129	7.42	7.419	0.0010	+/-0.500	
Terphenyl-d14	3849	69.4	14 - 129	17.26	17.241	0.0190	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16725	Instrument:	MS-BNA3
		Calibration:	0161002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
32SB-47-0506 (1004294-12) ug/Kg dry				Lab File ID: 0429412.D		Analyzed: 06/13/10 08:27		
2-Fluorobiphenyl	3924	53.3	14 - 129	7.42	7.419	0.0010	+/-0.500	
Terphenyl-d14	3924	44.0	14 - 129	17.251	17.241	0.0100	+/-0.500	
32SS-48-0002 (1004294-13) ug/Kg dry				Lab File ID: 0429413.D		Analyzed: 06/13/10 09:03		
2-Fluorobiphenyl	3602	71.3	14 - 129	7.418	7.419	-0.0010	+/-0.500	
Terphenyl-d14	3602	52.8	14 - 129	17.25	17.241	0.0090	+/-0.500	
32SB-48-0405 (1004294-14) ug/Kg dry				Lab File ID: 0429414.D		Analyzed: 06/13/10 09:39		
2-Fluorobiphenyl	3865	84.0	14 - 129	7.419	7.419	0.0000	+/-0.500	
Terphenyl-d14	3865	60.4	14 - 129	17.251	17.241	0.0100	+/-0.500	
32SB-49-0405 (1004294-16) ug/Kg dry				Lab File ID: 0429416.D		Analyzed: 06/13/10 10:16		
2-Fluorobiphenyl	4008	92.5	14 - 129	7.437	7.419	0.0180	+/-0.500	
Terphenyl-d14	4008	71.7	14 - 129	17.268	17.241	0.0270	+/-0.500	
32SS-50-0002 (1004294-17) ug/Kg dry				Lab File ID: 0429417.D		Analyzed: 06/13/10 10:52		
2-Fluorobiphenyl	3931	66.5	14 - 129	7.419	7.419	0.0000	+/-0.500	
Terphenyl-d14	3931	58.4	14 - 129	17.251	17.241	0.0100	+/-0.500	
32SS-51-0002 (1004294-19) ug/Kg dry				Lab File ID: 0429419.D		Analyzed: 06/13/10 11:28		
2-Fluorobiphenyl	3913	84.7	14 - 129	7.422	7.419	0.0030	+/-0.500	
Terphenyl-d14	3913	60.8	14 - 129	17.253	17.241	0.0120	+/-0.500	
32SS-49-0002 (1004294-15) ug/Kg dry				Lab File ID: 0429415.D		Analyzed: 06/13/10 12:04		
2-Fluorobiphenyl	3708	80.7	14 - 129	7.428	7.419	0.0090	+/-0.500	
Terphenyl-d14	3708	65.1	14 - 129	17.268	17.241	0.0270	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16739	Instrument:	MS-BNA3
		Calibration:	0161002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16739-CCV1) ug/mL				Lab File ID: SEQ-CCV3.D		Analyzed: 06/13/10 13:34		
2-Fluorobiphenyl	5.000	92.5	80 - 120	7.419	7.419	0.0000	+/-0.500	
Terphenyl-d14	5.000	115	80 - 120	17.241	17.241	0.0000	+/-0.500	
32SS-46-0002 (1004294-09) ug/Kg dry				Lab File ID: 0429409D.D		Analyzed: 06/13/10 17:11		
2-Fluorobiphenyl	3819	72.8	14 - 129	7.429	7.419	0.0100	+/-0.500	
Terphenyl-d14	3819	69.5	14 - 129	17.26	17.241	0.0190	+/-0.500	
32SB-46-0304 (1004294-10) ug/Kg dry				Lab File ID: 0429410D.D		Analyzed: 06/13/10 17:47		
2-Fluorobiphenyl	3815	74.5	14 - 129	7.428	7.419	0.0090	+/-0.500	
Terphenyl-d14	3815	77.1	14 - 129	17.259	17.241	0.0180	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16802	Instrument:	MS-BNA3
		Calibration:	0166002

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16802-CCV1) ug/mL				Lab File ID: SEQ-CCV2.D		Analyzed: 06/16/10 23:33		
2-Fluorobiphenyl	5.000	111	80 - 120	7.354	7.354	0.0000	+/-0.500	
Terphenyl-d14	5.000	117	80 - 120	17.148	17.148	0.0000	+/-0.500	
32SB-51-0708 (1004294-20) ug/Kg dry				Lab File ID: 0429420D.D		Analyzed: 06/17/10 05:21		
2-Fluorobiphenyl	3639	97.6	14 - 129	7.357	7.354	0.0030	+/-0.500	
Terphenyl-d14	3639	83.1	14 - 129	17.16	17.148	0.0120	+/-0.500	
32SS-FD042910-05 (1004294-01) ug/Kg dry				Lab File ID: 429401D2.D		Analyzed: 06/17/10 05:56		
2-Fluorobiphenyl	3732	109	14 - 129	7.366	7.354	0.0120	+/-0.500	
Terphenyl-d14	3732	73.6	14 - 129	17.16	17.148	0.0120	+/-0.500	
32SB-50-0607 (1004294-18) ug/Kg dry				Lab File ID: 0429418D.D		Analyzed: 06/17/10 08:57		
2-Fluorobiphenyl	3638	108	14 - 129	7.355	7.354	0.0010	+/-0.500	
Terphenyl-d14	3638	82.1	14 - 129	17.158	17.148	0.0100	+/-0.500	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15503	Instrument:	MS-BNA3
		Calibration:	0132007

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15503-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/24/10 09:29			
Phenanthrene-d10	122297	13.045	233208	13.276	52	50 - 200	-0.2310	+/-0.50	
Perylene-d12	67747	24.918	135470	25.094	50	50 - 200	-0.1760	+/-0.50	
Blank (0E12948-BLK1)			Lab File ID: E12948B1.D			Analyzed: 05/24/10 10:41			
Phenanthrene-d10	96434	13.056	122297	13.045	79	50 - 200	0.0110	+/-0.50	
Perylene-d12	45947	24.92	67747	24.918	68	50 - 200	0.0020	+/-0.50	
LCS (0E12948-BS1)			Lab File ID: E12948L1.D			Analyzed: 05/24/10 11:17			
Phenanthrene-d10	126654	13.044	122297	13.045	104	50 - 200	-0.0010	+/-0.50	
Perylene-d12	71350	24.918	67747	24.918	105	50 - 200	0.0000	+/-0.50	
32SB-51-1415 (1004294-21)			Lab File ID: 0429421.D			Analyzed: 05/24/10 11:54			
Phenanthrene-d10	120323	13.054	122297	13.045	98	50 - 200	0.0090	+/-0.50	
Perylene-d12	70862	24.918	67747	24.918	105	50 - 200	0.0000	+/-0.50	
32SS-52-0002 (1004294-22)			Lab File ID: 0429422.D			Analyzed: 05/24/10 12:30			
Phenanthrene-d10	94324	13.054	122297	13.045	77	50 - 200	0.0090	+/-0.50	
Perylene-d12	53380	24.918	67747	24.918	79	50 - 200	0.0000	+/-0.50	
32SB-52-0809 (1004294-23)			Lab File ID: 0429423D.D			Analyzed: 05/24/10 13:06			
Phenanthrene-d10	68108	13.053	122297	13.045	56	50 - 200	0.0080	+/-0.50	
Perylene-d12	49952	24.917	67747	24.918	74	50 - 200	-0.0010	+/-0.50	
32SB-52-1415 (1004294-24)			Lab File ID: 0429424.D			Analyzed: 05/24/10 13:42			
Phenanthrene-d10	79953	13.081	122297	13.045	65	50 - 200	0.0360	+/-0.50	
Perylene-d12	49448	24.917	67747	24.918	73	50 - 200	-0.0010	+/-0.50	
32SS-53-0002 (1004294-25)			Lab File ID: 0429425.D			Analyzed: 05/24/10 14:19			
Phenanthrene-d10	104589	13.054	122297	13.045	86	50 - 200	0.0090	+/-0.50	
Perylene-d12	56604	24.918	67747	24.918	84	50 - 200	0.0000	+/-0.50	
32SB-53-0910 (1004294-26)			Lab File ID: 0429426D.D			Analyzed: 05/24/10 14:55			
Phenanthrene-d10	95433	13.057	122297	13.045	78	50 - 200	0.0120	+/-0.50	
Perylene-d12	58526	24.921	67747	24.918	86	50 - 200	0.0030	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16725	Instrument:	MS-BNA3
		Calibration:	0161002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16725-CCV1)			Lab File ID: SEQ-CCV2.D			Analyzed: 06/13/10 00:34			
Phenanthrene-d10	109485	12.46	109351	12.47	100	50 - 200	-0.0100	+/-0.50	
Perylene-d12	58227	24.37	46195	24.39	126	50 - 200	-0.0200	+/-0.50	
LCS (0E12947-BS1)			Lab File ID: E12947L1.D			Analyzed: 06/13/10 01:11			
Phenanthrene-d10	109352	12.461	109485	12.46	100	50 - 200	0.0010	+/-0.50	
Perylene-d12	48798	24.372	58227	24.37	84	50 - 200	0.0020	+/-0.50	
Blank (0E12947-BLK1)			Lab File ID: E12947B1.D			Analyzed: 06/13/10 01:47			
Phenanthrene-d10	96211	12.469	109485	12.46	88	50 - 200	0.0090	+/-0.50	
Perylene-d12	42893	24.38	58227	24.37	74	50 - 200	0.0100	+/-0.50	
32SB-FD042910-05 (1004294-02)			Lab File ID: 0429402.D			Analyzed: 06/13/10 03:37			
Phenanthrene-d10	100227	12.46	109485	12.46	92	50 - 200	0.0000	+/-0.50	
Perylene-d12	54407	24.371	58227	24.37	93	50 - 200	0.0010	+/-0.50	
32SS-43-0002 (1004294-03)			Lab File ID: 0429403.D			Analyzed: 06/13/10 04:13			
Phenanthrene-d10	105541	12.461	109485	12.46	96	50 - 200	0.0010	+/-0.50	
Perylene-d12	65034	24.372	58227	24.37	112	50 - 200	0.0020	+/-0.50	
32SB-43-0506 (1004294-04)			Lab File ID: 0429404.D			Analyzed: 06/13/10 04:49			
Phenanthrene-d10	103228	12.459	109485	12.46	94	50 - 200	-0.0010	+/-0.50	
Perylene-d12	61732	24.37	58227	24.37	106	50 - 200	0.0000	+/-0.50	
32SS-44-0002 (1004294-05)			Lab File ID: 0429405.D			Analyzed: 06/13/10 05:25			
Phenanthrene-d10	87217	12.462	109485	12.46	80	50 - 200	0.0020	+/-0.50	
Perylene-d12	53697	24.373	58227	24.37	92	50 - 200	0.0030	+/-0.50	
32SB-44-0506 (1004294-06)			Lab File ID: 0429406.D			Analyzed: 06/13/10 06:02			
Phenanthrene-d10	103697	12.516	109485	12.46	95	50 - 200	0.0560	+/-0.50	
Perylene-d12	66051	24.38	58227	24.37	113	50 - 200	0.0100	+/-0.50	
32SS-45-0002 (1004294-07)			Lab File ID: 0429407.D			Analyzed: 06/13/10 06:38			
Phenanthrene-d10	98592	12.507	109485	12.46	90	50 - 200	0.0470	+/-0.50	
Perylene-d12	55574	24.371	58227	24.37	95	50 - 200	0.0010	+/-0.50	
32SB-45-0607 (1004294-08)			Lab File ID: 0429408.D			Analyzed: 06/13/10 07:14			
Phenanthrene-d10	85204	12.508	109485	12.46	78	50 - 200	0.0480	+/-0.50	
Perylene-d12	49804	24.372	58227	24.37	86	50 - 200	0.0020	+/-0.50	
32SS-47-0002 (1004294-11)			Lab File ID: 0429411.D			Analyzed: 06/13/10 07:50			
Phenanthrene-d10	85490	12.47	109485	12.46	78	50 - 200	0.0100	+/-0.50	
Perylene-d12	47187	24.399	58227	24.37	81	50 - 200	0.0290	+/-0.50	
32SB-47-0506 (1004294-12)			Lab File ID: 0429412.D			Analyzed: 06/13/10 08:27			
Phenanthrene-d10	129428	12.461	109485	12.46	118	50 - 200	0.0010	+/-0.50	
Perylene-d12	46366	24.371	58227	24.37	80	50 - 200	0.0010	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16725	Instrument:	MS-BNA3
		Calibration:	0161002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
32SS-48-0002 (1004294-13)			Lab File ID: 0429413.D			Analyzed: 06/13/10 09:03			
Phenanthrene-d10	122479	12.459	109485	12.46	112	50 - 200	-0.0010	+/-0.50	
Perylene-d12	52029	24.379	58227	24.37	89	50 - 200	0.0090	+/-0.50	
32SB-48-0405 (1004294-14)			Lab File ID: 0429414.D			Analyzed: 06/13/10 09:39			
Phenanthrene-d10	100168	12.46	109485	12.46	91	50 - 200	0.0000	+/-0.50	
Perylene-d12	48006	24.371	58227	24.37	82	50 - 200	0.0010	+/-0.50	
32SB-49-0405 (1004294-16)			Lab File ID: 0429416.D			Analyzed: 06/13/10 10:16			
Phenanthrene-d10	98318	12.505	109485	12.46	90	50 - 200	0.0450	+/-0.50	
Perylene-d12	51879	24.379	58227	24.37	89	50 - 200	0.0090	+/-0.50	
32SS-50-0002 (1004294-17)			Lab File ID: 0429417.D			Analyzed: 06/13/10 10:52			
Phenanthrene-d10	109477	12.46	109485	12.46	100	50 - 200	0.0000	+/-0.50	
Perylene-d12	50907	24.371	58227	24.37	87	50 - 200	0.0010	+/-0.50	
32SS-51-0002 (1004294-19)			Lab File ID: 0429419.D			Analyzed: 06/13/10 11:28			
Phenanthrene-d10	96772	12.463	109485	12.46	88	50 - 200	0.0030	+/-0.50	
Perylene-d12	47813	24.374	58227	24.37	82	50 - 200	0.0040	+/-0.50	
32SS-49-0002 (1004294-15)			Lab File ID: 0429415.D			Analyzed: 06/13/10 12:04			
Phenanthrene-d10	103984	12.478	109485	12.46	95	50 - 200	0.0180	+/-0.50	
Perylene-d12	55213	24.38	58227	24.37	95	50 - 200	0.0100	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16739	Instrument:	MS-BNA3
		Calibration:	0161002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16739-CCV1)			Lab File ID: SEQ-CCV3.D			Analyzed: 06/13/10 13:34			
Phenanthrene-d10	130911	12.469	109351	12.47	120	50 - 200	-0.0010	+/-0.50	
Perylene-d12	64518	24.38	46195	24.39	140	50 - 200	-0.0100	+/-0.50	
32SS-46-0002 (1004294-09)			Lab File ID: 0429409D.D			Analyzed: 06/13/10 17:11			
Phenanthrene-d10	87350	12.479	130911	12.469	67	50 - 200	0.0100	+/-0.50	
Perylene-d12	50592	24.39	64518	24.38	78	50 - 200	0.0100	+/-0.50	
32SB-46-0304 (1004294-10)			Lab File ID: 0429410D.D			Analyzed: 06/13/10 17:47			
Phenanthrene-d10	95082	12.478	130911	12.469	73	50 - 200	0.0090	+/-0.50	
Perylene-d12	56713	24.398	64518	24.38	88	50 - 200	0.0180	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16802	Instrument:	MS-BNA3
		Calibration:	0166002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16802-CCV1)			Lab File ID: SEQ-CCV2.D			Analyzed: 06/16/10 23:33			
Phenanthrene-d10	136682	12.376	124404	12.433	110	50 - 200	-0.0570	+/-0.50	
Perylene-d12	70508	24.296	77162	24.353	91	50 - 200	-0.0570	+/-0.50	
32SB-51-0708 (1004294-20)			Lab File ID: 0429420D.D			Analyzed: 06/17/10 05:21			
Phenanthrene-d10	80739	12.398	136682	12.376	59	50 - 200	0.0220	+/-0.50	
Perylene-d12	66921	24.299	70508	24.296	95	50 - 200	0.0030	+/-0.50	
32SS-FD042910-05 (1004294-01)			Lab File ID: 429401D2.D			Analyzed: 06/17/10 05:56			
Phenanthrene-d10	70874	12.398	136682	12.376	52	50 - 200	0.0220	+/-0.50	
Perylene-d12	52591	24.29	70508	24.296	75	50 - 200	-0.0060	+/-0.50	
32SB-50-0607 (1004294-18)			Lab File ID: 0429418D.D			Analyzed: 06/17/10 08:57			
Phenanthrene-d10	66721	12.386	136682	12.376	49	50 - 200	0.0100	+/-0.50	*
Perylene-d12	48794	24.297	70508	24.296	69	50 - 200	0.0010	+/-0.50	

Empirical Laboratories, LLC

Data file : \\ELABNSH05\TARGET\chem\bna3.i\051010b3.b\SEQ-CAL1.D
Lab Smp Id: SEQ-CAL1 Client Smp ID: SEQ-CAL1
Inj Date : 10-MAY-2010 14:34 MS Autotune Date: 28-JUL-1998 06:19
Operator : ADM Inst ID: bna3.i
Smp Info : cal0.05PPM;;;;;;
Misc Info : ;;;;;;pahsurmis.sub;
Comment :
Method : \\ELABNSH05\TARGET\chem\bna3.i\051010b3.b\IXBN3LOW.m
Meth Date : 12-May-2010 07:09 amonteiro Quant Type: ISTD
Cal Date : 10-MAY-2010 14:34 Cal File: SEQ-CAL1.D
Als bottle: 4 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: pahsurmis.sub
Target Version: 4.04
Processing Host: TARGET02_VM

M 5/14/10

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ng/ul)	AMOUNTS ON-COL (ng/ul)
* 101 Phenanthrene-d10	188	13.276	13.276	(1.000)	190971	1.00000	
20 N-Nitroso-di-n-propylamine	70	5.274	5.274	(0.397)	871	0.05000	0.2603
38 Isophorone	82	5.710	5.710	(0.430)	4375	0.05000	0.04897
50 Naphthalene	128	6.304	6.304	(0.475)	12692	0.05000	0.05191
52 Hexachlorobutadiene	225	6.471	6.471	(0.487)	2057	0.05000	0 05252
54 2-Methylnaphthalene	142	7.363	7.363	(0.555)	7392	0.05000	0.05316
55 1-Methylnaphthalene	142	7.530	7.530	(0.567)	5778	0.05000	0.04793
69 Hexachlorocyclopentadiene	237	7.650	7.650	(0.576)	456	0.05000	0.2599
$ 73 2-Fluorobiphenyl	172	8.040	8.040	(0.606)	7500	0.05000	0.04862
76 Acenaphthylene	152	9.126	9.126	(0.687)	6469	0.05000	0.04045
79 Acenaphthene	153	9.516	9.516	(0.717)	5556	0.05000	0.05338
87 Fluorene	166	10.779	10.779	(0.812)	5811	0.05000	0.04815
$ 106 2,4,6-Tribromophenol	330	11.401	11.401	(0.859)	780	0.10000	0.2046
110 Phenanthrene	178	13.341	13.341	(1.005)	9744	0.05000	0.05154
108 Hexachlorobenzene	284	12.209	12.209	(0.920)	2460	0.05000	0.05498
111 Anthracene	178	13.480	13.480	(1.015)	5541	0.05000	0.03334
115 Fluoranthene	202	16.767	16.767	(1.263)	6321	0.05000	0.1084
133 Pyrene	202	17.398	17.398	(1.310)	6407	0.05000	0.04673
* 153 Perylene-d12	264	25.094	25.094	(1.000)	88801	1.00000	
$ 134 Terphenyl-d14	244	18.085	18.085	(1.362)	4529	0.05000	0.1957
137 Benzo(a)anthracene	228	21.009	21.009	(1.582)	4501	0.05000	0.02758
138 Chrysene	228	21.111	21.111	(1.590)	6093	0.05000	0.04286
155 Benzo(b)fluoranthene	252	24.305	24.305	(0.969)	3264	0.05000	0.05723
156 Benzo(k)fluoranthene	252	24.379	24.379	(0.972)	3815	0.05000	0.03854
157 Benzo(a)pyrene	252	24.983	24.983	(0.996)	2762	0.05000	0.08353
158 Indeno(1,2,3-cd)pyrene	276	26.932	26.932	(1.073)	2515	0.05000	0.03544

5/12/10

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE 1 OF 1

CLIENT NSWC Crane		JOB NUMBER CTOF273_007	
SUBJECT Sample Calculation			
BASED ON		DRAWING NUMBER	
BY John Cognetti	CHECKED BY	APPROVED BY	DATE 7-22-10

I. VOC Sample 325B-45-0607; Benzene

$$\frac{27372}{1031119} * 50 * \frac{30}{1.044291} * \frac{1}{0.8254} = 46.2 \text{ ug/kg Benzene}$$

II. PAH Sample 325B-52-0809; Naphthalene

$$\frac{33743}{68108} * 10 * 1 * \frac{1000}{15} * \frac{1}{1.28018} * \frac{1}{0.8454} = 305.2 \text{ ug/kg Naphthalene}$$

Sample Calculation VOC

ANALYSIS DATA SHEET

32SB-45-0607

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-08	File ID:	0429408.D
Sampled:	04/29/10 09:55	Prepared:	05/16/10 00:00	Analyzed:	05/16/10 21:55
Solids:	82.54	Preparation:	5035	Dilution:	50

Batch: 0E16003 Sequence: 0F15201 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene	46.9	25.6	218	H1, J, D
100-41-4	Ethylbenzene	304	40.9	545	H1, J, D
108-88-3	Toluene		46.8	545	H1, U
1330-20-7	Xylenes (total)	1200	38.1	545	H1, D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	32.68	39.52	121	85 - 120	*
Dibromofluoromethane	32.68	34.24	105	80 - 125	
1,2-Dichloroethane-d4	32.68	35.97	110	75 - 140	
Toluene-d8	32.68	32.35	99.0	85 - 115	

Sample Calculation
VOC

Data File: \\ELABNSH05\TARGET\chem\voa4.i\051610V4.b\0429408.D
Report Date: 01-Jun-2010 08:23

Empirical Laboratories, LLC

Data file : \\ELABNSH05\TARGET\chem\voa4.i\051610V4.b\0429408.D
Lab Smp Id: 1004294-08 Client Smp ID: 32SB-45-0607
Inj Date : 16-MAY-2010 21:55 MS Autotune Date: 07-MAY-2010 17:53
Operator : ADM Inst ID: voa4.i
Smp Info : 1004294-08;;;;;
Misc Info : ;0;;;;gm-allap9.sub;
Comment :
Method : \\ELABNSH05\TARGET\chem\voa4.i\051610V4.b\VSOIL4.m
Meth Date : 01-Jun-2010 08:21 amonteiro Quant Type: ISTD
Cal Date : 02-MAY-2010 04:43 Cal File: SEQ-CALO.D
Als bottle: 13
Dil Factor: 50.00000
Integrator: HP RTE Compound Sublist: gm-allap9.sub
Target Version: 4.04
Processing Host: TARGET02_VM

RW 6-5-10 M 6/1/10

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/Kg)	FINAL (ug/Kg)
* 59 Fluorobenzene	96	14.075	14.084	(1.000)	958116	30.0000	
10 Acetonitrile	41	7.178	7.166	(0.510)	56021	53.4194	2671
12 Acetone	43	7.404	7.403	(0.526)	194403	103.001	5175
20 Methylene chloride	84	8.555	8.554	(0.608)	237617	20.1162	1006
37 Hexane	57	11.576	11.574	(0.822)	80161	3.12891	156.4
$ 46 Dibromofluoromethane	111	12.334	12.342	(0.876)	286009	31.4313	31.43(R)
54 Cyclohexane	56	13.682	13.681	(0.972)	299083	20.2094	1010
$ 50 1,2-Dichloroethane-d4	102	13.013	13.021	(0.925)	64111	33.0182	33.02(R)
56 Benzene	78	13.800	13.799	(0.980)	27372	0.86101	43.05
$ 77 Toluene-d8	98	16.053	16.052	(0.926)	794798	29.6977	29.70(R)
69 Methyl cyclohexane	83	15.187	15.196	(1.079)	1031119	71.5145	3576
* 87 Chlorobenzene-d5	82	17.332	17.331	(1.000)	383646	30.0000	(Q)
89 Ethylbenzene	91	17.500	17.498	(1.010)	184703	5.58491	279.2
90 m,p-Xylene	91	17.647	17.656	(1.018)	51456	2.04094	102.0
M 96 Xylene(total)	91				554918	22.0319	1102
94 o-Xylene	91	17.972	17.981	(1.037)	503462	19.9910	999.5
100 Isopropylbenzene	105	18.257	18.256	(1.053)	1384906	51.5353	2577
$ 101 Bromofluorobenzene	95	18.306	18.305	(1.056)	382399	36.2785	36.28(R)
103 n-Propylbenzene	91	18.602	18.610	(0.960)	2710231	79.7962	3990
106 1,3,5 Trimethylbenzene	105	18.720	18.807	(0.966)	150498	6.58789	329.4
108 tert-Butylbenzene	119	19.064	19.063	(0.984)	124342	6.19162	309.6
110 sec-Butylbenzene	105	19.251	19.250	(0.993)	1869428	60.7653	3038
* 112 1,4-Dichlorobenzene-d4	152	19.379	19.388	(1.000)	253900	30.0000	(Q)
116 n-Butylbenzene	91	19.733	19.732	(1.018)	1844626	77.6611	3883

Sample Calculation
VOC

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0144005
Lab File ID:	SEQ-CCV2.D	Calibration Date:	05/13/10 12:58
Sequence:	0F15201	Injection Date:	05/16/10
Lab Sample ID:	0F15201-CCV1	Injection Time:	14:36

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	104.0	1.044291	1.043547		-0.07	20
Ethylbenzene	A	100.0	89.52	2.698668	2.315105		-14.2	20
Naphthalene	A	100.0	96.26	1.996388	1.557661		-22.0	20 *
Methyl t-Butyl Ether	A	100.0	97.78	0.7267424	0.6618533		-8.9	20
Toluene	A	100.0	91.55	1.328513	1.275345		-4.0	20
m,p-Xylene	Q	200.0	162.4	2.002384	1.600583		-18.8	20
o-Xylene	A	100.0	88.12	1.977768	1.735437		-12.3	20
Xylenes (total)	Q	300.0	250.5	2.00992	1.645534		-16.5	20
Bromofluorobenzene	A	30.00	29.66	0.8537608	0.8148329		-4.6	20
Dibromofluoromethane	A	30.00	30.65	0.2871282	0.2935067		2.2	20
1,2-Dichloroethane-d4	A	30.00	29.34	6.763165E-02	5.996744E-02		-11.3	20
Toluene-d8	A	30.00	28.89	1.971808	2.01542		2.2	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

Sample Calculation PAH

ANALYSIS DATA SHEET

32SB-52-0809

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004294-23	File ID:	0429423D.D
Sampled:	04/29/10 14:20	Prepared:	05/13/10 15:20	Analyzed:	05/24/10 13:06
Solids:	84.54	Preparation:	EXT_3546	Dilution:	10

Batch: 0E12948 Sequence: 0F15503 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		15.7	78.9	U
50-32-8	Benzo(a)pyrene		15.7	59.1	U
205-99-2	Benzo(b)fluoranthene		15.7	78.9	U
207-08-9	Benzo(k)fluoranthene		15.7	78.9	X, U
218-01-9	Chrysene		15.7	78.9	U
53-70-3	Dibenz(a,h)anthracene		15.7	59.1	U
193-39-5	Indeno(1,2,3-cd)pyrene		15.7	78.9	U
91-20-3	Naphthalene	305	15.7	59.1	Y, D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC. (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3943	3325	84.3	14 - 129	
Terphenyl-d14	3943	2713	68.8	14 - 129	

Sample Calculation PAH

Data File: \\ELABNSH05\TARGET\chem\bna3.i\052410b3.b\0429423D.D
Report Date: 27-May-2010 10:57

Empirical Laboratories, LLC

Data file : \\ELABNSH05\TARGET\chem\bna3.i\052410b3.b\0429423D.D
Lab Smp Id: 1004294-23 Client Smp ID: 32SB-52-0809
Inj Date : 24-MAY-2010 13:06 MS Autotune Date: 28-JUL-1998 06:19
Operator : ADM Inst ID: bna3.i
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Misc Info : ;0;;;;0E12948;pahsurmis.sub;
Comment :
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Meth Date : 27-May-2010 09:26 gquick Quant Type: ISTD
Cal Date : 10-MAY-2010 20:37 Cal File: SEQ-CALB.D
Als bottle: 7
Dil Factor: 10.00000
Integrator: HP RTE Compound Sublist: pahsurmis.sub
Target Version: 4.04
Processing Host: TARGET17_VM

Concentration Formula: Amt * DF * Uf * Vt*Vi/(Amt * Vi * (Solids/100))

Name	Value	Description
DF	10.000	Dilution Factor
Uf	1.000	ng unit correction factor
Vt	1000.000	Volume of final extract (uL)(1000 low, 2
Amt	15.000	Mass of initial extraction
Vi	1.000	Volume injected (uL)
Solids	100.000	Percent Solids

M 6/3/10

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng/ul)	FINAL (UG/KG)
* 101 Phenanthrene-d10	188	13.053	13.045	(1.000)	68108	1.00000	
50 Naphthalene	128	6.156	6.156	(0.472)	33743	0.38700	258.0
54 2-Methylnaphthalene	142	7.186	7.187	(0.551)	118313	2.38580	1590
55 1-Methylnaphthalene	142	7.353	7.354	(0.563)	104167	2.42280	1615
$ 73 2-Fluorobiphenyl	172	7.854	7.855	(0.602)	231982	4.21650	2811
79 Acenaphthene	153	9.321	9.313	(0.714)	7775	0.20947	139.6
87 Fluorene	166	10.565	10.566	(0.809)	12215	0.28381	189.2
$ 106 2,4,6-Tribromophenol	330	11.196	11.188	(0.858)	42496	8.11884	5412
110 Phenanthrene	178	13.118	13.110	(1.005)	35534	0.52704	351.4
* 153 Perylene-d12	264	24.917	24.918	(1.000)	49952	1.00000	
$ 134 Terphenyl-d14	244	17.853	17.844	(1.368)	177422	3.44115	2294

SQ 05/27/10

Sample Calculation PAH

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_007
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0132007
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/10/10 17:04
Sequence:	0F15503	Injection Date:	05/24/10
Lab Sample ID:	0F15503-CCV1	Injection Time:	09:29

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.742	0.5449914	0.6259238		14.9	20
Acenaphthylene	A	5.000	6.085	0.837393	1.01909		21.7	20 *
Anthracene	L	5.000	5.201	0.8127224	0.9944774		4.0	20
Benzo(a)anthracene	L	5.000	5.040	0.6443703	0.8082341		0.8	20
Benzo(a)pyrene	L	5.000	5.702	0.8806429	1.238924		14.0	20
Benzo(b)fluoranthene	L	5.000	5.726	1.02129	1.397748		14.5	20
Benzo(g,h,i)perylene	A	5.000	4.718	0.9507735	0.8972353		-5.6	20
Benzo(k)fluoranthene	A	5.000	6.283	1.114795	1.400948		25.7	20 *
Chrysene	A	5.000	5.245	0.7443354	0.7807943		4.9	20
Dibenz(a,h)anthracene	L	5.000	4.329	0.824039	0.7860953		-13.4	20
Fluoranthene	L	5.000	5.025	0.8561351	1.053995		0.5	20
Fluorene	A	5.000	5.472	0.6319282	0.6916229		9.4	20
Indeno(1,2,3-cd)pyrene	L	5.000	4.578	0.792655	0.8411974		-8.4	20
1-Methylnaphthalene	A	5.000	4.693	0.6312687	0.5925542		-6.1	20
2-Methylnaphthalene	A	5.000	4.692	0.7281161	0.6832465		-6.2	20
Naphthalene	A	5.000	3.961	1.28018	1.01409		-20.8	20 *
Phenanthrene	A	5.000	5.241	0.9899291	1.037708		4.8	20
Pyrene	L	5.000	5.325	0.8735304	1.088951		6.5	20
2-Fluorobiphenyl	A	5.000	4.750	0.8077998	0.7674694		-5.0	20
Terphenyl-d14	Q	5.000	4.576	0.6178417	0.6946107		-8.5	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

NSWC CRANE
SOIL DATA
CTOF273_007

FRACTION	CHEMICAL	32SB-FD042910-05	UNITS	32SB-50-0607	RPD	D
PAH	NAPHTHALENE	ND	UG/KG	1360 J	200.00	1360.00

Current RPD Quality Control Limit: 50 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

NSWC CRANE
SOIL DATA
CTOF273_007

FRACTION	CHEMICAL	32SB-FD042910-05DL	UNITS	32SB-50-0607DL	RPD	D
OV	ETHYLBENZENE	ND	UG/KG	87.5 J	200.00	N/A 87.50 < 2X RoL
OV	TOTAL XYLENES	289 J	UG/KG	803 J	94.14	N/A 514.00 < 2X RoL

Current RPD Quality Control Limit: 50 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**T.KLIMEK**	**DATE:**	**AUGUST 9, 2010**
FROM:	**EDWARD SEDLMYER**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION: SELECT VOC / PAH**
NSWC CRANE, CTO F273
SDG CTOF273_008

SAMPLES: 1 / Soil / SELECT VOC / PAH

32SB-53-1415

3 / Water / SELECT VOC / PAH

32GW-01 32GW-02 Trip Blank #7809

OVERVIEW

The sample set for NSWC Crane, CTO F273, SDG CTOF273_008 consisted of one (1) soil sample, two (2) aqueous samples, and one (1) trip blank. All samples were analyzed for select volatile organic compounds (VOCs) (benzene, ethylbenzene, toluene, and total xylenes, and select polynuclear aromatic hydrocarbons (PAH) (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene). The trip blank was analyzed for VOCs only.

The samples were collected by TetraTech NUS on April 28 and 29, 2010 and analyzed by Empirical Laboratories, LLC. All analyses were conducted using USEPA SW-846 Methods 8260B and 8270C analytical and reporting protocols.

The data contained in this SDG were fully validated with regard to the following parameters:

*	• Data Completeness
	• Holding Times
*	• GC/MS Tuning
	• Initial and Continuing Calibration
*	• Laboratory Blank Analyses
*	• Surrogate Recoveries
*	• Blank Spike/Blank Spike Duplicate Results
	• Matrix Spike/Matrix Spike Duplicate Results
*	• Internal Standard Recoveries
*	• Compound Quantitation
*	• Compound Identification
*	• Detection Limits

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

SELECT VOC

The 14 day analytical hold time for sample 32SB-53-1415 was exceeded by five days. The nondetected results for sample 32SB-53-1415 have been qualified as estimated (UJ).

SELECT PAH

The 7 day extraction hold time was exceeded by five days for samples 32GW-02 and 32GW-01. The positive and non-detected results for samples 32GW-02 and 32GW-01 have been qualified as estimated, (J) and (UJ), respectively.

The matrix spike / matrix spike duplicate (MS/MSD) performed on sample 32GW-02 had a relative percent difference that exceeded the 30 percent laboratory quality control limit. No action was taken on this basis because the percent recoveries were acceptable.

The continuing calibration analyzed on instrument MS-BNA3 on 5/24/10 @ 09:29 and associated with sample 32SB-53-1415 had a percent difference (%D) greater than 25% for benzo(k)fluoranthene. The nondetected benzo(k)fluoranthene result for sample 32SB-53-1415 was qualified as estimated (UJ).

ADDITIONAL COMMENTS

Positive results less than the reporting limit (RL) were qualified as estimated, (J), due to uncertainty near the detection limit.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Sample results were qualified due to hold time noncompliances for one VOC and two PAH samples. A PAH continuing calibration noncompliance resulted in the qualification of two compounds in one sample.

Other factors affecting data quality: Positive results less than the reporting limit (RL) were qualified estimated, (J), due to uncertainty near the detection limit.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999) and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006). The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech NUS
Edward Sedlmyer
Chemist/Data Validator

TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Data Validation Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$ / ICP PDS Recovery Noncompliance
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; e.g. chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 02111	NSAMPLE	32SB-53-1415		
SDG: CTOF273_008	LAB_ID	1004295-01		
FRACTION: OV	SAMP_DATE	4/29/2010		
MEDIA: SOIL	QC_TYPE	NM		
	UNITS	UG/KG		
	PCT_SOLIDS	85.8		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
BENZENE		0.447	UJ	H
ETHYLBENZENE		0.713	UJ	H
TOLUENE		0.818	UJ	H
TOTAL XYLENES		0.666	UJ	H

PROJ_NO: 02111	NSAMPLE	32GW-01			32GW-02			Trip Blank #7809		
SDG: CTOF273_008	LAB_ID	1004295-03			1004295-02			1004295-04		
FRACTION: OV	SAMP_DATE	4/28/2010			4/28/2010			4/28/2010		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.14	U		0.14	U		0.14	U	
ETHYLBENZENE		0.15	U		0.15	U		0.15	U	
TOLUENE		0.19	U		0.19	U		0.19	U	
TOTAL XYLENES		0.22	U		0.22	U		0.22	U	

PROJ_NO: 02111	NSAMPLE	32SB-53-1415		
SDG: CTOF273_008	LAB_ID	1004295-01		
FRACTION: PAH	SAMP_DATE	4/29/2010		
MEDIA: SOIL	QC_TYPE	NM		
	UNITS	UG/KG		
	PCT_SOLIDS	85.8		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.55	U	
BENZO(A)PYRENE		6.23		
BENZO(B)FLUORANTHENE		4.39	J	P
BENZO(K)FLUORANTHENE		1.55	UJ	C
CHRYSENE		1.55	U	
DIBENZO(A,H)ANTHRACENE		1.55	U	
INDENO(1,2,3-CD)PYRENE		1.55	U	
NAPHTHALENE		1.55	U	

PROJ_NO: 02111	NSAMPLE	32GW-01			32GW-02		
SDG: CTOF273_008	LAB_ID	1004295-03			1004295-02		
FRACTION: PAH	SAMP_DATE	4/28/2010			4/28/2010		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		0.0189	UJ	H	0.0189	UJ	H
BENZO(A)PYRENE		0.0189	UJ	H	0.0189	UJ	H
BENZO(B)FLUORANTHENE		0.0189	UJ	H	0.0189	UJ	H
BENZO(K)FLUORANTHENE		0.0189	UJ	H	0.0189	UJ	H
CHRYSENE		0.0189	UJ	H	0.0189	UJ	H
DIBENZO(A,H)ANTHRACENE		0.0189	UJ	H	0.0189	UJ	H
INDENO(1,2,3-CD)PYRENE		0.0189	UJ	H	0.0189	UJ	H
NAPHTHALENE		0.0189	UJ	H	0.0402	J	HP

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

ANALYSIS DATA SHEET

32GW-01

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1004295-03	File ID:	0429503.D
Sampled:	04/28/10 15:50	Prepared:	05/11/10 18:03	Analyzed:	05/12/10 08:43
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E11045 Sequence: 0E13351 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	28.77	95.9	75 - 120	
Dibromofluoromethane	30.00	30.05	100	85 - 115	
1,2-Dichloroethane-d4	30.00	30.34	101	70 - 120	
Toluene-d8	30.00	31.76	106	85 - 120	

ANALYSIS DATA SHEET

32GW-02

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1004295-02	File ID:	0429502.D
Sampled:	04/28/10 12:08	Prepared:	05/11/10 18:03	Analyzed:	05/12/10 08:13
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E11045 Sequence: 0E13351 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.47	98.2	75 - 120	
Dibromofluoromethane	30.00	30.13	100	85 - 115	
1,2-Dichloroethane-d4	30.00	30.25	101	70 - 120	
Toluene-d8	30.00	31.99	107	85 - 120	

ANALYSIS DATA SHEET

Trip Blank #7809

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1004295-04	File ID:	0429504.D
Sampled:	04/28/10 00:00	Prepared:	05/11/10 18:03	Analyzed:	05/12/10 07:43
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E11045 Sequence: 0E13351 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.71	99.0	75 - 120	
Dibromofluoromethane	30.00	29.80	99.3	85 - 115	
1,2-Dichloroethane-d4	30.00	30.11	100	70 - 120	
Toluene-d8	30.00	31.44	105	85 - 120	

ANALYSIS DATA SHEET

32SB-53-1415

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1004295-01	File ID:	0429501.D
Sampled:	04/29/10 15:15	Prepared:	05/18/10 17:35	Analyzed:	05/19/10 02:28
Solids:	85.79	Preparation:	5035	Dilution:	1

Batch: 0E18025 Sequence: 0F15214 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.447	5.00	H1, U
100-41-4	Ethylbenzene		0.713	9.51	H1, U
108-88-3	Toluene		0.818	9.51	H1, U
1330-20-7	Xylenes (total)		0.666	9.51	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	28.52	29.55	104	85 - 120	
Dibromofluoromethane	28.52	29.16	102	80 - 125	
1,2-Dichloroethane-d4	28.52	27.27	95.6	75 - 140	
Toluene-d8	28.52	30.26	106	85 - 115	

ANALYSIS DATA SHEET

32GW-01

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_008	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Ground Water	Laboratory ID:	1004295-03	File ID:	0429503.D
Sampled:	04/28/10 15:50	Prepared:	05/11/10 12:00	Analyzed:	06/06/10 12:10
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0E11002 Sequence: 0F16103 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0189	0.0943	H2, U
50-32-8	Benzo(a)pyrene		0.0189	0.0943	H2, U
205-99-2	Benzo(b)fluoranthene		0.0189	0.0943	H2, U
207-08-9	Benzo(k)fluoranthene		0.0189	0.0943	H2, U
218-01-9	Chrysene		0.0189	0.0943	H2, U
53-70-3	Dibenz(a,h)anthracene		0.0189	0.0943	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0189	0.0943	H2, U
91-20-3	Naphthalene		0.0189	0.0943	H2, U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	47.17	38.63	81.9	34 - 167	
Terphenyl-d14	47.17	17.37	36.8	34 - 167	

ANALYSIS DATA SHEET

32GW-02

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1004295-02	File ID:	0429502.D
Sampled:	04/28/10 12:08	Prepared:	05/11/10 12:00	Analyzed:	06/06/10 01:27
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0E11002 Sequence: 0F16006 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0185	0.0926	U, H2
50-32-8	Benzo(a)pyrene		0.0185	0.0926	U, H2, R
205-99-2	Benzo(b)fluoranthene		0.0185	0.0926	U, H2
207-08-9	Benzo(k)fluoranthene		0.0185	0.0926	H2, U
218-01-9	Chrysene		0.0185	0.0926	H2, U
53-70-3	Dibenz(a,h)anthracene		0.0185	0.0926	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0185	0.0926	H2, U
91-20-3	Naphthalene	0.0402	0.0185	0.0926	H2, J

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.30	42.45	91.7	34 - 167	
Terphenyl-d14	46.30	21.78	47.1	34 - 167	

ANALYSIS DATA SHEET

32SB-53-1415

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_008	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Soil	Laboratory ID:	1004295-01	File ID:	0429501.D
Sampled:	04/29/10 15:15	Prepared:	05/13/10 15:20	Analyzed:	05/24/10 15:31
Solids:	85.79	Preparation:	EXT_3546	Dilution:	1

Batch: 0E12948 Sequence: 0F15503 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.55	7.78	U
50-32-8	Benzo(a)pyrene	6.23	1.55	5.83	
205-99-2	Benzo(b)fluoranthene	4.39	1.55	7.78	J
207-08-9	Benzo(k)fluoranthene		1.55	7.78	X, U
218-01-9	Chrysene		1.55	7.78	U
53-70-3	Dibenz(a,h)anthracene		1.55	5.83	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.55	7.78	U
91-20-3	Naphthalene		1.55	5.83	Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3886	2922	75.2	14 - 129	
Terphenyl-d14	3886	2514	64.7	14 - 129	

APPENDIX C

SUPPORT DOCUMENTATION

HOLDTIME

SDG CTOF273_008

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV	UG/KG	32SB-53-1415	1004295-01	NM	04/29/2010	05/18/2010	05/19/2010	19	1	20
OV	UG/L	Trip Blank #7809	1004295-04	NM	04/28/2010	05/11/2010	05/12/2010	13	1	14
OV	UG/L	32GW-02	1004295-02	NM	04/28/2010	05/11/2010	05/12/2010	13	1	14
OV	UG/L	32GW-01	1004295-03	NM	04/28/2010	05/11/2010	05/12/2010	13	1	14
SIM	UG/KG	32SB-53-1415	1004295-01	NM	04/29/2010	05/13/2010	05/24/2010	14	11	25
SIM	UG/L	32GW-02	1004295-02	NM	04/28/2010	05/11/2010	06/06/2010	13	26	39
SIM	UG/L	32GW-01	1004295-03	NM	04/28/2010	05/11/2010	06/06/2010	13	26	39

ANALYTICAL SUMMARY DATA PACKAGE
SDG # CTOF273_008

PROJECT NAME: NSA CRANE SMU32
PROJECT LOCATION: CRANE, INDIANA
CONTRACT #: N62470-08-D-1001

SUBMITTAL TO:
Tobrena Skeen
Tetra Tech NUS, Inc.
Foster Plaza 7
661 Andersen Drive
Pittsburgh, PA 15220

SUBMITTAL BY:
Empirical Laboratories, LLC (EL)
621 Mainstream Drive, Suite 270
Nashville, TN 37228
Tel (615)345-1115
Fax (615)846-5426

LABORATORY CONTACT PERSON:
Project Manager: Kim A. Kostzer
Tel (615)345-1115
Fax (615)846-5426
Email: kkostzer@empirlabs.com

Original Report Date: June 17, 2010
Report Revision #: N/A
Revision Date: N/A
Total # of Pages: 104

THIS DOCUMENT MEETS DoD QSM 4.1 STANDARDS

The results relate to only the samples associated with the referenced SDG and the submitted data has been produced in accordance with laboratory procedures. The Laboratory's Technical Lab Director, Mr. Rick Davis, is responsible for the final data produced and reported. His signature is listed at the end of the Case Narrative within the Analytical Data Package. If applicable to this report package, details on report revisions and the information on subcontracted analysis are listed in the package Case Narrative. This report shall not be reproduced, except in full, without the written approval of Empirical Laboratories, LLC.

Sample Delivery Group Case Narrative

Receipt Information

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision

This is an original submittal of the final report package.

Analytical Information

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. The following information is provided specific to individual methods:

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.
B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.
C: The peak was manually integrated to correct the baseline from the original chromatogram.
D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

SW8260B:

Sample 1004295-01 was analyzed outside the method holding time; however, the sample was analyzed within a 2X of the holding time.

No additional anomalies or deviations are noted and the data is properly qualified.

SW8270C PAHs:

Samples 1004295-02 and 1004295-03 were extracted outside the method holding time; however, the sample was prepared within a 2X of the holding time.

The continuing calibration standard 0F15503-CCV1 failed criteria for Benzo(k)fluoranthene and Naphthalene. The matrix spikes associated with sample 1004295-02 failed accuracy and/or precision criteria for Benzo(a)pyrene.

No additional anomalies or deviations are noted and the data is properly qualified.

Data Qualifiers
As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL), also known as Reporting Limit **(RL),** is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

*****: A failing quality control criteria is associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the EQL. One should feel confident that the result is greater than zero and less than the EQL.

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In metals, the qualifier indicates that the parameters MDL/RL

has been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The RPD and/or percent recovery failed in the associated Blank Spike and/or Blank Spike Duplicate.

R: The RPD and/or percent recovery failed in the associated Matrix Spike and/or Matrix Spike Duplicate.

S: The Internal Standard failed criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

LIMS Definitions / Naming Conventions:
The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

BLK: LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

BS: LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes

within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "**RE**" implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:
I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, Ms. Marcia K. McGinnity is authorized to sign this Statement of Data Authenticity.

Mr. Rick D. Davis
Laboratory Technical Director / VP Operations

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 4 OF 4

PROJECT NO: 112G02111	SITE NAME: F273
PROJECT MANAGER AND PHONE NUMBER	Tony Kilimek 513-251-2730
LABORATORY NAME AND CONTACT:	Empirical - Kim Kostner
SAMPLERS (SIGNATURE)	
FIELD OPERATIONS LEADER AND PHONE NUMBER	George Ten Eyck 513-251-2730
ADDRESS	621 Mainstream Dr, Suite 270
CARRIER/WAYBILL NUMBER	FedEx
CITY, STATE	Nashville, TN

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): 6 P
PRESERVATIVE USED: 4°C 4°C

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	BTEX							COMMENTS
4/29	1515	32SB-53-1415	SB	G	1	X					1004295		-01	~~-01~~
	1342	32SB-51-0708	SB	G	3		X					1004294		-20
	1342	32SB-51-1415	SB	G	3		X							-21
	1420	32SB-52-0809	SB	G	3		X							-23
	1420	32SB-52-1415	SB	G	3		X							-24
	1515	32SB-53-0910	SB	G	3		X							-26
	1515	32SB-53-1415	SB	G	3		X				1004295			-01

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/29/10	1700	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	4/30/10	08:30

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 4

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G02111	F273	Tony Klimek 513-251-2730	Empirical - Kim Kostzer
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George Ten Eyck 513-251-2730	ADDRESS: 621 Mainstream Dr. Suite 270
		CARRIER/WAYBILL NUMBER: FEDEX	CITY, STATE: Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G
PRESERVATIVE USED: 4°C 4°C HCl

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHS	BTEX						COMMENTS
4/28	1208	32GW-02	GW	G	6	X					1004295-	02	MS/MSD
	1208	32GW-02	GW	G	9		X						MS/MSD
	1550	32GW-01	GW	G	2	X						-03	
	1550	32GW-01	GW	G	3		X						
4/29	0000	32SS-FD042910-05	SS	G	1	X					1004294		-01
	0000	32SB-FD042910-05	SB	G	1	X							-02
	0915	32SS-43-0002	SS	G	1	X							-03
	0910	32SB-43-0506	SB	G	1	X							-04
	0926	32SS-44-0002	SS	G	1	X							-05
	0926	32SB-44-0506	SB	G	1	X							-06
	0955	32SS-45-0002	SS	G	1	X							-07
	0955	32SB-45-0607	SB	G	1	X							-08
	1016	32SS-46-0002	SS	G	1	X							-09

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/29/10	1700	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	4/30/10	08:30

COMMENTS: 1.1°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004294, 1004295 Number of Coolers: 1 of 2

Client: TTNUS Project: F273

Date/Time Received: 4/30/10 08:30 Date cooler(s) opened: 4/30/10

Opened By (print): Will Schwab (signature): [illegible]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 5343

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 1 Seal date: 4/29/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 2.6 °C

Dates samples were logged-in: 4/30/10

9. Initial this form to acknowledge login of sample(s): (Name): Will Schwab (Initial): WS
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

If Non-Conformance issues were present, list by sample ID: _____

1004295 - Rec'd trip blank that is not on COC. Tagged as -04. CAR#: _____

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1004294, 1004295 Number of Coolers: 2 of 2

Client: TTNUS Project: F273

Date/Time Received: **4/30/10** **08:30** Date cooler(s) opened: **4/30/10**

Opened By (print): Will Schwab (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 3354

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 1 Seal date: 4/29/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 1.1 °C

~~Dates samples were logged-in:~~ **4/30/10**

9. Initial this form to acknowledge login of sample(s): (Name): _____ (Initial): _____
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

See page 1 of 2

WORK ORDER

Printed: 5/20/2010 8:44:24PM

1004295

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32

Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Report To:
Tetra Tech NUS, Inc. (T010)
Tobrena Skeen
Foster Plaza 7, 661 Anderson Drive
Pittsburgh, PA 15220
Phone: (412) 921-8182
Fax: (412) 921-4040

Invoice To:
Tetra Tech NUS, Inc. (T010)
Accounts Payable
Foster Plaza 7, 661 Anderson Drive
Pittsburgh, PA 15220
Phone :(412) 921-8182
Fax: (412) 921-4040

Date Due: 05/21/2010 16:00 (15 day TAT)

Received By: William Schwab
Date Received: 04/30/2010 08:30

Logged In By: William Schwab
Date Logged In: 04/30/2010 11:18

Samples Received at: **2.6°C**

Custody Seals	Yes	Received On Ice	Yes
Containers Intact	Yes		
COC/Labels Agree	Yes		
Preservation Confirm	Yes		

Method	Test Code	Due	TAT	Expires	Comments
1004295-01 32SB-53-1415 [Solid] Sampled 04/29/2010 15:15 Central					**DoD QSM 4.1**
SM2540B	WC_PERCENT_SOLIDS_2540B	05/18/2010 14:00	15	05/06/2010 15:15	
SW8260B	VOC_8260B_BTEXMN	05/18/2010 14:00	15	05/13/2010 15:15	ENCORES
SW8270C	SMS_PAH_8270C_3546_LOW	05/18/2010 14:00	15	05/13/2010 15:15	See version
1004295-02 32GW-02 [Water] Sampled 04/28/2010 12:08 Central					**MS/MSD. DoD QSM 4.1**
SW8260B	VOC_8260B_BTEXMN	05/18/2010 14:00	15	05/12/2010 12:08	MS/MSD.
SW8270C	SMS_PAH_8270C_3510_LOW	05/18/2010 14:00	15	05/05/2010 12:08	MS/MSD.
1004295-03 32GW-01 [Water] Sampled 04/28/2010 15:50 Central					**DoD QSM 4.1**
SW8260B	VOC_8260B_BTEXMN	05/18/2010 14:00	15	05/12/2010 15:50	See version
SW8270C	SMS_PAH_8270C_3510_LOW	05/18/2010 14:00	15	05/05/2010 15:50	See version
1004295-04 Trip Blank #7809 [Water] Sampled 04/28/2010 00:00 Central					**DoD QSM 4.1**
SW8260B	VOC_8260B_BTEXMN	05/18/2010 14:00	15	05/12/2010 00:00	See version

Reviewed By

Date

Sample Delivery Group Assignment Form

CLIENT: Tetra Tech NUS, Inc. (T010)
PROJECT NAME: CTOF273 NSA Crane SMU32
SDG #: CTOF273_008
MATRIX: Water

QC LEVEL: EDD/IV
Report Due: 5/21/2010 - 5/21/2010
Client Sample Count: 3

Sample Type	Sampled	Received	Lab ID	Client ID	SM2540B	SW8260	SW8260B	SW8270C
Client Sample	4/29/2010	4/30/2010	1004295-01	32SB-53-1415	DoD QSM 4.1		DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/28/2010	4/30/2010	1004295-02	32GW-02		MS/MSD. DoD QSM 4.1	MS/MSD. DoD QSM 4.1	MS/MSD. DoD QSM 4.1
Client Sample	4/28/2010	4/30/2010	1004295-03	32GW-01			DoD QSM 4.1	DoD QSM 4.1
Trip Blank	4/28/2010	4/30/2010	1004295-04	Trip Blank #7809			DoD QSM 4.1	

HOLDING TIME SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_008

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SB-53-1415	04/29/10 15:15	04/30/10 08:30	05/18/10 17:35	N/A	14.00	05/19/10 02:28	19.47	14.00	*
32GW-02	04/28/10 12:08	04/30/10 08:30	05/11/10 18:03	N/A	14.00	05/12/10 08:13	13.84	14.00	
32GW-01	04/28/10 15:50	04/30/10 08:30	05/11/10 18:03	N/A	14.00	05/12/10 08:43	13.70	14.00	
Trip Blank #7809	04/28/10 00:00	04/30/10 08:30	05/11/10 18:03	N/A	14.00	05/12/10 07:43	14.32	14.00	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13351

SDG: CTOF273_008
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA3
Calibration: 0128001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E13351-CCV1) ug/L				Lab File ID: SEQ-CCV3.D		Analyzed: 05/12/10 03:43		
Bromofluorobenzene	30.00	99.2	80 - 120	17.219	17.219	0.0000	+/-1.000	
Dibromofluoromethane	30.00	98.6	80 - 120	10.478	10.478	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	95.3	80 - 120	11.397	11.397	0.0000	+/-1.000	
Toluene-d8	30.00	95.7	80 - 120	14.889	14.889	0.0000	+/-1.000	
LCS (0E11045-BS1) ug/L				Lab File ID: V3LCS03.D		Analyzed: 05/12/10 04:43		
Bromofluorobenzene	30.00	100	75 - 120	17.219	17.219	0.0000	+/-1.000	
Dibromofluoromethane	30.00	98.6	85 - 115	10.478	10.478	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	96.8	70 - 120	11.397	11.397	0.0000	+/-1.000	
Toluene-d8	30.00	101	85 - 120	14.889	14.889	0.0000	+/-1.000	
Blank (0E11045-BLK1) ug/L				Lab File ID: V3BLK3.D		Analyzed: 05/12/10 06:43		
Bromofluorobenzene	30.00	98.9	75 - 120	17.219	17.219	0.0000	+/-1.000	
Dibromofluoromethane	30.00	98.8	85 - 115	10.478	10.478	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	97.7	70 - 120	11.397	11.397	0.0000	+/-1.000	
Toluene-d8	30.00	106	85 - 120	14.889	14.889	0.0000	+/-1.000	
Trip Blank #7809 (1004295-04) ug/L				Lab File ID: 0429504.D		Analyzed: 05/12/10 07:43		
Bromofluorobenzene	30.00	99.0	75 - 120	17.219	17.219	0.0000	+/-1.000	
Dibromofluoromethane	30.00	99.3	85 - 115	10.472	10.478	-0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	100	70 - 120	11.397	11.397	0.0000	+/-1.000	
Toluene-d8	30.00	105	85 - 120	14.889	14.889	0.0000	+/-1.000	
32GW-02 (1004295-02) ug/L				Lab File ID: 0429502.D		Analyzed: 05/12/10 08:13		
Bromofluorobenzene	30.00	98.2	75 - 120	17.219	17.219	0.0000	+/-1.000	
Dibromofluoromethane	30.00	100	85 - 115	10.466	10.478	-0.0120	+/-1.000	
1,2-Dichloroethane-d4	30.00	101	70 - 120	11.397	11.397	0.0000	+/-1.000	
Toluene-d8	30.00	107	85 - 120	14.889	14.889	0.0000	+/-1.000	
32GW-01 (1004295-03) ug/L				Lab File ID: 0429503.D		Analyzed: 05/12/10 08:43		
Bromofluorobenzene	30.00	95.9	75 - 120	17.213	17.219	-0.0060	+/-1.000	
Dibromofluoromethane	30.00	100	85 - 115	10.472	10.478	-0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	101	70 - 120	11.391	11.397	-0.0060	+/-1.000	
Toluene-d8	30.00	106	85 - 120	14.883	14.889	-0.0060	+/-1.000	
Matrix Spike (0E11045-MS1) ug/L				Lab File ID: 0429502M.D		Analyzed: 05/12/10 14:45		
Bromofluorobenzene	30.00	100	75 - 120	17.219	17.219	0.0000	+/-1.000	
Dibromofluoromethane	30.00	99.9	85 - 115	10.472	10.478	-0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	99.3	70 - 120	11.403	11.397	0.0060	+/-1.000	
Toluene-d8	30.00	98.9	85 - 120	14.889	14.889	0.0000	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13351	Instrument:	MS-VOA3
		Calibration:	0128001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (0E11045-MSD1) ug/L				Lab File ID: 0429502S.D		Analyzed: 05/12/10 15:15		
Bromofluorobenzene	30.00	101	75 - 120	17.219	17.219	0.0000	+/-1.000	
Dibromofluoromethane	30.00	101	85 - 115	10.466	10.478	-0.0120	+/-1.000	
1,2-Dichloroethane-d4	30.00	101	70 - 120	11.397	11.397	0.0000	+/-1.000	
Toluene-d8	30.00	98.5	85 - 120	14.889	14.889	0.0000	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15214	Instrument:	MS-VOA4
		Calibration:	0144005

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15214-CCV1) ug/L				Lab File ID: CCVE1.D		Analyzed: 05/18/10 22:53		
Bromofluorobenzene	30.00	97.2	80 - 120	18.305	18.305	0.0000	+/-1.000	
Dibromofluoromethane	30.00	101	80 - 120	12.342	12.342	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	91.8	80 - 120	13.021	13.021	0.0000	+/-1.000	
Toluene-d8	30.00	98.1	80 - 120	16.051	16.051	0.0000	+/-1.000	
LCS (0E18025-BS1) ug/Kg wet				Lab File ID: V4LCSE01.D		Analyzed: 05/19/10 00:25		
Bromofluorobenzene	30.00	95.9	85 - 120	18.304	18.305	-0.0010	+/-1.000	
Dibromofluoromethane	30.00	98.7	80 - 125	12.342	12.342	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	90.8	75 - 140	13.021	13.021	0.0000	+/-1.000	
Toluene-d8	30.00	98.1	85 - 115	16.051	16.051	0.0000	+/-1.000	
Blank (0E18025-BLK1) ug/Kg wet				Lab File ID: V4BLKE01.D		Analyzed: 05/19/10 01:57		
Bromofluorobenzene	30.00	105	85 - 120	18.307	18.305	0.0020	+/-1.000	
Dibromofluoromethane	30.00	103	80 - 125	12.344	12.342	0.0020	+/-1.000	
1,2-Dichloroethane-d4	30.00	94.4	75 - 140	13.023	13.021	0.0020	+/-1.000	
Toluene-d8	30.00	107	85 - 115	16.054	16.051	0.0030	+/-1.000	
32SB-53-1415 (1004295-01) ug/Kg dry				Lab File ID: 0429501.D		Analyzed: 05/19/10 02:28		
Bromofluorobenzene	28.52	104	85 - 120	18.304	18.305	-0.0010	+/-1.000	
Dibromofluoromethane	28.52	102	80 - 125	12.341	12.342	-0.0010	+/-1.000	
1,2-Dichloroethane-d4	28.52	95.6	75 - 140	13.02	13.021	-0.0010	+/-1.000	
Toluene-d8	28.52	106	85 - 115	16.051	16.051	0.0000	+/-1.000	

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E12804	Instrument:	MS-VOA3
Calibration:	0128001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E12804-TUN1	SEQ-TUN1.D	05/07/10 13:11
Cal Standard	0E12804-CAL1	SEQ-CAL1.D	05/07/10 13:41
Cal Standard	0E12804-CAL2	SEQ-CAL2.D	05/07/10 14:11
Cal Standard	0E12804-CAL3	SEQ-CAL3.D	05/07/10 14:42
Cal Standard	0E12804-CAL4	SEQ-CAL4.D	05/07/10 15:12
Cal Standard	0E12804-CAL5	SEQ-CAL5.D	05/07/10 15:42
Cal Standard	0E12804-CAL6	SEQ-CAL6.D	05/07/10 16:13
Cal Standard	0E12804-CAL7	SEQ-CAL7.D	05/07/10 16:43
Cal Standard	0E12804-CAL8	SEQ-CAL8.D	05/07/10 17:13
Cal Standard	0E12804-CAL9	SEQ-CAL9.D	05/07/10 17:43
Initial Cal Check	0E12804-ICV1	SEQ-ICV1.D	05/07/10 18:14
Cal Standard	0E12804-CALA	SEQ-CALA.D	05/07/10 18:44
Cal Standard	0E12804-CALB	SEQ-CALB.D	05/07/10 19:14
Cal Standard	0E12804-CALC	SEQ-CALC.D	05/07/10 19:45
Cal Standard	0E12804-CALD	SEQ-CALD.D	05/07/10 20:15
Cal Standard	0E12804-CALE	SEQ-CALE.D	05/07/10 20:45
Cal Standard	0E12804-CALF	SEQ-CALF.D	05/07/10 21:15
Cal Standard	0E12804-CALG	SEQ-CALG.D	05/07/10 21:45
Cal Standard	0E12804-CALH	SEQ-CALH.D	05/07/10 22:15
Cal Standard	0E12804-CALI	SEQ-CALI.D	05/07/10 22:46
MS Tune	0E12804-TUN2	SEQ-TUN2.D	05/07/10 23:46
Cal Standard	0E12804-CALJ	SEQ-CALJ.D	05/08/10 00:16
Cal Standard	0E12804-CALK	SEQ-CALK.D	05/08/10 00:46
Cal Standard	0E12804-CALL	SEQ-CALL.D	05/08/10 01:16
Cal Standard	0E12804-CALM	SEQ-CALM.D	05/08/10 01:46
Cal Standard	0E12804-CALN	SEQ-CALN.D	05/08/10 02:16
Cal Standard	0E12804-CALO	SEQ-CALO.D	05/08/10 02:46
Cal Standard	0E12804-CALP	SEQ-CALP.D	05/08/10 03:16
Cal Standard	0E12804-CALQ	SEQ-CALQ.D	05/08/10 03:46
Cal Standard	0E12804-CALR	SEQ-CALR.D	05/08/10 04:16

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/07/10
Instrument ID:	MS-VOA3	Injection Time:	13:11
Sequence:	0E12804	Lab Sample ID:	0E12804-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	21	PASS
75	30 - 60% of 95	48.9	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.32	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	70.9	PASS
175	5 - 9% of 174	6.93	PASS
176	95 - 101% of 174	98.2	PASS
177	5 - 9% of 176	7.81	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/07/10
Instrument ID:	MS-VOA3	Injection Time:	23:46
Sequence:	0E12804	Lab Sample ID:	0E12804-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	20.1	PASS
75	30 - 60% of 95	49.7	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.39	PASS
173	Less than 2% of 174	0.632	PASS
174	50 - 200% of 95	71	PASS
175	5 - 9% of 174	7.33	PASS
176	95 - 101% of 174	98.7	PASS
177	5 - 9% of 176	5.91	PASS

INITIAL CALIBRATION DATA

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0128001	Instrument:	MS-VOA3
Matrix:	Water	Calibration Date:	5/7/2010 3:51:54PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	0.5	0.9327359	1	0.8530789	2	0.8963187	5	0.8861681	10	0.8702683	50	0.8658091
Bromofluorobenzene	30	0.8753103	30	0.8711151	30	0.8836995	30	0.8838533	30	0.8830609	30	0.8667947
Ethylbenzene	0.5	2.340871	1	2.363477	2	2.270154	5	2.264944	10	2.261402	50	2.22059
Naphthalene	0.5	1.709822	1	1.662022	2	1.687884	5	1.670324	10	1.680615	50	1.71651
Methyl t-Butyl Ether	0.5	0.6292388	1	0.587448	2	0.5967256	5	0.5869144	10	0.6056585	50	0.600861
Toluene	0.5	1.334494	1	1.300532	2	1.337319	5	1.294521	10	1.299861	50	1.269326
m,p-Xylene	1	1.847045	2	1.803497	4	1.771053	10	1.73709	20	1.749037	100	1.708793
o-Xylene	0.5	1.925191	1	1.847349	2	1.886602	5	1.793533	10	1.842876	50	1.809921
Xylenes (total)	1.5	1.873094	3	1.818114	6	1.809569	15	1.755905	30	1.780317	150	1.742502
Dibromofluoromethane	30	0.26405	30	0.2654019	30	0.2679439	30	0.269411	30	0.2660265	30	0.2635822
1,2-Dichloroethane-d4	30	5.832724E-02	30	5.969276E-02	30	5.950816E-02	30	5.826555E-02	30	5.903404E-02	30	5.867149E-02
Toluene-d8	30	2.342085	30	2.382263	30	2.384284	30	2.343894	30	2.347006	30	2.22497

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0128001	Instrument:	MS-VOA3
Matrix:	Water	Calibration Date:	5/7/2010 3:51:54PM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	100	0.824858	150	0.7783886	200	0.754341						
Bromofluorobenzene	30	0.8305129	30	0.7885503	30	0.7570297						
Ethylbenzene	100	1.999746	150	1.770237	200	1.571548						
Naphthalene	100	1.738267	150	1.625639	200	1.512204						
Methyl t-Butyl Ether	100	0.608605	150	0.5776147	200	0.5754462						
Toluene	100	1.210423	150	1.124325	200	1.05793						
m,p-Xylene	200	1.500056	300	1.289306	400	~~1.10086~~						
o-Xylene	100	1.665008	150	1.530729	200	1.383268						
Xylenes (total)	300	1.55504	450	1.36978	600	1.194996						
Dibromofluoromethane	30	0.2660578	30	0.25877	30	0.2598842						
1,2-Dichloroethane-d4	30	5.732934E-02	30	0.0567267	30	5.649804E-02						
Toluene-d8	30	2.112862	30	2.039294	30	1.927015						

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0128001	Instrument:	MS-VOA3
Matrix:	Water	Calibration Date:	5/7/2010 3:51:54PM

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene												
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane												
1,2-Dichloroethane-d4												
Toluene-d8												

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0128001	Instrument:	MS-VOA3
Matrix:	Water	Calibration Date:	5/7/2010 3:51:54PM

Compound	Level 19		Level 20		Level 21		Level 22		Level 23		Level 24	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene												
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane												
1,2-Dichloroethane-d4												
Toluene-d8												

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0128001	Instrument:	MS-VOA3
Matrix:	Water	Calibration Date:	5/7/2010 3:51:54PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	0.8513296	6.678909	12.36133	1.763584E-02			15	
Bromofluorobenzene	0.8488807	5.514613	17.231	2.208685E-02			15	
Ethylbenzene	2.118108	13.13578	16.44622	1.212614E-02			CCC (20)	
Naphthalene	1.667032	4.006895	20.51467	6.777849E-03			15	
Methyl t-Butyl Ether	0.5965014	2.839457	8.019	6.343752E-02			15	
Toluene	1.247637	7.830692	14.97533	1.596385E-02			CCC (20)	
m,p-Xylene	1.675735	11.16825	16.59938	9.642842E-03			15	
o-Xylene	1.74272	10.38945	16.915	1.710043E-02			15	
Xylenes (total)	1.65548	14.07832	0	0			15	
Dibromofluoromethane	0.2645697	1.31402	10.50167	1.966633E-02			15	
1,2-Dichloroethane-d4	5.822815E-02	1.9858	11.42044	3.477841E-03			15	
Toluene-d8	2.233741	7.557731	14.901	1.850725E-02			15	

INITIAL CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA3	Calibration:	0128001
Lab File ID:	SEQ-ICV1.D	Calibration Date:	05/07/10 15:51
Sequence:	0E12804	Injection Date:	05/07/10
Lab Sample ID:	0E12804-ICV1	Injection Time:	18:14

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzene	A	100.0	94.23	0.8513296	0.8022267		-5.8	20
Ethylbenzene	A	100.0	94.84	2.118108	2.008724		-5.2	20
Toluene	A	100.0	95.42	1.247637	1.190468		-4.6	20
Xylenes (total)	A	300.0	277.1	1.65548	1.569467		-5.2	20
Bromofluorobenzene	A	30.00	29.75	0.8488807	0.8417188		-0.8	20
Dibromofluoromethane	A	30.00	30.02	0.2645697	0.264731		0.06	20
1,2-Dichloroethane-d4	A	30.00	29.96	5.822815E-02	5.814867E-02		-0.1	20
Toluene-d8	A	30.00	29.03	2.233741	2.161863		-3.2	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13351	Instrument:	MS-VOA3
Calibration:	0128001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13351-TUN1	SEQ-TUN2.D	05/12/10 03:13
Calibration Check	0E13351-CCV1	SEQ-CCV3.D	05/12/10 03:43
LCS	0E11045-BS1	V3LCS03.D	05/12/10 04:43
Blank	0E11045-BLK1	V3BLK3.D	05/12/10 06:43
Trip Blank #7809	1004295-04	0429504.D	05/12/10 07:43
32GW-02	1004295-02	0429502.D	05/12/10 08:13
32GW-01	1004295-03	0429503.D	05/12/10 08:43
32GW-02	0E11045-MS1	0429502M.D	05/12/10 14:45
32GW-02	0E11045-MSD1	0429502S.D	05/12/10 15:15

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/12/10
Instrument ID:	MS-VOA3	Injection Time:	03:13
Sequence:	0E13351	Lab Sample ID:	0E13351-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	20.7	PASS
75	30 - 60% of 95	51.5	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.69	PASS
173	Less than 2% of 174	0.804	PASS
174	50 - 200% of 95	68.7	PASS
175	5 - 9% of 174	8.43	PASS
176	95 - 101% of 174	96.5	PASS
177	5 - 9% of 176	6.44	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA3	Calibration:	0128001
Lab File ID:	SEQ-CCV3.D	Calibration Date:	05/07/10 15:51
Sequence:	0E13351	Injection Date:	05/12/10
Lab Sample ID:	0E13351-CCV1	Injection Time:	03:43

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	99.31	0.8513296	0.8454782		-0.7	20
Ethylbenzene	A	100.0	101.5	2.118108	2.150372		1.5	20
Toluene	A	100.0	99.21	1.247637	1.237813		-0.8	20
Xylenes (total)	A	300.0	302.2	1.65548	1.711764		3.4	20
Bromofluorobenzene	A	30.00	29.75	0.8488807	0.8418883		-0.8	20
Dibromofluoromethane	A	30.00	29.57	0.2645697	0.260791		-1.4	20
1,2-Dichloroethane-d4	A	30.00	28.58	5.822815E-02	5.547723E-02		-4.7	20
Toluene-d8	A	30.00	28.72	2.233741	2.138089		-4.3	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_008

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E11045 Batch Matrix: Water Preparation: 5030B

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E11045-BLK1	05/11/10 18:03	5.00	5.00
LCS	0E11045-BS1	05/11/10 18:03	5.00	5.00
32GW-02	0E11045-MS1	05/11/10 18:03	5.00	5.00
32GW-02	0E11045-MSD1	05/11/10 18:03	5.00	5.00
32GW-02	1004295-02	05/11/10 18:03	5.00	5.00
32GW-01	1004295-03	05/11/10 18:03	5.00	5.00
Trip Blank #7809	1004295-04	05/11/10 18:03	5.00	5.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_008	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E11045-BLK1	File ID:	V3BLK3.D
Sampled:		Prepared:		Analyzed:	05/12/10 06:43
Solids:		Preparation:	5030B	Dilution:	

Batch: 0E11045 Sequence: 0E13351 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.67	98.9	75 - 120	
Dibromofluoromethane	30.00	29.65	98.8	85 - 115	
1,2-Dichloroethane-d4	30.00	29.32	97.7	70 - 120	
Toluene-d8	30.00	31.90	106	85 - 120	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Water		
Batch:	0E11045	Laboratory ID:	0E11045-BS1
Preparation:	5030B	Initial/Final:	5 mL / 5 mL

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	51.0	102	80 - 120
Ethylbenzene	50.00	54.5	109	75 - 125
Toluene	50.00	51.3	103	75 - 120
Xylenes (total)	150.0	162	108	75 - 130

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8260B

32GW-02

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_008

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Water

Batch: 0E11045

% Solids:

Source Sample Name: **1004295-02**

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Benzene	50.00	ND	52.8	106		80 - 120
Ethylbenzene	50.00	ND	53.4	107		75 - 125
Toluene	50.00	ND	51.5	103		75 - 120
Xylenes (total)	150.0	ND	158	106		75 - 130

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzene	50.00	50.5	101	4.59		30	80 - 120
Ethylbenzene	50.00	51.8	104	3.05		30	75 - 125
Toluene	50.00	49.0	98.0	4.97		30	75 - 120
Xylenes (total)	150.0	155	103	2.18		30	75 - 130

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14024	Instrument:	MS-VOA4
Calibration:	0144005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14024-TUN1	SEQ-TUN1.D	05/13/10 13:56
Cal Standard	0E14024-CAL1	SEQ-CAL1.D	05/13/10 14:27
Cal Standard	0E14024-CAL2	SEQ-CAL2.D	05/13/10 14:58
Cal Standard	0E14024-CAL3	SEQ-CAL3.D	05/13/10 15:29
Cal Standard	0E14024-CAL4	SEQ-CAL4.D	05/13/10 16:00
Cal Standard	0E14024-CAL5	SEQ-CAL5.D	05/13/10 16:31
Cal Standard	0E14024-CAL6	SEQ-CAL6.D	05/13/10 17:02
Cal Standard	0E14024-CAL7	SEQ-CAL7.D	05/13/10 17:33
Cal Standard	0E14024-CAL8	SEQ-CAL8.D	05/13/10 18:03
Cal Standard	0E14024-CAL9	SEQ-CAL9.D	05/13/10 19:05
Cal Standard	0E14024-CALA	SEQ-CALA.D	05/13/10 19:36
Cal Standard	0E14024-CALB	SEQ-CALB.D	05/13/10 20:07
Cal Standard	0E14024-CALC	SEQ-CALC.D	05/13/10 20:38
Cal Standard	0E14024-CALD	SEQ-CALD.D	05/13/10 21:09
Cal Standard	0E14024-CALE	SEQ-CALE.D	05/13/10 21:39
Cal Standard	0E14024-CALF	SEQ-CALF.D	05/13/10 22:10
Cal Standard	0E14024-CALG	SEQ-CALG.D	05/13/10 22:41
Initial Cal Check	0E14024-ICV2	SEQ-ICV2.D	05/13/10 23:12
MS Tune	0E14024-TUN2	SEQ-TUN2.D	05/13/10 23:42
Cal Standard	0E14024-CALH	SEQ-CALH.D	05/14/10 00:13
Cal Standard	0E14024-CALI	SEQ-CALI.D	05/14/10 00:44
Cal Standard	0E14024-CALJ	SEQ-CALJ.D	05/14/10 01:14
Cal Standard	0E14024-CALK	SEQ-CALK.D	05/14/10 01:45
Cal Standard	0E14024-CALL	SEQ-CALL.D	05/14/10 02:16
Cal Standard	0E14024-CALM	SEQ-CALM.D	05/14/10 02:46
Cal Standard	0E14024-CALN	SEQ-CALN.D	05/14/10 03:17
Cal Standard	0E14024-CALO	SEQ-CALO.D	05/14/10 03:48
MS Tune	0E14024-TUN3	SEQ-TUN1A.D	05/14/10 11:07
Initial Cal Check	0E14024-ICV4	SEQ-ICV4.D	05/14/10 11:37
Initial Cal Check	0E14024-ICV5	SEQ-ICV5.D	05/14/10 12:08

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15214	Instrument:	MS-VOA4
Calibration:	0144005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15214-TUN1	SEQ-TUNE.D	05/18/10 22:23
Calibration Check	0F15214-CCV1	CCVE1.D	05/18/10 22:53
LCS	0E18025-BS1	V4LCSE01.D	05/19/10 00:25
Blank	0E18025-BLK1	V4BLKE01.D	05/19/10 01:57
32SB-53-1415	1004295-01	0429501.D	05/19/10 02:28

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/13/10
Instrument ID:	MS-VOA4	Injection Time:	13:56
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	24.2	PASS
75	30 - 60% of 95	46.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.6	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	72.9	PASS
175	5 - 9% of 174	8.01	PASS
176	95 - 101% of 174	97.4	PASS
177	5 - 9% of 176	6.63	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/13/10
Instrument ID:	MS-VOA4	Injection Time:	23:42
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	27.6	PASS
75	30 - 60% of 95	49	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.84	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	50.2	PASS
175	5 - 9% of 174	7.16	PASS
176	95 - 101% of 174	95.8	PASS
177	5 - 9% of 176	7.75	PASS

INITIAL CALIBRATION DATA

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0144005	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/13/2010 12:58:00PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	2	1.036366	5	1.067105	10	0.9843456	20	1.10997	50	1.077942	100	1.086138
Bromofluorobenzene	30	0.9035148	30	0.9571747	30	0.8731974	30	0.8902059	30	0.8245535	30	0.8193029
Ethylbenzene	2	3.143056	5	3.05004	10	2.737193	20	2.883795	50	2.513633	100	2.418378
Naphthalene	2	2.078406	5	1.983331	10	1.914312	20	1.870742	50	1.902599	100	2.080679
Methyl t-Butyl Ether	2	0.7081603	5	0.676929	10	0.6556261	20	0.7027104	50	0.7309727	100	0.7905091
Toluene	2	1.463183	5	1.521538	10	1.446754	20	1.474482	50	1.314986	100	1.222235
m,p-Xylene	4	2.506911	10	2.370684	20	2.083337	40	2.133943	100	1.789652	200	1.662296
o-Xylene	2	~~2.308337~~	5	2.429571	10	2.030316	20	2.119764	50	1.835088	100	1.821505
Xylenes (total)	6	2.44072	15	2.390313	30	2.065663	60	2.129216	150	1.804797	300	1.715366
Dibromofluoromethane	30	0.273298	30	0.2843417	30	0.279687	30	0.2884724	30	0.2903404	30	0.2931575
1,2-Dichloroethane-d4	30	6.740232E-02	30	6.382306E-02	30	6.395501E-02	30	6.452364E-02	30	6.883676E-02	30	7.204757E-02
Toluene-d8	30	2.037457	30	2.08042	30	2.017173	30	2.112017	30	2.003245	30	1.863828

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0144005	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/13/2010 12:58:00PM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	150	1.012481	200	0.9799764								
Bromofluorobenzene	30	0.7861138	30	0.7760234	30		30		30		30	
Ethylbenzene	150	2.144581	200	~~1.952143~~								
Naphthalene	150	1.982337	200	2.158701								
Methyl t-Butyl Ether	150	0.746068	200	0.802964								
Toluene	150	1.128493	200	1.05643								
m,p-Xylene	300	1.469862	400	~~1.297473~~								
o-Xylene	150	1.630361	200	~~1.444647~~								
Xylenes (total)	450	1.523362	600	~~1.346531~~								
Dibromofluoromethane	30	0.291495	30	0.2962335	30		30		30		30	
1,2-Dichloroethane-d4	30	7.041683E-02	30	7.004798E-02	30		30		30		30	
Toluene-d8	30	1.861277	30	1.79905	30		30		30		30	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0144005	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/13/2010 12:58:00PM

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene	30		30		30		30		30		30	
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane	30		30		30		30		30		30	
1,2-Dichloroethane-d4	30		30		30		30		30		30	
Toluene-d8	30		30		30		30		30		30	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0144005	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/13/2010 12:58:00PM

Compound	Level 19		Level 20		Level 21		Level 22		Level 23		Level 24	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene	30		30		30		30		30		30	
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane	30		30		30		30		30		30	
1,2-Dichloroethane-d4	30		30		30		30		30		30	
Toluene-d8	30		30		30		30		30		30	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0144005	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/13/2010 12:58:00PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	1.044291	4.652266	13.76237	3.391041E-02			15	
Bromofluorobenzene	0.8537608	7.34618	18.281	8.410647E-03			15	
Ethylbenzene	2.698668	13.33057	17.47429	6.927592E-03			CCC (20)	
Naphthalene	1.996388	5.075341	21.90313	1.378937E-02			15	
Methyl t-Butyl Ether	0.7267424	7.117503	10.3995	0.1372416			15	
Toluene	1.328513	13.22851	16.0955	5.342824E-03			CCC (20)	
m,p-Xylene	2.002384	18.89119	17.62343	2.237986E-02		0.9993129	0.99	
o-Xylene	1.977768	14.16671	17.947	1.172407E-02			15	
Xylenes (total)	2.00992	17.15348	0	0		0.9991333	0.99	
Dibromofluoromethane	0.2871282	2.648676	12.29125	3.601698E-02			15	
1,2-Dichloroethane-d4	6.763165E-02	4.751393	12.97875	3.193036E-02			15	
Toluene-d8	1.971808	5.830891	16.02787	1.491481E-02			15	

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1A.D	Injection Date:	05/14/10
Instrument ID:	MS-VOA4	Injection Time:	11:07
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN3

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	25.5	PASS
75	30 - 60% of 95	48.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.2	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	62.6	PASS
175	5 - 9% of 174	8.21	PASS
176	95 - 101% of 174	95.7	PASS
177	5 - 9% of 176	6.95	PASS

INITIAL CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0144005
Lab File ID:	SEQ-ICV4.D	Calibration Date:	05/13/10 12:58
Sequence:	0E14024	Injection Date:	05/14/10
Lab Sample ID:	0E14024-ICV4	Injection Time:	11:37

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzene	A	100.0	99.51	1.044291	1.039213		-0.5	20
Ethylbenzene	A	100.0	94.40	2.698668	2.547461		-5.6	20
Toluene	A	100.0	95.86	1.328513	1.27348		-4.1	20
Xylenes (total)	Q	300.0	298.4	2.00992	1.719716		-0.5	20
Bromofluorobenzene	A	30.00	30.32	0.8537608	0.8627737		1.1	20
Dibromofluoromethane	A	30.00	31.96	0.2871282	0.3058803		6.5	20
1,2-Dichloroethane-d4	A	30.00	27.56	6.763165E-02	6.213989E-02		-8.1	20
Toluene-d8	A	30.00	31.03	1.971808	2.039809		3.4	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUNE.D	Injection Date:	05/18/10
Instrument ID:	MS-VOA4	Injection Time:	22:23
Sequence:	0F15214	Lab Sample ID:	0F15214-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	27.2	PASS
75	30 - 60% of 95	46.2	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.26	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	59.2	PASS
175	5 - 9% of 174	7.99	PASS
176	95 - 101% of 174	95.6	PASS
177	5 - 9% of 176	6.95	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0144005
Lab File ID:	CCVE1.D	Calibration Date:	05/13/10 12:58
Sequence:	0F15214	Injection Date:	05/18/10
Lab Sample ID:	0F15214-CCV1	Injection Time:	22:53

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	103.1	1.044291	1.076336		3.1	20
Ethylbenzene	A	100.0	92.61	2.698668	2.499242		-7.4	20
Toluene	A	100.0	98.74	1.328513	1.311805		-1.3	20
Xylenes (total)	Q	300.0	301.1	2.00992	1.72762		0.4	20
Bromofluorobenzene	A	30.00	29.17	0.8537608	0.8300873		-2.8	20
Dibromofluoromethane	A	30.00	30.43	0.2871282	0.2912287		1.4	20
1,2-Dichloroethane-d4	A	30.00	27.53	6.763165E-02	6.207367E-02		-8.2	20
Toluene-d8	A	30.00	29.42	1.971808	1.934014		-1.9	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_008

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E18025 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E18025-BLK1	05/18/10 17:35	5.00	5.00
LCS	0E18025-BS1	05/18/10 17:35	5.00	5.00
32SB-53-1415	1004295-01	05/18/10 17:35	6.13	5.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E18025-BLK1	File ID:	V4BLKE01.D
Sampled:		Prepared:		Analyzed:	05/19/10 01:57
Solids:		Preparation:	5035	Dilution:	

Batch: 0E18025 Sequence: 0F15214 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.61	105	85 - 120	
Dibromofluoromethane	30.00	30.96	103	80 - 125	
1,2-Dichloroethane-d4	30.00	28.33	94.4	75 - 140	
Toluene-d8	30.00	32.13	107	85 - 115	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E18025	Laboratory ID:	0E18025-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	50.81	102	75 - 125
Ethylbenzene	50.00	48.74	97.5	75 - 125
Toluene	50.00	50.66	101	70 - 125
Xylenes (total)	150.0	153.0	102	75 - 125

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13351	Instrument:	MS-VOA3
		Calibration:	0128001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E13351-CCV1)			Lab File ID: SEQ-CCV3.D			Analyzed: 05/12/10 03:43			
Fluorobenzene	1126354	12.687	1370254	12.699	82	50 - 200	-0.0120	+/-0.50	
Chlorobenzene-d5	496946	16.246	547120	16.258	91	50 - 200	-0.0120	+/-0.50	
1,4-Dichlorobenzene-d4	515813	18.241	538426	18.247	96	50 - 200	-0.0060	+/-0.50	
LCS (0E11045-BS1)			Lab File ID: V3LCS03.D			Analyzed: 05/12/10 04:43			
Fluorobenzene	1150287	12.687	1126354	12.687	102	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	486335	16.246	496946	16.246	98	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	503476	18.241	515813	18.241	98	50 - 200	0.0000	+/-0.50	
Blank (0E11045-BLK1)			Lab File ID: V3BLK3.D			Analyzed: 05/12/10 06:43			
Fluorobenzene	1062713	12.681	1126354	12.687	94	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	427570	16.246	496946	16.246	86	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	400664	18.235	515813	18.241	78	50 - 200	-0.0060	+/-0.50	
Trip Blank #7809 (1004295-04)			Lab File ID: 0429504.D			Analyzed: 05/12/10 07:43			
Fluorobenzene	1035579	12.681	1126354	12.687	92	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	420757	16.246	496946	16.246	85	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	397766	18.235	515813	18.241	77	50 - 200	-0.0060	+/-0.50	
32GW-02 (1004295-02)			Lab File ID: 0429502.D			Analyzed: 05/12/10 08:13			
Fluorobenzene	1033664	12.681	1126354	12.687	92	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	419774	16.246	496946	16.246	84	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	394711	18.235	515813	18.241	77	50 - 200	-0.0060	+/-0.50	
32GW-01 (1004295-03)			Lab File ID: 0429503.D			Analyzed: 05/12/10 08:43			
Fluorobenzene	1023036	12.681	1126354	12.687	91	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	417598	16.24	496946	16.246	84	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	389582	18.235	515813	18.241	76	50 - 200	-0.0060	+/-0.50	
Matrix Spike (0E11045-MS1)			Lab File ID: 0429502M.D			Analyzed: 05/12/10 14:45			
Fluorobenzene	1105923	12.681	1126354	12.687	98	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	476829	16.246	496946	16.246	96	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	485962	18.235	515813	18.241	94	50 - 200	-0.0060	+/-0.50	
Matrix Spike Dup (0E11045-MSD1)			Lab File ID: 0429502S.D			Analyzed: 05/12/10 15:15			
Fluorobenzene	1112953	12.681	1126354	12.687	99	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	483119	16.246	496946	16.246	97	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	496621	18.235	515813	18.241	96	50 - 200	-0.0060	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15214	Instrument:	MS-VOA4
		Calibration:	0144005

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15214-CCV1)			Lab File ID: CCVE1.D			Analyzed: 05/18/10 22:53			
Fluorobenzene	931941	14.083	822611	14.04	113	50 - 200	0.0430	+/-0.50	
Chlorobenzene-d5	422829	17.33	341417	17.297	124	50 - 200	0.0330	+/-0.50	
1,4-Dichlorobenzene-d4	268266	19.387	297455	19.354	90	50 - 200	0.0330	+/-0.50	
LCS (0E18025-BS1)			Lab File ID: V4LCSE01.D			Analyzed: 05/19/10 00:25			
Fluorobenzene	934923	14.083	931941	14.083	100	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	418759	17.33	422829	17.33	99	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	288732	19.387	268266	19.387	108	50 - 200	0.0000	+/-0.50	
Blank (0E18025-BLK1)			Lab File ID: V4BLKE01.D			Analyzed: 05/19/10 01:57			
Fluorobenzene	954910	14.076	931941	14.083	102	50 - 200	-0.0070	+/-0.50	
Chlorobenzene-d5	398644	17.333	422829	17.33	94	50 - 200	0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	327545	19.389	268266	19.387	122	50 - 200	0.0020	+/-0.50	
32SB-53-1415 (1004295-01)			Lab File ID: 0429501.D			Analyzed: 05/19/10 02:28			
Fluorobenzene	949730	14.083	931941	14.083	102	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	388348	17.33	422829	17.33	92	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	314175	19.386	268266	19.387	117	50 - 200	-0.0010	+/-0.50	

HOLDING TIME SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_008

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SB-53-1415	04/29/10 15:15	04/30/10 08:30	05/13/10 15:20	14.00	14.00	05/24/10 15:31	11.01	40.00	
32GW-02	04/28/10 12:08	04/30/10 08:30	05/11/10 12:00	12.99	7.00	06/06/10 01:27	25.56	40.00	*
32GW-01	04/28/10 15:50	04/30/10 08:30	05/11/10 12:00	12.84	7.00	06/06/10 12:10	26.01	40.00	*

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15503	Instrument:	MS-BNA3
		Calibration:	0132007

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15503-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 05/24/10 09:29		
2-Fluorobiphenyl	5.000	95.0	80 - 120	7.855	7.855	0.0000	+/-0.500	
Terphenyl-d14	5.000	91.5	80 - 120	17.844	17.844	0.0000	+/-0.500	
Blank (0E12948-BLK1) ug/Kg wet				Lab File ID: E12948B1.D		Analyzed: 05/24/10 10:41		
2-Fluorobiphenyl	3333	75.4	14 - 129	7.857	7.855	0.0020	+/-0.500	
Terphenyl-d14	3333	94.6	14 - 129	17.856	17.844	0.0120	+/-0.500	
LCS (0E12948-BS1) ug/Kg wet				Lab File ID: E12948L1.D		Analyzed: 05/24/10 11:17		
2-Fluorobiphenyl	3333	64.4	14 - 129	7.864	7.855	0.0090	+/-0.500	
Terphenyl-d14	3333	82.3	14 - 129	17.862	17.844	0.0180	+/-0.500	
32SB-53-1415 (1004295-01) ug/Kg dry				Lab File ID: 0429501.D		Analyzed: 05/24/10 15:31		
2-Fluorobiphenyl	3886	75.2	14 - 129	7.865	7.855	0.0100	+/-0.500	
Terphenyl-d14	3886	64.7	14 - 129	17.872	17.844	0.0280	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16006	Instrument:	MS-BNA3
		Calibration:	0156001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16006-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 06/05/10 18:45		
2-Fluorobiphenyl	5.000	118	80 - 120	7.578	7.578	0.0000	+/-0.500	
Terphenyl-d14	5.000	105	80 - 120	17.464	17.464	0.0000	+/-0.500	
LCS (0E11002-BS1) ug/L				Lab File ID: E11002L1.D		Analyzed: 06/05/10 19:24		
2-Fluorobiphenyl	50.00	88.3	34 - 167	7.587	7.578	0.0090	+/-0.500	
Terphenyl-d14	50.00	105	34 - 167	17.492	17.464	0.0280	+/-0.500	
Blank (0E11002-BLK1) ug/L				Lab File ID: E11002B1.D		Analyzed: 06/05/10 20:00		
2-Fluorobiphenyl	50.00	89.0	34 - 167	7.589	7.578	0.0110	+/-0.500	
Terphenyl-d14	50.00	111	34 - 167	17.494	17.464	0.0300	+/-0.500	
32GW-02 (1004295-02) ug/L				Lab File ID: 0429502.D		Analyzed: 06/06/10 01:27		
2-Fluorobiphenyl	46.30	91.7	34 - 167	7.588	7.578	0.0100	+/-0.500	
Terphenyl-d14	46.30	47.1	34 - 167	17.475	17.464	0.0110	+/-0.500	
Matrix Spike (0E11002-MS1) ug/L				Lab File ID: 0429502M.D		Analyzed: 06/06/10 02:04		
2-Fluorobiphenyl	47.17	95.3	34 - 167	7.585	7.578	0.0070	+/-0.500	
Terphenyl-d14	47.17	91.2	34 - 167	17.49	17.464	0.0260	+/-0.500	
Matrix Spike Dup (0E11002-MSD1) ug/L				Lab File ID: 0429502S.D		Analyzed: 06/06/10 02:40		
2-Fluorobiphenyl	47.17	100	34 - 167	7.585	7.578	0.0070	+/-0.500	
Terphenyl-d14	47.17	102	34 - 167	17.491	17.464	0.0270	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16103	Instrument:	MS-BNA3
		Calibration:	0156001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F16103-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 06/06/10 06:44		
2-Fluorobiphenyl	5.000	109	80 - 120	7.577	7.577	0.0000	+/-0.500	
Terphenyl-d14	5.000	108	80 - 120	17.464	17.464	0.0000	+/-0.500	
32GW-01 (1004295-03) ug/L				Lab File ID: 0429503.D		Analyzed: 06/06/10 12:10		
2-Fluorobiphenyl	47.17	81.9	34 - 167	7.586	7.577	0.0090	+/-0.500	
Terphenyl-d14	47.17	36.8	34 - 167	17.482	17.464	0.0180	+/-0.500	

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_008

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E11002 Batch Matrix: Water Preparation: EXT_3510

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E11002-BLK1	05/11/10 12:00	1,000.00	1.00
LCS	0E11002-BS1	05/11/10 12:00	1,000.00	1.00
32GW-02	0E11002-MS1	05/11/10 12:00	1,060.00	1.00
32GW-02	0E11002-MSD1	05/11/10 12:00	1,060.00	1.00
32GW-02	1004295-02	05/11/10 12:00	1,080.00	1.00
32GW-01	1004295-03	05/11/10 12:00	1,060.00	1.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E11002-BLK1	File ID:	E11002B1.D
Sampled:		Prepared:		Analyzed:	06/05/10 20:00
Solids:		Preparation:	EXT_3510	Dilution:	

Batch: 0E11002 Sequence: 0F16006 Calibration: 0156001 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0200	0.100	U
50-32-8	Benzo(a)pyrene		0.0200	0.100	U
205-99-2	Benzo(b)fluoranthene		0.0200	0.100	U
207-08-9	Benzo(k)fluoranthene		0.0200	0.100	U
218-01-9	Chrysene		0.0200	0.100	U
53-70-3	Dibenz(a,h)anthracene		0.0200	0.100	U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0200	0.100	U
91-20-3	Naphthalene		0.0200	0.100	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	44.51	89.0	34 - 167	
Terphenyl-d14	50.00	55.39	111	34 - 167	

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E12948	Laboratory ID:	0E12948-BS1
Preparation:	EXT_3546	Initial/Final:	15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.67	49.81	74.7	31 - 146
Benzo(a)pyrene	66.67	58.48	87.7	28 - 128
Benzo(b)fluoranthene	66.67	57.72	86.6	30 - 139
Benzo(k)fluoranthene	66.67	69.46	104	42 - 129
Chrysene	66.67	57.84	86.8	39 - 134
Dibenz(a,h)anthracene	66.67	49.28	73.9	30 - 138
Indeno(1,2,3-cd)pyrene	66.67	49.27	73.9	17 - 164
Naphthalene	66.67	35.55	53.3	29 - 106

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_008

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0E12948 Batch Matrix: Solid Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E12948-BLK1	05/13/10 15:20	15.00	1.00
LCS	0E12948-BS1	05/13/10 15:20	15.00	1.00
32SB-53-1415	1004295-01	05/13/10 15:20	15.00	1.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E12948-BLK1	File ID:	E12948B1.D
Sampled:		Prepared:		Analyzed:	05/24/10 10:41
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E12948 Sequence: 0F15503 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.33	6.67	U
50-32-8	Benzo(a)pyrene		1.33	5.00	U
205-99-2	Benzo(b)fluoranthene		1.33	6.67	U
207-08-9	Benzo(k)fluoranthene		1.33	6.67	X, U
218-01-9	Chrysene		1.33	6.67	U
53-70-3	Dibenz(a,h)anthracene		1.33	5.00	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.33	6.67	U
91-20-3	Naphthalene		1.33	5.00	Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	2514	75.4	14 - 129	
Terphenyl-d14	3333	3155	94.6	14 - 129	

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Water		
Batch:	0E11002	Laboratory ID:	0E11002-BS1
Preparation:	EXT_3510	Initial/Final:	1000 mL / 1 mL

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	1.000	0.9606	96.1	58 - 141
Benzo(a)pyrene	1.000	0.9083	90.8	31 - 142
Benzo(b)fluoranthene	1.000	0.9114	91.1	42 - 156
Benzo(k)fluoranthene	1.000	1.111	111	49 - 165
Chrysene	1.000	1.020	102	51 - 155
Dibenz(a,h)anthracene	1.000	0.8398	84.0	28 - 153
Indeno(1,2,3-cd)pyrene	1.000	0.7920	79.2	20 - 167
Naphthalene	1.000	0.9360	93.6	39 - 125

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32GW-02

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_008

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Water

Batch: 0E11002

% Solids:

Source Sample Name: **1004295-02**

ANALYTE	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	0.9434	ND	0.8166	86.6		58 - 141
Benzo(a)pyrene	0.9434	ND	0.4354	46.2		31 - 142
Benzo(b)fluoranthene	0.9434	ND	0.7000	74.2		42 - 156
Benzo(k)fluoranthene	0.9434	ND	0.8680	92.0		49 - 165
Chrysene	0.9434	ND	0.8352	88.5		51 - 155
Dibenz(a,h)anthracene	0.9434	ND	0.4552	48.3		28 - 153
Indeno(1,2,3-cd)pyrene	0.9434	ND	0.3275	34.7		20 - 167
Naphthalene	0.9434	0.04020	0.9213	93.4		39 - 125

ANALYTE	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzo(a)anthracene	0.9434	0.9288	98.5	12.9		30	58 - 141
Benzo(a)pyrene	0.9434	0.5906	62.6	30.3	*	30	31 - 142
Benzo(b)fluoranthene	0.9434	0.8177	86.7	15.5		30	42 - 156
Benzo(k)fluoranthene	0.9434	0.9451	100	8.51		30	49 - 165
Chrysene	0.9434	0.8866	94.0	5.97		30	51 - 155
Dibenz(a,h)anthracene	0.9434	0.4148	44.0	9.30		30	28 - 153
Indeno(1,2,3-cd)pyrene	0.9434	0.4030	42.7	20.7		30	20 - 167
Naphthalene	0.9434	0.9668	98.2	4.82		30	39 - 125

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/05/10
Instrument ID:	MS-BNA3	Injection Time:	17:47
Sequence:	0F16006	Lab Sample ID:	0F16006-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	38.6	PASS
68	Less than 2% of 69	0.184	PASS
69	Less than 200% of 198	44.8	PASS
70	Less than 2% of 69	0.611	PASS
127	40 - 60% of 198	53	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.68	PASS
275	10 - 30% of 198	24.3	PASS
365	1 - 200% of 198	3.22	PASS
441	0.001 - 100% of 443	78	PASS
442	40 - 200% of 198	69.6	PASS
443	17 - 23% of 442	19.2	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0156001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	06/03/10 10:00
Sequence:	0F16006	Injection Date:	06/05/10
Lab Sample ID:	0F16006-CCV1	Injection Time:	18:45

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzo(a)anthracene	A	5.000	4.824	0.7827159	0.7552417		-3.5	20
Benzo(a)pyrene	Q	5.000	5.106	1.030906	1.198916		2.1	20
Benzo(b)fluoranthene	L	5.000	5.329	1.129732	1.366294		6.6	20
Benzo(k)fluoranthene	Q	5.000	5.614	1.107235	1.403415		12.3	20
Chrysene	A	5.000	4.488	0.8305551	0.7454264		-10.2	20
Dibenz(a,h)anthracene	A	5.000	4.589	0.855389	0.7851103		-8.2	20
Indeno(1,2,3-cd)pyrene	A	5.000	4.355	0.9165747	0.7984037		-12.9	20
Naphthalene	A	5.000	5.802	0.9310503	1.080431		16.0	20
2-Fluorobiphenyl	A	5.000	5.883	0.694446	0.8170782		17.7	20
Terphenyl-d14	A	5.000	5.247	0.6581084	0.6905983		4.9	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16006	Instrument:	MS-BNA3
		Calibration:	0156001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16006-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 06/05/10 18:45			
Phenanthrene-d10	113150	12.683	114187	12.766	99	50 - 200	-0.0830	+/-0.50	
Perylene-d12	53124	24.594	78489	24.667	68	50 - 200	-0.0730	+/-0.50	
LCS (0E11002-BS1)			Lab File ID: E11002L1.D			Analyzed: 06/05/10 19:24			
Phenanthrene-d10	114697	12.684	113150	12.683	101	50 - 200	0.0010	+/-0.50	
Perylene-d12	70390	24.594	53124	24.594	133	50 - 200	0.0000	+/-0.50	
Blank (0E11002-BLK1)			Lab File ID: E11002B1.D			Analyzed: 06/05/10 20:00			
Phenanthrene-d10	113837	12.676	113150	12.683	101	50 - 200	-0.0070	+/-0.50	
Perylene-d12	72704	24.596	53124	24.594	137	50 - 200	0.0020	+/-0.50	
32GW-02 (1004295-02)			Lab File ID: 0429502.D			Analyzed: 06/06/10 01:27			
Phenanthrene-d10	86459	12.675	113150	12.683	76	50 - 200	-0.0080	+/-0.50	
Perylene-d12	46619	24.595	53124	24.594	88	50 - 200	0.0010	+/-0.50	
Matrix Spike (0E11002-MS1)			Lab File ID: 0429502M.D			Analyzed: 06/06/10 02:04			
Phenanthrene-d10	92783	12.682	113150	12.683	82	50 - 200	-0.0010	+/-0.50	
Perylene-d12	55010	24.592	53124	24.594	104	50 - 200	-0.0020	+/-0.50	
Matrix Spike Dup (0E11002-MSD1)			Lab File ID: 0429502S.D			Analyzed: 06/06/10 02:40			
Phenanthrene-d10	102308	12.682	113150	12.683	90	50 - 200	-0.0010	+/-0.50	
Perylene-d12	63423	24.592	53124	24.594	119	50 - 200	-0.0020	+/-0.50	

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/06/10
Instrument ID:	MS-BNA3	Injection Time:	06:22
Sequence:	0F16103	Lab Sample ID:	0F16103-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	40.3	PASS
68	Less than 2% of 69	0.891	PASS
69	Less than 200% of 198	46.7	PASS
70	Less than 2% of 69	0.554	PASS
127	40 - 60% of 198	53.6	PASS
197	Less than 1% of 198	0.0454	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.05	PASS
275	10 - 30% of 198	24.8	PASS
365	1 - 200% of 198	3.18	PASS
441	0.001 - 100% of 443	75.2	PASS
442	40 - 200% of 198	73.5	PASS
443	17 - 23% of 442	19.8	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0156001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	06/03/10 10:00
Sequence:	0F16103	Injection Date:	06/06/10
Lab Sample ID:	0F16103-CCV1	Injection Time:	06:44

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzo(a)anthracene	A	5.000	4.946	0.7827159	0.7742593		-1.1	20
Benzo(a)pyrene	Q	5.000	5.385	1.030906	1.264995		7.7	20
Benzo(b)fluoranthene	L	5.000	5.736	1.129732	1.470614		14.7	20
Benzo(k)fluoranthene	Q	5.000	5.690	1.107235	1.421977		13.8	20
Chrysene	A	5.000	4.346	0.8305551	0.7219164		-13.1	20
Dibenz(a,h)anthracene	A	5.000	5.035	0.855389	0.8613325		0.7	20
Indeno(1,2,3-cd)pyrene	A	5.000	5.024	0.9165747	0.9210273		0.5	20
Naphthalene	A	5.000	4.946	0.9310503	0.9209389		-1.1	20
2-Fluorobiphenyl	A	5.000	5.437	0.694446	0.7551623		8.7	20
Terphenyl-d14	A	5.000	5.401	0.6581084	0.710859		8.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F16103	Instrument:	MS-BNA3
		Calibration:	0156001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F16103-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 06/06/10 06:44			
Phenanthrene-d10	138116	12.674	114187	12.766	121	50 - 200	-0.0920	+/-0.50	
Perylene-d12	70827	24.594	78489	24.667	90	50 - 200	-0.0730	+/-0.50	
32GW-01 (1004295-03)			Lab File ID: 0429503.D			Analyzed: 06/06/10 12:10			
Phenanthrene-d10	113548	12.682	138116	12.674	82	50 - 200	0.0080	+/-0.50	
Perylene-d12	63188	24.593	70827	24.594	89	50 - 200	-0.0010	+/-0.50	

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/24/10
Instrument ID:	MS-BNA3	Injection Time:	09:07
Sequence:	0F15503	Lab Sample ID:	0F15503-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	54.7	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	53.3	PASS
70	Less than 2% of 69	0.471	PASS
127	40 - 60% of 198	54.9	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.1	PASS
275	10 - 30% of 198	21.3	PASS
365	1 - 200% of 198	2.12	PASS
441	0.001 - 100% of 443	75.6	PASS
442	40 - 200% of 198	42.4	PASS
443	17 - 23% of 442	20.3	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0132007
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/10/10 17:04
Sequence:	0F15503	Injection Date:	05/24/10
Lab Sample ID:	0F15503-CCV1	Injection Time:	09:29

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.742	0.5449914	0.6259238		14.9	20
Acenaphthylene	A	5.000	6.085	0.837393	1.01909		21.7	20 *
Anthracene	L	5.000	5.201	0.8127224	0.9944774		4.0	20
Benzo(a)anthracene	L	5.000	5.040	0.6443703	0.8082341		0.8	20
Benzo(a)pyrene	L	5.000	5.702	0.8806429	1.238924		14.0	20
Benzo(b)fluoranthene	L	5.000	5.726	1.02129	1.397748		14.5	20
~~Benzo(g,h,i)perylene~~	A	5.000	4.718	0.9507735	0.8972353		-5.6	20
Benzo(k)fluoranthene	A	5.000	6.283	1.114795	1.400948		25.7	20 *
~~Chrysene~~	A	5.000	5.245	0.7443354	0.7807943		4.9	20
Dibenz(a,h)anthracene	L	5.000	4.329	0.824039	0.7860953		-13.4	20
Fluoranthene	L	5.000	5.025	0.8561351	1.053995		0.5	20
Fluorene	A	5.000	5.472	0.6319282	0.6916229		9.4	20
Indeno(1,2,3-cd)pyrene	L	5.000	4.578	0.792655	0.8411974		-8.4	20
1-Methylnaphthalene	A	5.000	4.693	0.6312687	0.5925542		-6.1	20
2-Methylnaphthalene	A	5.000	4.692	0.7281161	0.6832465		-6.2	20
Naphthalene	A	5.000	3.961	1.28018	1.01409		-20.8	20 *
Phenanthrene	A	5.000	5.241	0.9899291	1.037708		4.8	20
Pyrene	L	5.000	5.325	0.8735304	1.088951		6.5	20
2-Fluorobiphenyl	A	5.000	4.750	0.8077998	0.7674694		-5.0	20
Terphenyl-d14	Q	5.000	4.576	0.6178417	0.6946107		-8.5	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15503	Instrument:	MS-BNA3
		Calibration:	0132007

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15503-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/24/10 09:29			
Phenanthrene-d10	122297	13.045	233208	13.276	52	50 - 200	-0.2310	+/-0.50	
Perylene-d12	67747	24.918	135470	25.094	50	50 - 200	-0.1760	+/-0.50	
Blank (0E12948-BLK1)			Lab File ID: E12948B1.D			Analyzed: 05/24/10 10:41			
Phenanthrene-d10	96434	13.056	122297	13.045	79	50 - 200	0.0110	+/-0.50	
Perylene-d12	45947	24.92	67747	24.918	68	50 - 200	0.0020	+/-0.50	
LCS (0E12948-BS1)			Lab File ID: E12948L1.D			Analyzed: 05/24/10 11:17			
Phenanthrene-d10	126654	13.044	122297	13.045	104	50 - 200	-0.0010	+/-0.50	
Perylene-d12	71350	24.918	67747	24.918	105	50 - 200	0.0000	+/-0.50	
32SB-53-1415 (1004295-01)			Lab File ID: 0429501.D			Analyzed: 05/24/10 15:31			
Phenanthrene-d10	98654	13.054	122297	13.045	81	50 - 200	0.0090	+/-0.50	
Perylene-d12	56707	24.918	67747	24.918	84	50 - 200	0.0000	+/-0.50	

SAMPLE ID 32GW-02

SAMPLE CALC IS AREA	DILUTION	COMPOUND OF INTEREST	IS AMOUNT (NG)	Final Extract Volume (UL)	AVE RRF	CONCENTRATION PPB
86459	1	3495	1	1000	0.9311	0.04
				Sample Volume (UL)		
				1080		

Naphthalene = 0.04 ug/L

Empirical Laboratories, LLC

Data file : \\ELABNSH05\TARGET\chem\bna3.i\060510b3.b\0429502.D
Lab Smp Id: 1004295-02 Client Smp ID: 32GW-02
Inj Date : 06-JUN-2010 01:27 MS Autotune Date: 28-JUL-1998 06:19
Operator : ADM Inst ID: bna3.i
Smp Info : 1004295-02;;1080;1000;;UG/L;11-MAY-2010
Misc Info : ;0;;;;0E11002;pahsurmis.sub;
Comment :
Method : \\ELABNSH05\TARGET\chem\bna3.i\060510b3.b\IXBN3LOW.m
Meth Date : 09-Jun-2010 14:06 mcobb Quant Type: ISTD
Cal Date : 03-JUN-2010 16:39 Cal File: SEQ-CALB.D
Als bottle: 13
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: pahsurmis.sub
Target Version: 4.04
Processing Host: TARGET09_VM

Concentration Formula: Amt * DF * Uf * Vt* Vi/(Amt * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Uf	1.000	ng unit correction factor
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Amt	1080.000	Volume of initial extraction

mg/kg

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng/ul)	FINAL (UG/L)
* 101 Phenanthrene-d10	188	12.675	12.683	(1.000)	86459	1.00000	
50 Naphthalene	128	5.926	5.934	(0.468)	3495	0.04342	0.04020(a)
54 2-Methylnaphthalene	142	6.929	6.928	(0.547)	2527	0.04639	0.04295(a)
55 1-Methylnaphthalene	142	7.087	7.086	(0.559)	1742	0.03460	0.03204(a)
$ 73 2-Fluorobiphenyl	172	7.588	7.578	(0.599)	2752336	45.8409	42.44
97 Fluorene	166	10.224	10.223	(0.807)	1675	0.03002	0.02779(a)
$ 106 2,4,6-Tribromophenol	330	10.846	10.845	(0.856)	525079	71.2873	66.01(A)
110 Phenanthrene	178	12.740	12.748	(1.005)	6488	0.07767	0.07192
115 Fluoranthene	202	16.147	16.146	(1.274)	3656	0.04528	0.04192(a)
133 Pyrene	202	16.769	16.777	(1.323)	1988	0.02346	0.02172(a)
* 153 Perylene-d12	264	24.595	24.594	(1.000)	46619	1.00000	
$ 134 Terphenyl-d14	244	17.475	17.464	(1.379)	1338623	23.5261	21.78
129 Bis(2-ethylhexyl)phthalate	149	21.003	21.001	(0.854)	4150	0.19466	0.1802

ANALYSIS SEQUENCE SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc: (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13201	Instrument:	MS-BNA3
Calibration:	0132007		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13201-TUN1	SEQ-TUN1.D	05/10/10 13:38
Cal Standard	0E13201-CAL1	SEQ-CAL1.D	05/10/10 14:34
Cal Standard	0E13201-CAL2	SEQ-CAL2.D	05/10/10 15:11
Cal Standard	0E13201-CAL3	SEQ-CAL3.D	05/10/10 15:47
Cal Standard	0E13201-CAL4	SEQ-CAL4.D	05/10/10 16:23
Cal Standard	0E13201-CAL5	SEQ-CAL5.D	05/10/10 16:59
Cal Standard	0E13201-CAL6	SEQ-CAL6.D	05/10/10 17:35
Cal Standard	0E13201-CAL7	SEQ-CAL7.D	05/10/10 18:12
Cal Standard	0E13201-CAL8	SEQ-CAL8.D	05/10/10 18:48
Cal Standard	0E13201-CAL9	SEQ-CAL9.D	05/10/10 19:24
Cal Standard	0E13201-CALA	SEQ-CALA.D	05/10/10 20:00
Cal Standard	0E13201-CALB	SEQ-CALB.D	05/10/10 20:37
Initial Cal Check	0E13201-ICV1	SEQ-ICV1.D	05/10/10 21:49

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/10/10
Instrument ID:	MS-BNA3	Injection Time:	13:38
Sequence:	0E13201	Lab Sample ID:	0E13201-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	44.5	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	44.9	PASS
70	Less than 2% of 69	0.457	PASS
127	40 - 60% of 198	57.3	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.04	PASS
275	10 - 30% of 198	20.5	PASS
365	1 - 200% of 198	1.8	PASS
441	0.001 - 100% of 443	75.7	PASS
442	40 - 200% of 198	47.8	PASS
443	17 - 23% of 442	20.1	PASS

INITIAL CALIBRATION DATA
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0132007	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	5/10/2010 5:04:48PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	0.05	0.5818685	0.1	0.5229676	0.25	0.5032725	0.5	0.5015158	1	0.5865322	2	0.5686914
Acenaphthylene	0.05	0.6774851	0.1	0.7075159	0.25	0.7166791	0.5	0.7539864	1	0.9590923	2	0.9654067
Anthracene	0.05	0.5802975	0.1	0.624741	0.25	0.6528708	0.5	0.6679715	1	0.9184162	2	0.9491389
Benzo(a)anthracene	0.05	0.4713805	0.1	0.3786766	0.25	0.40029	0.5	0.4319466	1	0.6822236	2	0.7242806
Benzo(a)pyrene	0.05	0.6220651	0.1	0.583032	0.25	0.6370554	0.5	0.7359112	1	1.007138	2	1.022336
Benzo(b)fluoranthene	0.05	0.7351269	0.1	0.7091471	0.25	0.7637801	0.5	0.9103193	1	1.160892	2	1.172083
Benzo(g,h,i)perylene	0.05	0.6880553	0.1	0.7971024	0.25	0.840149	0.5	0.9200705	1	1.047184	2	1.076417
Benzo(k)fluoranthene	0.05	0.8592246	0.1	0.8388905	0.25	1.002913	0.5	1.064317	1	1.252322	2	1.183269
Chrysene	0.05	0.6381074	0.1	0.6161836	0.25	0.6220352	0.5	0.6476433	1	0.8479426	2	0.8599069
Dibenz(a,h)anthracene	0.05	0.5626063	0.1	0.722159	0.25	0.6940047	0.5	0.8035997	1	0.9471248	2	0.9364995
Fluoranthene	0.05	0.6619853	0.1	0.6268938	0.25	0.6855573	0.5	0.7426575	1	1.019926	2	1.016297
Fluorene	0.05	0.6085741	0.1	0.5279191	0.25	0.5728052	0.5	0.5658728	1	0.714701	2	0.6982195
2-Fluorobiphenyl	0.05	0.7854596	0.1	0.8530449	0.25	0.9098403	0.5	0.8784665	1	0.9102475	2	0.8453379
2-Fluorophenol	0.1		0.2		0.5		1		2		4	
Indeno(1,2,3-cd)pyrene	0.05	0.5664351	0.1	0.7015151	0.25	0.513718	0.5	0.6478124	1	0.8176423	2	0.8596125
1-Methylnaphthalene	0.05	0.6051181	0.1	0.6587551	0.25	0.7100006	0.5	0.6738966	1	0.7315315	2	0.6741355
2-Methylnaphthalene	0.05	0.774149	0.1	0.7734453	0.25	0.7709466	0.5	0.7735594	1	0.8214384	2	0.7872633
Naphthalene	0.05	1.329207	0.1	1.500713	0.25	1.373958	0.5	1.336964	1	1.354966	2	1.256244
Nitrobenzene-d5	0.05		0.1		0.25		0.5		1		2	
Phenanthrene	0.05	1.020469	0.1	0.9574016	0.25	0.9615319	0.5	1.001085	1	1.148571	2	1.091075
Phenol-d6	0.1		0.2		0.5		1		2		4	
Pyrene	0.05	0.6709919	0.1	0.6598315	0.25	0.693457	0.5	0.7237546	1	0.9787357	2	1.027105
Terphenyl-d14	0.05	0.4743129	0.1	0.4866392	0.25	0.5139008	0.5	0.5319923	1	0.7067511	2	0.7049185
2,4,6-Tribromophenol	0.1	0.0408439	0.2	2.903582E-02	0.5	0.0319423	1	3.932154E-02	2	6.395149E-02	4	7.184222E-02
Acenaphthene-d10	1		1		1		1		1		1	
Chrysene-d12	1		1		1		1		1		1	

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0132007	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	5/10/2010 5:04:48PM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	5	0.5613193	10	0.5806996	20	0.5557654	40	0.5281662	50	0.5041073		
Acenaphthylene	5	0.9938905	10	0.9800077	20	0.9104221	40	0.808151	50	0.7386865		
Anthracene	5	0.9688053	10	1.011121	20	0.9411397	40	~~0.8491735~~	50	~~0.7972907~~		
Benzo(a)anthracene	5	0.7415124	10	0.8655551	20	0.8468654	40	0.7861357	50	0.7592068		
Benzo(a)pyrene	5	1.116963	10	1.114807	20	1.086478	40	~~0.9814795~~	50	~~0.9406469~~		
Benzo(b)fluoranthene	5	1.286296	10	1.236526	20	1.217443	40	~~1.160141~~	50	~~1.143805~~		
Benzo(g,h,i)perylene	5	1.062892	10	1.061439	20	1.054695	40	0.9608569	50	0.949647		
Benzo(k)fluoranthene	5	1.365954	10	1.270907	20	1.187458	40	1.152917	50	1.08457		
Chrysene	5	0.8160702	10	0.8823108	20	0.8320742	40	0.7390478	50	0.6863673		
Dibenz(a,h)anthracene	5	0.9583288	10	0.8810743	20	0.9109538	40	~~0.829438~~	50	~~0.8781058~~		
Fluoranthene	5	1.035556	10	1.060208	20	~~0.9902438~~	40	~~0.8905255~~	50	~~0.8285773~~		
Fluorene	5	0.7017543	10	0.7010988	20	0.6634315	40	0.6109895	50	0.5858439		
2-Fluorobiphenyl	5	0.8409516	10	0.7561573	20	0.6876144	40	0.6108783	50	~~0.5606627~~		
2-Fluorophenol	10		20		40		80		100			
Indeno(1,2,3-cd)pyrene	5	0.8800362	10	0.9326311	20	0.9752539	40	0.9063287	50	0.9182198		
1-Methylnaphthalene	5	0.6819844	10	0.6229462	20	0.5804433	40	0.5225319	50	0.4826126		
2-Methylnaphthalene	5	0.7857391	10	0.7222322	20	0.664035	40	0.5963124	50	0.5401563		
Naphthalene	5	1.262752	10	1.11946	20	0.9873599	40	~~0.7967098~~	50	~~0.6694096~~		
Nitrobenzene-d5	5		10		20		40		50			
Phenanthrene	5	1.075886	10	1.036847	20	0.9517481	40	0.8454922	50	0.7991136		
Phenol-d6	10		20		40		80		100			
Pyrene	5	1.020759	10	1.076557	20	1.010582	40	~~0.9052261~~	50	~~0.8673362~~		
Terphenyl-d14	5	0.7094577	10	0.735858	20	0.6976663	40	0.6348001	50	0.5999615		
2,4,6-Tribromophenol	10	7.570678E-02	20	8.168856E-02	40	8.208093E-02	80	7.754055E-02	100	7.780785E-02		
Acenaphthene-d10	1		1		1		1		1			
Chrysene-d12	1		1		1		1		1			

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0132007	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	5/10/2010 5:04:48PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.5449914	6.188575	9.529636	0.1288221			CCC (30)	
Acenaphthylene	0.837393	14.91185	9.133091	0.1088431			15	
Anthracene	0.8127224	21.57029	13.491	6.203524E-02	0.998714		0.995	
Benzo(a)anthracene	0.6443703	28.8539	21.02345	9.171847E-02	0.998062		0.995	
Benzo(a)pyrene	0.8806429	26.16793	24.98811	3.640226E-02	0.9996956		CCC (30)	
Benzo(b)fluoranthene	1.02129	23.35663	24.31167	4.129969E-02	0.9996703		0.995	
Benzo(g,h,i)perylene	0.9507735	13.57635	27.44509	0.1091032			15	
Benzo(k)fluoranthene	1.114795	14.88106	24.39082	0.1031939			15	
Chrysene	0.7443354	14.17831	21.12218	0.1213313			15	
Dibenz(a,h)anthracene	0.824039	16.76544	27.019	3.953226E-02	0.9994966		0.995	
Fluoranthene	0.8561351	22.44759	16.77187	3.955482E-02	0.9998072		CCC (30)	
Fluorene	0.6319282	10.45895	10.79218	0.1358297			15	
2-Fluorobiphenyl	0.8077998	12.16042	8.0446	8.697962E-02			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	0.792655	20.05219	26.95882	8.628932E-02	0.99938		0.995	
1-Methylnaphthalene	0.6312687	12.32071	7.535364	0.1087572			15	
2-Methylnaphthalene	0.7281161	12.31812	7.365818	0.1013574			15	
Naphthalene	1.28018	11.75289	6.309889	7.265111E-02			15	
Nitrobenzene-d5							15	
Phenanthrene	0.9899291	10.43171	13.35291	0.1258165			15	
Phenol-d6							15	
Pyrene	0.8735304	20.55353	17.40789	5.106602E-02	0.9989986		0.995	
Terphenyl-d14	0.6178417	16.24808	18.09664	8.671295E-02		0.9998644	0.99	
2,4,6-Tribromophenol	6.106927E-02	34.78759	11.40991	0.1459834	0.9995088		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0132007
Lab File ID:	SEQ-ICV1.D	Calibration Date:	05/10/10 17:04
Sequence:	0E13201	Injection Date:	05/10/10
Lab Sample ID:	0E13201-ICV1	Injection Time:	21:49

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Acenaphthene	A	5.000	5.487	0.5449914	0.5980619		9.7	20
Acenaphthylene	A	5.000	5.881	0.837393	0.9849436		17.6	20
Anthracene	L	5.000	5.185	0.8127224	0.9913835		3.7	20
Benzo(a)anthracene	L	5.000	4.798	0.6443703	0.7694452		-4.0	20
Benzo(a)pyrene	L	5.000	5.058	0.8806429	1.097758		1.2	20
Benzo(b)fluoranthene	L	5.000	5.112	1.02129	1.247038		2.2	20
Benzo(g,h,i)perylene	A	5.000	5.423	0.9507735	1.031177		8.5	20
Benzo(k)fluoranthene	A	5.000	5.888	1.114795	1.312769		17.8	20
Chrysene	A	5.000	5.580	0.7443354	0.8306387		11.6	20
Dibenz(a,h)anthracene	L	5.000	4.856	0.824039	0.8818608		-2.9	20
Fluoranthene	L	5.000	5.011	0.8561351	1.050939		0.2	20
Fluorene	A	5.000	5.550	0.6319282	0.7013998		11.0	20
Indeno(1,2,3-cd)pyrene	L	5.000	5.009	0.792655	0.9204299		0.2	20
1-Methylnaphthalene	A	5.000	5.139	0.6312687	0.6488054		2.8	20
2-Methylnaphthalene	A	5.000	5.160	0.7281161	0.7514322		3.2	20
Naphthalene	A	5.000	4.558	1.28018	1.167106		-8.8	20
Phenanthrene	A	5.000	5.359	0.9899291	1.061057		7.2	20
Pyrene	L	5.000	5.189	0.8735304	1.0611		3.8	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	06/03/10
Instrument ID:	MS-BNA3	Injection Time:	10:13
Sequence:	0F15501	Lab Sample ID:	0F15501-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	41.5	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	48.5	PASS
70	Less than 2% of 69	0.535	PASS
127	40 - 60% of 198	57.2	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.15	PASS
275	10 - 30% of 198	21.3	PASS
365	1 - 200% of 198	2.05	PASS
441	0.001 - 100% of 443	71.8	PASS
442	40 - 200% of 198	42.1	PASS
443	17 - 23% of 442	20.3	PASS

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0156001	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	6/3/2010 10:00:02AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.6012431	7.184963	9.083455	0.1514793			CCC (30)	
Acenaphthylene	0.9158405	9.534423	8.697545	0.1224601			15	
Anthracene	0.8705871	12.60701	12.99	0.1331843			15	
Benzo(a)anthracene	0.7827159	11.93588	20.47909	0.1037901			15	
Benzo(a)pyrene	1.030906	16.82034	24.56209	9.824416E-02		0.9996429	CCC (30)	
Benzo(b)fluoranthene	1.129732	17.94265	23.74682	0.1340174	0.9995021		0.995	
Benzo(g,h,i)perylene	0.9698277	5.644128	26.92336	0.1059566			15	
Benzo(k)fluoranthene	1.107235	15.53366	23.83891	0.1427109		0.9995849	0.99	
Chrysene	0.8305551	8.726862	20.58036	0.113825			15	
Dibenz(a,h)anthracene	0.855389	11.29456	26.542	7.745018E-02			15	
Fluoranthene	0.933897	12.06893	16.25082	0.108705			CCC (30)	
Fluorene	0.6453976	9.224112	10.32127	0.1362755			15	
2-Fluorobiphenyl	0.694446	6.728885	7.654455	0.1153448			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	0.9165747	14.56335	26.47864	8.292637E-02			15	
1-Methylnaphthalene	0.582316	8.672515	7.157364	0.1267128			15	
2-Methylnaphthalene	0.6301093	6.416041	6.996091	9.985584E-02			15	
Naphthalene	0.9310503	9.373293	5.993454	0.1135701			15	
Nitrobenzene-d5							15	
Phenanthrene	0.9661153	6.161989	12.843	0.1252231			15	
Phenol-d6							15	
Pyrene	0.9799586	10.54414	16.87882	0.1189006			15	
Terphenyl-d14	0.6581084	10.97145	17.571	8.350396E-02			15	
2,4,6-Tribromophenol	7.286756E-02	24.60508	10.93736	0.1598562	0.9994666		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_008
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0156001
Lab File ID:	SEQ-ICV1.D	Calibration Date:	06/03/10 10:00
Sequence:	0F15501	Injection Date:	06/03/10
Lab Sample ID:	0F15501-ICV1	Injection Time:	17:16

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzo(a)anthracene	A	5.000	5.465	0.7827159	0.8554742		9.3	20
Benzo(a)pyrene	Q	5.000	4.888	1.030906	1.147426		-2.2	20
Benzo(b)fluoranthene	L	5.000	4.779	1.129732	1.225146		-4.4	20
Benzo(k)fluoranthene	Q	5.000	4.634	1.107235	1.16417		-7.3	20
Chrysene	A	5.000	4.997	0.8305551	0.8300321		-0.06	20
Dibenz(a,h)anthracene	A	5.000	5.286	0.855389	0.904263		5.7	20
Indeno(1,2,3-cd)pyrene	A	5.000	5.218	0.9165747	0.9566115		4.4	20
Naphthalene	A	5.000	4.505	0.9310503	0.8388271		-9.9	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**T.KLIMEK**	**DATE:**	**AUGUST 5, 2010**
FROM:	**JOSEPH KALINYAK**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION: VOC / PAH**
NSWC CRANE, CTO F273
SDG CTOF273_009

SAMPLES: 4 / Sediment / VOC (benzene, ethyl benzene, toluene, total xylenes) / PAH

32SD-01-0006 32SD-02-0006 32SD-03-0006
32SD-FD-043010-01

2 / Aqueous / VOC (benzene, ethyl benzene, toluene, total xylenes)

32SS-RB042910-05 32SS-TB042910-01

1 / Aqueous / PAH

32SS-RB042910-05

OVERVIEW

The sample set for NSWC Crane, CTO F273, SDG CTOF273_009 consisted of four (4) sediment samples, one (1) aqueous rinse blank sample, and one (1) aqueous trip blank sample. One (1) field duplicate sample pair was included in the sample delivery group (SDG); 32SD-FD-043010-01 / 32SD-02-0006. The four (4) sediment samples and one (1) aqueous rinse blank sample were analyzed for a short list of four (4) volatile organic compounds (VOC), benzene, ethyl benzene, toluene, and a list of eight (8) polynuclear aromatic hydrocarbons (PAH), benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene. The one (1) trip blank was analyzed for the short list of VOCs only.

The samples were collected by TetraTech NUS on April 29 and 30, 2010 and analyzed by Empirical Laboratories, LLC. All analyses were conducted using USEPA SW-846 Methods 8260B and 8270C analytical and reporting protocols. The data contained in this SDG were fully validated with regard to the following parameters:

*	Data Completeness
	Holding Times
*	GC/MS Tuning
*	Initial and Continuing Calibration
*	Laboratory Blank Analyses
	Surrogate Recoveries
*	Blank Spike/Blank Spike Duplicate Results
*	Matrix Spike/Matrix Spike Duplicate Results
	Internal Standard Recoveries
	Field Duplicate Results
*	Compound Quantitation
*	Compound Identification
*	Detection Limits

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

VOC

The sample to analysis hold time quality control limit of 14 days was exceeded by <2X for sediment samples 32SD-01-0006, 32SD-02-0006, 32SD-03-0006, and 32SD-FD-043010-01. All positive and non-detected VOC analytes for the aforementioned samples were qualified estimated, (J) and (UJ), respectively.

The analysis of sample 32SD-03-0006 had percent recoveries (%R) for all three internal standards less than the quality control limit (and >10%). The sample was not re-analyzed and the non-detected VOC results for sample were qualified estimated, (UJ).

Samples 32SD-02-0006 and 32SD-FD-043010-01 were diluted 50X for the VOC analysis resulting in elevated reporting limits and minimum detection limits for the non-detected analytes.

The surrogate %R was less than the quality control limit for 1,2-dichloroethane-d4 for the continuing calibration verification (CCV) check 0F15210-CCV1. All results for the CCV were within the quality control limits and no action was taken.

The rinse blank sample 32S-RB042910-05 had a positive toluene result.

PAH

The sample to extraction hold time quality control limit of 7 days was exceeded for sample 32SS-RB042910-05 by <2X times. All analytes were non-detected and were qualified estimated, (UJ).

The CCV percent difference (%D) for chrysene and benzo(a)anthracene was greater than the 25% quality control limit for instrument MS-BNA4 on 05/22/10 @ 14:18 affecting rinse blank sample 32SS-RB042910-05. The non-detected chrysene and benzo(a)anthracene results for the aforementioned samples were qualified estimated, (UJ).

The CCV %D for benzo(k)fluoranthene was greater than the 25% quality control limit for instrument MS-BNA3 on 05/22/10 @ 12:28 affecting samples 32SD-01-0006, 32SD-02-0006, and 32SD-03-0006. The positive and non-detected benzo(k)fluoranthene results for the aforementioned samples were qualified estimated, (J) and (UJ), respectively.

The CCV %D for benzo(k)fluoranthene and naphthalene was greater than the 25% quality control limit for instrument MS-BNA3 on 05/24/10 @ 22:25 affecting sample 32SD-FD-043010-01. The positive benzo(k)fluoranthene and naphthalene results for sample 32SD-FD-043010-01 were qualified estimated, (J).

PAH analytes were detected in the method blank 0E13315-BLK1 associated with batch 0E13315 affecting rinse blank sample 32SS-RB042910-05. No action was taken as rinse blanks are not qualified due to method blank contamination and the rinse blank had non-detected results for all analytes.

The matrix spike (MS) %Rs for spiked sample 32SD-01-0006 exceeded the quality control limit for all PAHs. The MS duplicate (MSD) associated with the sample had %Rs that were within the quality control limit. An investigation by the laboratory into this issue revealed that the MS was not performed on the sample 32SD-01-0006. Therefore, only the sample MSD was used to evaluate the spike of the sample. The sample 32SD-01-0006 positive and non-detected results were not qualified as the MSD results were all within the quality control limits for the spiked sample.

The field duplicate sample 32SD-02-0006 and 32SD-FD-043010-01 RPDs were greater than the 50% quality control limit for PAHs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene. The positive and non-detected aforementioned PAHs were qualified estimated, (J) and (UJ), respectively, for the field duplicate samples.

ADDITIONAL COMMENTS

Positive results less than the reporting limit (RL) were qualified as estimated, (J), due to uncertainty near the detection limit.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Sample VOC analytes were qualified due to sample to analysis hold time quality control limit exceedances. Sample 32SD-03-0006 VOC results were qualified due to internal standard percent recoveries less than the quality control limit. PAH analytes for sample 32SS-RB042910-05 were qualified due to sample to an extraction hold time quality control limit exceedance. Continuing calibration verification quality control limit exceedances resulted in PAH analyte data qualifications for some samples. Field duplicate quality control limit exceedances resulted in PAH sample data qualifications.

Other factors affecting data quality: Positive results less than the reporting limit (RL) were qualified estimated, (J), due to uncertainty near the detection limit.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999) and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006). The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech NUS
Joseph Kalinyak
Chemist/Data Validator

TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Value Qualifier Key (Val Qual)

J – The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

UJ – The result is an estimated non-detected quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

U - Value is a non-detect as reported by the laboratory.

UR – Non-detected result is considered rejected, (UR), as a result of technical non-compliances.

DATA QUALIFICATION CODE (QUAL CODE)

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$ / ICP PDS Recovery Noncompliance
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; e.g. chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 02111 SDG: CTOF273_009 FRACTION: OV MEDIA: SOIL	NSAMPLE	32SD-01-0006			32SD-02-0006			32SD-03-0006			32SD-FD-043010-01		
	LAB_ID	1005021-01			1005021-02RE1			1005021-03			1005021-04RE2		
	SAMP_DATE	4/30/2010			4/30/2010			4/30/2010			4/30/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	81.5			80.6			80.8			82.1		
	DUP_OF										32SD-02-0006		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.537	UJ	H	56.1	J	HP	0.54	UJ	HN	24.5	UJ	H
ETHYLBENZENE		0.857	UJ	H	65.7	J	HP	0.862	UJ	HN	39.1	UJ	H
TOLUENE		0.983	UJ	H	62.6	J	HP	0.989	UJ	HN	44.8	UJ	H
TOTAL XYLENES		0.8	UJ	H	220	J	HP	0.805	UJ	HN	36.5	UJ	H

PROJ_NO: 02111	NSAMPLE	32SS-RB042910-05			32SS-TB042910-01		
SDG: CTOF273_009	LAB_ID	1005021-05			1005021-06		
FRACTION: OV	SAMP_DATE	4/29/2010			4/29/2010		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.14	U		0.14	U	
ETHYLBENZENE		0.15	U		0.15	U	
TOLUENE		0.648	J	P	0.19	U	
TOTAL XYLENES		0.22	U		0.22	U	

PROJ_NO: 02111	NSAMPLE	32SS-RB042910-05		
SDG: CTOF273_009	LAB_ID	1005021-05		
FRACTION: PAH	SAMP_DATE	4/29/2010		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		0.0189	UJ	CH
BENZO(A)PYRENE		0.0189	UJ	H
BENZO(B)FLUORANTHENE		0.0189	UJ	H
BENZO(K)FLUORANTHENE		0.0189	UJ	H
CHRYSENE		0.0189	UJ	CH
DIBENZO(A,H)ANTHRACENE		0.0189	UJ	H
INDENO(1,2,3-CD)PYRENE		0.0189	UJ	H
NAPHTHALENE		0.0189	UJ	H

PROJ_NO: 02111	NSAMPLE	32SD-01-0006			32SD-02-0006			32SD-03-0006			32SD-FD-043010-01		
SDG: CTOF273_009	LAB_ID	1005021-01			1005021-02			1005021-03			1005021-04		
FRACTION: PAH	SAMP_DATE	4/30/2010			4/30/2010			4/30/2010			4/30/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	81.5			80.6			80.8			82.1		
	DUP_OF										32SD-02-0006		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		2.81	J	P	6.59	J	GP	11			36.4	J	G
BENZO(A)PYRENE		7.59			16.7	J	G	20.1			84.9	J	G
BENZO(B)FLUORANTHENE		1.63	U		21.8	J	G	25.2			98.3	J	G
BENZO(K)FLUORANTHENE		1.63	UJ	C	8.07	J	CGP	7.67	J	CP	40.1	J	CG
CHRYSENE		2.97	J	P	6.69	J	GP	21.5			45.5	J	G
DIBENZO(A,H)ANTHRACENE		1.63	U		1.65	UJ	G	1.65	U		13.8	J	G
INDENO(1,2,3-CD)PYRENE		1.63	U		8.51	J	G	9.62			74.6	J	G
NAPHTHALENE		1.63	U		1.65	UJ	G	1.65	U		2.06	J	CGP

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

ANALYSIS DATA SHEET

32SS-RB042910-05

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1005021-05	File ID:	0502105.D
Sampled:	04/29/10 15:30	Prepared:	05/12/10 00:00	Analyzed:	05/13/10 15:55
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E12945 Sequence: 0E13414 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene	0.648	0.190	1.00	J
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.94	99.8	75 - 120	
Dibromofluoromethane	30.00	31.31	104	85 - 115	
1,2-Dichloroethane-d4	30.00	30.76	103	70 - 120	
Toluene-d8	30.00	31.82	106	85 - 120	

ANALYSIS DATA SHEET

32SS-TB042910-01

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1005021-06	File ID:	0502106.D
Sampled:	04/29/10 15:30	Prepared:	05/12/10 00:00	Analyzed:	05/13/10 12:39
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0E12945 Sequence: 0E13414 Calibration: 0128001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.80	99.3	75 - 120	
Dibromofluoromethane	30.00	30.32	101	85 - 115	
1,2-Dichloroethane-d4	30.00	30.60	102	70 - 120	
Toluene-d8	30.00	31.79	106	85 - 120	

ANALYSIS DATA SHEET

32SD-01-0006

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1005021-01	File ID:	0502101.D
Sampled:	04/30/10 12:50	Prepared:	05/24/10 11:42	Analyzed:	05/24/10 18:51
Solids:	81.47	Preparation:	5035	Dilution:	1

Batch: 0E24008 Sequence: 0E14711 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.537	5.00	H1, U
100-41-4	Ethylbenzene		0.857	11.4	H1, U
108-88-3	Toluene		0.983	11.4	H1, U
1330-20-7	Xylenes (total)		0.800	11.4	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	34.29	36.99	108	85 - 120	
Dibromofluoromethane	34.29	33.88	98.8	80 - 125	
1,2-Dichloroethane-d4	34.29	29.51	86.1	75 - 140	
Toluene-d8	34.29	36.16	105	85 - 115	

ANALYSIS DATA SHEET

32SD-02-0006

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1005021-02RE1	File ID:	0502102D.D
Sampled:	04/30/10 11:55	Prepared:	05/20/10 00:00	Analyzed:	05/20/10 13:58
Solids:	80.62	Preparation:	5035	Dilution:	50
Batch:	0E22001	Sequence:	0E14304	Calibration:	0144005
Instrument:	MS-VOA4				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene	56.1	29.1	248	H1, J, D
100-41-4	Ethylbenzene	65.7	46.4	619	H1, J, D
108-88-3	Toluene	62.6	53.2	619	H1, J, D
1330-20-7	Xylenes (total)	220	43.3	619	H1, J, D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	37.14	39.84	107	85 - 120	
Dibromofluoromethane	37.14	35.36	95.2	80 - 125	
1,2-Dichloroethane-d4	37.14	33.47	90.1	75 - 140	
Toluene-d8	37.14	41.16	111	85 - 115	

ANALYSIS DATA SHEET

32SD-03-0006

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1005021-03	File ID:	0502103.D
Sampled:	04/30/10 12:10	Prepared:	05/16/10 15:47	Analyzed:	05/18/10 16:45
Solids:	80.82	Preparation:	5035	Dilution:	1

Batch: 0E18013 Sequence: 0E14605 Calibration: 0144005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.540	5.00	H1, S, U
100-41-4	Ethylbenzene		0.862	11.5	H1, S, U
108-88-3	Toluene		0.989	11.5	H1, S, U
1330-20-7	Xylenes (total)		0.805	11.5	H1, S, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	34.50	37.95	110	85 - 120	
Dibromofluoromethane	34.50	34.12	98.9	80 - 125	
1,2-Dichloroethane-d4	34.50	33.44	96.9	75 - 140	
Toluene-d8	34.50	36.90	107	85 - 115	

ANALYSIS DATA SHEET

32SD-FD-043010-01

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1005021-04RE2	File ID:	0502104D.D
Sampled:	04/30/10 00:00	Prepared:	05/21/10 00:00	Analyzed:	05/21/10 23:43
Solids:	82.07	Preparation:	5035	Dilution:	50
Batch:	0E21026	Sequence:	0F15210	Calibration:	0141001
Instrument:	MS-VOA1				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		24.5	208	H1, U
100-41-4	Ethylbenzene		39.1	521	H1, U
108-88-3	Toluene		44.8	521	H1, U
1330-20-7	Xylenes (total)		36.5	521	H1, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	31.24	33.42	107	85 - 120	
Dibromofluoromethane	31.24	31.34	100	80 - 125	
1,2-Dichloroethane-d4	31.24	28.03	89.7	75 - 140	
Toluene-d8	31.24	32.30	103	85 - 115	

ANALYSIS DATA SHEET

32SS-RB042910-05

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_009	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Water	Laboratory ID:	1005021-05	File ID:	0502105.D
Sampled:	04/29/10 15:30	Prepared:	05/13/10 14:45	Analyzed:	05/22/10 21:07
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0E13315 Sequence: 0F15409 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0189	0.0943	H2, X, U
50-32-8	Benzo(a)pyrene		0.0189	0.0943	H2, U
205-99-2	Benzo(b)fluoranthene		0.0189	0.0943	H2, U
207-08-9	Benzo(k)fluoranthene		0.0189	0.0943	H2, U
218-01-9	Chrysene		0.0189	0.0943	H2, X, U
53-70-3	Dibenz(a,h)anthracene		0.0189	0.0943	H2, U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0189	0.0943	H2, X, U
91-20-3	Naphthalene		0.0189	0.0943	H2, U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	47.17	37.15	78.8	34 - 167	
Terphenyl-d14	47.17	40.21	85.2	34 - 167	

ANALYSIS DATA SHEET

32SD-01-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_009	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Soil	Laboratory ID:	1005021-01	File ID:	0502101.D
Sampled:	04/30/10 12:50	Prepared:	05/14/10 14:00	Analyzed:	05/22/10 22:12
Solids:	81.47	Preparation:	EXT_3546	Dilution:	1

Batch: 0E13318 Sequence: 0F15502 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	2.81	1.63	8.19	R, J
50-32-8	Benzo(a)pyrene	7.59	1.63	6.14	R
205-99-2	Benzo(b)fluoranthene		1.63	8.19	R, U
207-08-9	Benzo(k)fluoranthene		1.63	8.19	R, X, U
218-01-9	Chrysene	2.97	1.63	8.19	R, J
53-70-3	Dibenz(a,h)anthracene		1.63	6.14	R, U
193-39-5	Indeno(1,2,3-cd)pyrene		1.63	8.19	R, U
91-20-3	Naphthalene		1.63	6.14	R, Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4091	2882	70.4	14 - 129	
Terphenyl-d14	4091	2708	66.2	14 - 129	

ANALYSIS DATA SHEET

32SD-02-0006

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1005021-02	File ID:	0502102.D
Sampled:	04/30/10 11:55	Prepared:	05/14/10 14:00	Analyzed:	05/22/10 20:24
Solids:	80.62	Preparation:	EXT_3546	Dilution:	1

Batch: 0E13318 Sequence: 0F15502 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	6.59	1.65	8.27	J
50-32-8	Benzo(a)pyrene	16.7	1.65	6.20	
205-99-2	Benzo(b)fluoranthene	21.8	1.65	8.27	
207-08-9	Benzo(k)fluoranthene	8.07	1.65	8.27	X, J
218-01-9	Chrysene	6.69	1.65	8.27	J
53-70-3	Dibenz(a,h)anthracene		1.65	6.20	U
193-39-5	Indeno(1,2,3-cd)pyrene	8.51	1.65	8.27	
91-20-3	Naphthalene		1.65	6.20	Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4135	2407	58.2	14 - 129	
Terphenyl-d14	4135	2167	52.4	14 - 129	

ANALYSIS DATA SHEET

32SD-03-0006

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1005021-03	File ID:	0502103.D
Sampled:	04/30/10 12:10	Prepared:	05/14/10 14:00	Analyzed:	05/22/10 21:00
Solids:	80.82	Preparation:	EXT_3546	Dilution:	1

Batch: 0E13318 Sequence: 0F15502 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	11.0	1.65	8.25	
50-32-8	Benzo(a)pyrene	20.1	1.65	6.19	
205-99-2	Benzo(b)fluoranthene	25.2	1.65	8.25	
207-08-9	Benzo(k)fluoranthene	7.67	1.65	8.25	X, J
218-01-9	Chrysene	21.5	1.65	8.25	
53-70-3	Dibenz(a,h)anthracene		1.65	6.19	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.62	1.65	8.25	
91-20-3	Naphthalene		1.65	6.19	Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4124	2864	69.4	14 - 129	
Terphenyl-d14	4124	2830	68.6	14 - 129	

ANALYSIS DATA SHEET

32SD-FD-043010-01

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Soil	Laboratory ID:	1005021-04	File ID:	0502104.D
Sampled:	04/30/10 00:00	Prepared:	05/14/10 14:00	Analyzed:	05/25/10 03:14
Solids:	82.07	Preparation:	EXT_3546	Dilution:	1

Batch: 0E13318 Sequence: 0F15504 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	36.4	1.62	8.13	
50-32-8	Benzo(a)pyrene	84.9	1.62	6.09	
205-99-2	Benzo(b)fluoranthene	98.3	1.62	8.13	X
207-08-9	Benzo(k)fluoranthene	40.1	1.62	8.13	X
218-01-9	Chrysene	45.5	1.62	8.13	
53-70-3	Dibenz(a,h)anthracene	13.8	1.62	6.09	
193-39-5	Indeno(1,2,3-cd)pyrene	74.6	1.62	8.13	
91-20-3	Naphthalene	2.06	1.62	6.09	Y, J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4062	2492	61.4	14 - 129	
Terphenyl-d14	4062	2711	66.8	14 - 129	

APPENDIX C

SUPPORT DOCUMENTATION

HOLDTIME

SDG CTOF273_009

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV	UG/KG	32SD-FD-043010-01	1005021-04RE2	NM	04/30/2010	05/21/2010	05/21/2010	21	0	21
OV	UG/KG	32SD-03-0006	1005021-03	NM	04/30/2010	05/16/2010	05/18/2010	16	2	18
OV	UG/KG	32SD-02-0006	1005021-02RE1	NM	04/30/2010	05/20/2010	05/20/2010	20	0	20
OV	UG/KG	32SD-01-0006	1005021-01	NM	04/30/2010	05/24/2010	05/24/2010	24	0	24
OV	UG/L	32SS-TB042910-01	1005021-06	NM	04/29/2010	05/12/2010	05/13/2010	13	1	14
OV	UG/L	32SS-RB042910-05	1005021-05	NM	04/29/2010	05/12/2010	05/13/2010	13	1	14
SIM	UG/KG	32SD-FD-043010-01	1005021-04	NM	04/30/2010	05/14/2010	05/25/2010	14	11	25
SIM	UG/KG	32SD-03-0006	1005021-03	NM	04/30/2010	05/14/2010	05/22/2010	14	8	22
SIM	UG/KG	32SD-02-0006	1005021-02	NM	04/30/2010	05/14/2010	05/22/2010	14	8	22
SIM	UG/KG	32SD-01-0006	1005021-01	NM	04/30/2010	05/14/2010	05/22/2010	14	8	22
SIM	UG/L	32SS-RB042910-05	1005021-05	NM	04/29/2010	05/13/2010	05/22/2010	14	9	23

TETRA TECH NUS, INC.

CHAIN OF CUSTODY

NUMBER 2144

PAGE ___ OF ___

PROJECT NO: 112G02111	FACILITY: F273 Sumo 32	PROJECT MANAGER: Tony Klimek	PHONE NUMBER: 513-251-2730
SAMPLERS (SIGNATURE): [signature]		FIELD OPERATIONS LEADER: George Ten Eyck	PHONE NUMBER: 513-251-2730
		CARRIER/WAYBILL NUMBER: FEDEX	

LABORATORY NAME AND CONTACT: Empirical – Kim Kostyen
ADDRESS: 621 Mainstream Dr, Suite 270
CITY, STATE: Nashville, TN

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: ~~GRO~~	~~DRO~~	PAH	BTEX	BTEX				COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	P	G						
PRESERVATIVE USED									4°C	4°C	4°C						
4/30	12:50	32 SD-01-0006	~~SB~~	–	–	SD	G	2	X								MS/MSD -01
4/30	12:50	32 SD-01-0006	–	–	–	SD	G	3		X							(00502) -
4/30	11:55	32 SD-02-0006	–	–	–	SD	G	1	X								-02
4/30	11:55	32 SD-02-0006	–	–	–	SD	G	2			X						
4/30	12:10	32 SD-03-0006	–	–	–	SD	G	1	X								-03
4/30	12:10	32 SD-03-0006				SD	G	2			X						
4/30	0000	32 SD FD 043010-01				SD	G	1	X								-04
4/30	0000	32 SD FD 043010-01	–	–	–	SD	G	2			X						

1. RELINQUISHED BY [signature]	DATE 4/30/10	TIME 1700	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY [signature]	DATE 5/1/10	TIME 11:00
COMMENTS				4.9°C	

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC.

CHAIN OF CUSTODY

NUMBER 2145

PAGE ___ OF ___

PROJECT NO: 112G02111	FACILITY: SWMU 32	PROJECT MANAGER: Tony Klimek	PHONE NUMBER: 513-557-5051	LABORATORY NAME AND CONTACT: Empirical Kim Kostze
SAMPLERS (SIGNATURE): [signature]		FIELD OPERATIONS LEADER: George Tu Eych	PHONE NUMBER: 513-251-2730	ADDRESS: 621 Mainstream Dr, Suite 270
		CARRIER/WAYBILL NUMBER		CITY, STATE: Nashville, TN 37228

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G

PRESERVATIVE USED: 4°C

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: BTEX	PAH	BTEX & PAH						COMMENTS
4/29	1530	3255-RB042910-05	–	–	–	QC	G	3	X								1005021-05
4/29	1530	3255 RB042910-05				QC	G	2		X							↓
4/29	1530	SWMU 3255 TB 042910-01				QC	G	2			X						-06

1. RELINQUISHED BY [signature]	DATE 4/30/10	TIME 12:40	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY [signature]	DATE 5/1/10	TIME 11:00
COMMENTS					4.9°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

10

CTOF273_009 Summ Package

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1005621 Number of Coolers: 1 of 2

Client: TINUS Project: F273 SW4032

Date/Time Received: 5/01/10 11:00 Date cooler(s) opened: 5/01/10

Opened By (print): Will Schwab (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered EL Courier Other: _____

If applicable, enter airbill number here: 3310

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 1 Seal date: 4/30/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 4-4 °C

Dates samples were logged-in: 5/7/10

9. Initial this form to acknowledge login of sample(s): (Name): Will Schwab (Initial): WS
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

If Non-Conformance issues were present, list by sample ID: _____

COC requests PAH on a trip Blank, CAR#: _____

could not tag for due to missing volume (DNP IC analysis)

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1005021 Number of Coolers: 2 of 2

Client: TTNUS Project: F273 SW4082

Date/Time Received: 5/01/10 11:00 Date cooler(s) opened: 5/01/10

Opened By (print): Will Schwab (signature): [illegible]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered EL Courier Other: _____

If applicable, enter airbill number here: 3386

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 1 Seal date: 4/30/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 4.9 °C

Dates samples were logged-in:

9. Initial this form to acknowledge login of sample(s): (Name): _____ (Initial): _____
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

See page 1 of 2

WORK ORDER

Printed: 5/20/2010 8:50:43PM

1005021

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32

Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Report To:
Tetra Tech NUS, Inc. (T010)
Tobrena Skeen
Foster Plaza 7, 661 Anderson Drive
Pittsburgh, PA 15220
Phone: (412) 921-8182
Fax: (412) 921-4040

Invoice To:
Tetra Tech NUS, Inc. (T010)
Accounts Payable
Foster Plaza 7, 661 Anderson Drive
Pittsburgh, PA 15220
Phone :(412) 921-8182
Fax: (412) 921-4040

Date Due: 05/24/2010 16:00 (15 day TAT)

Received By: William Schwab
Date Received: 05/01/2010 11:00

Logged In By: William Schwab
Date Logged In: 05/07/2010 10:58

Samples Received at: **4.4°C**

Custody Seals	Yes	Received On Ice	Yes
Containers Intact	Yes		
COC/Labels Agree	Yes		
Preservation Confirm	Yes		

Method	Test Code	Due	TAT	Expires	Comments
1005021-01 32SD-01-0006 [Solid] Sampled 04/30/2010 12:50 Central					**MS/MSD. DoD QSM 4.1**
SM2540B	WC_PERCENT_SOLIDS_2540B	05/19/2010 14:00	15	05/07/2010 12:50	MS/MSD.
SW8260B	VOC_8260B_BTEXMN	05/19/2010 14:00	15	05/14/2010 12:50	MS/MSD. ENCORES!!
SW8270C	SMS_PAH_8270C_3546_LOW	05/19/2010 14:00	15	05/14/2010 12:50	MS/MSD.
1005021-02 32SD-02-0006 [Solid] Sampled 04/30/2010 11:55 Central					**DoD QSM 4.1**
SM2540B	WC_PERCENT_SOLIDS_2540B	05/19/2010 14:00	15	05/07/2010 11:55	DO NOT USE CONTAINER A!!!
SW8260B	VOC_8260B_BTEXMN	05/19/2010 14:00	15	05/14/2010 11:55	USE CONTAINER A!!!
SW8270C	SMS_PAH_8270C_3546_LOW	05/19/2010 14:00	15	05/14/2010 11:55	DO NOT USE CONTAINER A!!!
1005021-03 32SD-03-0006 [Solid] Sampled 04/30/2010 12:10 Central					**DoD QSM 4.1**
SM2540B	WC_PERCENT_SOLIDS_2540B	05/19/2010 14:00	15	05/07/2010 12:10	DO NOT USE CONTAINER A!!!
SW8260B	VOC_8260B_BTEXMN	05/19/2010 14:00	15	05/14/2010 12:10	USE CONTAINER A!!!
SW8270C	SMS_PAH_8270C_3546_LOW	05/19/2010 14:00	15	05/14/2010 12:10	DO NOT USE CONTAINER A!!!
1005021-04 32SD-FD-043010-01 [Solid] Sampled 04/30/2010 00:00 Central					**DoD QSM 4.1**
SM2540B	WC_PERCENT_SOLIDS_2540B	05/19/2010 14:00	15	05/07/2010 00:00	DO NOT USE CONTAINER A!!!
SW8260B	VOC_8260B_BTEXMN	05/19/2010 14:00	15	05/14/2010 00:00	USE CONTAINER A!!!
SW8270C	SMS_PAH_8270C_3546_LOW	05/19/2010 14:00	15	05/14/2010 00:00	DO NOT USE CONTAINER A!!!
1005021-05 32SS-RB042910-05 [Water] Sampled 04/29/2010 15:30 Central					**DoD QSM 4.1**
SW8270C	SMS_PAH_8270C_3510_LOW	05/19/2010 14:00	15	05/06/2010 15:30	See version
SW8260B	VOC_8260B_BTEXMN	05/19/2010 14:00	15	05/13/2010 15:30	See version

WORK ORDER

Printed: 5/20/2010 8:50:43PM

1005021

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32

Project Manager: Kim Kostzer
Project Number: TET10CTOF273

Method	Test Code	Due	TAT	Expires	Comments
1005021-06	32SS-TB042910-01 [Water]	Sampled 04/29/2010 15:30 Central			DoD QSM 4.1
SW8260B	VOC_8260B_BTEXMN	05/19/2010 14:00	15	05/13/2010 15:30	See version

Reviewed By

Date

Sample Delivery Group Assignment Form

CLIENT: Tetra Tech NUS, Inc. (T010)
PROJECT NAME: CTOF273 NSA Crane SMU32
SDG #: CTOF273_009
MATRIX: Water

QC LEVEL: EDD/IV
Report Due: 5/24/2010 - 5/24/2010
Client Sample Count: 4

Sample Type	Sampled	Received	Lab ID	Client ID	SM2540B	SW8260B	SW8270C
					MS/MSD. DoD QSM 4.1	MS/MSD. DoD QSM 4.1	MS/MSD. DoD QSM 4.1
Client Sample	4/30/2010	5/1/2010	1005021-01	32SD-01-0006			
Client Sample	4/30/2010	5/1/2010	1005021-02	32SD-02-0006	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/30/2010	5/1/2010	1005021-03	32SD-03-0006	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Field Duplicate	4/30/2010	5/1/2010	1005021-04	32SD-FD-043010-01	DoD QSM 4.1	DoD QSM 4.1	DoD QSM 4.1
Client Sample	4/29/2010	5/1/2010	1005021-05	32SS-RB042910-05		DoD QSM 4.1	DoD QSM 4.1
Trip Blank	4/29/2010	5/1/2010	1005021-06	32SS-TB042910-01		DoD QSM 4.1	

Sample Delivery Group Case Narrative

Receipt Information

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision

This is an original submittal of the final report package.

Analytical Information

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. The following information is provided specific to individual methods:

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.
B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.
C: The peak was manually integrated to correct the baseline from the original chromatogram.
D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

SW8260B:

Samples 1005021-01, 1005021-02RE1, 1005021-03, and 1005021-04RE2 were analyzed outside the method holding time; however, the sample was analyzed within a 2X of the holding time.

The internal standards associated with sample 1005021-03 failed criteria and the associated parameters are qualified.

No additional anomalies or deviations are noted and the data is properly qualified.

SW8270C PAHs:
Sample 1005021-05 was extracted outside the method holding time; however, the sample was prepared within a 2X of the holding time.

The continuing calibration standards failed criteria in 0F15502-CCV1 for Benzo(k)fluoranthene and Naphthalene, in 0F15504-CCV1 for Benzo(b)fluoranthene, Benzo(k)fluoranthene, and Naphthalene, in 0F15409-CCV1 for Benzo(a)anthracene, Chrysene, and Indeno(1,2,3-cd)pyrene.

The matrix spikes associated with sample 1005021-01 failed accuracy and/or precision criteria for all the reported analytes. No additional anomalies or deviations are noted and the data is properly qualified.

Data Qualifiers

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL), also known as Reporting Limit **(RL),** is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

*****: A failing quality control criteria is associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the EQL. One should feel confident that the result is greater than zero and less than the EQL.

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In metals, the qualifier indicates that the parameters MDL/RL

has been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The RPD and/or percent recovery failed in the associated Blank Spike and/or Blank Spike Duplicate.

R: The RPD and/or percent recovery failed in the associated Matrix Spike and/or Matrix Spike Duplicate.

S: The Internal Standard failed criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

LIMS Definitions / Naming Conventions:

The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

BLK: LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

BS: LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes

within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "**RE**" implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:
I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, Ms. Marcia K. McGinnity is authorized to sign this Statement of Data Authenticity.

Mr. Rick D. Davis
Laboratory Technical Director / VP Operations

HOLDING TIME SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_009

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SD-01-0006	04/30/10 12:50	05/01/10 11:00	05/24/10 11:42	N/A	14.00	05/24/10 18:51	24.25	14.00	*
32SD-02-0006	04/30/10 11:55	05/01/10 11:00	05/20/10 00:00	N/A	14.00	05/20/10 13:58	20.09	14.00	*
32SD-03-0006	04/30/10 12:10	05/01/10 11:00	05/16/10 15:47	N/A	14.00	05/18/10 16:45	18.19	14.00	*
32SD-FD-043010-01	04/30/10 00:00	05/01/10 11:00	05/21/10 00:00	N/A	14.00	05/21/10 23:43	21.99	14.00	*
32SS-RB042910-05	04/29/10 15:30	05/01/10 11:00	05/12/10 00:00	N/A	14.00	05/13/10 15:55	14.02	14.00	
32SS-TB042910-01	04/29/10 15:30	05/01/10 11:00	05/12/10 00:00	N/A	14.00	05/13/10 12:39	13.88	14.00	

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13909	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13909-TUN1	SEQ-TUN1.D	05/16/10 13:42
Cal Standard	0E13909-CAL1	SEQ-CAL1.D	05/16/10 14:17
Cal Standard	0E13909-CAL2	SEQ-CAL2.D	05/16/10 14:57
Cal Standard	0E13909-CAL3	SEQ-CAL3.D	05/16/10 15:36
Cal Standard	0E13909-CAL4	SEQ-CAL4.D	05/16/10 16:15
Cal Standard	0E13909-CAL5	SEQ-CAL5.D	05/16/10 16:54
Cal Standard	0E13909-CAL6	SEQ-CAL6.D	05/16/10 17:34
Cal Standard	0E13909-CAL7	SEQ-CAL7.D	05/16/10 18:13
Cal Standard	0E13909-CAL8	SEQ-CAL8.D	05/16/10 18:52
Initial Cal Check	0E13909-ICV1	SEQ-ICV1.D	05/16/10 19:31
Cal Standard	0E13909-CAL9	SEQ-CAL9.D	05/16/10 20:10
Cal Standard	0E13909-CALA	SEQ-CALA.D	05/16/10 20:49
Cal Standard	0E13909-CALB	SEQ-CALB.D	05/16/10 21:28
Cal Standard	0E13909-CALC	SEQ-CALC.D	05/16/10 22:07
Cal Standard	0E13909-CALD	SEQ-CALD.D	05/16/10 22:46
Cal Standard	0E13909-CALE	SEQ-CALE.D	05/16/10 23:25
Cal Standard	0E13909-CALF	SEQ-CALF.D	05/17/10 00:04
Cal Standard	0E13909-CALG	SEQ-CALG.D	05/17/10 01:13
Cal Standard	0E13909-CALH	SEQ-CALH.D	05/17/10 02:31
Cal Standard	0E13909-CALI	SEQ-CALI.D	05/17/10 03:10
Cal Standard	0E13909-CALJ	SEQ-CALJ.D	05/17/10 03:49
Cal Standard	0E13909-CALK	SEQ-CALK.D	05/17/10 04:28
Cal Standard	0E13909-CALL	SEQ-CALL.D	05/17/10 05:07
Cal Standard	0E13909-CALM	SEQ-CALM.D	05/17/10 05:46
Cal Standard	0E13909-CALN	SEQ-CALN.D	05/17/10 06:25
Cal Standard	0E13909-CALO	SEQ-CALO.D	05/17/10 07:04

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/16/10
Instrument ID:	MS-VOA1	Injection Time:	13:42
Sequence:	0E13909	Lab Sample ID:	0E13909-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	21.1	PASS
75	30 - 60% of 95	47.2	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.37	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	67.1	PASS
175	5 - 9% of 174	7.31	PASS
176	95 - 101% of 174	95.7	PASS
177	5 - 9% of 176	6.29	PASS

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0141001

Matrix: Water

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Instrument: MS-VOA1

Calibration Date: 5/16/2010 5:53:49AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	0.9538096	3.675415	14.21375	4.186609E-02			15	
Bromofluorobenzene	0.806614	6.33105	22.47137	1.987755E-02			15	
Ethylbenzene	2.625901	8.273184	20.69738	1.993286E-02			CCC (20)	
Naphthalene	1.42045	7.973596	29.36488	1.155791E-02			15	
Methyl t-Butyl Ether	0.4789501	5.76918	10.66088	8.608269E-02			15	
Toluene	1.306087	5.445475	17.8805	2.681495E-02			CCC (20)	
m,p-Xylene	1.994748	13.5635	21.01925	2.161043E-02			15	
o-Xylene	1.962043	8.658804	21.74325	2.516958E-02			15	
Xylenes (total)	1.983846	11.91374	0	0			15	
Dibromofluoromethane	0.2558456	1.002136	12.42088	3.528492E-02			15	
1,2-Dichloroethane-d4	6.111453E-02	2.620876	13.20788	4.616384E-02			15	
Toluene-d8	2.151044	5.303775	17.753	2.907062E-02			15	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0141001	Instrument:	MS-VOA1
Matrix:	Water	Calibration Date:	5/16/2010 5:53:49AM

Compound	Level 19		Level 20		Level 21		Level 22		Level 23		Level 24	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene	30		30		30		30		30		30	
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane	30		30		30		30		30		30	
1,2-Dichloroethane-d4	30		30		30		30		30		30	
Toluene-d8	30		30		30		30		30		30	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0141001

Matrix: Water

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Instrument: MS-VOA1

Calibration Date: 5/16/2010 5:53:49AM

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene	30		30		30		30		30		30	
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane	30		30		30		30		30		30	
1,2-Dichloroethane-d4	30		30		30		30		30		30	
Toluene-d8	30		30		30		30		30		30	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0141001	Instrument:	MS-VOA1
Matrix:	Water	Calibration Date:	5/16/2010 5:53:49AM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	150	0.9741708	200	0.9659294								
Bromofluorobenzene	30	0.7561767	30	0.7220561	30		30		30		30	
Ethylbenzene	150	2.452987	200	2.334669								
Naphthalene	150	1.511979	200	1.549901								
Methyl t-Butyl Ether	150	0.5096833	200	0.5078905								
Toluene	150	1.24974	200	1.192926								
m,p-Xylene	300	1.7773	400	1.658249								
o-Xylene	150	1.81764	200	1.735105								
Xylenes (total)	450	1.790747	600	1.683867								
Dibromofluoromethane	30	0.2596112	30	0.255618	30		30		30		30	
1,2-Dichloroethane-d4	30	6.061878E-02	30	5.973461E-02	30		30		30		30	
Toluene-d8	30	2.024174	30	1.973151	30		30		30		30	

INITIAL CALIBRATION DATA

SW8260B

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0141001

Matrix: Water

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Instrument: MS-VOA1

Calibration Date: 5/16/2010 5:53:49AM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	2	0.8849878	5	0.972602	10	0.9853452	20	0.943815	50	0.9214057	100	0.9822208
Bromofluorobenzene	30	0.8611234	30	0.8606347	30	0.8363984	30	0.8372024	30	0.801363	30	0.7779574
Ethylbenzene	2	2.950846	5	2.888922	10	2.737467	20	2.627149	50	2.492771	100	2.522396
Naphthalene	2	1.271417	5	1.526757	10	1.403937	20	1.281606	50	1.333712	100	1.484289
Methyl t-Butyl Ether	2	0.4452765	5	0.4884644	10	0.4810369	20	0.4423394	50	0.4561748	100	0.5007352
Toluene	2	1.369272	5	1.377616	10	1.393225	20	1.317638	50	1.257523	100	1.290759
m,p-Xylene	4	2.449439	10	2.289064	20	2.11532	40	1.974326	100	1.847361	200	1.846925
o-Xylene	2	2.195524	5	2.183794	10	2.051667	20	1.972249	50	1.848001	100	1.892363
Xylenes (total)	6	2.3648	15	2.253974	30	2.094102	60	1.973633	150	1.847574	300	1.86207
Dibromofluoromethane	30	0.2537246	30	0.2587008	30	0.2560301	30	0.2532324	30	0.2526237	30	0.257224
1,2-Dichloroethane-d4	30	6.211388E-02	30	6.375223E-02	30	6.152346E-02	30	6.172243E-02	30	5.841071E-02	30	6.104017E-02
Toluene-d8	30	2.281891	30	2.253988	30	2.228989	30	2.216471	30	2.151398	30	2.07829

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15210	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15210-TUN1	SEQ-TUN1.D	05/21/10 15:57
Calibration Check	0F15210-CCV1	SEQ-CCV1.D	05/21/10 16:29
LCS	0E21026-BS1	V1LCS1.D	05/21/10 17:08
Blank	0E21026-BLK2	V1MBLK1.D	05/21/10 19:08
32SD-FD-043010-01	1005021-04RE2	0502104D.D	05/21/10 23:43

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/21/10
Instrument ID:	MS-VOA1	Injection Time:	15:57
Sequence:	0F15210	Lab Sample ID:	0F15210-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	23.5	PASS
75	30 - 60% of 95	46.8	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.56	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	55.5	PASS
175	5 - 9% of 174	7.52	PASS
176	95 - 101% of 174	96	PASS
177	5 - 9% of 176	6.52	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA1	Calibration:	0141001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/16/10 05:53
Sequence:	0F15210	Injection Date:	05/21/10
Lab Sample ID:	0F15210-CCV1	Injection Time:	16:29

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	96.53	0.9538096	0.9207242		-3.5	20
Ethylbenzene	A	100.0	92.24	2.625901	2.422007		-7.8	20
Toluene	A	100.0	94.46	1.306087	1.233704		-5.5	20
Xylenes (total)	A	300.0	269.3	1.983846	1.781017		-10.2	20
Bromofluorobenzene	A	30.00	28.69	0.806614	0.7713755		-4.4	20
Dibromofluoromethane	A	30.00	28.25	0.2558456	0.2409428		-5.8	20
1,2-Dichloroethane-d4	A	30.00	23.73	6.111453E-02	4.833412E-02		-20.9	20 *
Toluene-d8	A	30.00	29.70	2.151044	2.129762		-1.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_009
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Matrix:
Laboratory ID: 0E21026-BLK2
File ID: V1MBLK1.D
Sampled:
Prepared:
Analyzed: 05/21/10 19:08
Solids:
Preparation: 5035
Dilution:
Batch: 0E21026
Sequence: 0F15210
Calibration: 0141001
Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		23.5	200	U
100-41-4	Ethylbenzene		37.5	500	U
108-88-3	Toluene		43.0	500	U
1330-20-7	Xylenes (total)		35.0	500	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.19	104	85 - 120	
Dibromofluoromethane	30.00	27.08	90.3	80 - 125	
1,2-Dichloroethane-d4	30.00	31.55	105	75 - 140	
Toluene-d8	30.00	30.36	101	85 - 115	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E21026	Laboratory ID:	0E21026-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	48.79	97.6	75 - 125
Ethylbenzene	50.00	49.68	99.4	75 - 125
Toluene	50.00	49.63	99.3	70 - 125
Xylenes (total)	150.0	145.0	96.6	75 - 125

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_009

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E21026

Batch Matrix: Solid

Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E21026-BLK2	05/21/10 00:00	5.00	5.00
LCS	0E21026-BS1	05/21/10 00:00	5.00	5.00
32SD-FD-043010-01	1005021-04RE2	05/21/10 00:00	5.85	5.00

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14711	Instrument:	MS-VOA1
Calibration:	0141001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14711-TUN1	SEQ-TUN1.D	05/24/10 10:20
Calibration Check	0E14711-CCV1	SEQ-CCV1.D	05/24/10 10:52
LCS	0E24008-BS1	V1LCS1.D	05/24/10 11:32
Blank	0E24008-BLK1	V1BLK01.D	05/24/10 12:51
32SD-01-0006	1005021-01	0502101.D	05/24/10 18:51
32SD-01-0006	0E24008-MS1	0502101M.D	05/24/10 19:31
32SD-01-0006	0E24008-MSD1	0502101S.D	05/24/10 20:10

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/24/10
Instrument ID:	MS-VOA1	Injection Time:	10:20
Sequence:	0E14711	Lab Sample ID:	0E14711-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	20.5	PASS
75	30 - 60% of 95	44.6	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.31	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	71.7	PASS
175	5 - 9% of 174	7.13	PASS
176	95 - 101% of 174	97.8	PASS
177	5 - 9% of 176	6.13	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Instrument ID: MS-VOA1

Lab File ID: SEQ-CCV1.D

Sequence: 0E14711

Lab Sample ID: 0E14711-CCV1

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Calibration: 0141001

Calibration Date: 05/16/10 05:53

Injection Date: 05/24/10

Injection Time: 10:52

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	109.8	0.9538096	1.047649		9.8	20
Ethylbenzene	A	100.0	95.94	2.625901	2.519327		-4.1	20
Toluene	A	100.0	98.54	1.306087	1.286976		-1.5	20
Xylenes (total)	A	300.0	280.5	1.983846	1.854538		-6.5	20
Bromofluorobenzene	A	30.00	29.31	0.806614	0.7879886		-2.3	20
Dibromofluoromethane	A	30.00	29.31	0.2558456	0.2499478		-2.3	20
1,2-Dichloroethane-d4	A	30.00	29.36	6.111453E-02	5.980784E-02		-2.1	20
Toluene-d8	A	30.00	28.22	2.151044	2.023382		-5.9	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_009	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0E24008-BLK1	File ID:	V1BLK01.D
Sampled:		Prepared:		Analyzed:	05/24/10 12:51
Solids:		Preparation:	5035	Dilution:	

Batch: 0E24008 Sequence: 0E14711 Calibration: 0141001 Instrument: MS-VOA1

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	32.00	107	85 - 120	
Dibromofluoromethane	30.00	30.87	103	80 - 125	
1,2-Dichloroethane-d4	30.00	32.04	107	75 - 140	
Toluene-d8	30.00	29.99	100	85 - 115	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E24008	Laboratory ID:	0E24008-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	56.52	113	75 - 125
Ethylbenzene	50.00	55.50	111	75 - 125
Toluene	50.00	55.18	110	70 - 125
Xylenes (total)	150.0	164.2	109	75 - 125

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8260B

32SD-01-0006

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Matrix: Solid

Batch: 0E24008

% Solids: 81.47

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Source Sample Name: **1005021-01**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzene	60.29	ND	63.61	106		75 - 125
Ethylbenzene	60.29	ND	60.85	101		75 - 125
Toluene	60.29	ND	61.63	102		70 - 125
Xylenes (total)	180.9	ND	178.2	98.5		75 - 125

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS	
						RPD	REC.
Benzene	57.57	59.04	103	7.46		30	75 - 125
Ethylbenzene	57.57	56.04	97.3	8.22		30	75 - 125
Toluene	57.57	56.18	97.6	9.26		30	70 - 125
Xylenes (total)	172.7	164.9	95.5	7.76		30	75 - 125

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_009

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E24008

Batch Matrix: Solid

Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E24008-BLK1	05/24/10 10:20	5.00	5.00
LCS	0E24008-BS1	05/24/10 10:20	5.00	5.00
32SD-01-0006	0E24008-MS1	05/24/10 10:20	5.09	5.00
32SD-01-0006	0E24008-MSD1	05/24/10 10:20	5.33	5.00
32SD-01-0006	1005021-01	05/24/10 11:42	5.37	5.00

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E12804	Instrument:	MS-VOA3
Calibration:	0128001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E12804-TUN1	SEQ-TUN1.D	05/07/10 13:11
Cal Standard	0E12804-CAL1	SEQ-CAL1.D	05/07/10 13:41
Cal Standard	0E12804-CAL2	SEQ-CAL2.D	05/07/10 14:11
Cal Standard	0E12804-CAL3	SEQ-CAL3.D	05/07/10 14:42
Cal Standard	0E12804-CAL4	SEQ-CAL4.D	05/07/10 15:12
Cal Standard	0E12804-CAL5	SEQ-CAL5.D	05/07/10 15:42
Cal Standard	0E12804-CAL6	SEQ-CAL6.D	05/07/10 16:13
Cal Standard	0E12804-CAL7	SEQ-CAL7.D	05/07/10 16:43
Cal Standard	0E12804-CAL8	SEQ-CAL8.D	05/07/10 17:13
Cal Standard	0E12804-CAL9	SEQ-CAL9.D	05/07/10 17:43
Initial Cal Check	0E12804-ICV1	SEQ-ICV1.D	05/07/10 18:14
Cal Standard	0E12804-CALA	SEQ-CALA.D	05/07/10 18:44
Cal Standard	0E12804-CALB	SEQ-CALB.D	05/07/10 19:14
Cal Standard	0E12804-CALC	SEQ-CALC.D	05/07/10 19:45
Cal Standard	0E12804-CALD	SEQ-CALD.D	05/07/10 20:15
Cal Standard	0E12804-CALE	SEQ-CALE.D	05/07/10 20:45
Cal Standard	0E12804-CALF	SEQ-CALF.D	05/07/10 21:15
Cal Standard	0E12804-CALG	SEQ-CALG.D	05/07/10 21:45
Cal Standard	0E12804-CALH	SEQ-CALH.D	05/07/10 22:15
Cal Standard	0E12804-CALI	SEQ-CALI.D	05/07/10 22:46
MS Tune	0E12804-TUN2	SEQ-TUN2.D	05/07/10 23:46
Cal Standard	0E12804-CALJ	SEQ-CALJ.D	05/08/10 00:16
Cal Standard	0E12804-CALK	SEQ-CALK.D	05/08/10 00:46
Cal Standard	0E12804-CALL	SEQ-CALL.D	05/08/10 01:16
Cal Standard	0E12804-CALM	SEQ-CALM.D	05/08/10 01:46
Cal Standard	0E12804-CALN	SEQ-CALN.D	05/08/10 02:16
Cal Standard	0E12804-CALO	SEQ-CALO.D	05/08/10 02:46
Cal Standard	0E12804-CALP	SEQ-CALP.D	05/08/10 03:16
Cal Standard	0E12804-CALQ	SEQ-CALQ.D	05/08/10 03:46
Cal Standard	0E12804-CALR	SEQ-CALR.D	05/08/10 04:16

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/07/10
Instrument ID:	MS-VOA3	Injection Time:	13:11
Sequence:	0E12804	Lab Sample ID:	0E12804-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	21	PASS
75	30 - 60% of 95	48.9	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.32	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	70.9	PASS
175	5 - 9% of 174	6.93	PASS
176	95 - 101% of 174	98.2	PASS
177	5 - 9% of 176	7.81	PASS

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0128001

Matrix: Water

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Instrument: MS-VOA3

Calibration Date: 5/7/2010 3:51:54PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	0.8513296	6.678909	12.36133	1.763584E-02			15	
Bromofluorobenzene	0.8488807	5.514613	17.231	2.208685E-02			15	
Ethylbenzene	2.118108	13.13578	16.44622	1.212614E-02			CCC (20)	
Naphthalene	1.667032	4.006895	20.51467	6.777849E-03			15	
Methyl t-Butyl Ether	0.5965014	2.839457	8.019	6.343752E-02			15	
Toluene	1.247637	7.830692	14.97533	1.596385E-02			CCC (20)	
m,p-Xylene	1.675735	11.16825	16.59938	9.642842E-03			15	
o-Xylene	1.74272	10.38945	16.915	1.710043E-02			15	
Xylenes (total)	1.65548	14.07832	0	0			15	
Dibromofluoromethane	0.2645697	1.31402	10.50167	1.966633E-02			15	
1,2-Dichloroethane-d4	5.822815E-02	1.9858	11.42044	3.477841E-03			15	
Toluene-d8	2.233741	7.557731	14.901	1.850725E-02			15	

INITIAL CALIBRATION DATA

SW8260B

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0128001

Matrix: Water

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Instrument: MS-VOA3

Calibration Date: 5/7/2010 3:51:54PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	0.5	0.9327359	1	0.8530789	2	0.8963187	5	0.8861681	10	0.8702683	50	0.8658091
Bromofluorobenzene	30	0.8753103	30	0.8711151	30	0.8836995	30	0.8838533	30	0.8830609	30	0.8667947
Ethylbenzene	0.5	2.340871	1	2.363477	2	2.270154	5	2.264944	10	2.261402	50	2.22059
Naphthalene	0.5	1.709822	1	1.662022	2	1.687884	5	1.670324	10	1.680615	50	1.71651
Methyl t-Butyl Ether	0.5	0.6292388	1	0.587448	2	0.5967256	5	0.5869144	10	0.6056585	50	0.600861
Toluene	0.5	1.334494	1	1.300532	2	1.337319	5	1.294521	10	1.299861	50	1.269326
m,p-Xylene	1	1.847045	2	1.803497	4	1.771053	10	1.73709	20	1.749037	100	1.708793
o-Xylene	0.5	1.925191	1	1.847349	2	1.886602	5	1.793533	10	1.842876	50	1.809921
Xylenes (total)	1.5	1.873094	3	1.818114	6	1.809569	15	1.755905	30	1.780317	150	1.742502
Dibromofluoromethane	30	0.26405	30	0.2654019	30	0.2679439	30	0.269411	30	0.2660265	30	0.2635822
1,2-Dichloroethane-d4	30	5.832724E-02	30	5.969276E-02	30	5.950816E-02	30	5.826555E-02	30	5.903404E-02	30	5.867149E-02
Toluene-d8	30	2.342085	30	2.382263	30	2.384284	30	2.343894	30	2.347006	30	2.22497

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0128001

Matrix: Water

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Instrument: MS-VOA3

Calibration Date: 5/7/2010 3:51:54PM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	100	0.824858	150	0.7783886	200	0.754341						
Bromofluorobenzene	30	0.8305129	30	0.7885503	30	0.7570297						
Ethylbenzene	100	1.999746	150	1.770237	200	1.571548						
Naphthalene	100	1.738267	150	1.625639	200	1.512204						
Methyl t-Butyl Ether	100	0.608605	150	0.5776147	200	0.5754462						
Toluene	100	1.210423	150	1.124325	200	1.05793						
m,p-Xylene	200	1.500056	300	1.289306	400	~~1.10086~~						
o-Xylene	100	1.665008	150	1.530729	200	1.383268						
Xylenes (total)	300	1.55504	450	1.36978	600	1.194996						
Dibromofluoromethane	30	0.2660578	30	0.25877	30	0.2598842						
1,2-Dichloroethane-d4	30	5.732934E-02	30	0.0567267	30	5.649804E-02						
Toluene-d8	30	2.112862	30	2.039294	30	1.927015						

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0128001

Matrix: Water

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Instrument: MS-VOA3

Calibration Date: 5/7/2010 3:51:54PM

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene												
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane												
1,2-Dichloroethane-d4												
Toluene-d8												

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0128001

Matrix: Water

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Instrument: MS-VOA3

Calibration Date: 5/7/2010 3:51:54PM

Compound	Level 19		Level 20		Level 21		Level 22		Level 23		Level 24	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene												
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane												
1,2-Dichloroethane-d4												
Toluene-d8												

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/07/10
Instrument ID:	MS-VOA3	Injection Time:	23:46
Sequence:	0E12804	Lab Sample ID:	0E12804-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	20.1	PASS
75	30 - 60% of 95	49.7	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.39	PASS
173	Less than 2% of 174	0.632	PASS
174	50 - 200% of 95	71	PASS
175	5 - 9% of 174	7.33	PASS
176	95 - 101% of 174	98.7	PASS
177	5 - 9% of 176	5.91	PASS

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13414	Instrument:	MS-VOA3
Calibration:	0128001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13414-TUN1	SEQ-TUN2.D	05/13/10 05:16
Calibration Check	0E13414-CCV1	SEQ-CCV4.D	05/13/10 05:46
LCS	0E12945-BS1	V3LCS04.D	05/13/10 06:46
Blank	0E12945-BLK1	BLK3.D	05/13/10 08:46
32SS-TB042910-01	1005021-06	0502106.D	05/13/10 12:39
32SS-RB042910-05	1005021-05	0502105.D	05/13/10 15:55

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/13/10
Instrument ID:	MS-VOA3	Injection Time:	05:16
Sequence:	0E13414	Lab Sample ID:	0E13414-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	20.1	PASS
75	30 - 60% of 95	49	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.75	PASS
173	Less than 2% of 174	0.787	PASS
174	50 - 200% of 95	74.5	PASS
175	5 - 9% of 174	6.96	PASS
176	95 - 101% of 174	99.1	PASS
177	5 - 9% of 176	6.64	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA3	Calibration:	0128001
Lab File ID:	SEQ-CCV4.D	Calibration Date:	05/07/10 15:51
Sequence:	0E13414	Injection Date:	05/13/10
Lab Sample ID:	0E13414-CCV1	Injection Time:	05:46

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	96.50	0.8513296	0.8215692		-3.5	20
Ethylbenzene	A	100.0	97.40	2.118108	2.063012		-2.6	20
Toluene	A	100.0	96.92	1.247637	1.209269		-3.1	20
Xylenes (total)	A	300.0	287.5	1.65548	1.627965		-1.7	20
Bromofluorobenzene	A	30.00	28.48	0.8488807	0.8060376		-5.0	20
Dibromofluoromethane	A	30.00	29.12	0.2645697	0.256834		-2.9	20
1,2-Dichloroethane-d4	A	30.00	27.59	5.822815E-02	5.355129E-02		-8.0	20
Toluene-d8	A	30.00	28.59	2.233741	2.128892		-4.7	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_009
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Matrix:
Laboratory ID: 0E12945-BLK1
File ID: BLK3.D
Sampled:
Prepared:
Analyzed: 05/13/10 08:46
Solids:
Preparation: 5030B
Dilution:
Batch: 0E12945
Sequence: 0E13414
Calibration: 0128001
Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.77	99.2	75 - 120	
Dibromofluoromethane	30.00	29.97	99.9	85 - 115	
1,2-Dichloroethane-d4	30.00	30.01	100	70 - 120	
Toluene-d8	30.00	31.81	106	85 - 120	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_009

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Water

Batch: 0E12945

Laboratory ID: 0E12945-BS1

Preparation: 5030B

Initial/Final: 5 mL / 5 mL

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	49.1	98.1	80 - 120
Ethylbenzene	50.00	52.5	105	75 - 125
Toluene	50.00	48.2	96.5	75 - 120
Xylenes (total)	150.0	153	102	75 - 130

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_009

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E12945 Batch Matrix: Water

Preparation: 5030B

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E12945-BLK1	05/12/10 00:00	5.00	5.00
LCS	0E12945-BS1	05/12/10 00:00	5.00	5.00
32SS-RB042910-05	1005021-05	05/12/10 00:00	5.00	5.00
32SS-TB042910-01	1005021-06	05/12/10 00:00	5.00	5.00

OK 5/13/10

05/27/10

ANALYSIS SEQUENCE SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E14024
Calibration: 0144005

SDG: CTOF273_009
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14024-TUN1	SEQ-TUN1.D	05/13/10 13:56
Cal Standard	0E14024-CAL1	SEQ-CAL1.D	05/13/10 14:27
Cal Standard	0E14024-CAL2	SEQ-CAL2.D	05/13/10 14:58
Cal Standard	0E14024-CAL3	SEQ-CAL3.D	05/13/10 15:29
Cal Standard	0E14024-CAL4	SEQ-CAL4.D	05/13/10 16:00
Cal Standard	0E14024-CAL5	SEQ-CAL5.D	05/13/10 16:31
Cal Standard	0E14024-CAL6	SEQ-CAL6.D	05/13/10 17:02
Cal Standard	0E14024-CAL7	SEQ-CAL7.D	05/13/10 17:33
Cal Standard	0E14024-CAL8	SEQ-CAL8.D	05/13/10 18:03
Cal Standard	0E14024-CAL9	SEQ-CAL9.D	05/13/10 19:05
Cal Standard	0E14024-CALA	SEQ-CALA.D	05/13/10 19:36
Cal Standard	0E14024-CALB	SEQ-CALB.D	05/13/10 20:07
Cal Standard	0E14024-CALC	SEQ-CALC.D	05/13/10 20:38
Cal Standard	0E14024-CALD	SEQ-CALD.D	05/13/10 21:09
Cal Standard	0E14024-CALE	SEQ-CALE.D	05/13/10 21:39
Cal Standard	0E14024-CALF	SEQ-CALF.D	05/13/10 22:10
Cal Standard	0E14024-CALG	SEQ-CALG.D	05/13/10 22:41
MS Tune	0E14024-TUN2	SEQ-TUN2.D	05/13/10 23:42
Cal Standard	0E14024-CALH	SEQ-CALH.D	05/14/10 00:13
Cal Standard	0E14024-CALI	SEQ-CALI.D	05/14/10 00:44
Cal Standard	0E14024-CALJ	SEQ-CALJ.D	05/14/10 01:14
Cal Standard	0E14024-CALK	SEQ-CALK.D	05/14/10 01:45
Cal Standard	0E14024-CALL	SEQ-CALL.D	05/14/10 02:16
Cal Standard	0E14024-CALM	SEQ-CALM.D	05/14/10 02:46
Cal Standard	0E14024-CALN	SEQ-CALN.D	05/14/10 03:17
Cal Standard	0E14024-CALO	SEQ-CALO.D	05/14/10 03:48
MS Tune	0E14024-TUN3	SEQ-TUN1A.D	05/14/10 11:07
Initial Cal Check	0E14024-ICV4	SEQ-ICV4.D	05/14/10 11:37

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/13/10
Instrument ID:	MS-VOA4	Injection Time:	13:56
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	24.2	PASS
75	30 - 60% of 95	46.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.6	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	72.9	PASS
175	5 - 9% of 174	8.01	PASS
176	95 - 101% of 174	97.4	PASS
177	5 - 9% of 176	6.63	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN2.D	Injection Date:	05/13/10
Instrument ID:	MS-VOA4	Injection Time:	23:42
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	27.6	PASS
75	30 - 60% of 95	49	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.84	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	50.2	PASS
175	5 - 9% of 174	7.16	PASS
176	95 - 101% of 174	95.8	PASS
177	5 - 9% of 176	7.75	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1A.D	Injection Date:	05/14/10
Instrument ID:	MS-VOA4	Injection Time:	11:07
Sequence:	0E14024	Lab Sample ID:	0E14024-TUN3

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	25.5	PASS
75	30 - 60% of 95	48.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.2	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	62.6	PASS
175	5 - 9% of 174	8.21	PASS
176	95 - 101% of 174	95.7	PASS
177	5 - 9% of 176	6.95	PASS

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0144005

Matrix: Solid

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Instrument: MS-VOA4

Calibration Date: 5/13/2010 12:58:00PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	1.044291	4.652266	13.76237	3.391041E-02			15	
Bromofluorobenzene	0.8537608	7.34618	18.281	8.410647E-03			15	
Ethylbenzene	2.698668	13.33057	17.47429	6.927592E-03			CCC (20)	
Naphthalene	1.996388	5.075341	21.90313	1.378937E-02			15	
Methyl t-Butyl Ether	0.7267424	7.117503	10.3995	0.1372416			15	
Toluene	1.328513	13.22851	16.0955	5.342824E-03			CCC (20)	
m,p-Xylene	2.002384	18.89119	17.62343	2.237986E-02		0.9993129	0.99	
o-Xylene	1.977768	14.16671	17.947	1.172407E-02			15	
Xylenes (total)	2.00992	17.15348	0	0		0.9991333	0.99	
Dibromofluoromethane	0.2871282	2.648676	12.29125	3.601698E-02			15	
1,2-Dichloroethane-d4	6.763165E-02	4.751393	12.97875	3.193036E-02			15	
Toluene-d8	1.971808	5.830891	16.02787	1.491481E-02			15	

INITIAL CALIBRATION DATA

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0144005	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/13/2010 12:58:00PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	2	1.036366	5	1.067105	10	0.9843456	20	1.10997	50	1.077942	100	1.086138
Bromofluorobenzene	30	0.9035148	30	0.9571747	30	0.8731974	30	0.8902059	30	0.8245535	30	0.8193029
Ethylbenzene	2	3.143056	5	3.05004	10	2.737193	20	2.883795	50	2.513633	100	2.418378
Naphthalene	2	2.078406	5	1.983331	10	1.914312	20	1.870742	50	1.902599	100	2.080679
Methyl t-Butyl Ether	2	0.7081603	5	0.676929	10	0.6556261	20	0.7027104	50	0.7309727	100	0.7905091
Toluene	2	1.463183	5	1.521538	10	1.446754	20	1.474482	50	1.314986	100	1.222235
m,p-Xylene	4	2.506911	10	2.370684	20	2.083337	40	2.133943	100	1.789652	200	1.662296
o-Xylene	2	~~2.308337~~	5	2.429571	10	2.030316	20	2.119764	50	1.835088	100	1.821505
Xylenes (total)	6	2.44072	15	2.390313	30	2.065663	60	2.129216	150	1.804797	300	1.715366
Dibromofluoromethane	30	0.273298	30	0.2843417	30	0.279687	30	0.2884724	30	0.2903404	30	0.2931575
1,2-Dichloroethane-d4	30	6.740232E-02	30	6.382306E-02	30	6.395501E-02	30	6.452364E-02	30	6.883676E-02	30	7.204757E-02
Toluene-d8	30	2.037457	30	2.08042	30	2.017173	30	2.112017	30	2.003245	30	1.863828

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0144005	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/13/2010 12:58:00PM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	150	1.012481	200	0.9799764								
Bromofluorobenzene	30	0.7861138	30	0.7760234	30		30		30		30	
Ethylbenzene	150	2.144581	200	~~1.952143~~								
Naphthalene	150	1.982337	200	2.158701								
Methyl t-Butyl Ether	150	0.746068	200	0.802964								
Toluene	150	1.128493	200	1.05643								
m,p-Xylene	300	1.469862	400	~~1.297473~~								
o-Xylene	150	1.630361	200	~~1.444647~~								
Xylenes (total)	450	1.523362	600	~~1.346531~~								
Dibromofluoromethane	30	0.291495	30	0.2962335	30		30		30		30	
1,2-Dichloroethane-d4	30	7.041683E-02	30	7.004798E-02	30		30		30		30	
Toluene-d8	30	1.861277	30	1.79905	30		30		30		30	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0144005

Matrix: Solid

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Instrument: MS-VOA4

Calibration Date: 5/13/2010 12:58:00PM

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene	30		30		30		30		30		30	
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane	30		30		30		30		30		30	
1,2-Dichloroethane-d4	30		30		30		30		30		30	
Toluene-d8	30		30		30		30		30		30	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0144005

Matrix: Solid

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Instrument: MS-VOA4

Calibration Date: 5/13/2010 12:58:00PM

Compound	Level 19		Level 20		Level 21		Level 22		Level 23		Level 24	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene	30		30		30		30		30		30	
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane	30		30		30		30		30		30	
1,2-Dichloroethane-d4	30		30		30		30		30		30	
Toluene-d8	30		30		30		30		30		30	

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14605	Instrument:	MS-VOA4
Calibration:	0144005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14605-TUN1	SEQ-TUN1.D	05/18/10 10:14
Calibration Check	0E14605-CCV1	SEQ-CCV1.D	05/18/10 11:25
LCS	0E18013-BS1	V4LCS01.D	05/18/10 12:28
Blank	0E18013-BLK1	V4BLK01.D	05/18/10 14:00
32SD-03-0006	1005021-03	0502103.D	05/18/10 16:45

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/18/10
Instrument ID:	MS-VOA4	Injection Time:	10:14
Sequence:	0E14605	Lab Sample ID:	0E14605-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	23.4	PASS
75	30 - 60% of 95	44.5	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.16	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	62.4	PASS
175	5 - 9% of 174	8.15	PASS
176	95 - 101% of 174	97.9	PASS
177	5 - 9% of 176	6.78	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0144005
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/13/10 12:58
Sequence:	0E14605	Injection Date:	05/18/10
Lab Sample ID:	0E14605-CCV1	Injection Time:	11:25

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	101.9	1.044291	1.064025		1.9	20
Ethylbenzene	A	100.0	92.49	2.698668	2.495973		-7.5	20
Toluene	A	100.0	98.11	1.328513	1.303417		-1.9	20
Xylenes (total)	Q	300.0	287.6	2.00992	1.669		-4.1	20
Bromofluorobenzene	A	30.00	26.30	0.8537608	0.7483983		-12.3	20
Dibromofluoromethane	A	30.00	28.58	0.2871282	0.2735643		-4.7	20
1,2-Dichloroethane-d4	A	30.00	24.83	6.763165E-02	5.598046E-02		-17.2	20
Toluene-d8	A	30.00	28.81	1.971808	1.893586		-4.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS DATA SHEET

Blank

Laboratory: Empirical Laboratories, LLC
SDG: CTOF273_009
Client: Tetra Tech NUS, Inc. (T010)
Project: CTOF273 NSA Crane SMU32
Matrix:
Laboratory ID: 0E18013-BLK1
File ID: V4BLK01.D
Sampled:
Prepared:
Analyzed: 05/18/10 14:00
Solids:
Preparation: 5035
Dilution:
Batch: 0E18013
Sequence: 0E14605
Calibration: 0144005
Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	32.76	109	85 - 120	
Dibromofluoromethane	30.00	31.56	105	80 - 125	
1,2-Dichloroethane-d4	30.00	32.14	107	75 - 140	
Toluene-d8	30.00	31.48	105	85 - 115	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0E18013	Laboratory ID:	0E18013-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	45.96	91.9	75 - 125
Ethylbenzene	50.00	49.81	99.6	75 - 125
Toluene	50.00	51.73	103	70 - 125
Xylenes (total)	150.0	155.9	104	75 - 125

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_009

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E18013

Batch Matrix: Solid

Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E18013-BLK1	05/18/10 09:59	5.00	5.00
LCS	0E18013-BS1	05/18/10 09:59	5.00	5.00
32SD-03-0006	1005021-03	05/16/10 15:47	5.38	5.00

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14304	Instrument:	MS-VOA4
Calibration:	0144005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E14304-TUN1	SEQ-TUN1.D	05/20/10 05:46
Calibration Check	0E14304-CCV1	SEQ-CCV1.D	05/20/10 06:17
LCS	0E22001-BS1	V4LCS01.D	05/20/10 07:19
32SD-02-0006	1005021-02RE1	0502102D.D	05/20/10 13:58

BLK 5/20/10 08:51

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/20/10
Instrument ID:	MS-VOA4	Injection Time:	05:46
Sequence:	0E14304	Lab Sample ID:	0E14304-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	25.3	PASS
75	30 - 60% of 95	48	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.26	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	70.3	PASS
175	5 - 9% of 174	8.62	PASS
176	95 - 101% of 174	97.7	PASS
177	5 - 9% of 176	6.62	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0144005
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/13/10 12:58
Sequence:	0E14304	Injection Date:	05/20/10
Lab Sample ID:	0E14304-CCV1	Injection Time:	06:17

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	102.0	1.044291	1.065014		2.0	20
Ethylbenzene	A	100.0	86.05	2.698668	2.322177		-14.0	20
Toluene	A	100.0	94.61	1.328513	1.256943		-5.4	20
Xylenes (total)	Q	300.0	281.4	2.00992	1.635669		-6.2	20
Bromofluorobenzene	A	30.00	29.32	0.8537608	0.8344805		-2.3	20
Dibromofluoromethane	A	30.00	30.86	0.2871282	0.2953508		2.9	20
1,2-Dichloroethane-d4	A	30.00	27.42	6.763165E-02	6.181878E-02		-8.6	20
Toluene-d8	A	30.00	31.09	1.971808	2.043507		3.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

Data File: \\ELABNSH05\TARGET\chem\voa4.i\052010V4.b\V4BLK01.D
Report Date: 22-May-2010 07:39

Empirical Laboratories, LLC

Data file : \\ELABNSH05\TARGET\chem\voa4.i\052010V4.b\V4BLK01.D
Lab Smp Id: 0E22001-BLK1 Client Smp ID: 0E22001-BLK1
Inj Date : 20-MAY-2010 08:51 MS Autotune Date: 07-MAY-2010 17:53
Operator : ADM Inst ID: voa4.i
Smp Info : 0E22001-BLK1;;;;;
Misc Info : ;3;;;;gm-allap9.sub;
Comment :
Method : \\ELABNSH05\TARGET\chem\voa4.i\052010V4.b\VSOIL4.m
Meth Date : 22-May-2010 07:09 ghallquist Quant Type: ISTD
Cal Date : 07-MAY-2010 22:52 Cal File: SEQ-CAL8.D
Als bottle: 7 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: gm-allap9.sub
Target Version: 4.04
Processing Host: TARGET03_VM

Concentration Formula: Amt * DF * 5*Uf/(Ws*(Solids/100))

Name	Value	Description
DF	1.000	Dilution Factor
Uf	1.000	unit correction factor
Ws	5.000	Weight of sample extracted (g)
Solids	100.000	Percent Solids

5/22/10

5-26-10

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/Kg)	FINAL (ug/Kg)
* 59 Fluorobenzene	96	14.077	14.078	(1.000)	949596	30.0000	
10 Acetonitrile	41	7.170	7.176	(0.509)	175860	159.836	159.8
12 Acetone	43	7.416	7.407	(0.527)	13612	4.30123	4.301(a)
20 Methylene chloride	84	8.557	8.558	(0.608)	174339	10.8956	10.90
37 Hexane	57	11.578	11.585	(0.822)	71212	2.74531	2.745(a)
$ 46 Dibromofluoromethane	111	12.326	12.336	(0.876)	272624	29.9965	30.00
$ 50 1,2-Dichloroethane-d4	102	13.015	13.015	(0.925)	63280	29.5596	29.56
$ 77 Toluene-d8	98	16.045	16.056	(0.926)	832839	32.3884	32.39
* 87 Chlorobenzene-d5	82	17.324	17.325	(1.000)	391226	30.0000	(Q)
$ 101 Bromofluorobenzene	95	18.299	18.309	(1.056)	358211	32.1733	32.17
* 112 1,4-Dichlorobenzene-d4	152	19.381	19.382	(1.000)	333121	30.0000	(Q)
118 1,2,4-Trichlorobenzene	180	21.615	21.615	(1.115)	3297	0.30339	0.3034(a)

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_009

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0E22001

Laboratory ID: 0E22001-BS1

Preparation: 5035

Initial/Final: 5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	47.80	95.6	75 - 125
Ethylbenzene	50.00	46.87	93.7	75 - 125
Toluene	50.00	49.99	100	70 - 125
Xylenes (total)	150.0	146.0	97.3	75 - 125

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_009

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E22001

Batch Matrix: Solid

Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
LCS	0E22001-BS1	05/20/10 00:00	5.00	5.00
32SD-02-0006	1005021-02RE1	05/20/10 00:00	5.01	5.00

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E13414

SDG: CTOF273_009
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA3
Calibration: 0128001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E13414-CCV1)			Lab File ID: SEQ-CCV4.D			Analyzed: 05/13/10 05:46			
Fluorobenzene	1191680	12.681	1370254	12.699	87	50 - 200	-0.0180	+/-0.50	
Chlorobenzene-d5	520900	16.246	547120	16.258	95	50 - 200	-0.0120	+/-0.50	
1,4-Dichlorobenzene-d4	516406	18.241	538426	18.247	96	50 - 200	-0.0060	+/-0.50	
LCS (0E12945-BS1)			Lab File ID: V3LCS04.D			Analyzed: 05/13/10 06:46			
Fluorobenzene	1173317	12.681	1191680	12.681	98	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	501834	16.246	520900	16.246	96	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	491281	18.235	516406	18.241	95	50 - 200	-0.0060	+/-0.50	
Blank (0E12945-BLK1)			Lab File ID: BLK3.D			Analyzed: 05/13/10 08:46			
Fluorobenzene	1070862	12.681	1191680	12.681	90	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	429153	16.239	520900	16.246	82	50 - 200	-0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	403174	18.235	516406	18.241	78	50 - 200	-0.0060	+/-0.50	
32SS-TB042910-01 (1005021-06)			Lab File ID: 0502106.D			Analyzed: 05/13/10 12:39			
Fluorobenzene	992755	12.681	1191680	12.681	83	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	404602	16.24	520900	16.246	78	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	376332	18.235	516406	18.241	73	50 - 200	-0.0060	+/-0.50	
32SS-RB042910-05 (1005021-05)			Lab File ID: 0502105.D			Analyzed: 05/13/10 15:55			
Fluorobenzene	947379	12.681	1191680	12.681	79	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	386003	16.24	520900	16.246	74	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	361325	18.235	516406	18.241	70	50 - 200	-0.0060	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E14605

SDG: CTOF273_009
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0144005

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E14605-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/18/10 11:25			
Fluorobenzene	969231	14.075	822611	14.04	118	50 - 200	0.0350	+/-0.50	
Chlorobenzene-d5	439536	17.332	341417	17.297	129	50 - 200	0.0350	+/-0.50	
1,4-Dichlorobenzene-d4	255022	19.388	297455	19.354	86	50 - 200	0.0340	+/-0.50	
LCS (0E18013-BS1)			Lab File ID: V4LCS01.D			Analyzed: 05/18/10 12:28			
Fluorobenzene	970065	14.078	969231	14.075	100	50 - 200	0.0030	+/-0.50	
Chlorobenzene-d5	391086	17.325	439536	17.332	89	50 - 200	-0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	278160	19.382	255022	19.388	109	50 - 200	-0.0060	+/-0.50	
Blank (0E18013-BLK1)			Lab File ID: V4BLK01.D			Analyzed: 05/18/10 14:00			
Fluorobenzene	936825	14.076	969231	14.075	97	50 - 200	0.0010	+/-0.50	
Chlorobenzene-d5	392684	17.323	439536	17.332	89	50 - 200	-0.0090	+/-0.50	
1,4-Dichlorobenzene-d4	330884	19.379	255022	19.388	130	50 - 200	-0.0090	+/-0.50	
32SD-03-0006 (1005021-03)			Lab File ID: 0502103.D			Analyzed: 05/18/10 16:45			
Fluorobenzene	354793	14.073	969231	14.075	37	50 - 200	-0.0020	+/-0.50	*
Chlorobenzene-d5	142691	17.32	439536	17.332	32	50 - 200	-0.0120	+/-0.50	*
1,4-Dichlorobenzene-d4	118485	19.376	255022	19.388	46	50 - 200	-0.0120	+/-0.50	*

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E14304

SDG: CTOF273_009
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0144005

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E14304-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/20/10 06:17			
Fluorobenzene	912603	14.078	822611	14.04	111	50 - 200	0.0380	+/-0.50	
Chlorobenzene-d5	412326	17.325	341417	17.297	121	50 - 200	0.0280	+/-0.50	
1,4-Dichlorobenzene-d4	280234	19.382	297455	19.354	94	50 - 200	0.0280	+/-0.50	
LCS (0E22001-BS1)			Lab File ID: V4LCS01.D			Analyzed: 05/20/10 07:19			
Fluorobenzene	879243	14.07	912603	14.078	96	50 - 200	-0.0080	+/-0.50	
Chlorobenzene-d5	386057	17.327	412326	17.325	94	50 - 200	0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	294877	19.383	280234	19.382	105	50 - 200	0.0010	+/-0.50	
32SD-02-0006 (1005021-02RE1)			Lab File ID: 0502102D.D			Analyzed: 05/20/10 13:58			
Fluorobenzene	840978	14.064	912603	14.078	92	50 - 200	-0.0140	+/-0.50	
Chlorobenzene-d5	341975	17.321	412326	17.325	83	50 - 200	-0.0040	+/-0.50	
1,4-Dichlorobenzene-d4	291872	19.378	280234	19.382	104	50 - 200	-0.0040	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E14711

SDG: CTOF273_009
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA1
Calibration: 0141001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0E14711-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/24/10 10:52			
Fluorobenzene	2531909	14.57	2403751	14.57	105	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1200355	20.321	960429	20.321	125	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	906186	24.807	805672	24.823	112	50 - 200	-0.0160	+/-0.50	
LCS (0E24008-BS1)			Lab File ID: V1LCS1.D			Analyzed: 05/24/10 11:32			
Fluorobenzene	2694225	14.563	2531909	14.57	106	50 - 200	-0.0070	+/-0.50	
Chlorobenzene-d5	1172563	20.315	1200355	20.321	98	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	895195	24.802	906186	24.807	99	50 - 200	-0.0050	+/-0.50	
Blank (0E24008-BLK1)			Lab File ID: V1BLK01.D			Analyzed: 05/24/10 12:51			
Fluorobenzene	2572939	14.571	2531909	14.57	102	50 - 200	0.0010	+/-0.50	
Chlorobenzene-d5	1101911	20.319	1200355	20.321	92	50 - 200	-0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	919991	24.806	906186	24.807	102	50 - 200	-0.0010	+/-0.50	
32SD-01-0006 (1005021-01)			Lab File ID: 0502101.D			Analyzed: 05/24/10 18:51			
Fluorobenzene	2799409	14.576	2531909	14.57	111	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1130275	20.318	1200355	20.321	94	50 - 200	-0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	911949	24.815	906186	24.807	101	50 - 200	0.0080	+/-0.50	
Matrix Spike (0E24008-MS1)			Lab File ID: 0502101M.D			Analyzed: 05/24/10 19:31			
Fluorobenzene	2722607	14.576	2531909	14.57	108	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1161461	20.314	1200355	20.321	97	50 - 200	-0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	864261	24.819	906186	24.807	95	50 - 200	0.0120	+/-0.50	
Matrix Spike Dup (0E24008-MSD1)			Lab File ID: 0502101S.D			Analyzed: 05/24/10 20:10			
Fluorobenzene	2716716	14.575	2531909	14.57	107	50 - 200	0.0050	+/-0.50	
Chlorobenzene-d5	1188298	20.313	1200355	20.321	99	50 - 200	-0.0080	+/-0.50	
1,4-Dichlorobenzene-d4	871383	24.816	906186	24.807	96	50 - 200	0.0090	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0F15210

SDG: CTOF273_009
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA1
Calibration: 0141001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15210-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/21/10 16:29			
Fluorobenzene	2662943	14.59	2403751	14.57	111	50 - 200	0.0200	+/-0.50	
Chlorobenzene-d5	1157308	20.342	960429	20.321	120	50 - 200	0.0210	+/-0.50	
1,4-Dichlorobenzene-d4	837707	24.832	805672	24.823	104	50 - 200	0.0090	+/-0.50	
LCS (0E21026-BS1)			Lab File ID: V1LCS1.D			Analyzed: 05/21/10 17:08			
Fluorobenzene	2759485	14.58	2662943	14.59	104	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	1150251	20.335	1157308	20.342	99	50 - 200	-0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	841774	24.822	837707	24.832	100	50 - 200	-0.0100	+/-0.50	
Blank (0E21026-BLK2)			Lab File ID: V1MBLK1.D			Analyzed: 05/21/10 19:08			
Fluorobenzene	2551659	14.551	2662943	14.59	96	50 - 200	-0.0390	+/-0.50	
Chlorobenzene-d5	1070031	20.321	1157308	20.342	92	50 - 200	-0.0210	+/-0.50	
1,4-Dichlorobenzene-d4	852037	24.824	837707	24.832	102	50 - 200	-0.0080	+/-0.50	
32SD-FD-043010-01 (1005021-04RE2)			Lab File ID: 0502104D.D			Analyzed: 05/21/10 23:43			
Fluorobenzene	2817962	14.569	2662943	14.59	106	50 - 200	-0.0210	+/-0.50	
Chlorobenzene-d5	1084296	20.323	1157308	20.342	94	50 - 200	-0.0190	+/-0.50	
1,4-Dichlorobenzene-d4	914470	24.822	837707	24.832	109	50 - 200	-0.0100	+/-0.50	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E13414	Instrument:	MS-VOA3
		Calibration:	0128001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E13414-CCV1) ug/L				Lab File ID: SEQ-CCV4.D		Analyzed: 05/13/10 05:46		
Bromofluorobenzene	30.00	94.9	80 - 120	17.219	17.219	0.0000	+/-1.000	
Dibromofluoromethane	30.00	97.1	80 - 120	10.466	10.466	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	92.0	80 - 120	11.397	11.397	0.0000	+/-1.000	
Toluene-d8	30.00	95.3	80 - 120	14.889	14.889	0.0000	+/-1.000	
LCS (0E12945-BS1) ug/L				Lab File ID: V3LCS04.D		Analyzed: 05/13/10 06:46		
Bromofluorobenzene	30.00	97.1	75 - 120	17.219	17.219	0.0000	+/-1.000	
Dibromofluoromethane	30.00	98.4	85 - 115	10.472	10.466	0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	96.6	70 - 120	11.397	11.397	0.0000	+/-1.000	
Toluene-d8	30.00	99.2	85 - 120	14.889	14.889	0.0000	+/-1.000	
Blank (0E12945-BLK1) ug/L				Lab File ID: BLK3.D		Analyzed: 05/13/10 08:46		
Bromofluorobenzene	30.00	99.2	75 - 120	17.213	17.219	-0.0060	+/-1.000	
Dibromofluoromethane	30.00	99.9	85 - 115	10.466	10.466	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	100	70 - 120	11.391	11.397	-0.0060	+/-1.000	
Toluene-d8	30.00	106	85 - 120	14.889	14.889	0.0000	+/-1.000	
32SS-TB042910-01 (1005021-06) ug/L				Lab File ID: 0502106.D		Analyzed: 05/13/10 12:39		
Bromofluorobenzene	30.00	99.3	75 - 120	17.213	17.219	-0.0060	+/-1.000	
Dibromofluoromethane	30.00	101	85 - 115	10.472	10.466	0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	102	70 - 120	11.397	11.397	0.0000	+/-1.000	
Toluene-d8	30.00	106	85 - 120	14.889	14.889	0.0000	+/-1.000	
32SS-RB042910-05 (1005021-05) ug/L				Lab File ID: 0502105.D		Analyzed: 05/13/10 15:55		
Bromofluorobenzene	30.00	99.8	75 - 120	17.213	17.219	-0.0060	+/-1.000	
Dibromofluoromethane	30.00	104	85 - 115	10.466	10.466	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	103	70 - 120	11.391	11.397	-0.0060	+/-1.000	
Toluene-d8	30.00	106	85 - 120	14.889	14.889	0.0000	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0E14304	Instrument:	MS-VOA4
		Calibration:	0144005

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E14304-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/20/10 06:17		
Bromofluorobenzene	30.00	97.7	80 - 120	18.309	18.309	0.0000	+/-1.000	
Dibromofluoromethane	30.00	103	80 - 120	12.336	12.336	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	91.4	80 - 120	13.015	13.015	0.0000	+/-1.000	
Toluene-d8	30.00	104	80 - 120	16.056	16.056	0.0000	+/-1.000	
LCS (0E22001-BS1) ug/Kg wet				Lab File ID: V4LCS01.D		Analyzed: 05/20/10 07:19		
Bromofluorobenzene	30.00	101	85 - 120	18.301	18.309	-0.0080	+/-1.000	
Dibromofluoromethane	30.00	104	80 - 125	12.328	12.336	-0.0080	+/-1.000	
1,2-Dichloroethane-d4	30.00	93.4	75 - 140	13.007	13.015	-0.0080	+/-1.000	
Toluene-d8	30.00	106	85 - 115	16.048	16.056	-0.0080	+/-1.000	
32SD-02-0006 (1005021-02RE1) ug/Kg dry				Lab File ID: 0502102D.D		Analyzed: 05/20/10 13:58		
Bromofluorobenzene	37.14	107	85 - 120	18.305	18.309	-0.0040	+/-1.000	
Dibromofluoromethane	37.14	95.2	80 - 125	12.322	12.336	-0.0140	+/-1.000	
1,2-Dichloroethane-d4	37.14	90.1	75 - 140	13.001	13.015	-0.0140	+/-1.000	
Toluene-d8	37.14	111	85 - 115	16.042	16.056	-0.0140	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E14605

SDG: CTOF273_009
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA4
Calibration: 0144005

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E14605-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/18/10 11:25		
Bromofluorobenzene	30.00	87.7	80 - 120	18.306	18.306	0.0000	+/-1.000	
Dibromofluoromethane	30.00	95.3	80 - 120	12.333	12.333	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	82.8	80 - 120	13.022	13.022	0.0000	+/-1.000	
Toluene-d8	30.00	96.0	80 - 120	16.053	16.053	0.0000	+/-1.000	
LCS (0E18013-BS1) ug/Kg wet				Lab File ID: V4LCS01.D		Analyzed: 05/18/10 12:28		
Bromofluorobenzene	30.00	101	85 - 120	18.309	18.306	0.0030	+/-1.000	
Dibromofluoromethane	30.00	94.6	80 - 125	12.336	12.333	0.0030	+/-1.000	
1,2-Dichloroethane-d4	30.00	84.2	75 - 140	13.015	13.022	-0.0070	+/-1.000	
Toluene-d8	30.00	105	85 - 115	16.056	16.053	0.0030	+/-1.000	
Blank (0E18013-BLK1) ug/Kg wet				Lab File ID: V4BLK01.D		Analyzed: 05/18/10 14:00		
Bromofluorobenzene	30.00	109	85 - 120	18.307	18.306	0.0010	+/-1.000	
Dibromofluoromethane	30.00	105	80 - 125	12.334	12.333	0.0010	+/-1.000	
1,2-Dichloroethane-d4	30.00	107	75 - 140	13.013	13.022	-0.0090	+/-1.000	
Toluene-d8	30.00	105	85 - 115	16.053	16.053	0.0000	+/-1.000	
32SD-03-0006 (1005021-03) ug/Kg dry				Lab File ID: 0502103.D		Analyzed: 05/18/10 16:45		
Bromofluorobenzene	34.50	110	85 - 120	18.304	18.306	-0.0020	+/-1.000	
Dibromofluoromethane	34.50	98.9	80 - 125	12.331	12.333	-0.0020	+/-1.000	
1,2-Dichloroethane-d4	34.50	96.9	75 - 140	13.01	13.022	-0.0120	+/-1.000	
Toluene-d8	34.50	107	85 - 115	16.051	16.053	-0.0020	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0E14711

SDG: CTOF273_009
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA1
Calibration: 0141001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0E14711-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/24/10 10:52		
Bromofluorobenzene	30.00	97.7	80 - 120	22.455	22.455	0.0000	+/-1.000	
Dibromofluoromethane	30.00	97.7	80 - 120	12.41	12.41	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	97.9	80 - 120	13.193	13.193	0.0000	+/-1.000	
Toluene-d8	30.00	94.1	80 - 120	17.749	17.749	0.0000	+/-1.000	
LCS (0E24008-BS1) ug/Kg wet				Lab File ID: V1LCS1.D		Analyzed: 05/24/10 11:32		
Bromofluorobenzene	30.00	96.3	85 - 120	22.448	22.455	-0.0070	+/-1.000	
Dibromofluoromethane	30.00	98.1	80 - 125	12.404	12.41	-0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	92.8	75 - 140	13.187	13.193	-0.0060	+/-1.000	
Toluene-d8	30.00	98.9	85 - 115	17.742	17.749	-0.0070	+/-1.000	
Blank (0E24008-BLK1) ug/Kg wet				Lab File ID: V1BLK01.D		Analyzed: 05/24/10 12:51		
Bromofluorobenzene	30.00	107	85 - 120	22.452	22.455	-0.0030	+/-1.000	
Dibromofluoromethane	30.00	103	80 - 125	12.413	12.41	0.0030	+/-1.000	
1,2-Dichloroethane-d4	30.00	107	75 - 140	13.195	13.193	0.0020	+/-1.000	
Toluene-d8	30.00	100	85 - 115	17.748	17.749	-0.0010	+/-1.000	
32SD-01-0006 (1005021-01) ug/Kg dry				Lab File ID: 0502101.D		Analyzed: 05/24/10 18:51		
Bromofluorobenzene	34.29	108	85 - 120	22.456	22.455	0.0010	+/-1.000	
Dibromofluoromethane	34.29	98.8	80 - 125	12.415	12.41	0.0050	+/-1.000	
1,2-Dichloroethane-d4	34.29	86.1	75 - 140	13.198	13.193	0.0050	+/-1.000	
Toluene-d8	34.29	105	85 - 115	17.744	17.749	-0.0050	+/-1.000	
Matrix Spike (0E24008-MS1) ug/Kg dry				Lab File ID: 0502101M.D		Analyzed: 05/24/10 19:31		
Bromofluorobenzene	36.17	96.5	85 - 120	22.464	22.455	0.0090	+/-1.000	
Dibromofluoromethane	36.17	98.4	80 - 125	12.414	12.41	0.0040	+/-1.000	
1,2-Dichloroethane-d4	36.17	88.8	75 - 140	13.197	13.193	0.0040	+/-1.000	
Toluene-d8	36.17	100	85 - 115	17.741	17.749	-0.0080	+/-1.000	
Matrix Spike Dup (0E24008-MSD1) ug/Kg dry				Lab File ID: 0502101S.D		Analyzed: 05/24/10 20:10		
Bromofluorobenzene	34.54	96.4	85 - 120	22.462	22.455	0.0070	+/-1.000	
Dibromofluoromethane	34.54	99.3	80 - 125	12.416	12.41	0.0060	+/-1.000	
1,2-Dichloroethane-d4	34.54	88.7	75 - 140	13.198	13.193	0.0050	+/-1.000	
Toluene-d8	34.54	98.6	85 - 115	17.741	17.749	-0.0080	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15210	Instrument:	MS-VOA1
		Calibration:	0141001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15210-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 05/21/10 16:29		
Bromofluorobenzene	30.00	95.6	80 - 120	22.476	22.476	0.0000	+/-1.000	
Dibromofluoromethane	30.00	94.2	80 - 120	12.43	12.43	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	79.1	80 - 120	13.213	13.213	0.0000	+/-1.000	*
Toluene-d8	30.00	99.0	80 - 120	17.755	17.755	0.0000	+/-1.000	
LCS (0E21026-BS1) ug/Kg wet				Lab File ID: V1LCS1.D		Analyzed: 05/21/10 17:08		
Bromofluorobenzene	30.00	94.5	85 - 120	22.467	22.476	-0.0090	+/-1.000	
Dibromofluoromethane	30.00	94.0	80 - 125	12.419	12.43	-0.0110	+/-1.000	
1,2-Dichloroethane-d4	30.00	81.6	75 - 140	13.218	13.213	0.0050	+/-1.000	
Toluene-d8	30.00	101	85 - 115	17.76	17.755	0.0050	+/-1.000	
Blank (0E21026-BLK2) ug/Kg wet				Lab File ID: V1MBLK1.D		Analyzed: 05/21/10 19:08		
Bromofluorobenzene	30.00	104	85 - 120	22.47	22.476	-0.0060	+/-1.000	
Dibromofluoromethane	30.00	90.3	80 - 125	12.407	12.43	-0.0230	+/-1.000	
1,2-Dichloroethane-d4	30.00	105	75 - 140	13.189	13.213	-0.0240	+/-1.000	
Toluene-d8	30.00	101	85 - 115	17.748	17.755	-0.0070	+/-1.000	
32SD-FD-043010-01 (1005021-04RE2) ug/Kg dry				Lab File ID: 0502104D.D		Analyzed: 05/21/10 23:43		
Bromofluorobenzene	31.24	107	85 - 120	22.464	22.476	-0.0120	+/-1.000	
Dibromofluoromethane	31.24	100	80 - 125	12.4	12.43	-0.0300	+/-1.000	
1,2-Dichloroethane-d4	31.24	89.7	75 - 140	13.196	13.213	-0.0170	+/-1.000	
Toluene-d8	31.24	103	85 - 115	17.735	17.755	-0.0200	+/-1.000	

Data for SW8270C (PAH) Forms

HOLDING TIME SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_009

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SD-01-0006	04/30/10 12:50	05/01/10 11:00	05/14/10 14:00	14.05	14.00	05/22/10 22:12	8.34	40.00	
32SD-02-0006	04/30/10 11:55	05/01/10 11:00	05/14/10 14:00	14.09	14.00	05/22/10 20:24	8.27	40.00	
32SD-03-0006	04/30/10 12:10	05/01/10 11:00	05/14/10 14:00	14.08	14.00	05/22/10 21:00	8.29	40.00	
32SD-FD-043010-01	04/30/10 00:00	05/01/10 11:00	05/14/10 14:00	14.58	14.00	05/25/10 03:14	10.55	40.00	
32SS-RB042910-05	04/29/10 15:30	05/01/10 11:00	05/13/10 14:45	13.97	7.00	05/22/10 21:07	9.27	40.00	*

ANALYSIS SEQUENCE SUMMARY
SW8270C

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 9L35713
Calibration: 0098001

SDG: CTOF273_009
Project: CTOF273 NSA Crane SMU32
Instrument: MS-BNA4

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	9L35713-TUN1	DF1112B1.D	11/12/09 15:24
Cal Standard	9L35713-CAL2	cal2.D	11/12/09 15:43
Cal Standard	9L35713-CAL3	cal3.D	11/12/09 16:16
Cal Standard	9L35713-CAL4	cal4.D	11/12/09 16:50
Cal Standard	9L35713-CAL5	cal5.D	11/12/09 17:24
Cal Standard	9L35713-CAL6	cal6.D	11/12/09 17:58
Cal Standard	9L35713-CAL7	cal7.D	11/12/09 18:32
Cal Standard	9L35713-CAL8	cal8.D	11/12/09 19:06
Cal Standard	9L35713-CAL9	cal9.D	11/12/09 19:40
Cal Standard	9L35713-CALA	cal10.D	11/12/09 20:14
Cal Standard	9L35713-CALB	cal11.D	11/12/09 20:48
Cal Standard	9L35713-CALC	cal12.D	11/12/09 21:22
Initial Cal Check	9L35713-ICV1	ICV1.D	11/12/09 21:55

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	DF1112B1.D	Injection Date:	11/12/09
Instrument ID:	MS-BNA4	Injection Time:	15:24
Sequence:	9L35713	Lab Sample ID:	9L35713-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	42.1	PASS
68	Less than 2% of 69	1.55	PASS
69	Less than 200% of 198	48.6	PASS
70	Less than 2% of 69	0.491	PASS
127	40 - 60% of 198	54.8	PASS
197	Less than 1% of 198	0.528	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.05	PASS
275	10 - 30% of 198	21.8	PASS
365	1 - 200% of 198	2.27	PASS
441	0.001 - 100% of 443	77.8	PASS
442	40 - 200% of 198	60.7	PASS
443	17 - 23% of 442	20.7	PASS

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Calibration: 0098001

Matrix: Water

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Instrument: MS-BNA4

Calibration Date: 11/12/2009 11:02:39AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.7457972	3.344503	9.800818	0.1353256			CCC (30)	
Acenaphthylene	0.9996575	4.521048	9.399819	0.1010786			15	
Anthracene	0.9948455	3.948054	13.76409	0.1121442			15	
Benzo(a)anthracene	0.7581512	9.598749	21.23564	8.644244E-02			15	
Benzo(a)pyrene	0.9592349	4.958823	25.12336	4.929242E-02			CCC (30)	
Benzo(b)fluoranthene	1.176864	5.852981	24.48764	8.052193E-02			15	
Benzo(g,h,i)perylene	0.8650452	8.212902	27.60627	8.125964E-02			15	
Benzo(k)fluoranthene	1.169451	7.140033	24.55273	7.841296E-02			15	
Chrysene	0.7324149	6.693602	21.33455	9.451961E-02			15	
Dibenz(a,h)anthracene	0.7647294	14.42237	27.17082	6.002815E-02			15	
Fluoranthene	1.030294	4.044356	17.02718	8.925874E-02			CCC (30)	
Fluorene	0.7457374	2.820772	11.06573	0.1195426			15	
2-Fluorobiphenyl	0.8655987	4.501562	8.293182	0.1186146			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	0.7715006	14.30866	27.10836	7.208997E-02			15	
1-Methylnaphthalene	0.7407783	4.834185	7.780455	0.1110235			15	
2-Methylnaphthalene	0.8009425	4.585363	7.604364	0.1026839			15	
Naphthalene	1.224033	6.200049	6.526273	0.1202152			15	
Nitrobenzene-d5							15	
Phenanthrene	1.064344	3.658701	13.61682	0.1199225			15	
Phenol-d6							15	
Pyrene	1.038027	4.119068	17.66	9.533415E-02			15	
Terphenyl-d14	0.776943	6.066613	18.31836	7.278378E-02			15	
2,4,6-Tribromophenol	0.1486418	13.96698	11.68556	0.1738714			15	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION DATA

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0098001	Instrument:	MS-BNA4
Matrix:	Water	Calibration Date:	11/12/2009 11:02:39AM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	0.05	0.7539309	0.1	0.7503073	0.25	0.768767	0.5	0.7568112	1	0.7370196	2	0.7459197
Acenaphthylene	0.05	0.9606713	0.1	0.9510809	0.25	0.9914017	0.5	0.9949361	1	0.9835879	2	1.00239
Anthracene	0.05	1.002039	0.1	0.9583342	0.25	1.009638	0.5	1.016999	1	0.9857789	2	1.008466
Benzo(a)anthracene	0.05	0.7163863	0.1	0.6525396	0.25	0.6686962	0.5	0.7311725	1	0.7139785	2	0.7422729
Benzo(a)pyrene	0.05	0.9180826	0.1	0.9277713	0.25	0.9171977	0.5	0.9521588	1	0.9076612	2	0.9364602
Benzo(b)fluoranthene	0.05	1.130268	0.1	1.07393	0.25	1.126651	0.5	1.142477	1	1.114895	2	1.156432
Benzo(g,h,i)perylene	0.05	0.8452024	0.1	0.7808392	0.25	0.7757333	0.5	0.857647	1	0.8120143	2	0.7948757
Benzo(k)fluoranthene	0.05	1.255414	0.1	1.209373	0.25	1.177126	0.5	1.184989	1	1.159359	2	1.167765
Chrysene	0.05	0.6824687	0.1	0.6600447	0.25	0.6802794	0.5	0.7632552	1	0.7224827	2	0.7411857
Dibenz(a,h)anthracene	0.05	0.6648759	0.1	0.6283833	0.25	0.6405993	0.5	0.7205704	1	0.7031075	2	0.682905
Fluoranthene	0.05	1.063796	0.1	0.9886064	0.25	1.02033	0.5	1.033758	1	1.019383	2	1.046735
Fluorene	0.05	0.7480492	0.1	0.7315194	0.25	0.7576392	0.5	0.7507404	1	0.7332491	2	0.7413528
2-Fluorobiphenyl	0.05	0.8404894	0.1	0.8723531	0.25	0.9006965	0.5	0.889582	1	0.8745376	2	0.8824086
2-Fluorophenol	0.1		0.2		0.5		1		2		4	
Indeno(1,2,3-cd)pyrene	0.05	0.6415542	0.1	0.6804172	0.25	0.6505592	0.5	0.7148773	1	0.6952532	2	0.6999829
1-Methylnaphthalene	0.05	0.76491	0.1	0.7638567	0.25	0.7834786	0.5	0.7478426	1	0.738161	2	0.7366986
2-Methylnaphthalene	0.05	0.8359801	0.1	0.7812343	0.25	0.8398501	0.5	0.802558	1	0.7961968	2	0.7948828
Naphthalene	0.05	1.347685	0.1	1.225697	0.25	1.261854	0.5	1.261558	1	1.214559	2	1.217678
Nitrobenzene-d5	0.05		0.1		0.25		0.5		1		2	
Phenanthrene	0.05	1.109967	0.1	1.048899	0.25	1.10165	0.5	1.088964	1	1.053725	2	1.069243
Phenol-d6	0.1		0.2		0.5		1		2		4	
Pyrene	0.05	1.023703	0.1	1.010517	0.25	1.044288	0.5	1.053237	1	1.022654	2	1.052758
Terphenyl-d14	0.05	0.8014743	0.1	0.792366	0.25	0.8388997	0.5	0.8485896	1	0.737305	2	0.7578167
2,4,6-Tribromophenol	0.1	~~9.940007E-02~~	0.2	~~9.698688E-02~~	0.5	0.1118322	1	0.1261892	2	0.1326213	4	0.1448347
Acenaphthene-d10	1		1		1		1		1		1	
Chrysene-d12	1		1		1		1		1		1	

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0098001	Instrument:	MS-BNA4
Matrix:	Water	Calibration Date:	11/12/2009 11:02:39AM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	5	0.7582583	10	0.7560949	20	0.7485443	40	0.7535901	50	0.6745263		
Acenaphthylene	5	1.055811	10	1.061519	20	1.0319	40	1.042741	50	0.9201937		
Anthracene	5	1.057032	10	1.03929	20	0.9809122	40	0.9700486	50	0.9147624		
Benzo(a)anthracene	5	0.8304942	10	0.8168799	20	0.752069	40	0.8753804	50	0.8397931		
Benzo(a)pyrene	5	1.028444	10	1.048643	20	0.9904805	40	0.9865028	50	0.9381823		
Benzo(b)fluoranthene	5	1.266465	10	1.271342	20	1.182943	40	1.269569	50	1.210528		
Benzo(g,h,i)perylene	5	0.9032267	10	0.9774642	20	0.9365976	40	0.9535296	50	0.8783668		
Benzo(k)fluoranthene	5	1.288024	10	1.226115	20	1.139186	40	1.062242	50	0.9943718		
Chrysene	5	0.8133009	10	0.7873273	20	0.7043946	40	0.7776537	50	0.7241708		
Dibenz(a,h)anthracene	5	0.8199422	10	0.8779499	20	0.8892525	40	0.9182126	50	0.8662251		
Fluoranthene	5	1.099824	10	1.089751	20	0.9905759	40	1.010809	50	0.9696705		
Fluorene	5	0.7774791	10	0.7614425	20	0.7485748	40	0.7571561	50	0.6959085		
2-Fluorobiphenyl	5	0.8813109	10	0.8771855	20	0.8678436	40	0.8781761	50	0.7570024		
2-Fluorophenol	10		20		40		80		100			
Indeno(1,2,3-cd)pyrene	5	0.8103948	10	0.8916495	20	0.8777567	40	0.9363458	50	0.8877157		
1-Methylnaphthalene	5	0.7586414	10	0.7422957	20	0.7298204	40	0.7388618	50	0.6439939		
2-Methylnaphthalene	5	0.8263398	10	0.8137484	20	0.8069974	40	0.8085536	50	0.7040261		
Naphthalene	5	1.247954	10	1.2342	20	1.210706	40	1.214362	50	1.02811		
Nitrobenzene-d5	5		10		20		40		50			
Phenanthrene	5	1.102685	10	1.083995	20	1.038977	40	1.028591	50	0.9810874		
Phenol-d6	10		20		40		80		100			
Pyrene	5	1.117608	10	1.100292	20	0.9886932	40	1.028681	50	0.9758617		
Terphenyl-d14	5	0.8024013	10	0.7986364	20	0.7150069	40	0.7429393	50	0.7109379		
2,4,6-Tribromophenol	10	0.1607078	20	0.165969	40	0.1673591	80	0.168706	100	0.1595565		
Acenaphthene-d10	1		1		1		1		1			
Chrysene-d12	1		1		1		1		1			

ANALYSIS SEQUENCE SUMMARY
SW8270C

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0F15409
Calibration: 0098001

SDG: CTOF273_009
Project: CTOF273 NSA Crane SMU32
Instrument: MS-BNA4

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15409-TUN1	SEQ-TUN1.D	05/22/10 14:01
Calibration Check	0F15409-CCV1	SEQ-CCV1.D	05/22/10 14:18
LCS	0E13315-BS1	E13315L1.D	05/22/10 15:27
Blank	0E13315-BLK1	E13315B1.D	05/22/10 16:01
32SS-RB042910-05	1005021-05	0502105.D	05/22/10 21:07

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Lab File ID: SEQ-TUN1.D

Instrument ID: MS-BNA4

Sequence: 0F15409

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Injection Date: 05/22/10

Injection Time: 14:01

Lab Sample ID: 0F15409-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	44.1	PASS
68	Less than 2% of 69	1.58	PASS
69	Less than 200% of 198	40.1	PASS
70	Less than 2% of 69	0.527	PASS
127	40 - 60% of 198	52.6	PASS
197	Less than 1% of 198	0.769	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.72	PASS
275	10 - 30% of 198	27.7	PASS
365	1 - 200% of 198	4.35	PASS
441	0.001 - 100% of 443	81.1	PASS
442	40 - 200% of 198	138	PASS
443	17 - 23% of 442	20.1	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0098001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	11/12/09 11:02
Sequence:	0F15409	Injection Date:	05/22/10
Lab Sample ID:	0F15409-CCV1	Injection Time:	14:18

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzo(a)anthracene	A	5.000	6.480	0.7581512	0.9825071		29.6	20 *
Benzo(a)pyrene	A	5.000	5.497	0.9592349	1.054589		9.9	20
Benzo(b)fluoranthene	A	5.000	5.114	1.176864	1.203678		2.3	20
Benzo(k)fluoranthene	A	5.000	5.179	1.169451	1.211374		3.6	20
Chrysene	A	5.000	6.414	0.7324149	0.9396101		28.3	20 *
Dibenz(a,h)anthracene	A	5.000	5.884	0.7647294	0.8999131		17.7	20
Indeno(1,2,3-cd)pyrene	A	5.000	6.115	0.7715006	0.94361		22.3	20 *
Naphthalene	A	5.000	4.976	1.224033	1.218054		-0.5	20
2-Fluorobiphenyl	A	5.000	4.862	0.8655987	0.8416767		-2.8	20
Terphenyl-d14	A	5.000	5.447	0.776943	0.8464514		8.9	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Water		
Batch:	0E13315	Laboratory ID:	0E13315-BS1
Preparation:	EXT_3510	Initial/Final:	1000 mL / 1 mL

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	1.000	1.326	133	58 - 141
Benzo(a)pyrene	1.000	1.085	109	31 - 142
Benzo(b)fluoranthene	1.000	1.109	111	42 - 156
Benzo(k)fluoranthene	1.000	1.131	113	49 - 165
Chrysene	1.000	1.367	137	51 - 155
Dibenz(a,h)anthracene	1.000	1.267	127	28 - 153
Indeno(1,2,3-cd)pyrene	1.000	1.343	134	20 - 167
Naphthalene	1.000	0.9236	92.4	39 - 125

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E13315-BLK1	File ID:	E13315B1.D
Sampled:		Prepared:		Analyzed:	05/22/10 16:01
Solids:		Preparation:	EXT_3510	Dilution:	

Batch: 0E13315 Sequence: 0F15409 Calibration: 0098001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	0.0340	0.0200	0.100	X, J
50-32-8	Benzo(a)pyrene		0.0200	0.100	U
205-99-2	Benzo(b)fluoranthene	0.0235	0.0200	0.100	J
207-08-9	Benzo(k)fluoranthene	0.0263	0.0200	0.100	J
218-01-9	Chrysene	0.0346	0.0200	0.100	X, J
53-70-3	Dibenz(a,h)anthracene		0.0200	0.100	U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0200	0.100	X, U
91-20-3	Naphthalene	0.379	0.0200	0.100	

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	34.56	69.1	34 - 167	
Terphenyl-d14	50.00	46.27	92.5	34 - 167	

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_009

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E13315 Batch Matrix: Water

Preparation: EXT_3510

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E13315-BLK1	05/13/10 14:45	1,000.00	1.00
LCS	0E13315-BS1	05/13/10 14:45	1,000.00	1.00
32SS-RB042910-05	1005021-05	05/13/10 14:45	1,060.00	1.00

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Sequence: 0E13201

Calibration: 0132007

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Instrument: MS-BNA3

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0E13201-TUN1	SEQ-TUN1.D	05/10/10 13:38
Cal Standard	0E13201-CAL1	SEQ-CAL1.D	05/10/10 14:34
Cal Standard	0E13201-CAL2	SEQ-CAL2.D	05/10/10 15:11
Cal Standard	0E13201-CAL3	SEQ-CAL3.D	05/10/10 15:47
Cal Standard	0E13201-CAL4	SEQ-CAL4.D	05/10/10 16:23
Cal Standard	0E13201-CAL5	SEQ-CAL5.D	05/10/10 16:59
Cal Standard	0E13201-CAL6	SEQ-CAL6.D	05/10/10 17:35
Cal Standard	0E13201-CAL7	SEQ-CAL7.D	05/10/10 18:12
Cal Standard	0E13201-CAL8	SEQ-CAL8.D	05/10/10 18:48
Cal Standard	0E13201-CAL9	SEQ-CAL9.D	05/10/10 19:24
Cal Standard	0E13201-CALA	SEQ-CALA.D	05/10/10 20:00
Cal Standard	0E13201-CALB	SEQ-CALB.D	05/10/10 20:37
Initial Cal Check	0E13201-ICV1	SEQ-ICV1.D	05/10/10 21:49

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Lab File ID: SEQ-TUN1.D

Instrument ID: MS-BNA3

Sequence: 0E13201

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Injection Date: 05/10/10

Injection Time: 13:38

Lab Sample ID: 0E13201-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	44.5	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	44.9	PASS
70	Less than 2% of 69	0.457	PASS
127	40 - 60% of 198	57.3	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.04	PASS
275	10 - 30% of 198	20.5	PASS
365	1 - 200% of 198	1.8	PASS
441	0.001 - 100% of 443	75.7	PASS
442	40 - 200% of 198	47.8	PASS
443	17 - 23% of 442	20.1	PASS

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_009

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Calibration: 0132007

Instrument: MS-BNA3

Matrix: Water

Calibration Date: 5/10/2010 5:04:48PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.5449914	6.188575	9.529636	0.1288221			CCC (30)	
Acenaphthylene	0.837393	14.91185	9.133091	0.1088431			15	
Anthracene	0.8127224	21.57029	13.491	6.203524E-02	0.998714		0.995	
Benzo(a)anthracene	0.6443703	28.8539	21.02345	9.171847E-02	0.998062		0.995	
Benzo(a)pyrene	0.8806429	26.16793	24.98811	3.640226E-02	0.9996956		CCC (30)	
Benzo(b)fluoranthene	1.02129	23.35663	24.31167	4.129969E-02	0.9996703		0.995	
Benzo(g,h,i)perylene	0.9507735	13.57635	27.44509	0.1091032			15	
Benzo(k)fluoranthene	1.114795	14.88106	24.39082	0.1031939			15	
Chrysene	0.7443354	14.17831	21.12218	0.1213313			15	
Dibenz(a,h)anthracene	0.824039	16.76544	27.019	3.953226E-02	0.9994966		0.995	
Fluoranthene	0.8561351	22.44759	16.77187	3.955482E-02	0.9998072		CCC (30)	
Fluorene	0.6319282	10.45895	10.79218	0.1358297			15	
2-Fluorobiphenyl	0.8077998	12.16042	8.0446	8.697962E-02			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	0.792655	20.05219	26.95882	8.628932E-02	0.99938		0.995	
1-Methylnaphthalene	0.6312687	12.32071	7.535364	0.1087572			15	
2-Methylnaphthalene	0.7281161	12.31812	7.365818	0.1013574			15	
Naphthalene	1.28018	11.75289	6.309889	7.265111E-02			15	
Nitrobenzene-d5							15	
Phenanthrene	0.9899291	10.43171	13.35291	0.1258165			15	
Phenol-d6							15	
Pyrene	0.8735304	20.55353	17.40789	5.106602E-02	0.9989986		0.995	
Terphenyl-d14	0.6178417	16.24808	18.09664	8.671295E-02		0.9998644	0.99	
2,4,6-Tribromophenol	6.106927E-02	34.78759	11.40991	0.1459834	0.9995088		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION DATA

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_009

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Calibration: 0132007

Instrument: MS-BNA3

Matrix: Water

Calibration Date: 5/10/2010 5:04:48PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	0.05	0.5818685	0.1	0.5229676	0.25	0.5032725	0.5	0.5015158	1	0.5865322	2	0.5686914
Acenaphthylene	0.05	0.6774851	0.1	0.7075159	0.25	0.7166791	0.5	0.7539864	1	0.9590923	2	0.9654067
Anthracene	0.05	0.5802975	0.1	0.624741	0.25	0.6528708	0.5	0.6679715	1	0.9184162	2	0.9491389
Benzo(a)anthracene	0.05	0.4713805	0.1	0.3786766	0.25	0.40029	0.5	0.4319466	1	0.6822236	2	0.7242806
Benzo(a)pyrene	0.05	0.6220651	0.1	0.583032	0.25	0.6370554	0.5	0.7359112	1	1.007138	2	1.022336
Benzo(b)fluoranthene	0.05	0.7351269	0.1	0.7091471	0.25	0.7637801	0.5	0.9103193	1	1.160892	2	1.172083
Benzo(g,h,i)perylene	0.05	0.6880553	0.1	0.7971024	0.25	0.840149	0.5	0.9200705	1	1.047184	2	1.076417
Benzo(k)fluoranthene	0.05	0.8592246	0.1	0.8388905	0.25	1.002913	0.5	1.064317	1	1.252322	2	1.183269
Chrysene	0.05	0.6381074	0.1	0.6161836	0.25	0.6220352	0.5	0.6476433	1	0.8479426	2	0.8599069
Dibenz(a,h)anthracene	0.05	0.5626063	0.1	0.722159	0.25	0.6940047	0.5	0.8035997	1	0.9471248	2	0.9364995
Fluoranthene	0.05	0.6619853	0.1	0.6268938	0.25	0.6855573	0.5	0.7426575	1	1.019926	2	1.016297
Fluorene	0.05	0.6085741	0.1	0.5279191	0.25	0.5728052	0.5	0.5658728	1	0.714701	2	0.6982195
2-Fluorobiphenyl	0.05	0.7854596	0.1	0.8530449	0.25	0.9098403	0.5	0.8784665	1	0.9102475	2	0.8453379
2-Fluorophenol	0.1		0.2		0.5		1		2		4	
Indeno(1,2,3-cd)pyrene	0.05	0.5664351	0.1	0.7015151	0.25	0.513718	0.5	0.6478124	1	0.8176423	2	0.8596125
1-Methylnaphthalene	0.05	0.6051181	0.1	0.6587551	0.25	0.7100006	0.5	0.6738966	1	0.7315315	2	0.6741355
2-Methylnaphthalene	0.05	0.774149	0.1	0.7734453	0.25	0.7709466	0.5	0.7735594	1	0.8214384	2	0.7872633
Naphthalene	0.05	1.329207	0.1	1.500713	0.25	1.373958	0.5	1.336964	1	1.354966	2	1.256244
Nitrobenzene-d5	0.05		0.1		0.25		0.5		1		2	
Phenanthrene	0.05	1.020469	0.1	0.9574016	0.25	0.9615319	0.5	1.001085	1	1.148571	2	1.091075
Phenol-d6	0.1		0.2		0.5		1		2		4	
Pyrene	0.05	0.6709919	0.1	0.6598315	0.25	0.693457	0.5	0.7237546	1	0.9787357	2	1.027105
Terphenyl-d14	0.05	0.4743129	0.1	0.4866392	0.25	0.5139008	0.5	0.5319923	1	0.7067511	2	0.7049185
2,4,6-Tribromophenol	0.1	0.0408439	0.2	2.903582E-02	0.5	0.0319423	1	3.932154E-02	2	6.395149E-02	4	7.184222E-02
Acenaphthene-d10	1		1		1		1		1		1	
Chrysene-d12	1		1		1		1		1		1	

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0132007	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	5/10/2010 5:04:48PM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	5	0.5613193	10	0.5806996	20	0.5557654	40	0.5281662	50	0.5041073		
Acenaphthylene	5	0.9938905	10	0.9800077	20	0.9104221	40	0.808151	50	0.7386865		
Anthracene	5	0.9688053	10	1.011121	20	0.9411397	40	~~0.8491735~~	50	~~0.7972907~~		
Benzo(a)anthracene	5	0.7415124	10	0.8655551	20	0.8468654	40	0.7861357	50	0.7592068		
Benzo(a)pyrene	5	1.116963	10	1.114807	20	1.086478	40	~~0.9814795~~	50	~~0.9406469~~		
Benzo(b)fluoranthene	5	1.286296	10	1.236526	20	1.217443	40	~~1.160141~~	50	~~1.143805~~		
Benzo(g,h,i)perylene	5	1.062892	10	1.061439	20	1.054695	40	0.9608569	50	0.949647		
Benzo(k)fluoranthene	5	1.365954	10	1.270907	20	1.187458	40	1.152917	50	1.08457		
Chrysene	5	0.8160702	10	0.8823108	20	0.8320742	40	0.7390478	50	0.6863673		
Dibenz(a,h)anthracene	5	0.9583288	10	0.8810743	20	0.9109538	40	~~0.829438~~	50	~~0.8781058~~		
Fluoranthene	5	1.035556	10	1.060208	20	~~0.9902438~~	40	~~0.8905255~~	50	~~0.8285773~~		
Fluorene	5	0.7017543	10	0.7010988	20	0.6634315	40	0.6109895	50	0.5858439		
2-Fluorobiphenyl	5	0.8409516	10	0.7561573	20	0.6876144	40	0.6108783	50	~~0.5606627~~		
2-Fluorophenol	10		20		40		80		100			
Indeno(1,2,3-cd)pyrene	5	0.8800362	10	0.9326311	20	0.9752539	40	0.9063287	50	0.9182198		
1-Methylnaphthalene	5	0.6819844	10	0.6229462	20	0.5804433	40	0.5225319	50	0.4826126		
2-Methylnaphthalene	5	0.7857391	10	0.7222322	20	0.664035	40	0.5963124	50	0.5401563		
Naphthalene	5	1.262752	10	1.11946	20	0.9873599	40	~~0.7967098~~	50	~~0.6694096~~		
Nitrobenzene-d5	5		10		20		40		50			
Phenanthrene	5	1.075886	10	1.036847	20	0.9517481	40	0.8454922	50	0.7991136		
Phenol-d6	10		20		40		80		100			
Pyrene	5	1.020759	10	1.076557	20	1.010582	40	~~0.9052261~~	50	~~0.8673362~~		
Terphenyl-d14	5	0.7094577	10	0.735858	20	0.6976663	40	0.6348001	50	0.5999615		
2,4,6-Tribromophenol	10	7.570678E-02	20	8.168856E-02	40	8.208093E-02	80	7.754055E-02	100	7.780785E-02		
Acenaphthene-d10	1		1		1		1		1			
Chrysene-d12	1		1		1		1		1			

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Sequence: 0F15502

Calibration: 0132007

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Instrument: MS-BNA3

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15502-TUN1	SEQ-TUN1.D	05/22/10 12:05
Calibration Check	0F15502-CCV1	SEQ-CCV1.D	05/22/10 12:28
LCS	0E13318-BS1	E13318L1.D	05/22/10 13:09
Blank	0E13318-BLK1	E13318B1.D	05/22/10 13:45
32SD-02-0006	1005021-02	0502102.D	05/22/10 20:24
32SD-03-0006	1005021-03	0502103.D	05/22/10 21:00
32SD-01-0006	1005021-01	0502101.D	05/22/10 22:12
32SD-01-0006	0E13318-MS1	0502101M.D	05/22/10 22:49
32SD-01-0006	0E13318-MSD1	0502101S.D	05/22/10 23:25

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	05/22/10
Instrument ID:	MS-BNA3	Injection Time:	12:05
Sequence:	0F15502	Lab Sample ID:	0F15502-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	31	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	32.9	PASS
70	Less than 2% of 69	0.509	PASS
127	40 - 60% of 198	43.1	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.77	PASS
275	10 - 30% of 198	26.8	PASS
365	1 - 200% of 198	3.1	PASS
441	0.001 - 100% of 443	74.7	PASS
442	40 - 200% of 198	78.2	PASS
443	17 - 23% of 442	19.6	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0132007
Lab File ID:	SEQ-CCV1.D	Calibration Date:	05/10/10 17:04
Sequence:	0F15502	Injection Date:	05/22/10
Lab Sample ID:	0F15502-CCV1	Injection Time:	12:28

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.878	0.5449914	0.6407063		17.6	20
Acenaphthylene	A	5.000	6.039	0.837393	1.011426		20.8	20 *
Anthracene	L	5.000	5.404	0.8127224	1.033317		8.1	20
Benzo(a)anthracene	L	5.000	5.598	0.6443703	0.8977632		12.0	20
Benzo(a)pyrene	L	5.000	5.838	0.8806429	1.268727		16.8	20
Benzo(b)fluoranthene	L	5.000	5.669	1.02129	1.383706		13.4	20
Benzo(g,h,i)perylene	A	5.000	5.149	0.9507735	0.9791356		3.0	20
Benzo(k)fluoranthene	A	5.000	6.398	1.114795	1.426547		28.0	20 *
Chrysene	A	5.000	5.925	0.7443354	0.882056		18.5	20
Dibenz(a,h)anthracene	L	5.000	4.966	0.824039	0.9017562		-0.7	20
Fluoranthene	L	5.000	5.238	0.8561351	1.099214		4.8	20
Fluorene	A	5.000	5.744	0.6319282	0.7260319		14.9	20
Indeno(1,2,3-cd)pyrene	L	5.000	5.354	0.792655	0.9838835		7.1	20
1-Methylnaphthalene	A	5.000	4.590	0.6312687	0.5794988		-8.2	20
2-Methylnaphthalene	A	5.000	4.714	0.7281161	0.6865104		-5.7	20
Naphthalene	A	5.000	3.757	1.28018	0.9620488		-24.9	20 *
Phenanthrene	A	5.000	5.447	0.9899291	1.078393		8.9	20
Pyrene	L	5.000	5.537	0.8735304	1.132357		10.7	20
2-Fluorobiphenyl	A	5.000	4.565	0.8077998	0.737503		-8.7	20
Terphenyl-d14	Q	5.000	4.979	0.6178417	0.7555211		-0.4	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0E13318-BLK1	File ID:	E13318B1.D
Sampled:		Prepared:		Analyzed:	05/22/10 13:45
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0E13318 Sequence: 0F15502 Calibration: 0132007 Instrument: MS-BNA3

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.33	6.67	U
50-32-8	Benzo(a)pyrene		1.33	5.00	U
205-99-2	Benzo(b)fluoranthene		1.33	6.67	U
207-08-9	Benzo(k)fluoranthene		1.33	6.67	X, U
218-01-9	Chrysene		1.33	6.67	U
53-70-3	Dibenz(a,h)anthracene		1.33	5.00	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.33	6.67	U
91-20-3	Naphthalene		1.33	5.00	Y, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	2426	72.8	14 - 129	
Terphenyl-d14	3333	3194	95.8	14 - 129	

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Matrix: Solid

Batch: 0E13318

Preparation: EXT_3546

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Laboratory ID: 0E13318-BS1

Initial/Final: 15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.67	59.70	89.6	31 - 146
Benzo(a)pyrene	66.67	66.41	99.6	28 - 128
Benzo(b)fluoranthene	66.67	62.37	93.6	30 - 139
Benzo(k)fluoranthene	66.67	79.26	119	42 - 129
Chrysene	66.67	70.00	105	39 - 134
Dibenz(a,h)anthracene	66.67	61.04	91.6	30 - 138
Indeno(1,2,3-cd)pyrene	66.67	60.91	91.4	17 - 164
Naphthalene	66.67	39.61	59.4	29 - 106

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_009

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Batch: 0E13318 Batch Matrix: Solid

Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0E13318-BLK1	05/14/10 14:00	15.00	1.00
LCS	0E13318-BS1	05/14/10 14:00	15.00	1.00
32SD-01-0006	0E13318-MS1	05/14/10 14:00	15.00	1.00
32SD-01-0006	0E13318-MSD1	05/14/10 14:00	15.00	1.00
32SD-01-0006	1005021-01	05/14/10 14:00	15.00	1.00
32SD-02-0006	1005021-02	05/14/10 14:00	15.00	1.00
32SD-03-0006	1005021-03	05/14/10 14:00	15.00	1.00
32SD-FD-043010-01	1005021-04	05/14/10 14:00	15.00	1.00

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15504	Instrument:	MS-BNA3
Calibration:	0132007		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F15504-TUN1	SEQ-TUN2.D	05/24/10 22:04
Calibration Check	0F15504-CCV1	SEQ-CCV2.D	05/24/10 22:25
32SD-FD-043010-01	1005021-04	0502104.D	05/25/10 03:14

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Lab File ID: SEQ-TUN2.D

Instrument ID: MS-BNA3

Sequence: 0F15504

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Injection Date: 05/24/10

Injection Time: 22:04

Lab Sample ID: 0F15504-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	33	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	34.8	PASS
70	Less than 2% of 69	0.592	PASS
127	40 - 60% of 198	44.5	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.79	PASS
275	10 - 30% of 198	25.8	PASS
365	1 - 200% of 198	3.11	PASS
441	0.001 - 100% of 443	76.3	PASS
442	40 - 200% of 198	68.9	PASS
443	17 - 23% of 442	20	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA3	Calibration:	0132007
Lab File ID:	SEQ-CCV2.D	Calibration Date:	05/10/10 17:04
Sequence:	0F15504	Injection Date:	05/24/10
Lab Sample ID:	0F15504-CCV1	Injection Time:	22:25

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	5.000	5.879	0.5449914	0.6407865		17.6	20
Acenaphthylene	A	5.000	6.032	0.837393	1.010263		20.6	20 *
Anthracene	L	5.000	5.407	0.8127224	1.033842		8.1	20
Benzo(a)anthracene	L	5.000	5.000	0.6443703	0.8018392		0.0	20
Benzo(a)pyrene	L	5.000	5.768	0.8806429	1.253373		15.4	20
Benzo(b)fluoranthene	L	5.000	6.040	1.02129	1.474649		20.8	20 *
Benzo(g,h,i)perylene	A	5.000	4.355	0.9507735	0.8282161		-12.9	20
Benzo(k)fluoranthene	A	5.000	6.519	1.114795	1.453439		30.4	20 *
Chrysene	A	5.000	5.218	0.7443354	0.7768674		4.4	20
Dibenz(a,h)anthracene	L	5.000	4.226	0.824039	0.7674004		-15.5	20
Fluoranthene	L	5.000	4.764	0.8561351	0.9982418		-4.7	20
Fluorene	A	5.000	5.760	0.6319282	0.7280343		15.2	20
Indeno(1,2,3-cd)pyrene	L	5.000	4.408	0.792655	0.8099336		-11.8	20
1-Methylnaphthalene	A	5.000	4.742	0.6312687	0.598723		-5.2	20
2-Methylnaphthalene	A	5.000	4.490	0.7281161	0.6538104		-10.2	20
Naphthalene	A	5.000	3.569	1.28018	0.9137754		-28.6	20 *
Phenanthrene	A	5.000	5.190	0.9899291	1.027462		3.8	20
Pyrene	L	5.000	4.949	0.8735304	1.011781		-1.0	20
2-Fluorobiphenyl	A	5.000	4.523	0.8077998	0.7307767		-9.5	20
Terphenyl-d14	Q	5.000	4.654	0.6178417	0.7065618		-6.9	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15409	Instrument:	MS-BNA4
		Calibration:	0098001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15409-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/22/10 14:18			
Phenanthrene-d10	110959	13.619	196258	13.55	57	50 - 200	0.0690	+/-0.50	
Perylene-d12	92066	25.305	108221	25.217	85	50 - 200	0.0880	+/-0.50	
LCS (0E13315-BS1)			Lab File ID: E13315L1.D			Analyzed: 05/22/10 15:27			
Phenanthrene-d10	93815	13.619	110959	13.619	85	50 - 200	0.0000	+/-0.50	
Perylene-d12	75530	25.305	92066	25.305	82	50 - 200	0.0000	+/-0.50	
Blank (0E13315-BLK1)			Lab File ID: E13315B1.D			Analyzed: 05/22/10 16:01			
Phenanthrene-d10	110208	13.619	110959	13.619	99	50 - 200	0.0000	+/-0.50	
Perylene-d12	81326	25.305	92066	25.305	88	50 - 200	0.0000	+/-0.50	
32SS-RB042910-05 (1005021-05)			Lab File ID: 0502105.D			Analyzed: 05/22/10 21:07			
Phenanthrene-d10	91925	13.619	110959	13.619	83	50 - 200	0.0000	+/-0.50	
Perylene-d12	75881	25.305	92066	25.305	82	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15502	Instrument:	MS-BNA3
		Calibration:	0132007

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15502-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 05/22/10 12:28			
Phenanthrene-d10	156654	13.045	233208	13.276	67	50 - 200	-0.2310	+/-0.50	
Perylene-d12	96969	24.91	135470	25.094	72	50 - 200	-0.1840	+/-0.50	
LCS (0E13318-BS1)			Lab File ID: E13318L1.D			Analyzed: 05/22/10 13:09			
Phenanthrene-d10	132381	13.048	156654	13.045	85	50 - 200	0.0030	+/-0.50	
Perylene-d12	81149	24.912	96969	24.91	84	50 - 200	0.0020	+/-0.50	
Blank (0E13318-BLK1)			Lab File ID: E13318B1.D			Analyzed: 05/22/10 13:45			
Phenanthrene-d10	117133	13.055	156654	13.045	75	50 - 200	0.0100	+/-0.50	
Perylene-d12	64184	24.919	96969	24.91	66	50 - 200	0.0090	+/-0.50	
32SD-02-0006 (1005021-02)			Lab File ID: 0502102.D			Analyzed: 05/22/10 20:24			
Phenanthrene-d10	150146	13.055	156654	13.045	96	50 - 200	0.0100	+/-0.50	
Perylene-d12	52893	24.919	96969	24.91	55	50 - 200	0.0090	+/-0.50	
32SD-03-0006 (1005021-03)			Lab File ID: 0502103.D			Analyzed: 05/22/10 21:00			
Phenanthrene-d10	111418	13.055	156654	13.045	71	50 - 200	0.0100	+/-0.50	
Perylene-d12	60845	24.919	96969	24.91	63	50 - 200	0.0090	+/-0.50	
32SD-01-0006 (1005021-01)			Lab File ID: 0502101.D			Analyzed: 05/22/10 22:12			
Phenanthrene-d10	116936	13.055	156654	13.045	75	50 - 200	0.0100	+/-0.50	
Perylene-d12	57880	24.919	96969	24.91	60	50 - 200	0.0090	+/-0.50	
Matrix Spike (0E13318-MS1)			Lab File ID: 0502101M.D			Analyzed: 05/22/10 22:49			
Phenanthrene-d10	109546	13.064	156654	13.045	70	50 - 200	0.0190	+/-0.50	
Perylene-d12	69789	24.947	96969	24.91	72	50 - 200	0.0370	+/-0.50	
Matrix Spike Dup (0E13318-MSD1)			Lab File ID: 0502101S.D			Analyzed: 05/22/10 23:25			
Phenanthrene-d10	116283	13.053	156654	13.045	74	50 - 200	0.0080	+/-0.50	
Perylene-d12	59049	24.917	96969	24.91	61	50 - 200	0.0070	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15504	Instrument:	MS-BNA3
		Calibration:	0132007

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0F15504-CCV1)			Lab File ID: SEQ-CCV2.D			Analyzed: 05/24/10 22:25			
Phenanthrene-d10	128425	13.063	233208	13.276	55	50 - 200	-0.2130	+/-0.50	
Perylene-d12	63602	24.937	135470	25.094	47	50 - 200	-0.1570	+/-0.50	
32SD-FD-043010-01 (1005021-04)			Lab File ID: 0502104.D			Analyzed: 05/25/10 03:14			
Phenanthrene-d10	133865	13.081	128425	13.063	104	50 - 200	0.0180	+/-0.50	
Perylene-d12	64566	24.964	63602	24.937	102	50 - 200	0.0270	+/-0.50	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0F15409	Instrument:	MS-BNA4
		Calibration:	0098001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15409-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 05/22/10 14:18		
2-Fluorobiphenyl	5.000	97.2	80 - 120	8.339	8.339	0.0000	+/-0.500	
Terphenyl-d14	5.000	109	80 - 120	18.388	18.388	0.0000	+/-0.500	
LCS (0E13315-BS1) ug/L				Lab File ID: E13315L1.D		Analyzed: 05/22/10 15:27		
2-Fluorobiphenyl	50.00	83.6	34 - 167	8.348	8.339	0.0090	+/-0.500	
Terphenyl-d14	50.00	105	34 - 167	18.416	18.388	0.0280	+/-0.500	
Blank (0E13315-BLK1) ug/L				Lab File ID: E13315B1.D		Analyzed: 05/22/10 16:01		
2-Fluorobiphenyl	50.00	69.1	34 - 167	8.348	8.339	0.0090	+/-0.500	
Terphenyl-d14	50.00	92.5	34 - 167	18.416	18.388	0.0280	+/-0.500	
32SS-RB042910-05 (1005021-05) ug/L				Lab File ID: 0502105.D		Analyzed: 05/22/10 21:07		
2-Fluorobiphenyl	47.17	78.8	34 - 167	8.348	8.339	0.0090	+/-0.500	
Terphenyl-d14	47.17	85.2	34 - 167	18.407	18.388	0.0190	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0F15502

SDG: CTOF273_009
Project: CTOF273 NSA Crane SMU32
Instrument: MS-BNA3
Calibration: 0132007

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15502-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 05/22/10 12:28		
2-Fluorobiphenyl	5.000	91.3	80 - 120	7.856	7.856	0.0000	+/-0.500	
Terphenyl-d14	5.000	99.6	80 - 120	17.845	17.845	0.0000	+/-0.500	
LCS (0E13318-BS1) ug/Kg wet				Lab File ID: E13318L1.D		Analyzed: 05/22/10 13:09		
2-Fluorobiphenyl	3333	67.4	14 - 129	7.868	7.856	0.0120	+/-0.500	
Terphenyl-d14	3333	94.5	14 - 129	17.866	17.845	0.0210	+/-0.500	
Blank (0E13318-BLK1) ug/Kg wet				Lab File ID: E13318B1.D		Analyzed: 05/22/10 13:45		
2-Fluorobiphenyl	3333	72.8	14 - 129	7.865	7.856	0.0090	+/-0.500	
Terphenyl-d14	3333	95.8	14 - 129	17.863	17.845	0.0180	+/-0.500	
32SD-02-0006 (1005021-02) ug/Kg dry				Lab File ID: 0502102.D		Analyzed: 05/22/10 20:24		
2-Fluorobiphenyl	4135	58.2	14 - 129	7.865	7.856	0.0090	+/-0.500	
Terphenyl-d14	4135	52.4	14 - 129	17.873	17.845	0.0280	+/-0.500	
32SD-03-0006 (1005021-03) ug/Kg dry				Lab File ID: 0502103.D		Analyzed: 05/22/10 21:00		
2-Fluorobiphenyl	4124	69.4	14 - 129	7.865	7.856	0.0090	+/-0.500	
Terphenyl-d14	4124	68.6	14 - 129	17.873	17.845	0.0280	+/-0.500	
32SD-01-0006 (1005021-01) ug/Kg dry				Lab File ID: 0502101.D		Analyzed: 05/22/10 22:12		
2-Fluorobiphenyl	4091	70.4	14 - 129	7.865	7.856	0.0090	+/-0.500	
Terphenyl-d14	4091	66.2	14 - 129	17.873	17.845	0.0280	+/-0.500	
Matrix Spike (0E13318-MS1) ug/Kg dry				Lab File ID: 0502101M.D		Analyzed: 05/22/10 22:49		
2-Fluorobiphenyl	4091	66.2	14 - 129	7.865	7.856	0.0090	+/-0.500	
Terphenyl-d14	4091	60.0	14 - 129	17.882	17.845	0.0370	+/-0.500	
Matrix Spike Dup (0E13318-MSD1) ug/Kg dry				Lab File ID: 0502101S.D		Analyzed: 05/22/10 23:25		
2-Fluorobiphenyl	4091	63.9	14 - 129	7.863	7.856	0.0070	+/-0.500	
Terphenyl-d14	4091	56.5	14 - 129	17.871	17.845	0.0260	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Sequence: 0F15504

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

Instrument: MS-BNA3

Calibration: 0132007

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0F15504-CCV1) ug/mL				Lab File ID: SEQ-CCV2.D		Analyzed: 05/24/10 22:25		
2-Fluorobiphenyl	5.000	90.5	80 - 120	7.865	7.865	0.0000	+/-0.500	
Terphenyl-d14	5.000	93.1	80 - 120	17.863	17.863	0.0000	+/-0.500	
32SD-FD-043010-01 (1005021-04) ug/Kg dry				Lab File ID: 0502104.D		Analyzed: 05/25/10 03:14		
2-Fluorobiphenyl	4062	61.4	14 - 129	7.883	7.865	0.0180	+/-0.500	
Terphenyl-d14	4062	66.8	14 - 129	17.909	17.863	0.0460	+/-0.500	

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SD-01-0006

Laboratory: Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)

Matrix: Solid

Batch: 0E13318

% Solids: 81.47

Source Sample Name: **1005021-01**

SDG: CTOF273_009

Project: CTOF273 NSA Crane SMU32

* MS Not used to evaluate sample. Laboratory discovered wrong sample spiked. RPD Not Applicable. MSD was correctly spiked.

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	81.83	2.814	2844	3470	*	31 - 146
Benzo(a)pyrene	81.83	7.591	3377	4120	*	28 - 128
Benzo(b)fluoranthene	81.83	ND	5055	6180	*	30 - 139
Benzo(k)fluoranthene	81.83	ND	2260	2760	*	42 - 129
Chrysene	81.83	2.969	5163	6310	*	39 - 134
Dibenz(a,h)anthracene	81.83	ND	554.8	678	*	30 - 138
Indeno(1,2,3-cd)pyrene	81.83	ND	2266	2770	*	17 - 164
Naphthalene	81.83	ND	138.9	170	*	29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzo(a)anthracene	81.83	57.59	66.9	192	*	30	31 - 146
Benzo(a)pyrene	81.83	72.35	79.1	192	*	30	28 - 128
Benzo(b)fluoranthene	81.83	75.72	92.5	194	*	30	30 - 139
Benzo(k)fluoranthene	81.83	79.83	97.6	186	*	30	42 - 129
Chrysene	81.83	61.04	71.0	195	*	30	39 - 134
Dibenz(a,h)anthracene	81.83	65.00	79.4	158	*	30	30 - 138
Indeno(1,2,3-cd)pyrene	81.83	65.59	80.2	189	*	30	17 - 164
Naphthalene	81.83	41.60	50.8	108	*	30	29 - 106

* N/A

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE 1 OF 1

CLIENT NSWC Crane		JOB NUMBER 02111	
SUBJECT Calculation Check SDG CTOF273_009			
BASED ON		DRAWING NUMBER	
BY J. Kalinyak	CHECKED BY	APPROVED BY ✓AI	DATE 07/27/10

VOC - toluene Sample - 3250-02-006

$$\frac{15307 \times 30\,\mu g/Kg \times 50\,df \times 5}{341975 \times 1.3285 \times 5g \times 0.806} \simeq 62.7\,\mu g/Kg$$

PAH - chrysene Sample - 32SD-FD-043010-01

$$\frac{55794 \times 1\,mg/ul \times 1000\,ul \times 1\,ul}{133865 \times 0.743 \times 15g \times 1\,ul \times 0.821} \simeq 45.5\,\mu g/Kg$$

Data File: \\ELABNSH05\TARGET\chem\voa4.i\052010V4.b\0502102D.D
Report Date: 22-May-2010 07:41

Empirical Laboratories, LLC

Data file : \\ELABNSH05\TARGET\chem\voa4.i\052010V4.b\0502102D.D
Lab Smp Id: 1005021-02 Client Smp ID: 32SD-02-0006
Inj Date : 20-MAY-2010 13:58 MS Autotune Date: 07-MAY-2010 17:53
Operator : ADM Inst ID: voa4.i
Smp Info : 1005021-02;;;;;
Misc Info : ;3;;;;gm-all.sub;50X
Comment :
Method : \\ELABNSH05\TARGET\chem\voa4.i\052010V4.b\VSOIL4.m
Meth Date : 22-May-2010 07:09 ghallquist Quant Type: ISTD
Cal Date : 07-MAY-2010 22:52 Cal File: SEQ-CAL8.D
Als bottle: 17 QC Sample: BLANK
Dil Factor: 50.00000
Integrator: HP RTE Compound Sublist: gm-all.sub
Target Version: 4.04
Processing Host: TARGET03_VM

Concentration Formula: Amt * DF * 5*Uf/(Ws*(Solids/100))

Name	Value	Description
DF	50.000	Dilution Factor
Uf	1.000	unit correction factor
Ws	5.000	Weight of sample extracted (g)
Solids	100.000	Percent Solids

0512110 Spiked using old syringe!

5-26-10

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/Kg)	FINAL (ug/Kg)
* 59 Fluorobenzene	96	14.064	14.078	(1.000)	840978	30.0000	
1 Dichlorodifluoromethane	85	4.844	4.848	(0.344)	4591	3.67480	183.7(a)
4 Chloromethane	50	5.110	5.144	(0.363)	7643	3.83379	191.7(a)
21 Trichlorotrifluoroethane	101	8.672	8.706	(0.617)	5583	0.70448	35.22(a)
16 Iodomethane	142	8.298	8.322	(0.590)	6272	4.48689	224.3(aH)
17 Acrylonitrile	53	8.328	8.332	(0.592)	7203	2.87306	143.6(a)
20 Methylene chloride	84	8.534	8.558	(0.607)	168605	12.6030	630.1
29 MTBE	73	10.473	10.467	(0.745)	10231	0.50220	25.11(a)
30 1,1-Dichloroethane	63	10.709	10.733	(0.761)	11631	0.74119	37.06(a)
32 Vinyl acetate	43	10.984	10.998	(0.781)	14824	0.72896	36.45(a)
35 2-Butanone	43	11.555	11.559	(0.822)	9886	2.14786	107.4(a)
40 Di-Isopropyl Ether	45	11.653	11.658	(0.829)	17328	0.52569	26.28(a)
42 Bromochloromethane	128	12.067	12.071	(0.858)	3126	0.81238	40.62(aQ)
43 Chloroform	83	12.136	12.159	(0.863)	13410	0.94689	47.34(a)
44 ETBE	59	12.303	12.317	(0.875)	13804	0.52433	26.22(a)

Data File: \\ELABNSH05\TARGET\chem\voa4.i\052010V4.b\0502102D.D
Report Date: 22-May-2010 07:41

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/Kg)	FINAL (ug/Kg)
$	46 Dibromofluoromethane	111	12.322	12.336	(0.876)	229877	28.5599	28.56
	22 Methyl acetate	43	8.613	8.627	(0.612)	12309	1.78461	89.23(a)
	54 Cyclohexane	56	13.661	13.685	(0.971)	11358	0.76613	38.31(a)
$	50 1,2-Dichloroethane-d4	102	13.001	13.015	(0.924)	51255	27.0348	27.03(Q)
	51 1,2-Dichloroethane	62	13.119	13.133	(0.933)	7985	0.70847	35.42(a)
	56 Benzene	78	13.789	13.803	(0.980)	26512	0.90564	45.28(a)
	58 tert-Amyl Methyl Ether	73	14.064	14.049	(1.000)	20426	0.92851	46.42(a)
	61 Dibromomethane	93	14.477	14.491	(1.029)	4165	0.83412	41.71(a)
	62 1,2-Dichloropropane	63	14.527	14.541	(1.033)	7023	0.79667	39.83(a)
	63 Trichloroethene	95	14.586	14.600	(1.037)	7836	1.01450	50.72(a)
	64 Bromodichloromethane	83	14.625	14.639	(1.040)	6943	0.66846	33.42(a)
	65 Methyl methacrylate	41	14.822	14.826	(1.054)	4508	3.06003	153.0(a)
	68 2-Chloroethyl vinyl ether	63	15.117	15.121	(1.075)	4065	1.82147	91.07(a)
	72 cis-1,3-Dichloropropene	75	15.353	15.357	(1.092)	8311	0.67813	33.91(a)
	74 4-Methyl-2-pentanone	43	15.471	15.475	(1.100)	6208	0.64652	32.33(a)
	75 trans-1,3-Dichloropropene	75	15.786	15.790	(0.911)	6987	0.75351	37.68(a)
	76 1,1,2-Trichloroethane	83	15.943	15.948	(0.920)	3873	0.82224	41.11(a)
$	77 Toluene-d8	98	16.042	16.056	(0.926)	747347	33.2495	33.25
	78 Toluene	92	16.111	16.125	(0.930)	15307	1.01077	50.54(a)
	80 1,3-Dichloropropane	76	16.170	16.174	(0.934)	8616	0.89430	44.71(a)
	79 Ethyl methacrylate	69	16.189	16.194	(0.935)	5526	0.62688	31.34(aQ)
	82 Dibromochloromethane	129	16.416	16.420	(0.948)	4513	0.64034	32.02(a)
	83 1,2-Dibromoethane	107	16.632	16.636	(0.960)	5213	0.86716	43.36(a)
	69 Methyl cyclohexane	83	15.186	15.190	(1.080)	8231	0.70217	35.11(a)
	84 Tetrachloroethene	166	16.780	16.794	(0.969)	9098	1.26249	63.12(a)
	85 1,1,1,2-Tetrachloroethane	131	17.292	17.296	(0.998)	5202	0.80091	40.04(aQ)
	86 1-Chlorohexane	91	17.282	17.286	(0.998)	9891	0.96601	48.30(aQ)
*	87 Chlorobenzene-d5	82	17.321	17.325	(1.000)	341975	30.0000	(Q)
	88 Chlorobenzene	112	17.351	17.355	(1.002)	16758	0.97397	48.70(aQ)
	89 Ethylbenzene	91	17.498	17.502	(1.010)	32662	1.06174	53.09(a)
	90 m,p-Xylene	91	17.646	17.650	(1.019)	59045	2.37813	118.9(a)
M	96 Xylene(total)	91				85592	3.55565	177.8(a)
	94 o-Xylene	91	17.970	17.975	(1.037)	26547	1.17752	58.88(a)
	93 Styrene	104	17.911	17.916	(1.034)	17224	0.97463	48.73(a)
	95 1,1,2,2-Tetrachloroethane	83	17.980	17.994	(0.928)	4280	0.55115	27.56(a)
	97 1,2,3-Trichloropropane	110	18.079	18.103	(1.044)	1521	0.71075	35.54(aQ)
$	101 Bromofluorobenzene	95	18.305	18.309	(1.057)	313201	32.1821	32.18
	102 Bromobenzene	156	18.492	18.496	(0.954)	7015	0.83444	41.72(a)
	103 n-Propylbenzene	91	18.600	18.604	(0.960)	31109	0.83267	41.63(a)
	104 2-Chlorotoluene	91	18.708	18.713	(0.965)	18627	0.79754	39.88(a)
	105 4-Chlorotoluene	91	18.767	18.772	(0.969)	23544	0.87577	43.79(a)
	106 1,3,5-Trimethylbenzene	105	18.807	18.811	(0.971)	21743	0.86510	43.26(a)
	108 tert-Butylbenzene	119	19.063	19.067	(0.984)	15669	0.72940	36.47(a)
	109 1,2,4-Trimethylbenzene	105	19.141	19.146	(0.988)	23057	0.90952	45.48(a)
	111 1,3-Dichlorobenzene	146	19.348	19.352	(0.998)	11920	0.87448	43.72(a)
*	112 1,4-Dichlorobenzene-d4	152	19.378	19.382	(1.000)	291872	30.0000	(Q)
	114 1,4-Dichlorobenzene	146	19.397	19.411	(1.001)	15152	1.06257	53.13(a)

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0144005	Instrument:	MS-VOA4
Matrix:	Solid	Calibration Date:	5/13/2010 12:58:00PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	1.044291	4.652266	13.76237	3.391041E-02			15	
Bromofluorobenzene	0.8537608	7.34618	18.281	8.410647E-03			15	
Ethylbenzene	2.698668	13.33057	17.47429	6.927592E-03			CCC (20)	
Naphthalene	1.996388	5.075341	21.90313	1.378937E-02			15	
Methyl t-Butyl Ether	0.7267424	7.117503	10.3995	0.1372416			15	
Toluene	1.328513	13.22851	16.0955	5.342824E-03			CCC (20)	
m,p-Xylene	2.002384	18.89119	17.62343	2.237986E-02		0.9993129	0.99	
o-Xylene	1.977768	14.16671	17.947	1.172407E-02			15	
Xylenes (total)	2.00992	17.15348	0	0		0.9991333	0.99	
Dibromofluoromethane	0.2871282	2.648676	12.29125	3.601698E-02			15	
1,2-Dichloroethane-d4	6.763165E-02	4.751393	12.97875	3.193036E-02			15	
Toluene-d8	1.971808	5.830891	16.02787	1.491481E-02			15	

Data File: \\ELABNSH05\TARGET\chem\bna3.i\052410b3E.b\0502104.D
Report Date: 02-Jun-2010 16:25

Empirical Laboratories, LLC

Data file : \\ELABNSH05\TARGET\chem\bna3.i\052410b3E.b\0502104.D
Lab Smp Id: 1005021-04 Client Smp ID: 32SD-FD-043010-01
Inj Date : 25-MAY-2010 03:14 MS Autotune Date: ~~28-JUL-1998~~ 06:19
Operator : ADM Inst ID: bna3.i
Smp Info : 1005021-04;1;15;1000;;UG/KG;14-MAY-2010
Misc Info : ;0;;;;0E13318;pahsurmis.sub;
Comment :
Method : \\ELABNSH05\TARGET\chem\bna3.i\052410b3E.b\IXBN3LOW.m
Meth Date : 27-May-2010 12:21 gquick Quant Type: ISTD
Cal Date : 10-MAY-2010 20:37 Cal File: SEQ-CALB.D
Als bottle: 28
Dil Factor: 1.00000
Integrator: ~~HP RTE~~ Compound Sublist: pahsurmis.sub
Target Version: 4.04
Processing Host: TARGET17_VM

Concentration Formula: Amt * DF * Uf * Vt*Vi/(Amt * Vi * (Solids/100))

Name	Value	Description
DF	1.000	Dilution Factor
Uf	1.000	ng unit correction factor
Vt	1000.000	Volume of final extract (uL)(1000 low, 2
Amt	15.000	Mass of initial extraction
Vi	1.000	Volume injected (uL)
Solids	100.000	Percent Solids

MG 1/5/10

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng/ul)	FINAL (UG/KG)
* 101 Phenanthrene-d10	188	13.081	13.063	(1.000)	133865	1.00000	
50 Naphthalene	128	6.174	6.166	(0.472)	4341	0.02533	1.689(a)
$ 73 2-Fluorobiphenyl	172	7.883	7.865	(0.603)	3317489	30.6788	2045
76 Acenaphthylene	152	8.950	8.932	(0.684)	15702	0.14007	9.338
79 Acenaphthene	153	9.340	9.322	(0.714)	3262	0.04471	2.981(a)
87 Fluorene	166	10.593	10.585	(0.810)	4575	0.05408	3.605
$ 106 2,4,6-Tribromophenol	330	11.252	11.207	(0.860)	1105018	105.546	7036(A)
110 Phenanthrene	178	13.146	13.128	(1.005)	68770	0.51895	34.60
111 Anthracene	178	13.295	13.268	(1.016)	38788	0.30593	20.40
115 Fluoranthene	202	16.581	16.554	(1.268)	88390	0.69729	46.49
133 Pyrene	202	17.212	17.185	(1.316)	88931	0.66205	44.14
* 153 Perylene-d12	264	24.964	24.937	(1.000)	64566	1.00000	
$ 134 Terphenyl-d14	244	17.909	17.863	(1.369)	2902450	33.3791	2225

DQ 6/2/10

Data File: \\ELABNSH05\TARGET\chem\bna3.i\052410b3E.b\0502104.D
Report Date: 02-Jun-2010 16:25

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng/ul)	FINAL (UG/KG)
137 Benzo(a)anthracene	228	20.824	20.796	(1.592)	48274	0.44809	29.87
138 Chrysene	228	20.926	20.889	(1.600)	55794	0.55995	37.33
155 Benzo(b)fluoranthene	252	24.138	24.101	(0.967)	93675	1.21031	80.69
156 Benzo(k)fluoranthene	252	24.212	24.176	(0.970)	35508	0.49332	32.89
157 Benzo(a)pyrene	252	24.853	24.825	(0.996)	70124	1.04517	69.68
158 Indeno(1,2,3-cd)pyrene	276	26.802	26.756	(1.074)	54237	0.91816	61.21
159 Dibenz(a,h)anthracene	278	26.849	26.821	(1.075)	9888	0.16966	11.31(M)
160 Benzo(g,h,i)perylene	276	27.276	27.230	(1.093)	64259	1.04677	69.78

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount exceeded maximum amount.
M - Compound response manually integrated.

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_009
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0132007	Instrument:	MS-BNA3
Matrix:	Water	Calibration Date:	5/10/2010 5:04:48PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.5449914	6.188575	9.529636	0.1288221			CCC (30)	
Acenaphthylene	0.837393	14.91185	9.133091	0.1088431			15	
Anthracene	0.8127224	21.57029	13.491	6.203524E-02	0.998714		0.995	
Benzo(a)anthracene	0.6443703	28.8539	21.02345	9.171847E-02	0.998062		0.995	
Benzo(a)pyrene	0.8806429	26.16793	24.98811	3.640226E-02	0.9996956		CCC (30)	
Benzo(b)fluoranthene	1.02129	23.35663	24.31167	4.129969E-02	0.9996703		0.995	
Benzo(g,h,i)perylene	0.9507735	13.57635	27.44509	0.1091032			15	
Benzo(k)fluoranthene	1.114795	14.88106	24.39082	0.1031939			15	
Chrysene	0.7443354	14.17831	21.12218	0.1213313			15	
Dibenz(a,h)anthracene	0.824039	16.76544	27.019	3.953226E-02	0.9994966		0.995	
Fluoranthene	0.8561351	22.44759	16.77187	3.955482E-02	0.9998072		CCC (30)	
Fluorene	0.6319282	10.45895	10.79218	0.1358297			15	
2-Fluorobiphenyl	0.8077998	12.16042	8.0446	8.697962E-02			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	0.792655	20.05219	26.95882	8.628932E-02	0.99938		0.995	
1-Methylnaphthalene	0.6312687	12.32071	7.535364	0.1087572			15	
2-Methylnaphthalene	0.7281161	12.31812	7.365818	0.1013574			15	
Naphthalene	1.28018	11.75289	6.309889	7.265111E-02			15	
Nitrobenzene-d5							15	
Phenanthrene	0.9899291	10.43171	13.35291	0.1258165			15	
Phenol-d6							15	
Pyrene	0.8735304	20.55353	17.40789	5.106602E-02	0.9989986		0.995	
Terphenyl-d14	0.6178417	16.24808	18.09664	8.671295E-02		0.9998644	0.99	
2,4,6-Tribromophenol	6.106927E-02	34.78759	11.40991	0.1459834	0.9995088		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	

NSWC CRANE
SOIL DATA
CTOF273_009

FRACTION	CHEMICAL	32SD-FD-043010-01	UNITS	32SD-02-0006	RPD	D
PAH	BENZO(A)ANTHRACENE	36.4	UG/KG	6.59 J	138.68	29.81
PAH	BENZO(A)PYRENE	84.9	UG/KG	16.7	134.25	68.20
PAH	BENZO(B)FLUORANTHENE	98.3	UG/KG	21.8	127.39	76.50
PAH	BENZO(K)FLUORANTHENE	40.1	UG/KG	8.07 J	132.99	32.03
PAH	CHRYSENE	45.5	UG/KG	6.69 J	148.73	38.81
PAH	DIBENZO(A,H)ANTHRACENE	13.8	UG/KG	ND	200.00	13.80
PAH	INDENO(1,2,3-CD)PYRENE	74.6	UG/KG	8.51	159.04	66.09
PAH	NAPHTHALENE	2.06 J	UG/KG	ND	200.00	2.06 N/A<2XR.L.

Current RPD Quality Control Limit: 50 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

NSWC CRANE
SOIL DATA
CTOF273_009

FRACTION	CHEMICAL	32SD-FD-043010-01	UNITS	32SD-02-0006	RPD	D
OV	BENZENE	ND	UG/KG	56.1 J	200.00	56.10 NA<2XRL
OV	ETHYLBENZENE	ND	UG/KG	65.7 J	200.00	65.70
OV	TOLUENE	ND	UG/KG	62.6 J	200.00	62.60
OV	TOTAL XYLENES	ND	UG/KG	220 J	200.00	220.00

Current RPD Quality Control Limit: 50 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**T.KLIMEK**	**DATE:**	**OCTOBER 26, 2010**
FROM:	**EDWARD SEDLMYER**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION: SELECT VOC / PAH**
NSWC CRANE, CTO F273
SDG CTOF273_010

SAMPLES: 1 / Soil / SELECT VOC

32SB-ST01-0708

19 / Soil / SELECT PAH

32SB-54-0708	32SB-54-1112	32SB-55-0708	32SB-55-1112
32SB-56-1011	32SB-56-1415	32SB-57-0708	32SB-58-0708
32SB-58-1112	32SB-59-0708	32SB-59-1112	32SB-60-0002
32SS-61-0002	32SS-62-0002	32SS-63-0002	32SS-64-0002
32SS-65-0002	FD092010-01	FD092010-02	

OVERVIEW

The sample set for NSWC Crane, CTO F273, SDG CTOF273_010 consisted of twenty (20) soil samples. Two field duplicate samples were included in this SDG: 32SB-56-1415 / FD092010-01 and 32SS-65-0002 / FD092010-02. Sample 32SB-ST01-0708 was analyzed for methyl tert-butyl ether and the remaining samples were analyzed for either benzo(a)pyrene or naphthalene.

The samples were collected by TetraTech NUS on September 20, 2010 and analyzed by Empirical Laboratories, LLC. All analyses were conducted using USEPA SW-846 Methods 8260B and 8270C analytical and reporting protocols.

The data contained in this SDG were fully validated with regard to the following parameters:

- * Data Completeness
- * Holding Times
- * GC/MS Tuning
- * Initial and Continuing Calibration
- * Laboratory Blank Analyses
- * Surrogate Recoveries
- * Blank Spike/Blank Spike Duplicate Results
- * Matrix Spike/Matrix Spike Duplicate Results
- Field Duplicate Results
- * Internal Standard Recoveries
- * Compound Quantitation
- * Compound Identification
- * Detection Limits

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

SELECT VOC

No qualification of the data was necessary.

SELECT PAH

The field duplicate precision exceeded the 50% relative percent difference (RPD) quality control criteria for benzo(a)pyrene in the field duplicate pair 32SS-65-0002 / FD092010-02. The positive results for benzo(a)pyrene in the duplicate samples 32SS-65-0002 / FD092010-02 were qualified as estimated (J).

ADDITIONAL COMMENTS

Positive results less than the reporting limit (RL) were qualified as estimated, (J), due to uncertainty near the detection limit.

EXECUTIVE SUMMARY

Laboratory Performance Issues: None.

Other factors affecting data quality: Positive results less than the reporting limit (RL) were qualified estimated, (J), due to uncertainty near the detection limit. Field duplicate imprecision noncompliance resulted in the qualification of benzo(a)pyrene is field duplicate pair 32SS-65-0002 / FD092010-02.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999) and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006). The text of this report has been formulated to address only those problem areas affecting data quality.

Edward Sedlmyer
Tetra Tech NUS
Edward Sedlmyer
Chemist/Data Validator

TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Data Validation Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$ / ICP PDS Recovery Noncompliance
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; e.g. chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 02111	NSAMPLE	32SB-ST01-0708		
SDG: CTOF273_010	LAB_ID	1009148-01		
FRACTION: OV	SAMP_DATE	9/20/2010		
MEDIA: SOIL	QC_TYPE	NM		
	UNITS	UG/KG		
	PCT_SOLIDS	83.5		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
METHYL TERT-BUTYL ETHER		0.317	U	

PROJ_NO: 02111	NSAMPLE	32SB-54-0708			32SB-54-1112			32SB-55-0708			32SB-55-1112		
SDG: CTOF273_010	LAB_ID	1009148-03			1009148-04			1009148-06			1009148-05		
FRACTION: PAH	SAMP_DATE	9/20/2010			9/20/2010			9/20/2010			9/20/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	86.0			83.5			82.9			70.4		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)PYRENE													
NAPHTHALENE		3.95	J	P	1.51	U		1.56	U		1.89	U	

PROJ_NO: 02111	NSAMPLE	32SB-56-1011			32SB-56-1415			32SB-57-0708			32SB-58-0708		
SDG: CTOF273_010	LAB_ID	1009148-07			1009148-08			1009148-09			1009148-10		
FRACTION: PAH	SAMP_DATE	9/20/2010			9/20/2010			9/20/2010			9/20/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	83.0			81.1			93.2			89.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)PYRENE													
NAPHTHALENE		13.5			1.62	U		1.4	U		5.11	J	P

PROJ_NO: 02111	NSAMPLE	32SB-58-1112			32SB-59-0708			32SB-59-1112			32SS-60-0002		
SDG: CTOF273_010	LAB_ID	1009148-11			1009148-12			1009148-13			1009148-16		
FRACTION: PAH	SAMP_DATE	9/20/2010			9/20/2010			9/20/2010			9/20/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	84.5			85.4			82.3			88.8		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)PYRENE											11.5		
NAPHTHALENE		1.53	U		1.48	U		1.56	U				

PROJ_NO: 02111	NSAMPLE	32SS-61-0002			32SS-62-0002			32SS-63-0002			32SS-64-0002		
SDG: CTOF273_010	LAB_ID	1009148-17			1009148-18			1009148-19			1009148-15		
FRACTION: PAH	SAMP_DATE	9/20/2010			9/20/2010			9/20/2010			9/20/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	75.6			75.1			75.5			95.6		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)PYRENE		1.72	U		1.74	U		157			3450		
NAPHTHALENE													

PROJ_NO: 02111	NSAMPLE	32SS-65-0002			FD092010-01			FD092010-02		
SDG: CTOF273_010	LAB_ID	1009148-14			1009148-02			1009148-20		
FRACTION: PAH	SAMP_DATE	9/20/2010			9/20/2010			9/20/2010		
MEDIA: SOIL	QC_TYPE	NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	82.3			81.3			81.0		
	DUP_OF				32SB-56-1415			32SS-65-0002		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)PYRENE		79.1	J	G				323	J	G
NAPHTHALENE					1.59	U				

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

ANALYSIS DATA SHEET

32SB-ST01-0708

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009148-01	File ID:	0914801.D
Sampled:	09/20/10 11:49	Prepared:	09/28/10 00:00	Analyzed:	09/28/10 19:51
Solids:	83.55	Preparation:	5035	Dilution:	1

Batch: 0I28020 Sequence: 0I27214 Calibration: 0270005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
1634-04-4	Methyl t-Butyl Ether		0.317	5.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	29.73	30.62	103	80 - 125	
1,2-Dichloroethane-d4	29.73	28.73	96.6	75 - 140	
Toluene-d8	29.73	30.65	103	85 - 115	

ANALYSIS DATA SHEET

32SB-54-0708

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_010	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1009148-03	File ID:	0914803.D
Sampled:	09/20/10 14:00	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 16:45
Solids:	86.05	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
91-20-3	Naphthalene	3.95	1.53	7.65	J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3823	1677	43.9	14 - 129	
Terphenyl-d14	3823	1905	49.8	14 - 129	

ANALYSIS DATA SHEET

32SB-54-1112

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009148-04	File ID:	0914804.D
Sampled:	09/20/10 14:00	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 17:13
Solids:	83.52	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
91-20-3	Naphthalene		1.51	7.58	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3789	1241	32.8	14 - 129	
Terphenyl-d14	3789	1339	35.3	14 - 129	

ANALYSIS DATA SHEET

32SB-55-0708

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009148-06	File ID:	0914806.D
Sampled:	09/20/10 10:40	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 18:08
Solids:	82.88	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
91-20-3	Naphthalene		1.56	7.84	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3918	1837	46.9	14 - 129	
Terphenyl-d14	3918	2206	56.3	14 - 129	

ANALYSIS DATA SHEET

32SB-55-1112

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009148-05	File ID:	0914805.D
Sampled:	09/20/10 10:40	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 17:40
Solids:	70.42	Preparation:	EXT_3546	Dilution:	1

Batch: 0121011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
91-20-3	Naphthalene		1.89	9.47	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4733	1855	39.2	14 - 129	
Terphenyl-d14	4733	2009	42.5	14 - 129	

ANALYSIS DATA SHEET

32SB-56-1011

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009148-07	File ID:	0914807.D
Sampled:	09/20/10 10:10	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 18:36
Solids:	82.96	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
91-20-3	Naphthalene	13.5	1.55	7.78	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3889	2167	55.7	14 - 129	
Terphenyl-d14	3889	2255	58.0	14 - 129	

ANALYSIS DATA SHEET

32SB-56-1415

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_010	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1009148-08	File ID:	0914808.D
Sampled:	09/20/10 10:10	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 19:04
Solids:	81.14	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
91-20-3	Naphthalene		1.62	8.11	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4054	1904	47.0	14 - 129	
Terphenyl-d14	4054	1850	45.6	14 - 129	

ANALYSIS DATA SHEET

32SB-57-0708

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009148-09	File ID:	0914809.D
Sampled:	09/20/10 13:41	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 19:31
Solids:	93.25	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
91-20-3	Naphthalene		1.40	7.01	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3505	1634	46.6	14 - 129	
Terphenyl-d14	3505	1726	49.3	14 - 129	

ANALYSIS DATA SHEET

32SB-58-0708

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_010	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1009148-10	File ID:	0914810.D
Sampled:	09/20/10 14:35	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 20:00
Solids:	88.99	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
91-20-3	Naphthalene	5.11	1.46	7.30	J

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3648	1335	36.6	14 - 129	
Terphenyl-d14	3648	1348	37.0	14 - 129	

ANALYSIS DATA SHEET

32SB-58-1112

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009148-11	File ID:	0914811.D
Sampled:	09/20/10 14:35	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 20:28
Solids:	84.55	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
91-20-3	Naphthalene		1.53	7.68	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3840	1236	32.2	14 - 129	
Terphenyl-d14	3840	1163	30.3	14 - 129	

ANALYSIS DATA SHEET

32SB-59-0708

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009148-12	File ID:	0914812.D
Sampled:	09/20/10 15:09	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 20:56
Solids:	85.36	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
91-20-3	Naphthalene		1.48	7.42	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3707	982.8	26.5	14 - 129	
Terphenyl-d14	3707	1019	27.5	14 - 129	

ANALYSIS DATA SHEET

32SB-59-1112

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009148-13	File ID:	0914813.D
Sampled:	09/20/10 15:09	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 21:23
Solids:	82.28	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
91-20-3	Naphthalene		1.56	7.85	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3921	1825	46.5	14 - 129	
Terphenyl-d14	3921	1901	48.5	14 - 129	

ANALYSIS DATA SHEET

32SS-60-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009148-16	File ID:	0914816.D
Sampled:	09/20/10 15:28	Prepared:	09/23/10 18:30	Analyzed:	10/01/10 00:37
Solids:	88.79	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
50-32-8	Benzo(a)pyrene	11.5	1.48	7.41	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3705	1548	41.8	14 - 129	
Terphenyl-d14	3705	1698	45.8	14 - 129	

ANALYSIS DATA SHEET

32SS-61-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009148-17	File ID:	0914817.D
Sampled:	09/20/10 15:40	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 22:19
Solids:	75.61	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
50-32-8	Benzo(a)pyrene		1.72	8.65	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4322	1891	43.8	14 - 129	
Terphenyl-d14	4322	1896	43.9	14 - 129	

ANALYSIS DATA SHEET

32SS-62-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009148-18	File ID:	0914818.D
Sampled:	09/20/10 15:50	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 22:46
Solids:	75.08	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
50-32-8	Benzo(a)pyrene		1.74	8.71	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4353	2031	46.7	14 - 129	
Terphenyl-d14	4353	2104	48.3	14 - 129	

ANALYSIS DATA SHEET

32SS-63-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009148-19	File ID:	0914819.D
Sampled:	09/20/10 16:03	Prepared:	09/23/10 18:30	Analyzed:	10/01/10 01:05
Solids:	75.45	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
50-32-8	Benzo(a)pyrene	157	1.75	8.78	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4389	1783	40.6	14 - 129	
Terphenyl-d14	4389	1907	43.4	14 - 129	

ANALYSIS DATA SHEET

32SS-64-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009148-15	File ID:	0914815D.D
Sampled:	09/20/10 13:06	Prepared:	09/23/10 18:30	Analyzed:	10/01/10 01:32
Solids:	95.57	Preparation:	EXT_3546	Dilution:	5

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
50-32-8	Benzo(a)pyrene	3450	6.91	34.7	D

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3465	1932	55.8	14 - 129	
Terphenyl-d14	3465	1969	56.8	14 - 129	

ANALYSIS DATA SHEET

32SS-65-0002

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009148-14	File ID:	0914814.D
Sampled:	09/20/10 12:50	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 21:51
Solids:	82.30	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
50-32-8	Benzo(a)pyrene	79.1	1.58	7.95	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3971	1925	48.5	14 - 129	
Terphenyl-d14	3971	2106	53.0	14 - 129	

ANALYSIS DATA SHEET

FD092010-01

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_010	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1009148-02	File ID:	0914802.D
Sampled:	09/20/10 00:00	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 16:17
Solids:	81.26	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
91-20-3	Naphthalene		1.59	7.99	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3995	1988	49.8	14 - 129	
Terphenyl-d14	3995	2145	53.7	14 - 129	

ANALYSIS DATA SHEET

FD092010-02

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_010	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1009148-20	File ID:	0914820.D
Sampled:	09/20/10 00:00	Prepared:	09/23/10 18:30	Analyzed:	09/30/10 23:14
Solids:	80.98	Preparation:	EXT_3546	Dilution:	1

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
50-32-8	Benzo(a)pyrene	323	1.61	8.07	

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4035	1656	41.0	14 - 129	
Terphenyl-d14	4035	1840	45.6	14 - 129	

APPENDIX C

SUPPORT DOCUMENTATION

SDG CTOF273_010

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV	UG/KG	32SB-ST01-0708	1009148-01	NM	09/20/2010	09/28/2010	09/28/2010	8	0	8
SIM	UG/KG	32SB-55-1112	1009148-05	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-58-1112	1009148-11	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-58-0708	1009148-10	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-58-0708	1009148-10	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-57-0708	1009148-09	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-57-0708	1009148-09	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-56-1415	1009148-08	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-56-1415	1009148-08	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-56-1011	1009148-07	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-59-0708	1009148-12	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-55-1112	1009148-05	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-55-0708	1009148-06	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-55-0708	1009148-06	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-54-1112	1009148-04	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
SIM	UG/KG	32SB-54-1112	1009148-04	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-54-0708	1009148-03	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-54-0708	1009148-03	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-56-1011	1009148-07	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SS-62-0002	1009148-18	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	FD092010-02	1009148-20	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	FD092010-01	1009148-02	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	FD092010-01	1009148-02	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SS-65-0002	1009148-14	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SS-65-0002	1009148-14	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SS-64-0002	1009148-15	SUR	09/20/2010	09/23/2010	10/01/2010	3	8	11
SIM	UG/KG	32SS-64-0002	1009148-15	NM	09/20/2010	09/23/2010	10/01/2010	3	8	11
SIM	UG/KG	32SB-58-1112	1009148-11	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SS-63-0002	1009148-19	NM	09/20/2010	09/23/2010	10/01/2010	3	8	11
SIM	UG/KG	32SB-59-0708	1009148-12	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SS-62-0002	1009148-18	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SS-61-0002	1009148-17	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SS-61-0002	1009148-17	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
SIM	UG/KG	32SS-60-0002	1009148-16	SUR	09/20/2010	09/23/2010	10/01/2010	3	8	11
SIM	UG/KG	32SS-60-0002	1009148-16	NM	09/20/2010	09/23/2010	10/01/2010	3	8	11
SIM	UG/KG	32SB-59-1112	1009148-13	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SB-59-1112	1009148-13	NM	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	FD092010-02	1009148-20	SUR	09/20/2010	09/23/2010	09/30/2010	3	7	10
SIM	UG/KG	32SS-63-0002	1009148-19	SUR	09/20/2010	09/23/2010	10/01/2010	3	8	11

NSWC CRANE
SOIL DATA
CTOF273_010

FRACTION	CHEMICAL	32SS-65-0002	UNITS	FD092010-02	RPD	D
PAH	BENZO(A)PYRENE	79.1 J	UG/KG	323 J	121.31	243.90

Current RPD Quality Control Limit: 50 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

ANALYTICAL SUMMARY DATA PACKAGE
SDG # CTOF273_010

PROJECT NAME: NSA CRANE SMU32
PROJECT LOCATION: CRANE, INDIANA
CONTRACT #: N62470-08-D-1001

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Report Revision #: N/A
Revision Date: N/A
Total # of Pages: 76

THIS DOCUMENT MEETS DoD QSM 4.1 STANDARDS

The results relate to only the samples associated with the referenced SDG and the submitted data has been produced in accordance with laboratory procedures. The Laboratory's Technical Lab Director, Mr. Rick Davis, is responsible for the final data produced and reported. His signature is listed at the end of the Case Narrative within the Analytical Data Package. If applicable to this report package, details on report revisions and the information on subcontracted analysis are listed in the package Case Narrative. This report shall not be reproduced, except in full, without the written approval of Empirical Laboratories, LLC.

Sample Delivery Group Case Narrative

Receipt Information
The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision
This is an original submittal of the final report package.

Analytical Information
All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. The following information is provided specific to individual methods:

Chromatographic Flags for Manual Integration:
The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.
B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.
C: The peak was manually integrated to correct the baseline from the original chromatogram.
D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

SW8260B:
No anomalies or deviations are noted.

SW8270C:
No anomalies or deviations are noted.

Data Qualifiers
As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL), also known as Reporting Limit **(RL),** is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

*****: An exceeding quality control criteria is associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the EQL. One should feel confident that the result is greater than zero and less than the EQL.

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In inorganics, it indicates that the parameters MDL/RL have

been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The RPD and/or percent recovery exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.

S: The associated internal standard failed criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

LIMS Definitions / Naming Conventions:
The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

BLK: LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

BS: LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "**RE**" implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:
I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, Ms. Marcia K. McGinnity is authorized to sign this Statement of Data Authenticity.

Mr. Rick D. Davis
Laboratory Technical Director / VP Operations

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER PAGE 2 OF 2

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G02111	CTOF273	Tony Klimek 513-251-2730	Empirical Laboratories
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George TenEyck 513-251-2730	ADDRESS: 621 Mainstream Dr, Suite 270
		CARRIER/WAYBILL NUMBER	CITY, STATE: Nashville, TN 37225

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G
PRESERVATIVE USED: 4°C 4°C

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: MTBE	Naphthalene							COMMENTS
0920	1149	32SB-S01-0708	SO	G	2	✓								1009148-01
0920	0000	FD 092010-01	SO	G	1		✓							-02
	1400	32SB-S4-0708			1		✓							-03
	1400	32SB-S4-1112					✓							-04
	1040	32SB-S5-1112					✓							-05
	1040	32SB-S5-0708					✓							-06
	1010	32SB-S6-1011					✓							-07
	1010	32SB-S6-1415					✓							-08
	1341	32SB-S7-0708					✓							-09
	1435	32SB S8-0708					✓							-10
	1435	32SB S8-1112					✓							-11
	1509	32SB-S9-0708					✓							-12
	1509	32SB-S9-1112					✓							-13

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	10.38	0920 2010	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	9/21/10	08:30

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

0-5°C

3/99 FORM NO. TtNUS-001

8

CTOF273_010 Summ Package

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER PAGE 1 OF 2

PROJECT NO: 112G02111	SITE NAME: CTOF273	PROJECT MANAGER AND PHONE NUMBER: Tony Klimek 513-251-2730	LABORATORY NAME AND CONTACT: Empirical Laboratories
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George TenEyck 513-251-2730	ADDRESS: 621 Mainstream Dr, Suite 270
		CARRIER/WAYBILL NUMBER: 8631-3888-4887	CITY, STATE: Nashville, TN 37225

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: Benzo(a) Pyrene								COMMENTS
09/20	12:50	3255-65-0002	SO	G	1	✓								1009148-14
	13:06	3255-64-0002	SO		1	✓								-15
	15:28	3255-60-0002	SO		1	✓								-16
	15:40	3255-61-0002	SO		1	✓								-17
	15:50	3255-62-0002	SO		1	✓								-18
	16:03	3255-63-0002	SO		1	✓								-19
	0000	FD 092010-02	SO		1	✓								-20

1. RELINQUISHED BY	DATE 1738	TIME 09 20 2010	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE 9/21/10	TIME 08:30

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY) 0.5°C

3/99
FORM NO. TtNUS-001

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1009148 Number of Coolers: 1 of 1

Client: TTNUS Project: CTO-F273

Date/Time Received: **9/21/10** **08:30** Date cooler(s) opened: **9/21/10**

Opened By (print): Will Schwab (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered
   EL Courier Other: _____

If applicable, enter airbill number here: 4887

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 2 Seal date: 9/20/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 0.5 °C

Dates samples were logged-in: **9/21/10**

9. Initial this form to acknowledge login of sample(s): (Name): Will Schwab (Initial): WS
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

HOLDING TIME SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_010

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SB-ST01-0708	09/20/10 11:49	09/21/10 08:30	09/28/10 00:00	N/A	14.00	09/28/10 19:51	8.33	14.00	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0I27214	Instrument:	MS-VOA4
		Calibration:	0270005

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0I27214-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 09/28/10 13:56		
Dibromofluoromethane	30.00	102	80 - 120	12.206	12.206	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	99.9	80 - 120	12.897	12.897	0.0000	+/-1.000	
Toluene-d8	30.00	96.1	80 - 120	15.964	15.964	0.0000	+/-1.000	
LCS (0I28020-BS1) ug/Kg wet				Lab File ID: V4LCS01.D		Analyzed: 09/28/10 14:43		
Dibromofluoromethane	30.00	98.0	80 - 125	12.202	12.206	-0.0040	+/-1.000	
1,2-Dichloroethane-d4	30.00	93.3	75 - 140	12.892	12.897	-0.0050	+/-1.000	
Toluene-d8	30.00	99.1	85 - 115	15.959	15.964	-0.0050	+/-1.000	
Blank (0I28020-BLK1) ug/Kg wet				Lab File ID: V4BLK01.D		Analyzed: 09/28/10 16:15		
Dibromofluoromethane	30.00	107	80 - 125	12.192	12.206	-0.0140	+/-1.000	
1,2-Dichloroethane-d4	30.00	110	75 - 140	12.892	12.897	-0.0050	+/-1.000	
Toluene-d8	30.00	103	85 - 115	15.959	15.964	-0.0050	+/-1.000	
32SB-ST01-0708 (1009148-01) ug/Kg dry				Lab File ID: 0914801.D		Analyzed: 09/28/10 19:51		
Dibromofluoromethane	29.73	103	80 - 125	12.196	12.206	-0.0100	+/-1.000	
1,2-Dichloroethane-d4	29.73	96.6	75 - 140	12.896	12.897	-0.0010	+/-1.000	
Toluene-d8	29.73	103	85 - 115	15.953	15.964	-0.0110	+/-1.000	
LCS Dup (0I28020-BSD1) ug/Kg wet				Lab File ID: V4LCSD01.D		Analyzed: 09/28/10 21:54		
Dibromofluoromethane	30.00	98.6	80 - 125	12.2	12.206	-0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	94.1	75 - 140	12.89	12.897	-0.0070	+/-1.000	
Toluene-d8	30.00	102	85 - 115	15.957	15.964	-0.0070	+/-1.000	

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_010

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0I28020 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0I28020-BLK1	09/28/10 00:00	5.00	5.00
LCS	0I28020-BS1	09/28/10 00:00	5.00	5.00
LCS Dup	0I28020-BSD1	09/28/10 00:00	5.00	5.00
32SB-ST01-0708	1009148-01	09/28/10 00:00	6.04	5.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:		Laboratory ID:	0I28020-BLK1	File ID:	V4BLK01.D
Sampled:		Prepared:		Analyzed:	09/28/10 16:15
Solids:		Preparation:	5035	Dilution:	

Batch: 0I28020 Sequence: 0I27214 Calibration: 0270005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
1634-04-4	Methyl t-Butyl Ether		0.320	5.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Dibromofluoromethane	30.00	32.23	107	80 - 125	
1,2-Dichloroethane-d4	30.00	33.08	110	75 - 140	
Toluene-d8	30.00	30.77	103	85 - 115	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0128020	Laboratory ID:	0128020-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Methyl t-Butyl Ether	50.00	62.75	126	55 - 150

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Methyl t-Butyl Ether	50.00	48.26	96.5	26.1	30	55 - 150

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0I27024	Instrument:	MS-VOA4
Calibration:	0270005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0I27024-TUN1	SEQ-TUN1.D	09/23/10 10:55
Cal Standard	0I27024-CAL1	SEQ-CAL1.D	09/23/10 11:26
Cal Standard	0I27024-CAL2	SEQ-CAL2.D	09/23/10 11:57
Cal Standard	0I27024-CAL3	SEQ-CAL3.D	09/23/10 12:28
Cal Standard	0I27024-CAL4	SEQ-CAL4.D	09/23/10 12:59
Cal Standard	0I27024-CAL5	SEQ-CAL5.D	09/23/10 13:30
Cal Standard	0I27024-CAL6	SEQ-CAL6.D	09/23/10 14:01
Cal Standard	0I27024-CAL7	SEQ-CAL7.D	09/23/10 14:33
Cal Standard	0I27024-CAL8	SEQ-CAL8.D	09/23/10 15:04
Initial Cal Check	0I27024-ICV1	SEQ-ICV1.D	09/23/10 15:35
Cal Standard	0I27024-CAL9	SEQ-CAL9.D	09/23/10 16:06

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	09/23/10
Instrument ID:	MS-VOA4	Injection Time:	10:55
Sequence:	0I27024	Lab Sample ID:	0I27024-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	15	PASS
75	30 - 60% of 95	40.2	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.81	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	109	PASS
175	5 - 9% of 174	7.43	PASS
176	95 - 101% of 174	97.8	PASS
177	5 - 9% of 176	6.7	PASS

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0270005	Instrument:	MS-VOA4
Matrix:	Water	Calibration Date:	9/23/2010 1:55:34PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	0.9865715	5.27787	13.64225	2.921089E-02			15	
Bromofluorobenzene	0.8399072	4.867482	18.1775	1.441427E-02			15	
Ethylbenzene	2.898956	9.114838	17.37863	1.313719E-02			CCC (20)	
Naphthalene	1.313515	17.27682	21.77187	1.910864E-02		0.9984369	0.99	
Methyl t-Butyl Ether	0.5337157	9.106772	10.16613	0.1515849			15	
Toluene	1.611344	8.88083	15.99425	2.197296E-02			CCC (20)	
m,p-Xylene	2.101996	13.38044	17.5265	1.536245E-02			15	
o-Xylene	2.146211	8.773516	17.85188	0.0220359			15	
Xylenes (total)	2.116734	11.74811	0	0			15	
Dibromofluoromethane	0.2799609	2.950869	12.14488	3.402701E-02			15	
1,2-Dichloroethane-d4	5.786345E-02	3.054362	12.845	3.218583E-02			15	
Toluene-d8	2.340159	3.111578	15.92638	0.0161495			15	

INITIAL CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0270005
Lab File ID:	SEQ-ICV1.D	Calibration Date:	09/23/10 13:55
Sequence:	0I27024	Injection Date:	09/23/10
Lab Sample ID:	0I27024-ICV1	Injection Time:	15:35

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzene	A	100.0	103.4	0.9865715	1.020445		3.4	20
Ethylbenzene	A	100.0	102.6	2.898956	2.974829		2.6	20
Naphthalene	Q	100.0	111.9	1.313515	1.597504		11.9	20
Methyl t-Butyl Ether	A	100.0	110.0	0.5337157	0.5870677		10.0	20
Toluene	A	100.0	98.52	1.611344	1.58755		-1.5	20
m,p-Xylene	A	200.0	198.3	2.101996	2.083793		-0.9	20
o-Xylene	A	100.0	100.5	2.146211	2.157527		0.5	20
Xylenes (total)	A	300.0	298.8	2.116734	2.108371		-0.4	20
Bromofluorobenzene	A	30.00	29.74	0.8399072	0.8326121		-0.9	20
Dibromofluoromethane	A	30.00	28.78	0.2799609	0.2685852		-4.1	20
1,2-Dichloroethane-d4	A	30.00	30.32	5.786345E-02	5.847877E-02		1.1	20
Toluene-d8	A	30.00	29.28	2.340159	2.284071		-2.4	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0I27214	Instrument:	MS-VOA4
Calibration:	0270005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0I27214-TUN1	SEQ-TUN1.D	09/28/10 12:39
Calibration Check	0I27214-CCV1	SEQ-CCV1.D	09/28/10 13:56
LCS	0I28020-BS1	V4LCS01.D	09/28/10 14:43
Blank	0I28020-BLK1	V4BLK01.D	09/28/10 16:15
32SB-ST01-0708	1009148-01	0914801.D	09/28/10 19:51
LCS Dup	0I28020-BSD1	V4LCSD01.D	09/28/10 21:54

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	09/28/10
Instrument ID:	MS-VOA4	Injection Time:	12:39
Sequence:	0I27214	Lab Sample ID:	0I27214-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	20.5	PASS
75	30 - 60% of 95	45.7	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.47	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	69.2	PASS
175	5 - 9% of 174	7.97	PASS
176	95 - 101% of 174	96.5	PASS
177	5 - 9% of 176	7.3	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0270005
Lab File ID:	SEQ-CCV1.D	Calibration Date:	09/23/10 13:55
Sequence:	0I27214	Injection Date:	09/28/10
Lab Sample ID:	0I27214-CCV1	Injection Time:	13:56

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Methyl t-Butyl Ether	A	100.0	104.8	0.5337157	0.5593635		4.8	20
Dibromofluoromethane	A	30.00	30.72	0.2799609	0.2867065		2.4	20
1,2-Dichloroethane-d4	A	30.00	29.96	5.786345E-02	5.778191E-02		-0.1	20
Toluene-d8	A	30.00	28.83	2.340159	2.24905		-3.9	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0I27214	Instrument:	MS-VOA4
		Calibration:	0270005

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0I27214-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 09/28/10 13:56			
Fluorobenzene	1033576	13.972	1023020	13.926	101	50 - 200	0.0460	+/-0.50	
Chlorobenzene-d5	428343	17.236	439111	17.2	98	50 - 200	0.0360	+/-0.50	
1,4-Dichlorobenzene-d4	447210	19.287	357477	19.252	125	50 - 200	0.0350	+/-0.50	
LCS (0I28020-BS1)			Lab File ID: V4LCS01.D			Analyzed: 09/28/10 14:43			
Fluorobenzene	1264508	13.977	1033576	13.972	122	50 - 200	0.0050	+/-0.50	
Chlorobenzene-d5	507600	17.241	428343	17.236	119	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	528098	19.282	447210	19.287	118	50 - 200	-0.0050	+/-0.50	
Blank (0I28020-BLK1)			Lab File ID: V4BLK01.D			Analyzed: 09/28/10 16:15			
Fluorobenzene	986100	13.967	1033576	13.972	95	50 - 200	-0.0050	+/-0.50	
Chlorobenzene-d5	383353	17.231	428343	17.236	89	50 - 200	-0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	424166	19.272	447210	19.287	95	50 - 200	-0.0150	+/-0.50	
32SB-ST01-0708 (1009148-01)			Lab File ID: 0914801.D			Analyzed: 09/28/10 19:51			
Fluorobenzene	1201559	13.971	1033576	13.972	116	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	456223	17.235	428343	17.236	107	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	468988	19.277	447210	19.287	105	50 - 200	-0.0100	+/-0.50	
LCS Dup (0I28020-BSD1)			Lab File ID: V4LCSD01.D			Analyzed: 09/28/10 21:54			
Fluorobenzene	1235377	13.975	1033576	13.972	120	50 - 200	0.0030	+/-0.50	
Chlorobenzene-d5	483839	17.229	428343	17.236	113	50 - 200	-0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	509749	19.28	447210	19.287	114	50 - 200	-0.0070	+/-0.50	

HOLDING TIME SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_010

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
FD092010-01	09/20/10 00:00	09/21/10 08:30	09/23/10 18:30	3.77	14.00	09/30/10 16:17	6.91	40.00	
32SB-54-0708	09/20/10 14:00	09/21/10 08:30	09/23/10 18:30	3.19	14.00	09/30/10 16:45	6.93	40.00	
32SB-54-1112	09/20/10 14:00	09/21/10 08:30	09/23/10 18:30	3.19	14.00	09/30/10 17:13	6.95	40.00	
32SB-55-1112	09/20/10 10:40	09/21/10 08:30	09/23/10 18:30	3.33	14.00	09/30/10 17:40	6.97	40.00	
32SB-55-0708	09/20/10 10:40	09/21/10 08:30	09/23/10 18:30	3.33	14.00	09/30/10 18:08	6.98	40.00	
32SB-56-1011	09/20/10 10:10	09/21/10 08:30	09/23/10 18:30	3.35	14.00	09/30/10 18:36	7.00	40.00	
32SB-56-1415	09/20/10 10:10	09/21/10 08:30	09/23/10 18:30	3.35	14.00	09/30/10 19:04	7.02	40.00	
32SB-57-0708	09/20/10 13:41	09/21/10 08:30	09/23/10 18:30	3.20	14.00	09/30/10 19:31	7.04	40.00	
32SB-58-0708	09/20/10 14:35	09/21/10 08:30	09/23/10 18:30	3.16	14.00	09/30/10 20:00	7.06	40.00	
32SB-58-1112	09/20/10 14:35	09/21/10 08:30	09/23/10 18:30	3.16	14.00	09/30/10 20:28	7.08	40.00	
32SB-59-0708	09/20/10 15:09	09/21/10 08:30	09/23/10 18:30	3.14	14.00	09/30/10 20:56	7.10	40.00	
32SB-59-1112	09/20/10 15:09	09/21/10 08:30	09/23/10 18:30	3.14	14.00	09/30/10 21:23	7.12	40.00	
32SS-65-0002	09/20/10 12:50	09/21/10 08:30	09/23/10 18:30	3.24	14.00	09/30/10 21:51	7.14	40.00	
32SS-64-0002	09/20/10 13:06	09/21/10 08:30	09/23/10 18:30	3.23	14.00	10/01/10 01:32	7.29	40.00	
32SS-60-0002	09/20/10 15:28	09/21/10 08:30	09/23/10 18:30	3.13	14.00	10/01/10 00:37	7.25	40.00	
32SS-61-0002	09/20/10 15:40	09/21/10 08:30	09/23/10 18:30	3.12	14.00	09/30/10 22:19	7.16	40.00	
32SS-62-0002	09/20/10 15:50	09/21/10 08:30	09/23/10 18:30	3.11	14.00	09/30/10 22:46	7.18	40.00	
32SS-63-0002	09/20/10 16:03	09/21/10 08:30	09/23/10 18:30	3.10	14.00	10/01/10 01:05	7.27	40.00	
FD092010-02	09/20/10 00:00	09/21/10 08:30	09/23/10 18:30	3.77	14.00	09/30/10 23:14	7.20	40.00	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0J27408	Instrument:	MS-BNA4
		Calibration:	0237003

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0J27408-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 09/30/10 14:38		
2-Fluorobiphenyl	5.000	88.5	80 - 120	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	5.000	97.9	80 - 120	11.322	11.322	0.0000	+/-0.500	
LCS (0I21011-BS1) ug/Kg wet				Lab File ID: I21011L1.D		Analyzed: 09/30/10 15:21		
2-Fluorobiphenyl	3333	45.7	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	3333	51.7	14 - 129	11.332	11.322	0.0100	+/-0.500	
Blank (0I21011-BLK1) ug/Kg wet				Lab File ID: I21011B1.D		Analyzed: 09/30/10 15:49		
2-Fluorobiphenyl	3333	51.5	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	3333	60.7	14 - 129	11.332	11.322	0.0100	+/-0.500	
FD092010-01 (1009148-02) ug/Kg dry				Lab File ID: 0914802.D		Analyzed: 09/30/10 16:17		
2-Fluorobiphenyl	3995	49.8	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	3995	53.7	14 - 129	11.332	11.322	0.0100	+/-0.500	
32SB-54-0708 (1009148-03) ug/Kg dry				Lab File ID: 0914803.D		Analyzed: 09/30/10 16:45		
2-Fluorobiphenyl	3823	43.9	14 - 129	7.66	7.659	0.0010	+/-0.500	
Terphenyl-d14	3823	49.8	14 - 129	11.332	11.322	0.0100	+/-0.500	
32SB-54-1112 (1009148-04) ug/Kg dry				Lab File ID: 0914804.D		Analyzed: 09/30/10 17:13		
2-Fluorobiphenyl	3789	32.8	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	3789	35.3	14 - 129	11.322	11.322	0.0000	+/-0.500	
32SB-55-1112 (1009148-05) ug/Kg dry				Lab File ID: 0914805.D		Analyzed: 09/30/10 17:40		
2-Fluorobiphenyl	4733	39.2	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	4733	42.5	14 - 129	11.322	11.322	0.0000	+/-0.500	
32SB-55-0708 (1009148-06) ug/Kg dry				Lab File ID: 0914806.D		Analyzed: 09/30/10 18:08		
2-Fluorobiphenyl	3918	46.9	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	3918	56.3	14 - 129	11.332	11.322	0.0100	+/-0.500	
32SB-56-1011 (1009148-07) ug/Kg dry				Lab File ID: 0914807.D		Analyzed: 09/30/10 18:36		
2-Fluorobiphenyl	3889	55.7	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	3889	58.0	14 - 129	11.331	11.322	0.0090	+/-0.500	
32SB-56-1415 (1009148-08) ug/Kg dry				Lab File ID: 0914808.D		Analyzed: 09/30/10 19:04		
2-Fluorobiphenyl	4054	47.0	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	4054	45.6	14 - 129	11.322	11.322	0.0000	+/-0.500	
32SB-57-0708 (1009148-09) ug/Kg dry				Lab File ID: 0914809.D		Analyzed: 09/30/10 19:31		
2-Fluorobiphenyl	3505	46.6	14 - 129	7.66	7.659	0.0010	+/-0.500	
Terphenyl-d14	3505	49.3	14 - 129	11.332	11.322	0.0100	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0J27408	Instrument:	MS-BNA4
		Calibration:	0237003

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
32SB-58-0708 (1009148-10) ug/Kg dry				Lab File ID: 0914810.D		Analyzed: 09/30/10 20:00		
2-Fluorobiphenyl	3648	36.6	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	3648	37.0	14 - 129	11.322	11.322	0.0000	+/-0.500	
32SB-58-1112 (1009148-11) ug/Kg dry				Lab File ID: 0914811.D		Analyzed: 09/30/10 20:28		
2-Fluorobiphenyl	3840	32.2	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	3840	30.3	14 - 129	11.322	11.322	0.0000	+/-0.500	
32SB-59-0708 (1009148-12) ug/Kg dry				Lab File ID: 0914812.D		Analyzed: 09/30/10 20:56		
2-Fluorobiphenyl	3707	26.5	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	3707	27.5	14 - 129	11.322	11.322	0.0000	+/-0.500	
32SB-59-1112 (1009148-13) ug/Kg dry				Lab File ID: 0914813.D		Analyzed: 09/30/10 21:23		
2-Fluorobiphenyl	3921	46.5	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	3921	48.5	14 - 129	11.322	11.322	0.0000	+/-0.500	
32SS-65-0002 (1009148-14) ug/Kg dry				Lab File ID: 0914814.D		Analyzed: 09/30/10 21:51		
2-Fluorobiphenyl	3971	48.5	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	3971	53.0	14 - 129	11.331	11.322	0.0090	+/-0.500	
32SS-61-0002 (1009148-17) ug/Kg dry				Lab File ID: 0914817.D		Analyzed: 09/30/10 22:19		
2-Fluorobiphenyl	4322	43.8	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	4322	43.9	14 - 129	11.322	11.322	0.0000	+/-0.500	
32SS-62-0002 (1009148-18) ug/Kg dry				Lab File ID: 0914818.D		Analyzed: 09/30/10 22:46		
2-Fluorobiphenyl	4353	46.7	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	4353	48.3	14 - 129	11.322	11.322	0.0000	+/-0.500	
FD092010-02 (1009148-20) ug/Kg dry				Lab File ID: 0914820.D		Analyzed: 09/30/10 23:14		
2-Fluorobiphenyl	4035	41.0	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	4035	45.6	14 - 129	11.332	11.322	0.0100	+/-0.500	
Matrix Spike (0I21011-MS1) ug/Kg dry				Lab File ID: 0914806M.D		Analyzed: 09/30/10 23:42		
2-Fluorobiphenyl	3995	51.1	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	3995	55.0	14 - 129	11.332	11.322	0.0100	+/-0.500	
Matrix Spike Dup (0I21011-MSD1) ug/Kg dry				Lab File ID: 0914806S.D		Analyzed: 10/01/10 00:10		
2-Fluorobiphenyl	3969	48.7	14 - 129	7.66	7.659	0.0010	+/-0.500	
Terphenyl-d14	3969	52.4	14 - 129	11.332	11.322	0.0100	+/-0.500	
32SS-60-0002 (1009148-16) ug/Kg dry				Lab File ID: 0914816.D		Analyzed: 10/01/10 00:37		
2-Fluorobiphenyl	3705	41.8	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	3705	45.8	14 - 129	11.332	11.322	0.0100	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0J27408	Instrument:	MS-BNA4
		Calibration:	0237003

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
32SS-63-0002 (1009148-19) ug/Kg dry				Lab File ID: 0914819.D		Analyzed: 10/01/10 01:05		
2-Fluorobiphenyl	4389	40.6	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	4389	43.4	14 - 129	11.332	11.322	0.0100	+/-0.500	
32SS-64-0002 (1009148-15) ug/Kg dry				Lab File ID: 0914815D.D		Analyzed: 10/01/10 01:32		
2-Fluorobiphenyl	3465	55.8	14 - 129	7.659	7.659	0.0000	+/-0.500	
Terphenyl-d14	3465	56.8	14 - 129	11.322	11.322	0.0000	+/-0.500	

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_010

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0I21011 Batch Matrix: Solid Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0I21011-BLK1	09/23/10 18:30	15.00	1.00
LCS	0I21011-BS1	09/23/10 18:30	15.00	1.00
32SB-55-0708	0I21011-MS1	09/23/10 18:30	15.10	1.00
32SB-55-0708	0I21011-MSD1	09/23/10 18:30	15.20	1.00
FD092010-01	1009148-02	09/23/10 18:30	15.40	1.00
32SB-54-0708	1009148-03	09/23/10 18:30	15.20	1.00
32SB-54-1112	1009148-04	09/23/10 18:30	15.80	1.00
32SB-55-1112	1009148-05	09/23/10 18:30	15.00	1.00
32SB-55-0708	1009148-06	09/23/10 18:30	15.40	1.00
32SB-56-1011	1009148-07	09/23/10 18:30	15.50	1.00
32SB-56-1415	1009148-08	09/23/10 18:30	15.20	1.00
32SB-57-0708	1009148-09	09/23/10 18:30	15.30	1.00
32SB-58-0708	1009148-10	09/23/10 18:30	15.40	1.00
32SB-58-1112	1009148-11	09/23/10 18:30	15.40	1.00
32SB-59-0708	1009148-12	09/23/10 18:30	15.80	1.00
32SB-59-1112	1009148-13	09/23/10 18:30	15.50	1.00
32SS-65-0002	1009148-14	09/23/10 18:30	15.30	1.00
32SS-64-0002	1009148-15	09/23/10 18:30	15.10	1.00
32SS-60-0002	1009148-16	09/23/10 18:30	15.20	1.00
32SS-61-0002	1009148-17	09/23/10 18:30	15.30	1.00
32SS-62-0002	1009148-18	09/23/10 18:30	15.30	1.00
32SS-63-0002	1009148-19	09/23/10 18:30	15.10	1.00
FD092010-02	1009148-20	09/23/10 18:30	15.30	1.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_010	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0I21011-BLK1	File ID:	I21011B1.D
Sampled:		Prepared:		Analyzed:	09/30/10 15:49
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 0I21011 Sequence: 0J27408 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
50-32-8	Benzo(a)pyrene		1.33	6.67	U
91-20-3	Naphthalene		1.33	6.67	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	1717	51.5	14 - 129	
Terphenyl-d14	3333	2024	60.7	14 - 129	

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0I21011	Laboratory ID:	0I21011-BS1
Preparation:	EXT_3546	Initial/Final:	15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)pyrene	66.67	46.44	69.7	28 - 128
Naphthalene	66.67	36.83	55.2	29 - 106

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SB-55-0708

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_010

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0I21011

% Solids: 82.88

Source Sample Name: **1009148-06**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Naphthalene	79.91	ND	49.93	62.5		29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Naphthalene	79.38	44.68	56.3	11.1		30	29 - 106

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0H23613	Instrument:	MS-BNA4
Calibration:	0237003		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0H23613-TUN1	SEQ-TUN1.D	08/23/10 10:58
Cal Standard	0H23613-CAL1	SEQ-CAL1.D	08/23/10 11:18
Cal Standard	0H23613-CAL2	SEQ-CAL2.D	08/23/10 11:46
Cal Standard	0H23613-CAL3	SEQ-CAL3.D	08/23/10 12:14
Cal Standard	0H23613-CAL4	SEQ-CAL4.D	08/23/10 12:43
Cal Standard	0H23613-CAL5	SEQ-CAL5.D	08/23/10 13:12
Cal Standard	0H23613-CAL6	SEQ-CAL6.D	08/23/10 13:41
Cal Standard	0H23613-CAL7	SEQ-CAL7.D	08/23/10 14:09
Cal Standard	0H23613-CAL8	SEQ-CAL8.D	08/23/10 14:38
Cal Standard	0H23613-CAL9	SEQ-CAL9.D	08/23/10 15:07
Cal Standard	0H23613-CALA	SEQ-CALA.D	08/23/10 15:35
Cal Standard	0H23613-CALB	SEQ-CALB.D	08/23/10 16:04
Initial Cal Check	0H23613-ICV1	SEQ-ICV1.D	08/23/10 16:33

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	08/23/10
Instrument ID:	MS-BNA4	Injection Time:	10:58
Sequence:	0H23613	Lab Sample ID:	0H23613-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	37.1	PASS
68	Less than 2% of 69	1.35	PASS
69	Less than 200% of 198	35.2	PASS
70	Less than 2% of 69	0.535	PASS
127	40 - 60% of 198	44.6	PASS
197	Less than 1% of 198	0.57	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.65	PASS
275	10 - 30% of 198	29.4	PASS
365	1 - 200% of 198	4.31	PASS
441	0.001 - 100% of 443	81.1	PASS
442	40 - 200% of 198	171	PASS
443	17 - 23% of 442	19.6	PASS

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0237003	Instrument:	MS-BNA4
Matrix:	Water	Calibration Date:	8/23/2010 2:19:08PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.8490211	6.818824	8.672363	7.491158E-02			CCC (30)	
Acenaphthylene	1.256297	7.321474	8.503636	4.741883E-02			15	
Anthracene	1.162297	5.411094	10.16845	5.870715E-02			15	
Benzo(a)anthracene	1.05022	6.564346	12.73	5.763089E-02			15	
Benzo(a)pyrene	1.281052	3.796487	14.64482	9.160048E-02			CCC (30)	
Benzo(b)fluoranthene	1.518281	6.790712	14.14373	0.0922259			15	
Benzo(g,h,i)perylene	1.255234	5.124687	17.09564	0.1289391			15	
Benzo(k)fluoranthene	1.472463	7.737223	14.18955	9.274443E-02			15	
Chrysene	1.036307	8.192401	12.77309	5.757095E-02			15	
Dibenz(a,h)anthracene	1.117366	8.548531	16.66327	0.1020264			15	
Fluoranthene	1.238826	5.482849	11.28455	5.677501E-02			CCC (30)	
Fluorene	0.8096793	5.615516	9.182	4.516641E-02			15	
2-Fluorobiphenyl	0.9978073	5.609346	7.992182	4.747639E-02			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	1.182429	8.792795	16.60736	0.0996987			15	
1-Methylnaphthalene	0.7624406	5.428982	7.722637	4.959277E-02			15	
2-Methylnaphthalene	0.8439543	5.17593	7.628818	3.890384E-02			15	
Naphthalene	1.34026	5.556837	6.945	0.1089812			15	
Nitrobenzene-d5							15	
Phenanthrene	1.181841	6.256198	10.12082	4.272592E-02			15	
Phenol-d6							15	
Pyrene	1.285122	5.967861	11.50618	3.003483E-02			15	
Terphenyl-d14	0.9438304	6.047221	11.67445	3.428681E-02			15	
2,4,6-Tribromophenol	0.171283	18.26313	9.417909	7.753255E-02	0.9989515		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0237003
Lab File ID:	SEQ-ICV1.D	Calibration Date:	08/23/10 14:19
Sequence:	0H23613	Injection Date:	08/23/10
Lab Sample ID:	0H23613-ICV1	Injection Time:	16:33

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzo(a)pyrene	A	5.000	5.685	1.281052	1.456646		13.7	20
Naphthalene	A	5.000	5.701	1.34026	1.528177		14.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0J27408	Instrument:	MS-BNA4
Calibration:	0237003		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0J27408-TUN1	SEQ-TUN1.D	09/30/10 14:20
Calibration Check	0J27408-CCV1	SEQ-CCV1.D	09/30/10 14:38
LCS	0I21011-BS1	I21011L1.D	09/30/10 15:21
Blank	0I21011-BLK1	I21011B1.D	09/30/10 15:49
FD092010-01	1009148-02	0914802.D	09/30/10 16:17
32SB-54-0708	1009148-03	0914803.D	09/30/10 16:45
32SB-54-1112	1009148-04	0914804.D	09/30/10 17:13
32SB-55-1112	1009148-05	0914805.D	09/30/10 17:40
32SB-55-0708	1009148-06	0914806.D	09/30/10 18:08
32SB-56-1011	1009148-07	0914807.D	09/30/10 18:36
32SB-56-1415	1009148-08	0914808.D	09/30/10 19:04
32SB-57-0708	1009148-09	0914809.D	09/30/10 19:31
32SB-58-0708	1009148-10	0914810.D	09/30/10 20:00
32SB-58-1112	1009148-11	0914811.D	09/30/10 20:28
32SB-59-0708	1009148-12	0914812.D	09/30/10 20:56
32SB-59-1112	1009148-13	0914813.D	09/30/10 21:23
32SS-65-0002	1009148-14	0914814.D	09/30/10 21:51
32SS-61-0002	1009148-17	0914817.D	09/30/10 22:19
32SS-62-0002	1009148-18	0914818.D	09/30/10 22:46
FD092010-02	1009148-20	0914820.D	09/30/10 23:14
32SB-55-0708	0I21011-MS1	0914806M.D	09/30/10 23:42
32SB-55-0708	0I21011-MSD1	0914806S.D	10/01/10 00:10
32SS-60-0002	1009148-16	0914816.D	10/01/10 00:37
32SS-63-0002	1009148-19	0914819.D	10/01/10 01:05
32SS-64-0002	1009148-15	0914815D.D	10/01/10 01:32

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	09/30/10
Instrument ID:	MS-BNA4	Injection Time:	14:20
Sequence:	0J27408	Lab Sample ID:	0J27408-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	58	PASS
68	Less than 2% of 69	1.4	PASS
69	Less than 200% of 198	56.7	PASS
70	Less than 2% of 69	0.43	PASS
127	40 - 60% of 198	57.4	PASS
197	Less than 1% of 198	0.593	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.79	PASS
275	10 - 30% of 198	24	PASS
365	1 - 200% of 198	2.99	PASS
441	0.001 - 100% of 443	78.2	PASS
442	40 - 200% of 198	94	PASS
443	17 - 23% of 442	20.4	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0237003
Lab File ID:	SEQ-CCV1.D	Calibration Date:	08/23/10 14:19
Sequence:	0J27408	Injection Date:	09/30/10
Lab Sample ID:	0J27408-CCV1	Injection Time:	14:38

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzo(a)pyrene	A	5.000	4.754	1.281052	1.217976		-4.9	20
Naphthalene	A	5.000	4.545	1.34026	1.218275		-9.1	20
2-Fluorobiphenyl	A	5.000	4.424	0.9978073	0.8827993		-11.5	20
Terphenyl-d14	A	5.000	4.894	0.9438304	0.9237487		-2.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0J27408	Instrument:	MS-BNA4
		Calibration:	0237003

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0J27408-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 09/30/10 14:38			
Phenanthrene-d10	155284	9.742	81910	10.091	190	50 - 200	-0.3490	+/-0.50	
Perylene-d12	99867	14.102	58089	14.73	172	50 - 200	-0.6280	+/-0.50	
LCS (0I21011-BS1)			Lab File ID: I21011L1.D			Analyzed: 09/30/10 15:21			
Phenanthrene-d10	160388	9.742	155284	9.742	103	50 - 200	0.0000	+/-0.50	
Perylene-d12	87953	14.102	99867	14.102	88	50 - 200	0.0000	+/-0.50	
Blank (0I21011-BLK1)			Lab File ID: I21011B1.D			Analyzed: 09/30/10 15:49			
Phenanthrene-d10	172267	9.742	155284	9.742	111	50 - 200	0.0000	+/-0.50	
Perylene-d12	117660	14.102	99867	14.102	118	50 - 200	0.0000	+/-0.50	
FD092010-01 (1009148-02)			Lab File ID: 0914802.D			Analyzed: 09/30/10 16:17			
Phenanthrene-d10	152463	9.742	155284	9.742	98	50 - 200	0.0000	+/-0.50	
Perylene-d12	103691	14.102	99867	14.102	104	50 - 200	0.0000	+/-0.50	
32SB-54-0708 (1009148-03)			Lab File ID: 0914803.D			Analyzed: 09/30/10 16:45			
Phenanthrene-d10	158726	9.742	155284	9.742	102	50 - 200	0.0000	+/-0.50	
Perylene-d12	109594	14.102	99867	14.102	110	50 - 200	0.0000	+/-0.50	
32SB-54-1112 (1009148-04)			Lab File ID: 0914804.D			Analyzed: 09/30/10 17:13			
Phenanthrene-d10	166855	9.742	155284	9.742	107	50 - 200	0.0000	+/-0.50	
Perylene-d12	117953	14.102	99867	14.102	118	50 - 200	0.0000	+/-0.50	
32SB-55-1112 (1009148-05)			Lab File ID: 0914805.D			Analyzed: 09/30/10 17:40			
Phenanthrene-d10	159117	9.742	155284	9.742	102	50 - 200	0.0000	+/-0.50	
Perylene-d12	115525	14.102	99867	14.102	116	50 - 200	0.0000	+/-0.50	
32SB-55-0708 (1009148-06)			Lab File ID: 0914806.D			Analyzed: 09/30/10 18:08			
Phenanthrene-d10	170730	9.742	155284	9.742	110	50 - 200	0.0000	+/-0.50	
Perylene-d12	112322	14.102	99867	14.102	112	50 - 200	0.0000	+/-0.50	
32SB-56-1011 (1009148-07)			Lab File ID: 0914807.D			Analyzed: 09/30/10 18:36			
Phenanthrene-d10	153001	9.742	155284	9.742	99	50 - 200	0.0000	+/-0.50	
Perylene-d12	114633	14.102	99867	14.102	115	50 - 200	0.0000	+/-0.50	
32SB-56-1415 (1009148-08)			Lab File ID: 0914808.D			Analyzed: 09/30/10 19:04			
Phenanthrene-d10	152889	9.742	155284	9.742	98	50 - 200	0.0000	+/-0.50	
Perylene-d12	112228	14.102	99867	14.102	112	50 - 200	0.0000	+/-0.50	
32SB-57-0708 (1009148-09)			Lab File ID: 0914809.D			Analyzed: 09/30/10 19:31			
Phenanthrene-d10	159373	9.742	155284	9.742	103	50 - 200	0.0000	+/-0.50	
Perylene-d12	111905	14.102	99867	14.102	112	50 - 200	0.0000	+/-0.50	
32SB-58-0708 (1009148-10)			Lab File ID: 0914810.D			Analyzed: 09/30/10 20:00			
Phenanthrene-d10	156133	9.742	155284	9.742	101	50 - 200	0.0000	+/-0.50	
Perylene-d12	116280	14.102	99867	14.102	116	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_010
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0J27408	Instrument:	MS-BNA4
		Calibration:	0237003

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
32SB-58-1112 (1009148-11)			Lab File ID: 0914811.D			Analyzed: 09/30/10 20:28			
Phenanthrene-d10	161008	9.732	155284	9.742	104	50 - 200	-0.0100	+/-0.50	
Perylene-d12	110287	14.102	99867	14.102	110	50 - 200	0.0000	+/-0.50	
32SB-59-0708 (1009148-12)			Lab File ID: 0914812.D			Analyzed: 09/30/10 20:56			
Phenanthrene-d10	168531	9.733	155284	9.742	109	50 - 200	-0.0090	+/-0.50	
Perylene-d12	107320	14.102	99867	14.102	107	50 - 200	0.0000	+/-0.50	
32SB-59-1112 (1009148-13)			Lab File ID: 0914813.D			Analyzed: 09/30/10 21:23			
Phenanthrene-d10	161823	9.742	155284	9.742	104	50 - 200	0.0000	+/-0.50	
Perylene-d12	111112	14.102	99867	14.102	111	50 - 200	0.0000	+/-0.50	
32SS-65-0002 (1009148-14)			Lab File ID: 0914814.D			Analyzed: 09/30/10 21:51			
Phenanthrene-d10	162039	9.742	155284	9.742	104	50 - 200	0.0000	+/-0.50	
Perylene-d12	113780	14.102	99867	14.102	114	50 - 200	0.0000	+/-0.50	
32SS-61-0002 (1009148-17)			Lab File ID: 0914817.D			Analyzed: 09/30/10 22:19			
Phenanthrene-d10	155834	9.742	155284	9.742	100	50 - 200	0.0000	+/-0.50	
Perylene-d12	110306	14.102	99867	14.102	110	50 - 200	0.0000	+/-0.50	
32SS-62-0002 (1009148-18)			Lab File ID: 0914818.D			Analyzed: 09/30/10 22:46			
Phenanthrene-d10	157418	9.742	155284	9.742	101	50 - 200	0.0000	+/-0.50	
Perylene-d12	118326	14.102	99867	14.102	118	50 - 200	0.0000	+/-0.50	
FD092010-02 (1009148-20)			Lab File ID: 0914820.D			Analyzed: 09/30/10 23:14			
Phenanthrene-d10	164355	9.742	155284	9.742	106	50 - 200	0.0000	+/-0.50	
Perylene-d12	127288	14.111	99867	14.102	127	50 - 200	0.0090	+/-0.50	
Matrix Spike (0I21011-MS1)			Lab File ID: 0914806M.D			Analyzed: 09/30/10 23:42			
Phenanthrene-d10	152617	9.742	155284	9.742	98	50 - 200	0.0000	+/-0.50	
Perylene-d12	112151	14.102	99867	14.102	112	50 - 200	0.0000	+/-0.50	
Matrix Spike Dup (0I21011-MSD1)			Lab File ID: 0914806S.D			Analyzed: 10/01/10 00:10			
Phenanthrene-d10	154708	9.742	155284	9.742	100	50 - 200	0.0000	+/-0.50	
Perylene-d12	106749	14.102	99867	14.102	107	50 - 200	0.0000	+/-0.50	
32SS-60-0002 (1009148-16)			Lab File ID: 0914816.D			Analyzed: 10/01/10 00:37			
Phenanthrene-d10	168184	9.742	155284	9.742	108	50 - 200	0.0000	+/-0.50	
Perylene-d12	115280	14.111	99867	14.102	115	50 - 200	0.0090	+/-0.50	
32SS-63-0002 (1009148-19)			Lab File ID: 0914819.D			Analyzed: 10/01/10 01:05			
Phenanthrene-d10	173603	9.742	155284	9.742	112	50 - 200	0.0000	+/-0.50	
Perylene-d12	109118	14.111	99867	14.102	109	50 - 200	0.0090	+/-0.50	
32SS-64-0002 (1009148-15)			Lab File ID: 0914815D.D			Analyzed: 10/01/10 01:32			
Phenanthrene-d10	133938	9.742	155284	9.742	86	50 - 200	0.0000	+/-0.50	
Perylene-d12	71569	14.12	99867	14.102	72	50 - 200	0.0180	+/-0.50	

SAMPLE ID 32SB-56-1011

SAMPLE CALC IS AREA	DILUTION	COMPOUND OF INTEREST	IS AMOUNT (NG)	Final Extract Volume (UL)	AVE RRF	CONCENTRATION PPB
153001	1	35582	1	1000	1.3403	13.49
		% Solids		**Sample Volume (Grams)**		
		0.83		15.5		

Naphthalene = 13.5 ug/kg

Data File: \\ELABNSH05\TARGET\chem\bna4.i\093010B4.b\0914807.D
Report Date: 01-Oct-2010 13:35

Laboratory Name

Data file : \\ELABNSH05\TARGET\chem\bna4.i\093010B4.b\0914807.D
Lab Smp Id: 1009148-07 Client Smp ID: 32SB-56-1011
Inj Date : 30-SEP-2010 18:36 MS Autotune Date: 08-MAY-2010 13:24
Operator : MEC Inst ID: bna4.i
Smp Info : 1009148-07;1;15;1000;1;UG/KG;21-SEP-2010
Misc Info : ;0;;;;0I21011;pahsurmis.sub;
Comment :
Method : \\ELABNSH05\TARGET\chem\bna4.i\093010B4.b\IXBN4LOW.m
Meth Date : 01-Oct-2010 13:33 mcobb Quant Type: ISTD
Cal Date : 23-AUG-2010 16:04 Cal File: SEQ-CALB.D
Als bottle: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: pahsurmis.sub
Target Version: 4.04
Processing Host: TARGET09_VM

Concentration Formula: Amt * DF * Uf * Vt*Vi/(Amt * Vi * (Solids/100))

Name	Value	Description
DF	1.000	Dilution Factor
Uf	1.000	ng unit correction factor
Vt	1000.000	Volume of final extract (uL)(1000 low, 2
Amt	15.000	Mass of initial extraction
Vi	1.000	Volume injected (uL)
Solids	100.000	Percent Solids

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng/ul)	FINAL (UG/KG)
* 102 Phenanthrene-d10	188	9.742	9.742	(1.000)	153001	1.00000	
51 Naphthalene	128	6.609	6.609	(0.678)	35582	0.17352	11.57
55 2-Methylnaphthalene	142	7.287	7.287	(0.748)	137421	1.06424	70.95
56 1-Methylnaphthalene	142	7.380	7.380	(0.758)	156111	1.33824	89.22
$ 74 2-Fluorobiphenyl	172	7.659	7.659	(0.786)	4253586	27.8621	1857
$ 107 2,4,6-Tribromophenol	330	9.082	9.072	(0.932)	2167998	69.4977	4633
134 Pyrene	202	11.136	11.136	(1.143)	4092	0.02081	1.387(a)
* 154 Perylene-d12	264	14.102	14.102	(1.000)	114633	1.00000	
$ 135 Terphenyl-d14	244	11.331	11.322	(1.163)	4187405	28.9972	1933
140 Bis(2-ethylhexyl)phthalate	149	12.410	12.419	(0.880)	13784	0.09851	6.568

GLQ
10/7/10

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**T.KLIMEK**	**DATE:**	**OCTOBER 26, 2010**
FROM:	**EDWARD SEDLMYER**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION: SELECT VOC / PAH**
NSWC CRANE, CTO F273
SDG CTOF273_011

SAMPLES: 3 / Soil / SELECT VOC / PAH

32SD-04-0006 32SD-05-0006 32SD-FD092110-01

6 / Aqueous / SELECT VOC / PAH

32GW-04 32GW-05 32GW-06 32GW-FD092210-01
Trip Blank_011 Trip Blank#7808

OVERVIEW

The sample set for NSWC Crane, CTO F273, SDG CTOF273_011 consisted of three (3) soil samples, four (4) aqueous samples and two (2) trip blanks. Two field duplicate samples were included in this SDG: 32GW-05 / 32GW-FD092210-01 and 32SD-05-0006 / 32SD-FD092110-01. All samples were analyzed for select volatile organic compounds (VOCs) (benzene, ethylbenzene, toluene, and total xylenes, and select polynuclear aromatic hydrocarbons (PAH) (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene). The trip blanks were analyzed for VOCs only.

The samples were collected by TetraTech NUS on September 21 and 22, 2010 and analyzed by Empirical Laboratories, LLC. All analyses were conducted using USEPA SW-846 Methods 8260B and 8270C analytical and reporting protocols.

The data contained in this SDG were fully validated with regard to the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
*	•	Initial and Continuing Calibration
	•	Laboratory Blank Analyses
*	•	Surrogate Recoveries
	•	Blank Spike/Blank Spike Duplicate Results
*	•	Matrix Spike/Matrix Spike Duplicate Results
*	•	Field Duplicate Results
*	•	Internal Standard Recoveries
*	•	Compound Quantitation
*	•	Compound Identification
*	•	Detection Limits

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

SELECT VOC

The laboratory control sample / laboratory control sample duplicate (LCS/LCSD) associated with batch 0128020 had percent recoveries greater than the laboratory control limits for all compounds. The LCSD had acceptable recoveries. No action was taken on this basis because all associated sample results were non-detect.

SELECT PAH

The following compounds were detected in the aqueous method blank at the maximum concentration indicated below:

Compound	Concentration	Action Level
Dibenz(a,h)anthracene	0.0209 ug/L	0.1045 ug/L
Indeno(1,2,3-cd)pyrene	0.0214 ug/L	0.107 ug/L

An action level of 5X the maximum contaminant concentration was established for dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene to evaluate laboratory contamination. Dilution factors and sample aliquots were taken into consideration during the application of all action levels. The positive dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene results in sample 32GW-06 were qualified (U).

ADDITIONAL COMMENTS

Positive results less than the reporting limit (RL) were qualified as estimated, (J), due to uncertainty near the detection limit.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Sample results were qualified due to blank contamination for one sample.

Other factors affecting data quality: Positive results less than the reporting limit (RL) were qualified estimated, (J), due to uncertainty near the detection limit.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999) and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006). The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech NUS
Edward Sedlmyer
Chemist/Data Validator

TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Data Validation Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$ / ICP PDS Recovery Noncompliance
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; e.g. chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 02111 SDG: CTOF273_011 FRACTION: OV MEDIA: SOIL	NSAMPLE	32SD-04-0006			32SD-05-0006			32SD-FD092110-01		
	LAB_ID	1009166-01			1009166-02			1009166-03		
	SAMP_DATE	9/21/2010			9/21/2010			9/21/2010		
	QC_TYPE	NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	82.8			81.8			81.1		
	DUP_OF							32SD-05-0006		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.526	U		0.582	U		0.572	U	
ETHYLBENZENE		0.84	U		0.928	U		0.912	U	
TOLUENE		0.963	U		1.06	U		1.05	U	
TOTAL XYLENES		0.784	U		0.867	U		0.852	U	

PROJ_NO: 02111 SDG: CTOF273_011 FRACTION: OV MEDIA: WATER	NSAMPLE	32GW-04			32GW-05			32GW-06			32GW-FD092210-01		
	LAB_ID	1009179-01			1009179-02			1009179-03			1009179-04		
	SAMP_DATE	9/22/2010			9/22/2010			9/21/2010			9/22/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF										32GW-05		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.14	U		0.14	U		0.14	U		0.14	U	
ETHYLBENZENE		0.15	U		0.15	U		0.15	U		0.15	U	
TOLUENE		0.19	U		0.19	U		0.19	U		0.19	U	
TOTAL XYLENES		0.22	U		0.22	U		0.22	U		0.22	U	

PROJ_NO: 02111 SDG: CTOF273_011 FRACTION: OV MEDIA: WATER	NSAMPLE	Trip Blank #7808			Trip Blank_011		
	LAB_ID	1009166-04			1009179-05		
	SAMP_DATE	9/21/2010			9/22/2010		
	QC_TYPE	NM			NM		
	UNITS	UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZENE		0.14	U		0.14	U	
ETHYLBENZENE		0.15	U		0.15	U	
TOLUENE		0.19	U		0.19	U	
TOTAL XYLENES		0.22	U		0.22	U	

PROJ_NO: 02111 SDG: CTOF273_011 FRACTION: PAH MEDIA: SOIL	NSAMPLE	32SD-04-0006			32SD-05-0006			32SD-FD092110-01		
	LAB_ID	1009166-01			1009166-02			1009166-03		
	SAMP_DATE	9/21/2010			9/21/2010			9/21/2010		
	QC_TYPE	NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	82.8			81.8			81.1		
	DUP_OF							32SD-05-0006		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		1.56	U		1.62	U		1.63	U	
BENZO(A)PYRENE		1.56	U		1.62	U		1.63	U	
BENZO(B)FLUORANTHENE		6.36	J	P	1.62	U		2.06	J	P
BENZO(K)FLUORANTHENE		1.56	U		1.62	U		2.22	J	P
CHRYSENE		1.56	U		1.62	U		1.63	U	
DIBENZO(A,H)ANTHRACENE		1.56	U		1.62	U		1.76	J	P
INDENO(1,2,3-CD)PYRENE		3.88	J	P	1.62	U		1.77	J	P
NAPHTHALENE		1.56	U		1.62	U		1.63	U	

PROJ_NO: 02111	NSAMPLE	32GW-04			32GW-05			32GW-06			32GW-FD092210-01		
SDG: CTOF273_011	LAB_ID	1009179-01			1009179-02			1009179-03			1009179-04		
FRACTION: PAH	SAMP_DATE	9/22/2010			9/22/2010			9/21/2010			9/22/2010		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF										32GW-05		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BENZO(A)ANTHRACENE		0.0187	U		0.0189	U		0.0469	J	P	0.0187	U	
BENZO(A)PYRENE		0.0187	U		0.0189	U		0.0374	J	P	0.0187	U	
BENZO(B)FLUORANTHENE		0.0187	U		0.0189	U		0.0558	J	P	0.0187	U	
BENZO(K)FLUORANTHENE		0.0187	U		0.0189	U		0.0562	J	P	0.0187	U	
CHRYSENE		0.0187	U		0.0189	U		0.0514	J	P	0.0187	U	
DIBENZO(A,H)ANTHRACENE		0.0187	U		0.0189	U		0.0187	U	A	0.0187	U	
INDENO(1,2,3-CD)PYRENE		0.0187	U		0.0189	U		0.0187	U	A	0.0187	U	
NAPHTHALENE		0.0187	U		0.0189	U		0.0187	U		0.0187	U	

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

ANALYSIS DATA SHEET

32GW-04

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1009179-01	File ID:	0917901.D
Sampled:	09/22/10 14:10	Prepared:	10/01/10 00:00	Analyzed:	10/01/10 16:07
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0J01010 Sequence: 0J27503 Calibration: 0273001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.23	104	75 - 120	
Dibromofluoromethane	30.00	29.54	98.5	85 - 115	
1,2-Dichloroethane-d4	30.00	30.89	103	70 - 120	
Toluene-d8	30.00	32.64	109	85 - 120	

ANALYSIS DATA SHEET

32GW-05

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_011	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Ground Water	Laboratory ID:	1009179-02	File ID:	0917902.D
Sampled:	09/22/10 12:25	Prepared:	10/01/10 00:00	Analyzed:	10/01/10 16:38
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0J01010 Sequence: 0J27503 Calibration: 0273001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.54	98.5	75 - 120	
Dibromofluoromethane	30.00	30.43	101	85 - 115	
1,2-Dichloroethane-d4	30.00	29.99	100	70 - 120	
Toluene-d8	30.00	31.77	106	85 - 120	

ANALYSIS DATA SHEET

32GW-06

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1009179-03	File ID:	0917903.D
Sampled:	09/21/10 20:55	Prepared:	10/01/10 00:00	Analyzed:	10/01/10 17:09
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0J01010 Sequence: 0J27503 Calibration: 0273001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.41	101	75 - 120	
Dibromofluoromethane	30.00	29.74	99.1	85 - 115	
1,2-Dichloroethane-d4	30.00	30.78	103	70 - 120	
Toluene-d8	30.00	32.07	107	85 - 120	

ANALYSIS DATA SHEET

32GW-FD092210-01

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1009179-04	File ID:	0917904.D
Sampled:	09/22/10 00:00	Prepared:	10/01/10 00:00	Analyzed:	10/01/10 17:39
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0J01010 Sequence: 0J27503 Calibration: 0273001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.57	102	75 - 120	
Dibromofluoromethane	30.00	31.04	103	85 - 115	
1,2-Dichloroethane-d4	30.00	32.08	107	70 - 120	
Toluene-d8	30.00	31.67	106	85 - 120	

ANALYSIS DATA SHEET

32SD-04-0006

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009166-01	File ID:	0916601.D
Sampled:	09/21/10 10:00	Prepared:	09/28/10 00:00	Analyzed:	09/28/10 20:22
Solids:	82.81	Preparation:	5035	Dilution:	1

Batch: 0I28020 Sequence: 0I27214 Calibration: 0270005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.526	5.00	Q, U
100-41-4	Ethylbenzene		0.840	11.2	Q, U
108-88-3	Toluene		0.963	11.2	Q, U
1330-20-7	Xylenes (total)		0.784	11.2	Q, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	33.61	34.55	103	85 - 120	
Dibromofluoromethane	33.61	34.59	103	80 - 125	
1,2-Dichloroethane-d4	33.61	32.11	95.6	75 - 140	
Toluene-d8	33.61	34.55	103	85 - 115	

ANALYSIS DATA SHEET

32SD-05-0006

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009166-02	File ID:	0916602.D
Sampled:	09/21/10 10:20	Prepared:	09/28/10 00:00	Analyzed:	09/28/10 20:53
Solids:	81.76	Preparation:	5035	Dilution:	1

Batch: 0I28020 Sequence: 0I27214 Calibration: 0270005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.582	5.00	Q, U
100-41-4	Ethylbenzene		0.928	12.4	Q, U
108-88-3	Toluene		1.06	12.4	Q, U
1330-20-7	Xylenes (total)		0.867	12.4	Q, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	37.14	36.41	98.0	85 - 120	
Dibromofluoromethane	37.14	37.66	101	80 - 125	
1,2-Dichloroethane-d4	37.14	34.59	93.1	75 - 140	
Toluene-d8	37.14	38.11	103	85 - 115	

ANALYSIS DATA SHEET

32SD-FD092110-01

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009166-03	File ID:	0916603.D
Sampled:	09/21/10 00:00	Prepared:	09/28/10 00:00	Analyzed:	09/28/10 21:23
Solids:	81.07	Preparation:	5035	Dilution:	1

Batch: 0I28020 Sequence: 0I27214 Calibration: 0270005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
71-43-2	Benzene		0.572	5.00	Q, U
100-41-4	Ethylbenzene		0.912	12.2	Q, U
108-88-3	Toluene		1.05	12.2	Q, U
1330-20-7	Xylenes (total)		0.852	12.2	Q, U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Bromofluorobenzene	36.49	37.01	101	85 - 120	
Dibromofluoromethane	36.49	37.67	103	80 - 125	
1,2-Dichloroethane-d4	36.49	34.91	95.7	75 - 140	
Toluene-d8	36.49	37.99	104	85 - 115	

ANALYSIS DATA SHEET

Trip Blank #7808

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1009166-04	File ID:	0916604.D
Sampled:	09/21/10 00:00	Prepared:	09/30/10 00:00	Analyzed:	09/30/10 23:04
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0130022 Sequence: 0J27403 Calibration: 0273001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.13	100	75 - 120	
Dibromofluoromethane	30.00	30.10	100	85 - 115	
1,2-Dichloroethane-d4	30.00	30.66	102	70 - 120	
Toluene-d8	30.00	31.62	105	85 - 120	

ANALYSIS DATA SHEET

Trip Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Water	Laboratory ID:	1009179-05	File ID:	0917905.D
Sampled:	09/22/10 00:00	Prepared:	10/01/10 00:00	Analyzed:	10/01/10 15:06
Solids:		Preparation:	5030B	Dilution:	1

Batch: 0J01010 Sequence: 0J27503 Calibration: 0273001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.80	103	75 - 120	
Dibromofluoromethane	30.00	30.84	103	85 - 115	
1,2-Dichloroethane-d4	30.00	31.44	105	70 - 120	
Toluene-d8	30.00	32.45	108	85 - 120	

ANALYSIS DATA SHEET

32GW-04

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1009179-01	File ID:	0917901.D
Sampled:	09/22/10 14:10	Prepared:	09/27/10 17:50	Analyzed:	09/28/10 15:15
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0I27031 Sequence: 0I27207 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0187	0.0935	U
50-32-8	Benzo(a)pyrene		0.0187	0.0935	U
205-99-2	Benzo(b)fluoranthene		0.0187	0.0935	U
207-08-9	Benzo(k)fluoranthene		0.0187	0.0935	U
218-01-9	Chrysene		0.0187	0.0935	U
53-70-3	Dibenz(a,h)anthracene		0.0187	0.0935	U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0187	0.0935	U
91-20-3	Naphthalene		0.0187	0.0935	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.73	27.66	59.2	34 - 167	
Terphenyl-d14	46.73	33.37	71.4	34 - 167	

ANALYSIS DATA SHEET

32GW-05

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_011	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Ground Water	Laboratory ID:	1009179-02	File ID:	0917902.D
Sampled:	09/22/10 12:25	Prepared:	09/27/10 17:50	Analyzed:	09/28/10 15:43
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0127031 Sequence: 0127207 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0189	0.0943	U
50-32-8	Benzo(a)pyrene		0.0189	0.0943	U
205-99-2	Benzo(b)fluoranthene		0.0189	0.0943	U
207-08-9	Benzo(k)fluoranthene		0.0189	0.0943	U
218-01-9	Chrysene		0.0189	0.0943	U
53-70-3	Dibenz(a,h)anthracene		0.0189	0.0943	U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0189	0.0943	U
91-20-3	Naphthalene		0.0189	0.0943	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	47.17	26.93	57.1	34 - 167	
Terphenyl-d14	47.17	32.82	69.6	34 - 167	

ANALYSIS DATA SHEET

32GW-06

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_011	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Ground Water	Laboratory ID:	1009179-03	File ID:	0917903.D
Sampled:	09/21/10 20:55	Prepared:	09/27/10 17:50	Analyzed:	09/28/10 16:11
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0I27031 Sequence: 0I27207 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene	0.0469	0.0187	0.0935	J
50-32-8	Benzo(a)pyrene	0.0374	0.0187	0.0935	J
205-99-2	Benzo(b)fluoranthene	0.0558	0.0187	0.0935	J
207-08-9	Benzo(k)fluoranthene	0.0562	0.0187	0.0935	J
218-01-9	Chrysene	0.0514	0.0187	0.0935	J
53-70-3	Dibenz(a,h)anthracene	0.0515	0.0187	0.0935	J, B
193-39-5	Indeno(1,2,3-cd)pyrene	0.0520	0.0187	0.0935	J, B
91-20-3	Naphthalene		0.0187	0.0935	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.73	29.41	62.9	34 - 167	
Terphenyl-d14	46.73	31.99	68.4	34 - 167	

ANALYSIS DATA SHEET

32GW-FD092210-01

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Ground Water	Laboratory ID:	1009179-04	File ID:	0917904.D
Sampled:	09/22/10 00:00	Prepared:	09/27/10 17:50	Analyzed:	09/28/10 16:39
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 0I27031 Sequence: 0I27207 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0187	0.0935	U
50-32-8	Benzo(a)pyrene		0.0187	0.0935	U
205-99-2	Benzo(b)fluoranthene		0.0187	0.0935	U
207-08-9	Benzo(k)fluoranthene		0.0187	0.0935	U
218-01-9	Chrysene		0.0187	0.0935	U
53-70-3	Dibenz(a,h)anthracene		0.0187	0.0935	U
193-39-5	Indeno(1,2,3-cd)pyrene		0.0187	0.0935	U
91-20-3	Naphthalene		0.0187	0.0935	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.73	28.54	61.1	34 - 167	
Terphenyl-d14	46.73	31.46	67.3	34 - 167	

ANALYSIS DATA SHEET

32SD-04-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_011	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1009166-01	File ID:	0916601.D
Sampled:	09/21/10 10:00	Prepared:	09/27/10 12:40	Analyzed:	09/28/10 20:49
Solids:	82.81	Preparation:	EXT_3546	Dilution:	1

Batch: 0I24729 Sequence: 0I27207 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.56	7.85	U
50-32-8	Benzo(a)pyrene		1.56	5.88	U
205-99-2	Benzo(b)fluoranthene	6.36	1.56	7.85	J
207-08-9	Benzo(k)fluoranthene		1.56	7.85	U
218-01-9	Chrysene		1.56	7.85	U
53-70-3	Dibenz(a,h)anthracene		1.56	5.88	U
193-39-5	Indeno(1,2,3-cd)pyrene	3.88	1.56	7.85	J
91-20-3	Naphthalene		1.56	5.88	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3921	2184	55.7	14 - 129	
Terphenyl-d14	3921	2377	60.6	14 - 129	

ANALYSIS DATA SHEET

32SD-05-0006

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid	Laboratory ID:	1009166-02	File ID:	0916602.D
Sampled:	09/21/10 10:20	Prepared:	09/27/10 12:40	Analyzed:	09/28/10 21:17
Solids:	81.76	Preparation:	EXT_3546	Dilution:	1

Batch: 0I24729 Sequence: 0I27207 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.62	8.10	U
50-32-8	Benzo(a)pyrene		1.62	6.08	U
205-99-2	Benzo(b)fluoranthene		1.62	8.10	U
207-08-9	Benzo(k)fluoranthene		1.62	8.10	U
218-01-9	Chrysene		1.62	8.10	U
53-70-3	Dibenz(a,h)anthracene		1.62	6.08	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.62	8.10	U
91-20-3	Naphthalene		1.62	6.08	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4050	2403	59.3	14 - 129	
Terphenyl-d14	4050	2648	65.4	14 - 129	

ANALYSIS DATA SHEET

32SD-FD092110-01

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_011	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:	Solid	Laboratory ID:	1009166-03	File ID:	0916603.D
Sampled:	09/21/10 00:00	Prepared:	09/27/10 12:40	Analyzed:	09/28/10 21:45
Solids:	81.07	Preparation:	EXT_3546	Dilution:	1

Batch: 0124729 Sequence: 0127207 Calibration: 0237003 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.63	8.17	U
50-32-8	Benzo(a)pyrene		1.63	6.13	U
205-99-2	Benzo(b)fluoranthene	2.06	1.63	8.17	J
207-08-9	Benzo(k)fluoranthene	2.22	1.63	8.17	J
218-01-9	Chrysene		1.63	8.17	U
53-70-3	Dibenz(a,h)anthracene	1.76	1.63	6.13	J
193-39-5	Indeno(1,2,3-cd)pyrene	1.77	1.63	8.17	J
91-20-3	Naphthalene		1.63	6.13	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	4085	2188	53.6	14 - 129	
Terphenyl-d14	4085	2718	66.6	14 - 129	

APPENDIX C

SUPPORT DOCUMENTATION

HOLD TIME

SDG CTOF273_011

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV	UG/KG	32SD-05-0006	1009166-02	NM	09/21/2010	09/28/2010	09/28/2010	7	0	7
OV	UG/KG	32SD-FD092110-01	1009166-03	NM	09/21/2010	09/28/2010	09/28/2010	7	0	7
OV	UG/KG	32SD-04-0006	1009166-01	NM	09/21/2010	09/28/2010	09/28/2010	7	0	7
OV	UG/L	32GW-04	1009179-01	NM	09/22/2010	10/01/2010	10/01/2010	9	0	9
OV	UG/L	32GW-05	1009179-02	NM	09/22/2010	10/01/2010	10/01/2010	9	0	9
OV	UG/L	32GW-06	1009179-03	NM	09/21/2010	10/01/2010	10/01/2010	10	0	10
OV	UG/L	32GW-FD092210-01	1009179-04	NM	09/22/2010	10/01/2010	10/01/2010	9	0	9
OV	UG/L	Trip Blank	1009179-05	NM	09/22/2010	10/01/2010	10/01/2010	9	0	9
OV	UG/L	Trip Blank #7808	1009166-04	NM	09/21/2010	09/30/2010	09/30/2010	9	0	9
SIM	UG/KG	32SD-05-0006	1009166-02	SUR	09/21/2010	09/27/2010	09/28/2010	6	1	7
SIM	UG/KG	32SD-04-0006	1009166-01	NM	09/21/2010	09/27/2010	09/28/2010	6	1	7
SIM	UG/KG	32SD-05-0006	1009166-02	NM	09/21/2010	09/27/2010	09/28/2010	6	1	7
SIM	UG/KG	32SD-FD092110-01	1009166-03	NM	09/21/2010	09/27/2010	09/28/2010	6	1	7
SIM	UG/KG	32SD-FD092110-01	1009166-03	SUR	09/21/2010	09/27/2010	09/28/2010	6	1	7
SIM	UG/KG	32SD-04-0006	1009166-01	SUR	09/21/2010	09/27/2010	09/28/2010	6	1	7

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
SIM	UG/L	32GW-FD092210-01	1009179-04	SUR	09/22/2010	09/27/2010	09/28/2010	5	1	6
SIM	UG/L	32GW-04	1009179-01	NM	09/22/2010	09/27/2010	09/28/2010	5	1	6
SIM	UG/L	32GW-04	1009179-01	SUR	09/22/2010	09/27/2010	09/28/2010	5	1	6
SIM	UG/L	32GW-05	1009179-02	NM	09/22/2010	09/27/2010	09/28/2010	5	1	6
SIM	UG/L	32GW-05	1009179-02	SUR	09/22/2010	09/27/2010	09/28/2010	5	1	6
SIM	UG/L	32GW-06	1009179-03	NM	09/21/2010	09/27/2010	09/28/2010	6	1	7
SIM	UG/L	32GW-06	1009179-03	SUR	09/21/2010	09/27/2010	09/28/2010	6	1	7
SIM	UG/L	32GW-FD092210-01	1009179-04	NM	09/22/2010	09/27/2010	09/28/2010	5	1	6

NSWC CRANE
SOIL DATA
CTOF273_011

FRACTION	CHEMICAL	32SD-05-0006	UNITS	32SD-FD092110-01	RPD	D
PAH	BENZO(B)FLUORANTHENE	ND	UG/KG	2.06 J	200.00	2.06
PAH	BENZO(K)FLUORANTHENE	ND	UG/KG	2.22 J	200.00	2.22
PAH	DIBENZO(A,H)ANTHRACENE	ND	UG/KG	1.76 J	200.00	1.76
PAH	INDENO(1,2,3-CD)PYRENE	ND	UG/KG	1.77 J	200.00	1.77

O.K. <2xRL

Current RPD Quality Control Limit: 50 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

ANALYTICAL SUMMARY DATA PACKAGE
SDG # CTOF273_011

PROJECT NAME: NSA CRANE SMU32
PROJECT LOCATION: CRANE, INDIANA
CONTRACT #: N62470-08-D-1001

SUBMITTAL TO:
Tobrena Skeen
Tetra Tech NUS, Inc.
Foster Plaza 7
661 Andersen Drive
Pittsburgh, PA 15220

SUBMITTAL BY:
Empirical Laboratories, LLC (EL)
621 Mainstream Drive, Suite 270
Nashville, TN 37228
Tel (615)345-1115
Fax (615)846-5426

LABORATORY CONTACT PERSON:
Project Manager: Kim Kostzer
Tel (615)345-1115
Fax (615)846-5426
Email: kkostzer@empirlabs.com

Original Report Date: October 11, 2010
Report Revision #: N/A
Revision Date: N/A
Total # of Pages: 112

THIS DOCUMENT MEETS DoD QSM 4.1 STANDARDS

The results relate to only the samples associated with the referenced SDG and the submitted data has been produced in accordance with laboratory procedures. The Laboratory's Technical Lab Director, Mr. Rick Davis, is responsible for the final data produced and reported. His signature is listed at the end of the Case Narrative within the Analytical Data Package. If applicable to this report package, details on report revisions and the information on subcontracted analysis are listed in the package Case Narrative. This report shall not be reproduced, except in full, without the written approval of Empirical Laboratories, LLC.

Sample Delivery Group Case Narrative

Receipt Information
The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.
Trip blanks were received with both shipments but were not listed on the CoCs. Trip Blanks were given lab IDs of 1009166-04 and 1009179-05.

Changes to the Revision
This is an original submittal of the final report package.

Analytical Information
All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. The following information is provided specific to individual methods:

Chromatographic Flags for Manual Integration:
The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.
B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.
C: The peak was manually integrated to correct the baseline from the original chromatogram.
D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

SW8260B:
The batch spike associated to batch 0I28020 exceeded criteria for Benzene, Ethylbenzene, Toluene and Xylene(total).

No additional anomalies or deviations are noted and the data is properly qualified.

SW8270C:
The method blank associated to batch 0I27031-BLK1 had positive results for

Indeno(1,2,3-cd)pyrene and Dibenz(a,h,)anthracene.

No additional anomalies or deviations are noted and the data is properly qualified.

Data Qualifiers
As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL), also known as Reporting Limit **(RL),** is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

*****: An exceeding quality control criteria is associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the EQL. One should feel confident that the result is greater than zero and less than the EQL.

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In inorganics, it indicates that the parameters MDL/RL have

been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The RPD and/or percent recovery exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.

S: The associated internal standard failed criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

LIMS Definitions / Naming Conventions:
The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

BLK: LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

BS: LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "**RE**" implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:
I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, Ms. Marcia K. McGinnity is authorized to sign this Statement of Data Authenticity.

Mr. Rick D. Davis
Laboratory Technical Director / VP Operations

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER PAGE 1 OF 1

PROJECT NO: 112602111	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER: Tony Klimek 513-251-2730	LABORATORY NAME AND CONTACT: Empirical Laboratories
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: George TenEyck 513-251-2730	ADDRESS: 621 Mainstream Dr. Suite 270
		CARRIER/WAYBILL NUMBER: 8631 3988 4832	CITY, STATE: Nashville, TN 37225

STANDARD TAT ☒ RUSH TAT ☐ ☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PAHs	BTEX	BTEX / % Moisture						COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	G	P						
PRESERVATIVE USED						4°c	4°c	4°c						
09/21	10:00	325D-04-0006			1	✓								1009166-01
	10:00	325D-04-0006			1		✓							
	10:00	325D-04-0006			3			✓						
	10:20	325D-05-0006			1	✓								-02
	10:20	325D-05-0006			1		✓							
	10:20	325D-05-0006			3			✓						
	0000	325D-FD092110-01			1	✓								-03
	0000	325D-FD092110-01			1		✓							
	0000	325D-FD092110-01			3			✓						

1. RELINQUISHED BY [signature]	DATE 09/21/10	TIME 15:00	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY [signature]	DATE 9/22/10	TIME 08:30

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

5.10C

3/99 FORM NO. TINUS-001

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1009166 Number of Coolers: 1 of 1

Client: TTNUS Project: —

Date/Time Received: **9/22/10** **08:30** Date cooler(s) opened: **9/22/10**

Opened By (print): Will Schwab (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 4832

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 2 Seal date: 9/21/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 5-1 °C

Dates samples were logged-in: **9/22/10**

9. Initial this form to acknowledge login of sample(s): (Name): Will Schwab (Initial): WS
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

If Non-Conformance issues were present, list by sample ID: _____

Trip Blank rec'd & not on COC Tagged CAR#: _____

GS-04

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER PAGE 1 OF 2

PROJECT NO: 112602111	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER: Tony Klimek - 513-251-2730	LABORATORY NAME AND CONTACT: Empirical Laboratories
SAMPLERS (SIGNATURE): Todd Clark, Jason Tech		FIELD OPERATIONS LEADER AND PHONE NUMBER: George Ten Eyck - 513-251-2730	ADDRESS: 621 Mainstream Dr. Suite 270
		CARRIER/WAYBILL NUMBER: 8631 3888 4810	CITY, STATE: Nashville, TN 37225

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G
PRESERVATIVE USED: 4°C/HCL 4°C

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	BTEX	PAHs							COMMENTS 1009179
09/22	14:10	32GW-04	GW		1	✓								1009179-01
	14:10	32GW-04			1	✓								
	14:10	32GW-04			1	✓								
	14:10	32GW-04			1		✓							
	14:10	32GW-04			1		✓							
	12:25	32GW-05			1	✓								-02
	12:25	32GW-05			1	✓								
	12:25	32GW-05			1	✓								
	12:25	32GW-05			1		✓							
	12:25	32GW-05			1		✓							
09/21	20:55	32GW-06			1	✓								-03
09/21	20:55	32GW-06			1	✓								
09/21	20:55	32GW-06			1	✓								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	09/22/10	19:00	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY	9/23/10	08:30

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

0.1°C

3/99 FORM NO. TINUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER PAGE 2 OF 2

PROJECT NO: 112G02111	SITE NAME:
PROJECT MANAGER AND PHONE NUMBER: Tony Klimek - 513-251-2730	LABORATORY NAME AND CONTACT: Empirical Laboratories
SAMPLERS (SIGNATURE): Todd [illegible]	FIELD OPERATIONS LEADER AND PHONE NUMBER: George Ten Eyck - 513-251-2730
	ADDRESS: 621 Mainstream Dr. Ste. 270
CARRIER/WAYBILL NUMBER: 8631 3888 4810	CITY, STATE: Nashville, TN 37225

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: BTEX ~~[illegible]~~	TYPE OF ANALYSIS: PAHs						COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	G						
PRESERVATIVE USED						4°C/HCL	4°C						
09/21	20:55	32 GW-06	GW		1		✓						1009179-03
09/21	20:55	32 GW-06			1		✓						
09/22	0000	32 GW-FD092210-01			1	✓							-04
	0000	32 GW-FD092210-01			1	✓							
	0000	32 GW-FD092210-01			1	✓							
	0000	32 GW-FD092210-01			1		✓						
	0000	32 GW-FD092210-01			1		✓						

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY [signature]	09/22/10	19:00	1. RECEIVED BY		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY [signature]	9/23/10	08:30

COMMENTS: 0.1°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1009179 Number of Coolers: 1 of 2

Client: TTNUS Project: —

Date/Time Received: **9/23/10** **08:30** Date cooler(s) opened: **9/23/10**

Opened By (print): Will Schwab (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 3884

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 2 WS 9/23/10 Seal date: 9/22/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Housed Trip Blank (1)

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 0.1 °C

Dates samples were logged-in: **9/23/10**

9. Initial this form to acknowledge login of sample(s): (Name): Will Schwab (Initial): WS
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

If Non-Conformance issues were present, list by sample ID: _____

Trip Blank rec'd + not on COC. CAR#: _____

Tagged as -04.

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 1009179 Number of Coolers: 2 of 2

Client: TTNUS Project: —

Date/Time Received: 9/23/10 08:30 Date cooler(s) opened: 9/23/10

Opened By (print): Will Schwab (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered
   EL Courier Other: _____

If applicable, enter airbill number here: 4810

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 2 Seal date: 9/22/10 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival?	Yes	No	N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler?	Yes	No	N/A
5. Were custody papers filled out properly (ink, signed, etc.)?	Yes	No	N/A
6. Did you sign custody papers in the appropriate place for acceptance?	Yes	No	N/A
7. Was project identifiable from custody papers?	Yes	No	N/A
8. If required, was enough ice present in the cooler(s)?	Yes	No	N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 2.9 °C

~~Dates samples were logged-in: 9/23/10~~

9. Initial this form to acknowledge login of sample(s): (Name): _____ (Initial): _____

10. Were all bottle lids intact and sealed tightly?	Yes	No	N/A
11. Did all bottles arrive unbroken?	Yes	No	N/A
12. Was all required bottle label information complete?	Yes	No	N/A
13. Did all bottle labels agree with custody papers?	Yes	No	N/A
14. Were correct containers used for the analyses indicated?	Yes	No	N/A
15. Were preservative levels correct in all applicable sample containers?	Yes	No	N/A
16. Was residual chlorine present in any applicable sample containers?	Yes	No	N/A
17. Was sufficient amount of sample sent for the analyses required?	Yes	No	N/A
18. Was headspace present in any included VOA vials?	Yes	No	N/A

See page 1 of 2

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

HOLDING TIME SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_011

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SD-04-0006	09/21/10 10:00	09/22/10 08:30	09/28/10 00:00	N/A	14.00	09/28/10 20:22	7.43	14.00	
32SD-05-0006	09/21/10 10:20	09/22/10 08:30	09/28/10 00:00	N/A	14.00	09/28/10 20:53	7.44	14.00	
32SD-FD092110-01	09/21/10 00:00	09/22/10 08:30	09/28/10 00:00	N/A	14.00	09/28/10 21:23	7.89	14.00	
Trip Blank #7808	09/21/10 00:00	09/22/10 08:30	09/30/10 00:00	N/A	14.00	09/30/10 23:04	9.96	14.00	
32GW-04	09/22/10 14:10	09/23/10 08:30	10/01/10 00:00	N/A	14.00	10/01/10 16:07	9.08	14.00	
32GW-05	09/22/10 12:25	09/23/10 08:30	10/01/10 00:00	N/A	14.00	10/01/10 16:38	9.18	14.00	
32GW-06	09/21/10 20:55	09/23/10 08:30	10/01/10 00:00	N/A	14.00	10/01/10 17:09	9.84	14.00	
32GW-FD092210-01	09/22/10 00:00	09/23/10 08:30	10/01/10 00:00	N/A	14.00	10/01/10 17:39	9.74	14.00	
Trip Blank	09/22/10 00:00	09/23/10 08:30	10/01/10 00:00	N/A	14.00	10/01/10 15:06	9.63	14.00	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0I27214	Instrument:	MS-VOA4
		Calibration:	0270005

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0I27214-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 09/28/10 13:56		
Bromofluorobenzene	30.00	100	80 - 120	18.212	18.212	0.0000	+/-1.000	
Dibromofluoromethane	30.00	102	80 - 120	12.206	12.206	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	99.9	80 - 120	12.897	12.897	0.0000	+/-1.000	
Toluene-d8	30.00	96.1	80 - 120	15.964	15.964	0.0000	+/-1.000	
LCS (0I28020-BS1) ug/Kg wet				Lab File ID: V4LCS01.D		Analyzed: 09/28/10 14:43		
Bromofluorobenzene	30.00	96.3	85 - 120	18.207	18.212	-0.0050	+/-1.000	
Dibromofluoromethane	30.00	98.0	80 - 125	12.202	12.206	-0.0040	+/-1.000	
1,2-Dichloroethane-d4	30.00	93.3	75 - 140	12.892	12.897	-0.0050	+/-1.000	
Toluene-d8	30.00	99.1	85 - 115	15.959	15.964	-0.0050	+/-1.000	
Blank (0I28020-BLK1) ug/Kg wet				Lab File ID: V4BLK01.D		Analyzed: 09/28/10 16:15		
Bromofluorobenzene	30.00	104	85 - 120	18.207	18.212	-0.0050	+/-1.000	
Dibromofluoromethane	30.00	107	80 - 125	12.192	12.206	-0.0140	+/-1.000	
1,2-Dichloroethane-d4	30.00	110	75 - 140	12.892	12.897	-0.0050	+/-1.000	
Toluene-d8	30.00	103	85 - 115	15.959	15.964	-0.0050	+/-1.000	
32SD-04-0006 (1009166-01) ug/Kg dry				Lab File ID: 0916601.D		Analyzed: 09/28/10 20:22		
Bromofluorobenzene	33.61	103	85 - 120	18.202	18.212	-0.0100	+/-1.000	
Dibromofluoromethane	33.61	103	80 - 125	12.197	12.206	-0.0090	+/-1.000	
1,2-Dichloroethane-d4	33.61	95.6	75 - 140	12.897	12.897	0.0000	+/-1.000	
Toluene-d8	33.61	103	85 - 115	15.954	15.964	-0.0100	+/-1.000	
32SD-05-0006 (1009166-02) ug/Kg dry				Lab File ID: 0916602.D		Analyzed: 09/28/10 20:53		
Bromofluorobenzene	37.14	98.0	85 - 120	18.211	18.212	-0.0010	+/-1.000	
Dibromofluoromethane	37.14	101	80 - 125	12.196	12.206	-0.0100	+/-1.000	
1,2-Dichloroethane-d4	37.14	93.1	75 - 140	12.896	12.897	-0.0010	+/-1.000	
Toluene-d8	37.14	103	85 - 115	15.963	15.964	-0.0010	+/-1.000	
32SD-FD092110-01 (1009166-03) ug/Kg dry				Lab File ID: 0916603.D		Analyzed: 09/28/10 21:23		
Bromofluorobenzene	36.49	101	85 - 120	18.211	18.212	-0.0010	+/-1.000	
Dibromofluoromethane	36.49	103	80 - 125	12.205	12.206	-0.0010	+/-1.000	
1,2-Dichloroethane-d4	36.49	95.7	75 - 140	12.896	12.897	-0.0010	+/-1.000	
Toluene-d8	36.49	104	85 - 115	15.963	15.964	-0.0010	+/-1.000	
LCS Dup (0I28020-BSD1) ug/Kg wet				Lab File ID: V4LCSD01.D		Analyzed: 09/28/10 21:54		
Bromofluorobenzene	30.00	98.8	85 - 120	18.205	18.212	-0.0070	+/-1.000	
Dibromofluoromethane	30.00	98.6	80 - 125	12.2	12.206	-0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	94.1	75 - 140	12.89	12.897	-0.0070	+/-1.000	
Toluene-d8	30.00	102	85 - 115	15.957	15.964	-0.0070	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0J27403	Instrument:	MS-VOA3
		Calibration:	0273001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0J27403-CCV1) ug/L				Lab File ID: SEQ-CCVE.D		Analyzed: 09/30/10 20:03		
Bromofluorobenzene	30.00	97.2	80 - 120	17.134	17.134	0.0000	+/-1.000	
Dibromofluoromethane	30.00	101	80 - 120	10.32	10.32	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	92.5	80 - 120	11.275	11.275	0.0000	+/-1.000	
Toluene-d8	30.00	92.9	80 - 120	14.804	14.804	0.0000	+/-1.000	
LCS (0I30022-BS1) ug/L				Lab File ID: V3LCS1E.D		Analyzed: 09/30/10 20:34		
Bromofluorobenzene	30.00	104	75 - 120	17.134	17.134	0.0000	+/-1.000	
Dibromofluoromethane	30.00	101	85 - 115	10.314	10.32	-0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	98.6	70 - 120	11.282	11.275	0.0070	+/-1.000	
Toluene-d8	30.00	102	85 - 120	14.804	14.804	0.0000	+/-1.000	
Blank (0I30022-BLK1) ug/L				Lab File ID: V3BLK1E.D		Analyzed: 09/30/10 22:03		
Bromofluorobenzene	30.00	101	75 - 120	17.134	17.134	0.0000	+/-1.000	
Dibromofluoromethane	30.00	101	85 - 115	10.308	10.32	-0.0120	+/-1.000	
1,2-Dichloroethane-d4	30.00	106	70 - 120	11.275	11.275	0.0000	+/-1.000	
Toluene-d8	30.00	105	85 - 120	14.798	14.804	-0.0060	+/-1.000	
Trip Blank #7808 (1009166-04) ug/L				Lab File ID: 0916604.D		Analyzed: 09/30/10 23:04		
Bromofluorobenzene	30.00	100	75 - 120	17.128	17.134	-0.0060	+/-1.000	
Dibromofluoromethane	30.00	100	85 - 115	10.302	10.32	-0.0180	+/-1.000	
1,2-Dichloroethane-d4	30.00	102	70 - 120	11.276	11.275	0.0010	+/-1.000	
Toluene-d8	30.00	105	85 - 120	14.798	14.804	-0.0060	+/-1.000	
LCS Dup (0I30022-BSD1) ug/L				Lab File ID: V3LCSD1E.D		Analyzed: 10/01/10 07:13		
Bromofluorobenzene	30.00	104	75 - 120	17.128	17.134	-0.0060	+/-1.000	
Dibromofluoromethane	30.00	101	85 - 115	10.302	10.32	-0.0180	+/-1.000	
1,2-Dichloroethane-d4	30.00	96.9	70 - 120	11.263	11.275	-0.0120	+/-1.000	
Toluene-d8	30.00	96.5	85 - 120	14.792	14.804	-0.0120	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0J27503	Instrument:	MS-VOA3
		Calibration:	0273001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0J27503-CCV1) ug/L				Lab File ID: SEQ-CCV1.D		Analyzed: 10/01/10 09:01		
Bromofluorobenzene	30.00	97.8	80 - 120	17.128	17.128	0.0000	+/-1.000	
Dibromofluoromethane	30.00	97.7	80 - 120	10.29	10.29	0.0000	+/-1.000	
1,2-Dichloroethane-d4	30.00	95.7	80 - 120	11.257	11.257	0.0000	+/-1.000	
Toluene-d8	30.00	97.5	80 - 120	14.792	14.792	0.0000	+/-1.000	
LCS (0J01010-BS1) ug/L				Lab File ID: V3LCS1.D		Analyzed: 10/01/10 09:32		
Bromofluorobenzene	30.00	103	75 - 120	17.128	17.128	0.0000	+/-1.000	
Dibromofluoromethane	30.00	98.4	85 - 115	10.296	10.29	0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	99.0	70 - 120	11.257	11.257	0.0000	+/-1.000	
Toluene-d8	30.00	103	85 - 120	14.792	14.792	0.0000	+/-1.000	
Blank (0J01010-BLK1) ug/L				Lab File ID: V3BLK1.D		Analyzed: 10/01/10 11:01		
Bromofluorobenzene	30.00	101	75 - 120	17.128	17.128	0.0000	+/-1.000	
Dibromofluoromethane	30.00	103	85 - 115	10.296	10.29	0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	102	70 - 120	11.263	11.257	0.0060	+/-1.000	
Toluene-d8	30.00	106	85 - 120	14.792	14.792	0.0000	+/-1.000	
Trip Blank (1009179-05) ug/L				Lab File ID: 0917905.D		Analyzed: 10/01/10 15:06		
Bromofluorobenzene	30.00	103	75 - 120	17.128	17.128	0.0000	+/-1.000	
Dibromofluoromethane	30.00	103	85 - 115	10.302	10.29	0.0120	+/-1.000	
1,2-Dichloroethane-d4	30.00	105	70 - 120	11.263	11.257	0.0060	+/-1.000	
Toluene-d8	30.00	108	85 - 120	14.792	14.792	0.0000	+/-1.000	
32GW-04 (1009179-01) ug/L				Lab File ID: 0917901.D		Analyzed: 10/01/10 16:07		
Bromofluorobenzene	30.00	104	75 - 120	17.128	17.128	0.0000	+/-1.000	
Dibromofluoromethane	30.00	98.5	85 - 115	10.308	10.29	0.0180	+/-1.000	
1,2-Dichloroethane-d4	30.00	103	70 - 120	11.257	11.257	0.0000	+/-1.000	
Toluene-d8	30.00	109	85 - 120	14.798	14.792	0.0060	+/-1.000	
32GW-05 (1009179-02) ug/L				Lab File ID: 0917902.D		Analyzed: 10/01/10 16:38		
Bromofluorobenzene	30.00	98.5	75 - 120	17.128	17.128	0.0000	+/-1.000	
Dibromofluoromethane	30.00	101	85 - 115	10.302	10.29	0.0120	+/-1.000	
1,2-Dichloroethane-d4	30.00	100	70 - 120	11.263	11.257	0.0060	+/-1.000	
Toluene-d8	30.00	106	85 - 120	14.792	14.792	0.0000	+/-1.000	
32GW-06 (1009179-03) ug/L				Lab File ID: 0917903.D		Analyzed: 10/01/10 17:09		
Bromofluorobenzene	30.00	101	75 - 120	17.128	17.128	0.0000	+/-1.000	
Dibromofluoromethane	30.00	99.1	85 - 115	10.296	10.29	0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	103	70 - 120	11.263	11.257	0.0060	+/-1.000	
Toluene-d8	30.00	107	85 - 120	14.792	14.792	0.0000	+/-1.000	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0J27503	Instrument:	MS-VOA3
		Calibration:	0273001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
32GW-FD092210-01 (1009179-04) ug/L				Lab File ID: 0917904.D		Analyzed: 10/01/10 17:39		
Bromofluorobenzene	30.00	102	75 - 120	17.128	17.128	0.0000	+/-1.000	
Dibromofluoromethane	30.00	103	85 - 115	10.296	10.29	0.0060	+/-1.000	
1,2-Dichloroethane-d4	30.00	107	70 - 120	11.269	11.257	0.0120	+/-1.000	
Toluene-d8	30.00	106	85 - 120	14.792	14.792	0.0000	+/-1.000	
LCS Dup (0J01010-BSD1) ug/L				Lab File ID: V3LCSD1.D		Analyzed: 10/01/10 20:12		
Bromofluorobenzene	30.00	102	75 - 120	17.128	17.128	0.0000	+/-1.000	
Dibromofluoromethane	30.00	94.1	85 - 115	10.308	10.29	0.0180	+/-1.000	
1,2-Dichloroethane-d4	30.00	97.1	70 - 120	11.263	11.257	0.0060	+/-1.000	
Toluene-d8	30.00	109	85 - 120	14.798	14.792	0.0060	+/-1.000	

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0I27024	Instrument:	MS-VOA4
Calibration:	0270005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0I27024-TUN1	SEQ-TUN1.D	09/23/10 10:55
Cal Standard	0I27024-CAL1	SEQ-CAL1.D	09/23/10 11:26
Cal Standard	0I27024-CAL2	SEQ-CAL2.D	09/23/10 11:57
Cal Standard	0I27024-CAL3	SEQ-CAL3.D	09/23/10 12:28
Cal Standard	0I27024-CAL4	SEQ-CAL4.D	09/23/10 12:59
Cal Standard	0I27024-CAL5	SEQ-CAL5.D	09/23/10 13:30
Cal Standard	0I27024-CAL6	SEQ-CAL6.D	09/23/10 14:01
Cal Standard	0I27024-CAL7	SEQ-CAL7.D	09/23/10 14:33
Cal Standard	0I27024-CAL8	SEQ-CAL8.D	09/23/10 15:04
Initial Cal Check	0I27024-ICV1	SEQ-ICV1.D	09/23/10 15:35
Cal Standard	0I27024-CAL9	SEQ-CAL9.D	09/23/10 16:06

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	09/23/10
Instrument ID:	MS-VOA4	Injection Time:	10:55
Sequence:	0I27024	Lab Sample ID:	0I27024-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	15	PASS
75	30 - 60% of 95	40.2	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.81	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	109	PASS
175	5 - 9% of 174	7.43	PASS
176	95 - 101% of 174	97.8	PASS
177	5 - 9% of 176	6.7	PASS

INITIAL CALIBRATION DATA

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0270005	Instrument:	MS-VOA4
Matrix:	Water	Calibration Date:	9/23/2010 1:55:34PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	2	1.011714	5	1.064295	10	0.9895909	20	0.9299405	50	1.04665	100	0.9197414
Bromofluorobenzene	30	0.8857673	30	0.8583159	30	0.8660519	30	0.8774557	30	0.8480019	30	0.819129
Ethylbenzene	2	3.110342	5	3.021237	10	3.121141	20	2.896758	50	3.230192	100	2.640388
Naphthalene	2	1.014549	5	1.234376	10	1.104346	20	1.251789	50	1.299605	100	1.322947
Methyl t-Butyl Ether	2	0.4874993	5	0.496333	10	0.49485	20	0.4878372	50	0.5649838	100	0.5416227
Toluene	2	1.772499	5	1.771642	10	1.677126	20	1.522499	50	1.742308	100	1.475192
m,p-Xylene	4	2.389841	10	2.398656	20	2.292768	40	2.094569	100	2.280706	200	1.84105
o-Xylene	2	2.283818	5	2.279972	10	2.287486	20	2.192793	50	2.343363	100	1.946549
Xylenes (total)	6	2.3545	15	2.359094	30	2.291007	60	2.12731	150	2.301591	300	1.876216
Dibromofluoromethane	30	0.2806741	30	0.2801594	30	0.27734	30	0.2861063	30	0.2715148	30	0.2779545
1,2-Dichloroethane-d4	30	5.929504E-02	30	5.645007E-02	30	5.456746E-02	30	6.005851E-02	30	5.702128E-02	30	5.839734E-02
Toluene-d8	30	2.356398	30	2.461606	30	2.389721	30	2.348463	30	2.372302	30	2.285237

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0270005	Instrument:	MS-VOA4
Matrix:	Water	Calibration Date:	9/23/2010 1:55:34PM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	150	0.9727618	200	0.9578782								
Bromofluorobenzene	30	0.7789302	30	0.7856055	30		30		30		30	
Ethylbenzene	150	2.645041	200	2.526551								
Naphthalene	150	1.598505	200	1.682005								
Methyl t-Butyl Ether	150	0.5966576	200	0.5999419								
Toluene	150	1.484569	200	1.44492								
m,p-Xylene	300	1.834553	400	1.683822								
o-Xylene	150	1.973565	200	1.862139								
Xylenes (total)	450	1.88089	600	1.743261								
Dibromofluoromethane	30	0.29599	30	0.2699478	30		30		30		30	
1,2-Dichloroethane-d4	30	0.0588541	30	5.826377E-02	30		30		30		30	
Toluene-d8	30	2.271113	30	2.236428	30		30		30		30	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0270005	Instrument:	MS-VOA4
Matrix:	Water	Calibration Date:	9/23/2010 1:55:34PM

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene	30		30		30		30					
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane	30		30		30		30					
1,2-Dichloroethane-d4	30		30		30		30					
Toluene-d8	30		30		30		30					

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0270005	Instrument:	MS-VOA4
Matrix:	Water	Calibration Date:	9/23/2010 1:55:34PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	0.9865715	5.27787	13.64225	2.921089E-02			15	
Bromofluorobenzene	0.8399072	4.867482	18.1775	1.441427E-02			15	
Ethylbenzene	2.898956	9.114838	17.37863	1.313719E-02			CCC (20)	
Naphthalene	1.313515	17.27682	21.77187	1.910864E-02		0.9984369	0.99	
Methyl t-Butyl Ether	0.5337157	9.106772	10.16613	0.1515849			15	
Toluene	1.611344	8.88083	15.99425	2.197296E-02			CCC (20)	
m,p-Xylene	2.101996	13.38044	17.5265	1.536245E-02			15	
o-Xylene	2.146211	8.773516	17.85188	0.0220359			15	
Xylenes (total)	2.116734	11.74811	0	0			15	
Dibromofluoromethane	0.2799609	2.950869	12.14488	3.402701E-02			15	
1,2-Dichloroethane-d4	5.786345E-02	3.054362	12.845	3.218583E-02			15	
Toluene-d8	2.340159	3.111578	15.92638	0.0161495			15	

INITIAL CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0270005
Lab File ID:	SEQ-ICV1.D	Calibration Date:	09/23/10 13:55
Sequence:	0I27024	Injection Date:	09/23/10
Lab Sample ID:	0I27024-ICV1	Injection Time:	15:35

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzene	A	100.0	103.4	0.9865715	1.020445		3.4	20
Ethylbenzene	A	100.0	102.6	2.898956	2.974829		2.6	20
Toluene	A	100.0	98.52	1.611344	1.58755		-1.5	20
Xylenes (total)	A	300.0	298.8	2.116734	2.108371		-0.4	20
Bromofluorobenzene	A	30.00	29.74	0.8399072	0.8326121		-0.9	20
Dibromofluoromethane	A	30.00	28.78	0.2799609	0.2685852		-4.1	20
1,2-Dichloroethane-d4	A	30.00	30.32	5.786345E-02	5.847877E-02		1.1	20
Toluene-d8	A	30.00	29.28	2.340159	2.284071		-2.4	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0I27214	Instrument:	MS-VOA4
Calibration:	0270005		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0I27214-TUN1	SEQ-TUN1.D	09/28/10 12:39
Calibration Check	0I27214-CCV1	SEQ-CCV1.D	09/28/10 13:56
LCS	0I28020-BS1	V4LCS01.D	09/28/10 14:43
Blank	0I28020-BLK1	V4BLK01.D	09/28/10 16:15
32SD-04-0006	1009166-01	0916601.D	09/28/10 20:22
32SD-05-0006	1009166-02	0916602.D	09/28/10 20:53
32SD-FD092110-01	1009166-03	0916603.D	09/28/10 21:23
LCS Dup	0I28020-BSD1	V4LCSD01.D	09/28/10 21:54

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	09/28/10
Instrument ID:	MS-VOA4	Injection Time:	12:39
Sequence:	0I27214	Lab Sample ID:	0I27214-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	20.5	PASS
75	30 - 60% of 95	45.7	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.47	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	69.2	PASS
175	5 - 9% of 174	7.97	PASS
176	95 - 101% of 174	96.5	PASS
177	5 - 9% of 176	7.3	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA4	Calibration:	0270005
Lab File ID:	SEQ-CCV1.D	Calibration Date:	09/23/10 13:55
Sequence:	0I27214	Injection Date:	09/28/10
Lab Sample ID:	0I27214-CCV1	Injection Time:	13:56

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	102.2	0.9865715	1.008854		2.3	20
Ethylbenzene	A	100.0	98.42	2.898956	2.853109		-1.6	20
Toluene	A	100.0	97.03	1.611344	1.563538		-3.0	20
Xylenes (total)	A	300.0	297.1	2.116734	2.096515		-1.0	20
Bromofluorobenzene	A	30.00	30.10	0.8399072	0.8427125		0.3	20
Dibromofluoromethane	A	30.00	30.72	0.2799609	0.2867065		2.4	20
1,2-Dichloroethane-d4	A	30.00	29.96	5.786345E-02	5.778191E-02		-0.1	20
Toluene-d8	A	30.00	28.83	2.340159	2.24905		-3.9	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_011

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0I28020 Batch Matrix: Solid Preparation: 5035

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0I28020-BLK1	09/28/10 00:00	5.00	5.00
LCS	0I28020-BS1	09/28/10 00:00	5.00	5.00
LCS Dup	0I28020-BSD1	09/28/10 00:00	5.00	5.00
32SD-04-0006	1009166-01	09/28/10 00:00	5.39	5.00
32SD-05-0006	1009166-02	09/28/10 00:00	4.94	5.00
32SD-FD092110-01	1009166-03	09/28/10 00:00	5.07	5.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_011	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0I28020-BLK1	File ID:	V4BLK01.D
Sampled:		Prepared:		Analyzed:	09/28/10 16:15
Solids:		Preparation:	5035	Dilution:	

Batch: 0I28020 Sequence: 0I27214 Calibration: 0270005 Instrument: MS-VOA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
71-43-2	Benzene		0.470	5.00	U
100-41-4	Ethylbenzene		0.750	10.0	U
108-88-3	Toluene		0.860	10.0	U
1330-20-7	Xylenes (total)		0.700	10.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.28	104	85 - 120	
Dibromofluoromethane	30.00	32.23	107	80 - 125	
1,2-Dichloroethane-d4	30.00	33.08	110	75 - 140	
Toluene-d8	30.00	30.77	103	85 - 115	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0I28020	Laboratory ID:	0I28020-BS1
Preparation:	5035	Initial/Final:	5 g / 5 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzene	**50.00**	**67.23**	**134**	**75 - 125**
Ethylbenzene	**50.00**	**66.21**	**132**	**75 - 125**
Toluene	**50.00**	**65.89**	**132**	**70 - 125**
Xylenes (total)	**150.0**	**199.8**	**133**	**75 - 125**

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCSD CONCENTRATION (ug/Kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzene	50.00	54.50	109	20.9	30	75 - 125
Ethylbenzene	50.00	55.73	111	17.2	30	75 - 125
Toluene	50.00	54.67	109	18.6	30	70 - 125
Xylenes (total)	150.0	170.6	114	15.7	30	75 - 125

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0127305	Instrument:	MS-VOA3
Calibration:	0273001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0127305-TUN1	SEQ-TUN1.D	09/29/10 06:44
Cal Standard	0127305-CAL1	SEQ-CAL1.D	09/29/10 07:15
Cal Standard	0127305-CAL2	SEQ-CAL2.D	09/29/10 07:45
Cal Standard	0127305-CAL3	SEQ-CAL3.D	09/29/10 08:16
Cal Standard	0127305-CAL4	SEQ-CAL4.D	09/29/10 08:47
Cal Standard	0127305-CAL5	SEQ-CAL5.D	09/29/10 09:17
Cal Standard	0127305-CAL6	SEQ-CAL6.D	09/29/10 09:48
Cal Standard	0127305-CAL7	SEQ-CAL7.D	09/29/10 10:18
Cal Standard	0127305-CAL8	SEQ-CAL8.D	09/29/10 10:49
Cal Standard	0127305-CAL9	SEQ-CAL9.D	09/29/10 11:20
Initial Cal Check	0127305-ICV1	SEQ-ICV1.D	09/29/10 11:50

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	09/29/10
Instrument ID:	MS-VOA3	Injection Time:	06:44
Sequence:	0I27305	Lab Sample ID:	0I27305-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	19.4	PASS
75	30 - 60% of 95	55.9	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.16	PASS
173	Less than 2% of 174	0.765	PASS
174	50 - 200% of 95	96.4	PASS
175	5 - 9% of 174	7.93	PASS
176	95 - 101% of 174	97.6	PASS
177	5 - 9% of 176	6.99	PASS

INITIAL CALIBRATION DATA

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0273001	Instrument:	MS-VOA3
Matrix:	Water	Calibration Date:	9/29/2010 11:37:21AM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	0.5	0.627679	1	0.7754466	2	0.8384474	5	0.7286995	10	0.7723701	50	0.7718844
Bromofluorobenzene	30	1.033184	30	1.038725	30	1.048735	30	1.089381	30	1.055099	30	1.08422
Ethylbenzene	0.5	2.0381	1	2.405895	2	2.387011	5	2.189227	10	2.352708	50	2.315814
Naphthalene	0.5	1.266866	1	1.344689	2	1.344036	5	1.190556	10	1.342412	50	1.422286
Methyl t-Butyl Ether	0.5	0.5077001	1	0.5543357	2	0.6264341	5	0.5119943	10	0.6125753	50	0.6034654
Toluene	0.5	1.089953	1	1.164051	2	1.19035	5	1.025419	10	1.116201	50	1.108344
m,p-Xylene	1	1.735625	2	2.124559	4	2.033926	10	1.866236	20	2.028984	100	1.915199
o-Xylene	0.5	1.766915	1	2.00762	2	2.208651	5	2.006377	10	2.183017	50	2.167157
Xylenes (total)	1.5	1.746055	3	2.085579	6	2.092168	15	1.912949	30	2.080328	150	1.999185
Dibromofluoromethane	30	0.3288081	30	0.3231863	30	0.336514	30	0.3324751	30	0.3293138	30	0.3182897
1,2-Dichloroethane-d4	30	5.630779E-02	30	6.003202E-02	30	5.901038E-02	30	5.921372E-02	30	5.929654E-02	30	5.696083E-02
Toluene-d8	30	2.121354	30	2.093153	30	2.071009	30	2.084688	30	2.028874	30	1.976242

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0273001	Instrument:	MS-VOA3
Matrix:	Water	Calibration Date:	9/29/2010 11:37:21AM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene	100	0.747566	150	0.717078	200	0.7020862						
Bromofluorobenzene	30	1.018077	30	0.9431888	30	0.9161542						
Ethylbenzene	100	2.02891	150	1.810897	200	1.570293						
Naphthalene	100	1.397999	150	1.361481	200	1.299543						
Methyl t-Butyl Ether	100	0.5865727	150	0.599185	200	0.5907935						
Toluene	100	1.035254	150	0.9911554	200	0.9097477						
m,p-Xylene	200	1.594059	300	1.381934	400	~~1.141319~~						
o-Xylene	100	1.854289	150	1.667498	200	1.436032						
Xylenes (total)	300	1.680802	450	1.477122	600	~~1.239557~~						
Dibromofluoromethane	30	0.3119957	30	0.314036	30	0.3201792						
1,2-Dichloroethane-d4	30	5.752281E-02	30	5.340872E-02	30	5.765576E-02						
Toluene-d8	30	1.909698	30	1.870232	30	1.804821						

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0273001	Instrument:	MS-VOA3
Matrix:	Water	Calibration Date:	9/29/2010 11:37:21AM

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene												
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane												
1,2-Dichloroethane-d4												
Toluene-d8												

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0273001	Instrument:	MS-VOA3
Matrix:	Water	Calibration Date:	9/29/2010 11:37:21AM

Compound	Level 19		Level 20		Level 21		Level 22		Level 23		Level 24	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Benzene												
Bromofluorobenzene												
Ethylbenzene												
Naphthalene												
Methyl t-Butyl Ether												
Toluene												
m,p-Xylene												
o-Xylene												
Xylenes (total)												
Dibromofluoromethane												
1,2-Dichloroethane-d4												
Toluene-d8												

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0273001	Instrument:	MS-VOA3
Matrix:	Water	Calibration Date:	9/29/2010 11:37:21AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzene	0.7423619	7.930244	12.23122	3.716908E-02			15	
Bromofluorobenzene	1.025196	5.767041	17.134	1.757232E-02			15	
Ethylbenzene	2.122095	13.56592	16.351	1.869615E-02			CCC (20)	
Naphthalene	1.329985	5.253583	20.37678	2.016888E-02			15	
Methyl t-Butyl Ether	0.5770062	7.435538	7.834	7.792808E-02			15	
Toluene	1.070053	8.255213	14.873	1.997065E-02			CCC (20)	
m,p-Xylene	1.835065	13.68796	16.5085	2.120044E-02			15	
o-Xylene	1.921951	13.69725	16.82389	0.0203987			15	
Xylenes (total)	1.884273	12.07682	0	0			15	
Dibromofluoromethane	0.3238664	2.608315	10.312	4.068301E-02			15	
1,2-Dichloroethane-d4	5.771206E-02	3.515355	11.271	2.942035E-02			15	
Toluene-d8	1.995563	5.600579	14.8	2.591078E-02			15	

INITIAL CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA3	Calibration:	0273001
Lab File ID:	SEQ-ICV1.D	Calibration Date:	09/29/10 11:37
Sequence:	0127305	Injection Date:	09/29/10
Lab Sample ID:	0127305-ICV1	Injection Time:	11:50

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzene	A	100.0	101.7	0.7423619	0.7551848		1.7	20
Ethylbenzene	A	100.0	96.58	2.122095	2.049534		-3.4	20
Toluene	A	100.0	99.34	1.070053	1.062992		-0.7	20
Xylenes (total)	A	300.0	267.9	1.884273	1.666116		-11.6	20
Bromofluorobenzene	A	30.00	28.71	1.025196	0.9810303		-4.3	20
Dibromofluoromethane	A	30.00	29.83	0.3238664	0.322009		-0.6	20
1,2-Dichloroethane-d4	A	30.00	30.43	5.771206E-02	5.854791E-02		1.4	20
Toluene-d8	A	30.00	30.31	1.995563	2.01649		1.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0J27403	Instrument:	MS-VOA3
Calibration:	0273001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0J27403-TUN1	SEQ-TUNE.D	09/30/10 19:33
Calibration Check	0J27403-CCV1	SEQ-CCVE.D	09/30/10 20:03
LCS	0I30022-BS1	V3LCS1E.D	09/30/10 20:34
Blank	0I30022-BLK1	V3BLK1E.D	09/30/10 22:03
Trip Blank #7808	1009166-04	0916604.D	09/30/10 23:04
LCS Dup	0I30022-BSD1	V3LCSD1E.D	10/01/10 07:13

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUNE.D	Injection Date:	09/30/10
Instrument ID:	MS-VOA3	Injection Time:	19:33
Sequence:	0J27403	Lab Sample ID:	0J27403-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	20.4	PASS
75	30 - 60% of 95	57.7	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.58	PASS
173	Less than 2% of 174	0.773	PASS
174	50 - 200% of 95	91.4	PASS
175	5 - 9% of 174	6.33	PASS
176	95 - 101% of 174	100	PASS
177	5 - 9% of 176	6.4	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA3	Calibration:	0273001
Lab File ID:	SEQ-CCVE.D	Calibration Date:	09/29/10 11:37
Sequence:	0J27403	Injection Date:	09/30/10
Lab Sample ID:	0J27403-CCV1	Injection Time:	20:03

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	102.1	0.7423619	0.7582089		2.1	20
Ethylbenzene	A	100.0	95.23	2.122095	2.020951		-4.8	20
Toluene	A	100.0	94.11	1.070053	1.007026		-5.9	20
Xylenes (total)	A	300.0	272.2	1.884273	1.693128		-10.1	20
Bromofluorobenzene	A	30.00	29.17	1.025196	0.9969447		-2.8	20
Dibromofluoromethane	A	30.00	30.31	0.3238664	0.3272562		1.0	20
1,2-Dichloroethane-d4	A	30.00	27.76	5.771206E-02	5.340543E-02		-7.5	20
Toluene-d8	A	30.00	27.88	1.995563	1.85471		-7.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_011

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0130022 Batch Matrix: Water Preparation: 5030B

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0130022-BLK1	09/30/10 00:00	5.00	5.00
LCS	0130022-BS1	09/30/10 00:00	5.00	5.00
LCS Dup	0130022-BSD1	09/30/10 00:00	5.00	5.00
Trip Blank #7808	1009166-04	09/30/10 00:00	5.00	5.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_011	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0130022-BLK1	File ID:	V3BLK1E.D
Sampled:		Prepared:		Analyzed:	09/30/10 22:03
Solids:		Preparation:	5030B	Dilution:	

Batch: 0130022 Sequence: 0J27403 Calibration: 0273001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.25	101	75 - 120	
Dibromofluoromethane	30.00	30.36	101	85 - 115	
1,2-Dichloroethane-d4	30.00	31.95	106	70 - 120	
Toluene-d8	30.00	31.52	105	85 - 120	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Water		
Batch:	0130022	Laboratory ID:	0130022-BS1
Preparation:	5030B	Initial/Final:	5 mL / 5 mL

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	51.7	103	80 - 120
Ethylbenzene	50.00	54.4	109	75 - 125
Toluene	50.00	52.3	105	75 - 120
Xylenes (total)	150.0	156	104	75 - 130

ANALYTE	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzene	50.00	53.6	107	3.52	30	80 - 120
Ethylbenzene	50.00	54.1	108	0.517	30	75 - 125
Toluene	50.00	50.6	101	3.20	30	75 - 120
Xylenes (total)	150.0	160	107	2.82	30	75 - 130

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0J27503	Instrument:	MS-VOA3
Calibration:	0273001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0J27503-TUN1	SEQ-TUN1.D	10/01/10 08:30
Calibration Check	0J27503-CCV1	SEQ-CCV1.D	10/01/10 09:01
LCS	0J01010-BS1	V3LCS1.D	10/01/10 09:32
Blank	0J01010-BLK1	V3BLK1.D	10/01/10 11:01
Trip Blank	1009179-05	0917905.D	10/01/10 15:06
32GW-04	1009179-01	0917901.D	10/01/10 16:07
32GW-05	1009179-02	0917902.D	10/01/10 16:38
32GW-06	1009179-03	0917903.D	10/01/10 17:09
32GW-FD092210-01	1009179-04	0917904.D	10/01/10 17:39
LCS Dup	0J01010-BSD1	V3LCSD1.D	10/01/10 20:12

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	10/01/10
Instrument ID:	MS-VOA3	Injection Time:	08:30
Sequence:	0J27503	Lab Sample ID:	0J27503-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	19.4	PASS
75	30 - 60% of 95	56.6	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.69	PASS
173	Less than 2% of 174	0.442	PASS
174	50 - 200% of 95	98.6	PASS
175	5 - 9% of 174	8.36	PASS
176	95 - 101% of 174	101	PASS
177	5 - 9% of 176	7.23	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-VOA3	Calibration:	0273001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	09/29/10 11:37
Sequence:	0J27503	Injection Date:	10/01/10
Lab Sample ID:	0J27503-CCV1	Injection Time:	09:01

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	95.54	0.7423619	0.7092669		-4.5	20
Ethylbenzene	A	100.0	94.26	2.122095	2.000182		-5.7	20
Toluene	A	100.0	95.90	1.070053	1.026137		-4.1	20
Xylenes (total)	A	300.0	264.7	1.884273	1.646315		-12.6	20
Bromofluorobenzene	A	30.00	29.34	1.025196	1.002632		-2.2	20
Dibromofluoromethane	A	30.00	29.31	0.3238664	0.316409		-2.3	20
1,2-Dichloroethane-d4	A	30.00	28.70	5.771206E-02	5.521258E-02		-4.3	20
Toluene-d8	A	30.00	29.26	1.995563	1.946255		-2.5	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_011

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0J01010 Batch Matrix: Water Preparation: 5030B

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0J01010-BLK1	10/01/10 00:00	5.00	5.00
LCS	0J01010-BS1	10/01/10 00:00	5.00	5.00
LCS Dup	0J01010-BSD1	10/01/10 00:00	5.00	5.00
32GW-04	1009179-01	10/01/10 00:00	5.00	5.00
32GW-05	1009179-02	10/01/10 00:00	5.00	5.00
32GW-06	1009179-03	10/01/10 00:00	5.00	5.00
32GW-FD092210-01	1009179-04	10/01/10 00:00	5.00	5.00
Trip Blank	1009179-05	10/01/10 00:00	5.00	5.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOF273_011	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTOF273 NSA Crane SMU32	
Matrix:		Laboratory ID:	0J01010-BLK1	File ID:	V3BLK1.D
Sampled:		Prepared:		Analyzed:	10/01/10 11:01
Solids:		Preparation:	5030B	Dilution:	

Batch: 0J01010 Sequence: 0J27503 Calibration: 0273001 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
71-43-2	Benzene		0.140	1.00	U
100-41-4	Ethylbenzene		0.150	1.00	U
108-88-3	Toluene		0.190	1.00	U
1330-20-7	Xylenes (total)		0.220	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.39	101	75 - 120	
Dibromofluoromethane	30.00	30.88	103	85 - 115	
1,2-Dichloroethane-d4	30.00	30.53	102	70 - 120	
Toluene-d8	30.00	31.74	106	85 - 120	

LCS / LCS DUPLICATE RECOVERY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Water		
Batch:	0J01010	Laboratory ID:	0J01010-BS1
Preparation:	5030B	Initial/Final:	5 mL / 5 mL

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Benzene	50.00	50.4	101	80 - 120
Ethylbenzene	50.00	54.0	108	75 - 125
Toluene	50.00	52.8	106	75 - 120
Xylenes (total)	150.0	157	104	75 - 130

ANALYTE	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzene	50.00	53.9	108	6.85	30	80 - 120
Ethylbenzene	50.00	56.8	114	5.17	30	75 - 125
Toluene	50.00	58.7	117	10.6	30	75 - 120
Xylenes (total)	150.0	160	106	1.92	30	75 - 130

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0I27214	Instrument:	MS-VOA4
		Calibration:	0270005

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0I27214-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 09/28/10 13:56			
Fluorobenzene	1033576	13.972	1023020	13.926	101	50 - 200	0.0460	+/-0.50	
Chlorobenzene-d5	428343	17.236	439111	17.2	98	50 - 200	0.0360	+/-0.50	
1,4-Dichlorobenzene-d4	447210	19.287	357477	19.252	125	50 - 200	0.0350	+/-0.50	
LCS (0I28020-BS1)			Lab File ID: V4LCS01.D			Analyzed: 09/28/10 14:43			
Fluorobenzene	1264508	13.977	1033576	13.972	122	50 - 200	0.0050	+/-0.50	
Chlorobenzene-d5	507600	17.241	428343	17.236	119	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	528098	19.282	447210	19.287	118	50 - 200	-0.0050	+/-0.50	
Blank (0I28020-BLK1)			Lab File ID: V4BLK01.D			Analyzed: 09/28/10 16:15			
Fluorobenzene	986100	13.967	1033576	13.972	95	50 - 200	-0.0050	+/-0.50	
Chlorobenzene-d5	383353	17.231	428343	17.236	89	50 - 200	-0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	424166	19.272	447210	19.287	95	50 - 200	-0.0150	+/-0.50	
32SD-04-0006 (1009166-01)			Lab File ID: 0916601.D			Analyzed: 09/28/10 20:22			
Fluorobenzene	1212853	13.972	1033576	13.972	117	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	456393	17.236	428343	17.236	107	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	468876	19.277	447210	19.287	105	50 - 200	-0.0100	+/-0.50	
32SD-05-0006 (1009166-02)			Lab File ID: 0916602.D			Analyzed: 09/28/10 20:53			
Fluorobenzene	1211121	13.971	1033576	13.972	117	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	455341	17.235	428343	17.236	106	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	430877	19.276	447210	19.287	96	50 - 200	-0.0110	+/-0.50	
32SD-FD092110-01 (1009166-03)			Lab File ID: 0916603.D			Analyzed: 09/28/10 21:23			
Fluorobenzene	1150804	13.971	1033576	13.972	111	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	424402	17.235	428343	17.236	99	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	440129	19.276	447210	19.287	98	50 - 200	-0.0110	+/-0.50	
LCS Dup (0I28020-BSD1)			Lab File ID: V4LCSD01.D			Analyzed: 09/28/10 21:54			
Fluorobenzene	1235377	13.975	1033576	13.972	120	50 - 200	0.0030	+/-0.50	
Chlorobenzene-d5	483839	17.229	428343	17.236	113	50 - 200	-0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	509749	19.28	447210	19.287	114	50 - 200	-0.0070	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0J27403	Instrument:	MS-VOA3
		Calibration:	0273001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0J27403-CCV1)			Lab File ID: SEQ-CCVE.D			Analyzed: 09/30/10 20:03			
Fluorobenzene	1104251	12.577	1077179	12.583	103	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	682096	16.16	556848	16.167	122	50 - 200	-0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	949795	18.15	778704	18.15	122	50 - 200	0.0000	+/-0.50	
LCS (0I30022-BS1)			Lab File ID: V3LCS1E.D			Analyzed: 09/30/10 20:34			
Fluorobenzene	1126977	12.577	1104251	12.577	102	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	624457	16.161	682096	16.16	92	50 - 200	0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	935483	18.15	949795	18.15	98	50 - 200	0.0000	+/-0.50	
Blank (0I30022-BLK1)			Lab File ID: V3BLK1E.D			Analyzed: 09/30/10 22:03			
Fluorobenzene	1020950	12.577	1104251	12.577	92	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	542968	16.16	682096	16.16	80	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	744419	18.15	949795	18.15	78	50 - 200	0.0000	+/-0.50	
Trip Blank #7808 (1009166-04)			Lab File ID: 0916604.D			Analyzed: 09/30/10 23:04			
Fluorobenzene	1025337	12.577	1104251	12.577	93	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	538051	16.161	682096	16.16	79	50 - 200	0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	732343	18.144	949795	18.15	77	50 - 200	-0.0060	+/-0.50	
LCS Dup (0I30022-BSD1)			Lab File ID: V3LCSD1E.D			Analyzed: 10/01/10 07:13			
Fluorobenzene	1080792	12.571	1104251	12.577	98	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	635398	16.155	682096	16.16	93	50 - 200	-0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	937127	18.138	949795	18.15	99	50 - 200	-0.0120	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8260B

Laboratory: Empirical Laboratories, LLC
Client: Tetra Tech NUS, Inc. (T010)
Sequence: 0J27503

SDG: CTOF273_011
Project: CTOF273 NSA Crane SMU32
Instrument: MS-VOA3
Calibration: 0273001

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0J27503-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 10/01/10 09:01			
Fluorobenzene	1208221	12.565	1077179	12.583	112	50 - 200	-0.0180	+/-0.50	
Chlorobenzene-d5	699484	16.154	556848	16.167	126	50 - 200	-0.0130	+/-0.50	
1,4-Dichlorobenzene-d4	989940	18.138	778704	18.15	127	50 - 200	-0.0120	+/-0.50	
LCS (0J01010-BS1)			Lab File ID: V3LCS1.D			Analyzed: 10/01/10 09:32			
Fluorobenzene	1267408	12.565	1208221	12.565	105	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	664941	16.154	699484	16.154	95	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	970595	18.138	989940	18.138	98	50 - 200	0.0000	+/-0.50	
Blank (0J01010-BLK1)			Lab File ID: V3BLK1.D			Analyzed: 10/01/10 11:01			
Fluorobenzene	1122354	12.565	1208221	12.565	93	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	578586	16.154	699484	16.154	83	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	806601	18.138	989940	18.138	81	50 - 200	0.0000	+/-0.50	
Trip Blank (1009179-05)			Lab File ID: 0917905.D			Analyzed: 10/01/10 15:06			
Fluorobenzene	1116379	12.571	1208221	12.565	92	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	583151	16.154	699484	16.154	83	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	800140	18.138	989940	18.138	81	50 - 200	0.0000	+/-0.50	
32GW-04 (1009179-01)			Lab File ID: 0917901.D			Analyzed: 10/01/10 16:07			
Fluorobenzene	1164275	12.571	1208221	12.565	96	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	585655	16.154	699484	16.154	84	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	829039	18.144	989940	18.138	84	50 - 200	0.0060	+/-0.50	
32GW-05 (1009179-02)			Lab File ID: 0917902.D			Analyzed: 10/01/10 16:38			
Fluorobenzene	1171111	12.571	1208221	12.565	97	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	603643	16.154	699484	16.154	86	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	817756	18.144	989940	18.138	83	50 - 200	0.0060	+/-0.50	
32GW-06 (1009179-03)			Lab File ID: 0917903.D			Analyzed: 10/01/10 17:09			
Fluorobenzene	1147198	12.571	1208221	12.565	95	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	583501	16.154	699484	16.154	83	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	818534	18.144	989940	18.138	83	50 - 200	0.0060	+/-0.50	
32GW-FD092210-01 (1009179-04)			Lab File ID: 0917904.D			Analyzed: 10/01/10 17:39			
Fluorobenzene	1144199	12.571	1208221	12.565	95	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	582125	16.155	699484	16.154	83	50 - 200	0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	797455	18.144	989940	18.138	81	50 - 200	0.0060	+/-0.50	
LCS Dup (0J01010-BSD1)			Lab File ID: V3LCSD1.D			Analyzed: 10/01/10 20:12			
Fluorobenzene	1756229	12.565	1208221	12.565	145	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	880557	16.154	699484	16.154	126	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	1271020	18.144	989940	18.138	128	50 - 200	0.0060	+/-0.50	

HOLDING TIME SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_011

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
32SD-04-0006	09/21/10 10:00	09/22/10 08:30	09/27/10 12:40	6.11	14.00	09/28/10 20:49	1.34	40.00	
32SD-05-0006	09/21/10 10:20	09/22/10 08:30	09/27/10 12:40	6.10	14.00	09/28/10 21:17	1.36	40.00	
32SD-FD092110-01	09/21/10 00:00	09/22/10 08:30	09/27/10 12:40	6.53	14.00	09/28/10 21:45	1.38	40.00	
32GW-04	09/22/10 14:10	09/23/10 08:30	09/27/10 17:50	5.15	7.00	09/28/10 15:15	0.89	40.00	
32GW-05	09/22/10 12:25	09/23/10 08:30	09/27/10 17:50	5.23	7.00	09/28/10 15:43	0.91	40.00	
32GW-06	09/21/10 20:55	09/23/10 08:30	09/27/10 17:50	5.87	7.00	09/28/10 16:11	0.93	40.00	
32GW-FD092210-01	09/22/10 00:00	09/23/10 08:30	09/27/10 17:50	5.74	7.00	09/28/10 16:39	0.95	40.00	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0I27207	Instrument:	MS-BNA4
		Calibration:	0237003

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (0I27207-CCV1) ug/mL				Lab File ID: SEQ-CCV1.D		Analyzed: 09/28/10 12:24		
2-Fluorobiphenyl	5.000	85.8	80 - 120	7.697	7.697	0.0000	+/-0.500	
Terphenyl-d14	5.000	100	80 - 120	11.359	11.359	0.0000	+/-0.500	
LCS (0I27031-BS1) ug/L				Lab File ID: I27031L1.D		Analyzed: 09/28/10 12:54		
2-Fluorobiphenyl	50.00	63.6	34 - 167	7.706	7.697	0.0090	+/-0.500	
Terphenyl-d14	50.00	76.9	34 - 167	11.378	11.359	0.0190	+/-0.500	
LCS Dup (0I27031-BSD1) ug/L				Lab File ID: I27031L2.D		Analyzed: 09/28/10 13:22		
2-Fluorobiphenyl	50.00	67.6	34 - 167	7.706	7.697	0.0090	+/-0.500	
Terphenyl-d14	50.00	78.4	34 - 167	11.378	11.359	0.0190	+/-0.500	
Blank (0I27031-BLK1) ug/L				Lab File ID: I27031B1.D		Analyzed: 09/28/10 13:51		
2-Fluorobiphenyl	50.00	69.0	34 - 167	7.706	7.697	0.0090	+/-0.500	
Terphenyl-d14	50.00	82.5	34 - 167	11.378	11.359	0.0190	+/-0.500	
LCS (0I24729-BS1) ug/Kg wet				Lab File ID: I24729L1.D		Analyzed: 09/28/10 14:19		
2-Fluorobiphenyl	3333	38.1	14 - 129	7.697	7.697	0.0000	+/-0.500	
Terphenyl-d14	3333	45.4	14 - 129	11.369	11.359	0.0100	+/-0.500	
Blank (0I24729-BLK1) ug/Kg wet				Lab File ID: I24729B1.D		Analyzed: 09/28/10 14:47		
2-Fluorobiphenyl	3333	50.9	14 - 129	7.706	7.697	0.0090	+/-0.500	
Terphenyl-d14	3333	55.1	14 - 129	11.369	11.359	0.0100	+/-0.500	
32GW-04 (1009179-01) ug/L				Lab File ID: 0917901.D		Analyzed: 09/28/10 15:15		
2-Fluorobiphenyl	46.73	59.2	34 - 167	7.706	7.697	0.0090	+/-0.500	
Terphenyl-d14	46.73	71.4	34 - 167	11.369	11.359	0.0100	+/-0.500	
32GW-05 (1009179-02) ug/L				Lab File ID: 0917902.D		Analyzed: 09/28/10 15:43		
2-Fluorobiphenyl	47.17	57.1	34 - 167	7.706	7.697	0.0090	+/-0.500	
Terphenyl-d14	47.17	69.6	34 - 167	11.369	11.359	0.0100	+/-0.500	
32GW-06 (1009179-03) ug/L				Lab File ID: 0917903.D		Analyzed: 09/28/10 16:11		
2-Fluorobiphenyl	46.73	62.9	34 - 167	7.706	7.697	0.0090	+/-0.500	
Terphenyl-d14	46.73	68.4	34 - 167	11.369	11.359	0.0100	+/-0.500	
32GW-FD092210-01 (1009179-04) ug/L				Lab File ID: 0917904.D		Analyzed: 09/28/10 16:39		
2-Fluorobiphenyl	46.73	61.1	34 - 167	7.706	7.697	0.0090	+/-0.500	
Terphenyl-d14	46.73	67.3	34 - 167	11.369	11.359	0.0100	+/-0.500	
32SD-04-0006 (1009166-01) ug/Kg dry				Lab File ID: 0916601.D		Analyzed: 09/28/10 20:49		
2-Fluorobiphenyl	3921	55.7	14 - 129	7.706	7.697	0.0090	+/-0.500	
Terphenyl-d14	3921	60.6	14 - 129	11.369	11.359	0.0100	+/-0.500	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0I27207	Instrument:	MS-BNA4
		Calibration:	0237003

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
32SD-05-0006 (1009166-02) ug/Kg dry				Lab File ID: 0916602.D		Analyzed: 09/28/10 21:17		
2-Fluorobiphenyl	4050	59.3	14 - 129	7.706	7.697	0.0090	+/-0.500	
Terphenyl-d14	4050	65.4	14 - 129	11.369	11.359	0.0100	+/-0.500	
32SD-FD092110-01 (1009166-03) ug/Kg dry				Lab File ID: 0916603.D		Analyzed: 09/28/10 21:45		
2-Fluorobiphenyl	4085	53.6	14 - 129	7.697	7.697	0.0000	+/-0.500	
Terphenyl-d14	4085	66.6	14 - 129	11.369	11.359	0.0100	+/-0.500	
Matrix Spike (0I24729-MS1) ug/Kg dry				Lab File ID: 0916601M.D		Analyzed: 09/28/10 22:40		
2-Fluorobiphenyl	4025	57.7	14 - 129	7.706	7.697	0.0090	+/-0.500	
Terphenyl-d14	4025	61.0	14 - 129	11.369	11.359	0.0100	+/-0.500	
Matrix Spike Dup (0I24729-MSD1) ug/Kg dry				Lab File ID: 0916601S.D		Analyzed: 09/28/10 23:07		
2-Fluorobiphenyl	3972	49.1	14 - 129	7.697	7.697	0.0000	+/-0.500	
Terphenyl-d14	3972	54.8	14 - 129	11.369	11.359	0.0100	+/-0.500	

ANALYSIS SEQUENCE SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0H23613	Instrument:	MS-BNA4
Calibration:	0237003		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0H23613-TUN1	SEQ-TUN1.D	08/23/10 10:58
Cal Standard	0H23613-CAL1	SEQ-CAL1.D	08/23/10 11:18
Cal Standard	0H23613-CAL2	SEQ-CAL2.D	08/23/10 11:46
Cal Standard	0H23613-CAL3	SEQ-CAL3.D	08/23/10 12:14
Cal Standard	0H23613-CAL4	SEQ-CAL4.D	08/23/10 12:43
Cal Standard	0H23613-CAL5	SEQ-CAL5.D	08/23/10 13:12
Cal Standard	0H23613-CAL6	SEQ-CAL6.D	08/23/10 13:41
Cal Standard	0H23613-CAL7	SEQ-CAL7.D	08/23/10 14:09
Cal Standard	0H23613-CAL8	SEQ-CAL8.D	08/23/10 14:38
Cal Standard	0H23613-CAL9	SEQ-CAL9.D	08/23/10 15:07
Cal Standard	0H23613-CALA	SEQ-CALA.D	08/23/10 15:35
Cal Standard	0H23613-CALB	SEQ-CALB.D	08/23/10 16:04
Initial Cal Check	0H23613-ICV1	SEQ-ICV1.D	08/23/10 16:33

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	08/23/10
Instrument ID:	MS-BNA4	Injection Time:	10:58
Sequence:	0H23613	Lab Sample ID:	0H23613-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	37.1	PASS
68	Less than 2% of 69	1.35	PASS
69	Less than 200% of 198	35.2	PASS
70	Less than 2% of 69	0.535	PASS
127	40 - 60% of 198	44.6	PASS
197	Less than 1% of 198	0.57	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.65	PASS
275	10 - 30% of 198	29.4	PASS
365	1 - 200% of 198	4.31	PASS
441	0.001 - 100% of 443	81.1	PASS
442	40 - 200% of 198	171	PASS
443	17 - 23% of 442	19.6	PASS

INITIAL CALIBRATION DATA

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0237003	Instrument:	MS-BNA4
Matrix:	Water	Calibration Date:	8/23/2010 2:19:08PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	0.05	0.9696934	0.1	0.87856	0.25	0.8781831	0.5	0.8812209	1	0.8628006	2	0.8699737
Acenaphthylene	0.05	1.231536	0.1	1.312532	0.25	1.329416	0.5	1.313629	1	1.284776	2	1.33692
Anthracene	0.05	1.20114	0.1	1.23021	0.25	1.181005	0.5	1.251104	1	1.181431	2	1.197467
Benzo(a)anthracene	0.05	1.056709	0.1	1.063984	0.25	0.9592916	0.5	1.137171	1	1.014809	2	1.080168
Benzo(a)pyrene	0.05	1.370862	0.1	1.225981	0.25	1.235854	0.5	1.299931	1	1.277867	2	1.24793
Benzo(b)fluoranthene	0.05	1.791746	0.1	1.524914	0.25	1.490824	0.5	1.514204	1	1.50173	2	1.501875
Benzo(g,h,i)perylene	0.05	1.395071	0.1	1.255036	0.25	1.153426	0.5	1.277585	1	1.237412	2	1.213123
Benzo(k)fluoranthene	0.05	1.662826	0.1	1.577931	0.25	1.432019	0.5	1.468413	1	1.45902	2	1.486771
Chrysene	0.05	1.103794	0.1	1.136482	0.25	0.9424454	0.5	1.129034	1	1.045611	2	1.033092
Dibenz(a,h)anthracene	0.05	1.139274	0.1	1.099879	0.25	0.9717406	0.5	1.054254	1	1.000809	2	1.044652
Fluoranthene	0.05	1.261932	0.1	1.312532	0.25	1.218395	0.5	1.336052	1	1.250409	2	1.282841
Fluorene	0.05	0.8721479	0.1	0.8024482	0.25	0.8229602	0.5	0.8665036	1	0.8275302	2	0.8463145
2-Fluorobiphenyl	0.05	1.103992	0.1	1.001536	0.25	1.02528	0.5	1.02845	1	1.017666	2	1.028772
2-Fluorophenol	0.1		0.2		0.5		1		2		4	
Indeno(1,2,3-cd)pyrene	0.05	1.285402	0.1	1.137769	0.25	1.018162	0.5	1.141125	1	1.122812	2	1.068976
1-Methylnaphthalene	0.05	0.8268518	0.1	0.7750073	0.25	0.8049635	0.5	0.7633511	1	0.7554511	2	0.7929684
2-Methylnaphthalene	0.05	0.935324	0.1	0.9039682	0.25	0.8410391	0.5	0.8502301	1	0.8366744	2	0.8488049
Naphthalene	0.05	1.509471	0.1	1.32439	0.25	1.388953	0.5	1.324128	1	1.335661	2	1.379137
Nitrobenzene-d5	0.05		0.1		0.25		0.5		1		2	
Phenanthrene	0.05	1.266104	0.1	1.223773	0.25	1.206562	0.5	1.301311	1	1.196081	2	1.210596
Phenol-d6	0.1		0.2		0.5		1		2		4	
Pyrene	0.05	1.334843	0.1	1.354202	0.25	1.289971	0.5	1.373848	1	1.28358	2	1.344309
Terphenyl-d14	0.05	0.9464493	0.1	0.9716105	0.25	0.9105197	0.5	1.026501	1	0.9582591	2	0.9948593
2,4,6-Tribromophenol	0.1	0.1167168	0.2	0.1337037	0.5	0.134955	1	0.1698679	2	0.1605726	4	0.1843697
Acenaphthene-d10	1		1		1		1		1		1	
Chrysene-d12	1		1		1		1		1		1	
Acenaphthene	0.05	0.9696934	0.1	0.87856	0.25	0.8781831	0.5	0.8812209	1	0.8628006	2	0.8699737
Acenaphthylene	0.05	1.231536	0.1	1.312532	0.25	1.329416	0.5	1.313629	1	1.284776	2	1.33692
Anthracene	0.05	1.20114	0.1	1.23021	0.25	1.181005	0.5	1.251104	1	1.181431	2	1.197467
Benzo(a)anthracene	0.05	1.056709	0.1	1.063984	0.25	0.9592916	0.5	1.137171	1	1.014809	2	1.080168
Benzo(a)pyrene	0.05	1.370862	0.1	1.225981	0.25	1.235854	0.5	1.299931	1	1.277867	2	1.24793

INITIAL CALIBRATION DATA

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0237003	Instrument:	MS-BNA4
Matrix:	Water	Calibration Date:	8/23/2010 2:19:08PM

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Benzo(b)fluoranthene	0.05	1.791746	0.1	1.524914	0.25	1.490824	0.5	1.514204	1	1.50173	2	1.501875
Benzo(g,h,i)perylene	0.05	1.395071	0.1	1.255036	0.25	1.153426	0.5	1.277585	1	1.237412	2	1.213123
Benzo(k)fluoranthene	0.05	1.662826	0.1	1.577931	0.25	1.432019	0.5	1.468413	1	1.45902	2	1.486771
Chrysene	0.05	1.103794	0.1	1.136482	0.25	0.9424454	0.5	1.129034	1	1.045611	2	1.033092
Dibenz(a,h)anthracene	0.05	1.139274	0.1	1.099879	0.25	0.9717406	0.5	1.054254	1	1.000809	2	1.044652
Fluoranthene	0.05	1.261932	0.1	1.312532	0.25	1.218395	0.5	1.336052	1	1.250409	2	1.282841
Fluorene	0.05	0.8721479	0.1	0.8024482	0.25	0.8229602	0.5	0.8665036	1	0.8275302	2	0.8463145
2-Fluorobiphenyl	0.05	1.103992	0.1	1.001536	0.25	1.02528	0.5	1.02845	1	1.017666	2	1.028772
2-Fluorophenol	0.1		0.2		0.5		1		2		4	
Indeno(1,2,3-cd)pyrene	0.05	1.285402	0.1	1.137769	0.25	1.018162	0.5	1.141125	1	1.122812	2	1.068976
1-Methylnaphthalene	0.05	0.8268518	0.1	0.7750073	0.25	0.8049635	0.5	0.7633511	1	0.7554511	2	0.7929684
2-Methylnaphthalene	0.05	0.935324	0.1	0.9039682	0.25	0.8410391	0.5	0.8502301	1	0.8366744	2	0.8488049
Naphthalene	0.05	1.509471	0.1	1.32439	0.25	1.388953	0.5	1.324128	1	1.335661	2	1.379137
Nitrobenzene-d5	0.05		0.1		0.25		0.5		1		2	
Phenanthrene	0.05	1.266104	0.1	1.223773	0.25	1.206562	0.5	1.301311	1	1.196081	2	1.210596
Phenol-d6	0.1		0.2		0.5		1		2		4	
Pyrene	0.05	1.334843	0.1	1.354202	0.25	1.289971	0.5	1.373848	1	1.28358	2	1.344309
Terphenyl-d14	0.05	0.9464493	0.1	0.9716105	0.25	0.9105197	0.5	1.026501	1	0.9582591	2	0.9948593
2,4,6-Tribromophenol	0.1	0.1167168	0.2	0.1337037	0.5	0.134955	1	0.1698679	2	0.1605726	4	0.1843697
Acenaphthene-d10	1		1		1		1		1		1	
Chrysene-d12	1		1		1		1		1		1	

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0237003	Instrument:	MS-BNA4
Matrix:	Water	Calibration Date:	8/23/2010 2:19:08PM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Acenaphthene	5	0.8202661	10	0.7995016	20	0.8365345	40	0.7671359	50	0.7753627		
Acenaphthylene	5	1.308739	10	1.247039	20	1.27871	40	1.137408	50	1.03856		
Anthracene	5	1.16291	10	1.134923	20	1.12897	40	1.058084	50	1.05802		
Benzo(a)anthracene	5	1.091661	10	1.119081	20	1.116848	40	0.9762791	50	0.9364189		
Benzo(a)pyrene	5	1.282697	10	1.337396	20	1.33134	40	1.23341	50	1.248302		
Benzo(b)fluoranthene	5	1.434198	10	1.443568	20	1.581412	40	1.402055	50	1.514568		
Benzo(g,h,i)perylene	5	1.192857	10	1.216479	20	1.295253	40	1.282242	50	1.289086		
Benzo(k)fluoranthene	5	1.441017	10	1.588601	20	1.488262	40	1.254446	50	1.337784		
Chrysene	5	1.060871	10	1.077258	20	1.064519	40	0.9299454	50	0.8763266		
Dibenz(a,h)anthracene	5	1.101334	10	1.16435	20	1.240666	40	1.230688	50	1.243382		
Fluoranthene	5	1.240388	10	1.235568	20	1.248391	40	1.123444	50	1.117132		
Fluorene	5	0.7954939	10	0.7951199	20	0.7994212	40	0.7639425	50	0.71459		
2-Fluorobiphenyl	5	1.003692	10	0.9298445	20	0.9918799	40	0.9438886	50	0.9008792		
2-Fluorophenol	10		20		40		80		100			
Indeno(1,2,3-cd)pyrene	5	1.146788	10	1.166502	20	1.295357	40	1.276062	50	1.347769		
1-Methylnaphthalene	5	0.7687382	10	0.7378496	20	0.7668029	40	0.7188929	50	0.6759695		
2-Methylnaphthalene	5	0.8191814	10	0.7991105	20	0.8535003	40	0.8021241	50	0.7935408		
Naphthalene	5	1.339167	10	1.26616	20	1.366447	40	1.282877	50	1.226471		
Nitrobenzene-d5	5		10		20		40		50			
Phenanthrene	5	1.168232	10	1.137986	20	1.150514	40	1.09771	50	1.041382		
Phenol-d6	10		20		40		80		100			
Pyrene	5	1.306428	10	1.287378	20	1.272105	40	1.154524	50	1.135154		
Terphenyl-d14	5	0.9402409	10	0.9693515	20	0.9739731	40	0.8470303	50	0.8433395		
2,4,6-Tribromophenol	10	0.1835148	20	0.1861623	40	0.2031178	80	0.210709	100	0.2004233		
Acenaphthene-d10	1		1		1		1		1			
Chrysene-d12	1		1		1		1		1			
Acenaphthene	5	0.8202661	10	0.7995016	20	0.8365345	40	0.7671359	50	0.7753627		
Acenaphthylene	5	1.308739	10	1.247039	20	1.27871	40	1.137408	50	1.03856		
Anthracene	5	1.16291	10	1.134923	20	1.12897	40	1.058084	50	1.05802		
Benzo(a)anthracene	5	1.091661	10	1.119081	20	1.116848	40	0.9762791	50	0.9364189		
Benzo(a)pyrene	5	1.282697	10	1.337396	20	1.33134	40	1.23341	50	1.248302		

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0237003	Instrument:	MS-BNA4
Matrix:	Water	Calibration Date:	8/23/2010 2:19:08PM

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF	ug/mL	RF
Benzo(b)fluoranthene	5	1.434198	10	1.443568	20	1.581412	40	1.402055	50	1.514568		
Benzo(g,h,i)perylene	5	1.192857	10	1.216479	20	1.295253	40	1.282242	50	1.289086		
Benzo(k)fluoranthene	5	1.441017	10	1.588601	20	1.488262	40	1.254446	50	1.337784		
Chrysene	5	1.060871	10	1.077258	20	1.064519	40	0.9299454	50	0.8763266		
Dibenz(a,h)anthracene	5	1.101334	10	1.16435	20	1.240666	40	1.230688	50	1.243382		
Fluoranthene	5	1.240388	10	1.235568	20	1.248391	40	1.123444	50	1.117132		
Fluorene	5	0.7954939	10	0.7951199	20	0.7994212	40	0.7639425	50	0.71459		
2-Fluorobiphenyl	5	1.003692	10	0.9298445	20	0.9918799	40	0.9438886	50	0.9008792		
2-Fluorophenol	10		20		40		80		100			
Indeno(1,2,3-cd)pyrene	5	1.146788	10	1.166502	20	1.295357	40	1.276062	50	1.347769		
1-Methylnaphthalene	5	0.7687382	10	0.7378496	20	0.7668029	40	0.7188929	50	0.6759695		
2-Methylnaphthalene	5	0.8191814	10	0.7991105	20	0.8535003	40	0.8021241	50	0.7935408		
Naphthalene	5	1.339167	10	1.26616	20	1.366447	40	1.282877	50	1.226471		
Nitrobenzene-d5	5		10		20		40		50			
Phenanthrene	5	1.168232	10	1.137986	20	1.150514	40	1.09771	50	1.041382		
Phenol-d6	10		20		40		80		100			
Pyrene	5	1.306428	10	1.287378	20	1.272105	40	1.154524	50	1.135154		
Terphenyl-d14	5	0.9402409	10	0.9693515	20	0.9739731	40	0.8470303	50	0.8433395		
2,4,6-Tribromophenol	10	0.1835148	20	0.1861623	40	0.2031178	80	0.210709	100	0.2004233		
Acenaphthene-d10	1		1		1		1		1			
Chrysene-d12	1		1		1		1		1			

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0237003	Instrument:	MS-BNA4
Matrix:	Water	Calibration Date:	8/23/2010 2:19:08PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.8490211	6.818824	8.672363	7.491158E-02			CCC (30)	
Acenaphthylene	1.256297	7.321474	8.503636	4.741883E-02			15	
Anthracene	1.162297	5.411094	10.16845	5.870715E-02			15	
Benzo(a)anthracene	1.05022	6.564346	12.73	5.763089E-02			15	
Benzo(a)pyrene	1.281052	3.796487	14.64482	9.160048E-02			CCC (30)	
Benzo(b)fluoranthene	1.518281	6.790712	14.14373	0.0922259			15	
Benzo(g,h,i)perylene	1.255234	5.124687	17.09564	0.1289391			15	
Benzo(k)fluoranthene	1.472463	7.737223	14.18955	9.274443E-02			15	
Chrysene	1.036307	8.192401	12.77309	5.757095E-02			15	
Dibenz(a,h)anthracene	1.117366	8.548531	16.66327	0.1020264			15	
Fluoranthene	1.238826	5.482849	11.28455	5.677501E-02			CCC (30)	
Fluorene	0.8096793	5.615516	9.182	4.516641E-02			15	
2-Fluorobiphenyl	0.9978073	5.609346	7.992182	4.747639E-02			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	1.182429	8.792795	16.60736	0.0996987			15	
1-Methylnaphthalene	0.7624406	5.428982	7.722637	4.959277E-02			15	
2-Methylnaphthalene	0.8439543	5.17593	7.628818	3.890384E-02			15	
Naphthalene	1.34026	5.556837	6.945	0.1089812			15	
Nitrobenzene-d5							15	
Phenanthrene	1.181841	6.256198	10.12082	4.272592E-02			15	
Phenol-d6							15	
Pyrene	1.285122	5.967861	11.50618	3.003483E-02			15	
Terphenyl-d14	0.9438304	6.047221	11.67445	3.428681E-02			15	
2,4,6-Tribromophenol	0.171283	18.26313	9.417909	7.753255E-02	0.9989515		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	
Acenaphthene	0.8490211	6.818824	8.672363	7.491158E-02			CCC (30)	
Acenaphthylene	1.256297	7.321474	8.503636	4.741883E-02			15	
Anthracene	1.162297	5.411094	10.16845	5.870715E-02			15	
Benzo(a)anthracene	1.05022	6.564346	12.73	5.763089E-02			15	
Benzo(a)pyrene	1.281052	3.796487	14.64482	9.160048E-02			CCC (30)	
Benzo(b)fluoranthene	1.518281	6.790712	14.14373	0.0922259			15	

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Calibration:	0237003	Instrument:	MS-BNA4
Matrix:	Water	Calibration Date:	8/23/2010 2:19:08PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Benzo(g,h,i)perylene	1.255234	5.124687	17.09564	0.1289391			15	
Benzo(k)fluoranthene	1.472463	7.737223	14.18955	9.274443E-02			15	
Chrysene	1.036307	8.192401	12.77309	5.757095E-02			15	
Dibenz(a,h)anthracene	1.117366	8.548531	16.66327	0.1020264			15	
Fluoranthene	1.238826	5.482849	11.28455	5.677501E-02			CCC (30)	
Fluorene	0.8096793	5.615516	9.182	4.516641E-02			15	
2-Fluorobiphenyl	0.9978073	5.609346	7.992182	4.747639E-02			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	1.182429	8.792795	16.60736	0.0996987			15	
1-Methylnaphthalene	0.7624406	5.428982	7.722637	4.959277E-02			15	
2-Methylnaphthalene	0.8439543	5.17593	7.628818	3.890384E-02			15	
Naphthalene	1.34026	5.556837	6.945	0.1089812			15	
Nitrobenzene-d5							15	
Phenanthrene	1.181841	6.256198	10.12082	4.272592E-02			15	
Phenol-d6							15	
Pyrene	1.285122	5.967861	11.50618	3.003483E-02			15	
Terphenyl-d14	0.9438304	6.047221	11.67445	3.428681E-02			15	
2,4,6-Tribromophenol	0.171283	18.26313	9.417909	7.753255E-02	0.9989515		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0237003
Lab File ID:	SEQ-ICV1.D	Calibration Date:	08/23/10 14:19
Sequence:	0H23613	Injection Date:	08/23/10
Lab Sample ID:	0H23613-ICV1	Injection Time:	16:33

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Acenaphthene	A	5.000	5.459	0.8490211	0.9269866		9.2	20
Acenaphthylene	A	5.000	5.703	1.256297	1.432929		14.1	20
Anthracene	A	5.000	5.160	1.162297	1.199487		3.2	20
Benzo(a)anthracene	A	5.000	5.178	1.05022	1.087508		3.6	20
Benzo(a)pyrene	A	5.000	5.685	1.281052	1.456646		13.7	20
Benzo(b)fluoranthene	A	5.000	5.211	1.518281	1.582416		4.2	20
Benzo(g,h,i)perylene	A	5.000	5.197	1.255234	1.304654		3.9	20
Benzo(k)fluoranthene	A	5.000	5.510	1.472463	1.622768		10.2	20
Chrysene	A	5.000	5.161	1.036307	1.069754		3.2	20
Dibenz(a,h)anthracene	A	5.000	5.628	1.117366	1.257663		12.6	20
Fluoranthene	A	5.000	5.209	1.238826	1.290573		4.2	20
Fluorene	A	5.000	5.488	0.8096793	0.8887667		9.8	20
Indeno(1,2,3-cd)pyrene	A	5.000	5.500	1.182429	1.300687		10.0	20
1-Methylnaphthalene	A	5.000	5.971	0.7624406	0.9105566		19.4	20
2-Methylnaphthalene	A	5.000	5.658	0.8439543	0.9550044		13.2	20
Naphthalene	A	5.000	5.701	1.34026	1.528177		14.0	20
Phenanthrene	A	5.000	5.284	1.181841	1.249062		5.7	20
Pyrene	A	5.000	5.200	1.285122	1.336607		4.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0I27207	Instrument:	MS-BNA4
Calibration:	0237003		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0I27207-TUN1	SEQ-TUN1.D	09/28/10 12:05
Calibration Check	0I27207-CCV1	SEQ-CCV1.D	09/28/10 12:24
LCS	0I27031-BS1	I27031L1.D	09/28/10 12:54
LCS Dup	0I27031-BSD1	I27031L2.D	09/28/10 13:22
Blank	0I27031-BLK1	I27031B1.D	09/28/10 13:51
LCS	0I24729-BS1	I24729L1.D	09/28/10 14:19
Blank	0I24729-BLK1	I24729B1.D	09/28/10 14:47
32GW-04	1009179-01	0917901.D	09/28/10 15:15
32GW-05	1009179-02	0917902.D	09/28/10 15:43
32GW-06	1009179-03	0917903.D	09/28/10 16:11
32GW-FD092210-01	1009179-04	0917904.D	09/28/10 16:39
32SD-04-0006	1009166-01	0916601.D	09/28/10 20:49
32SD-05-0006	1009166-02	0916602.D	09/28/10 21:17
32SD-FD092110-01	1009166-03	0916603.D	09/28/10 21:45
32SD-04-0006	0I24729-MS1	0916601M.D	09/28/10 22:40
32SD-04-0006	0I24729-MSD1	0916601S.D	09/28/10 23:07

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Lab File ID:	SEQ-TUN1.D	Injection Date:	09/28/10
Instrument ID:	MS-BNA4	Injection Time:	12:05
Sequence:	0I27207	Lab Sample ID:	0I27207-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	54.9	PASS
68	Less than 2% of 69	1.39	PASS
69	Less than 200% of 198	51.7	PASS
70	Less than 2% of 69	0.463	PASS
127	40 - 60% of 198	55.1	PASS
197	Less than 1% of 198	0.661	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.87	PASS
275	10 - 30% of 198	23.8	PASS
365	1 - 200% of 198	2.79	PASS
441	0.001 - 100% of 443	78.3	PASS
442	40 - 200% of 198	97.1	PASS
443	17 - 23% of 442	20.1	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Instrument ID:	MS-BNA4	Calibration:	0237003
Lab File ID:	SEQ-CCV1.D	Calibration Date:	08/23/10 14:19
Sequence:	0I27207	Injection Date:	09/28/10
Lab Sample ID:	0I27207-CCV1	Injection Time:	12:24

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzo(a)anthracene	A	5.000	4.965	1.05022	1.042814		-0.7	20
Benzo(a)pyrene	A	5.000	4.725	1.281052	1.210724		-5.5	20
Benzo(b)fluoranthene	A	5.000	4.913	1.518281	1.491962		-1.7	20
Benzo(k)fluoranthene	A	5.000	4.687	1.472463	1.380286		-6.3	20
Chrysene	A	5.000	4.770	1.036307	0.9887461		-4.6	20
Dibenz(a,h)anthracene	A	5.000	4.931	1.117366	1.10189		-1.4	20
Indeno(1,2,3-cd)pyrene	A	5.000	4.811	1.182429	1.137848		-3.8	20
Naphthalene	A	5.000	4.322	1.34026	1.158594		-13.6	20
2-Fluorobiphenyl	A	5.000	4.290	0.9978073	0.8561707		-14.2	20
Terphenyl-d14	A	5.000	5.017	0.9438304	0.9470661		0.3	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_011

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0I24729 Batch Matrix: Solid Preparation: EXT_3546

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0I24729-BLK1	09/27/10 12:40	15.00	1.00
LCS	0I24729-BS1	09/27/10 12:40	15.00	1.00
32SD-04-0006	0I24729-MS1	09/27/10 12:40	15.00	1.00
32SD-04-0006	0I24729-MSD1	09/27/10 12:40	15.20	1.00
32SD-04-0006	1009166-01	09/27/10 12:40	15.40	1.00
32SD-05-0006	1009166-02	09/27/10 12:40	15.10	1.00
32SD-FD092110-01	1009166-03	09/27/10 12:40	15.10	1.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0I24729-BLK1	File ID:	I24729B1.D
Sampled:		Prepared:		Analyzed:	09/28/10 14:47
Solids:		Preparation:	EXT_3546	Dilution:	

Batch:	0I24729	Sequence:	0I27207	Calibration:	0237003	Instrument:	MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/Kg wet)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		1.33	6.67	U
50-32-8	Benzo(a)pyrene		1.33	5.00	U
205-99-2	Benzo(b)fluoranthene		1.33	6.67	U
207-08-9	Benzo(k)fluoranthene		1.33	6.67	U
218-01-9	Chrysene		1.33	6.67	U
53-70-3	Dibenz(a,h)anthracene		1.33	5.00	U
193-39-5	Indeno(1,2,3-cd)pyrene		1.33	6.67	U
91-20-3	Naphthalene		1.33	5.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg wet)	CONC (ug/Kg wet)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	3333	1697	50.9	14 - 129	
Terphenyl-d14	3333	1836	55.1	14 - 129	

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Solid		
Batch:	0124729	Laboratory ID:	0124729-BS1
Preparation:	EXT_3546	Initial/Final:	15 g / 1 mL

ANALYTE	SPIKE ADDED (ug/Kg wet)	LCS CONCENTRATION (ug/Kg wet)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	66.67	34.59	51.9	31 - 146
Benzo(a)pyrene	66.67	36.85	55.3	28 - 128
Benzo(b)fluoranthene	66.67	35.55	53.3	30 - 139
Benzo(k)fluoranthene	66.67	35.32	53.0	42 - 129
Chrysene	66.67	33.93	50.9	39 - 134
Dibenz(a,h)anthracene	66.67	40.01	60.0	30 - 138
Indeno(1,2,3-cd)pyrene	66.67	40.37	60.6	17 - 164
Naphthalene	66.67	28.22	42.3	29 - 106

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8270C

32SD-04-0006

Laboratory: Empirical Laboratories, LLC

SDG: CTOF273_011

Client: Tetra Tech NUS, Inc. (T010)

Project: CTOF273 NSA Crane SMU32

Matrix: Solid

Batch: 0I24729

% Solids: 82.81

Source Sample Name: **1009166-01**

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Benzo(a)anthracene	80.51	ND	62.89	78.1		31 - 146
Benzo(a)pyrene	80.51	ND	67.01	83.2		28 - 128
Benzo(b)fluoranthene	80.51	6.359	67.57	76.0		30 - 139
Benzo(k)fluoranthene	80.51	ND	69.17	85.9		42 - 129
Chrysene	80.51	ND	61.20	76.0		39 - 134
Dibenz(a,h)anthracene	80.51	ND	67.96	84.4		30 - 138
Indeno(1,2,3-cd)pyrene	80.51	3.880	68.29	80.0		17 - 164
Naphthalene	80.51	ND	49.72	61.8		29 - 106

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Benzo(a)anthracene	79.45	56.97	71.7	9.88		30	31 - 146
Benzo(a)pyrene	79.45	58.68	73.9	13.2		30	28 - 128
Benzo(b)fluoranthene	79.45	59.14	66.4	13.3		30	30 - 139
Benzo(k)fluoranthene	79.45	58.86	74.1	16.1		30	42 - 129
Chrysene	79.45	54.42	68.5	11.7		30	39 - 134
Dibenz(a,h)anthracene	79.45	58.27	73.4	15.3		30	30 - 138
Indeno(1,2,3-cd)pyrene	79.45	58.34	68.5	15.7		30	17 - 164
Naphthalene	79.45	43.16	54.3	14.1		30	29 - 106

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOF273_011

Client: Tetra Tech NUS, Inc. (T010) Project: CTOF273 NSA Crane SMU32

Batch: 0127031 Batch Matrix: Water Preparation: EXT_3510

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	0127031-BLK1	09/27/10 15:08	1,000.00	1.00
LCS	0127031-BS1	09/27/10 15:08	1,000.00	1.00
LCS Dup	0127031-BSD1	09/27/10 15:08	1,000.00	1.00
32GW-04	1009179-01	09/27/10 17:50	1,070.00	1.00
32GW-05	1009179-02	09/27/10 17:50	1,060.00	1.00
32GW-06	1009179-03	09/27/10 17:50	1,070.00	1.00
32GW-FD092210-01	1009179-04	09/27/10 17:50	1,070.00	1.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32

Matrix:		Laboratory ID:	0I27031-BLK1	File ID:	I27031B1.D
Sampled:		Prepared:		Analyzed:	09/28/10 13:51
Solids:		Preparation:	EXT_3510	Dilution:	

Batch:	0I27031	Sequence:	0I27207	Calibration:	0237003	Instrument:	MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	MDL	MRL	Q
56-55-3	Benzo(a)anthracene		0.0200	0.100	U
50-32-8	Benzo(a)pyrene		0.0200	0.100	U
205-99-2	Benzo(b)fluoranthene		0.0200	0.100	U
207-08-9	Benzo(k)fluoranthene		0.0200	0.100	U
218-01-9	Chrysene		0.0200	0.100	U
53-70-3	Dibenz(a,h)anthracene	0.0209	0.0200	0.100	J
193-39-5	Indeno(1,2,3-cd)pyrene	0.0214	0.0200	0.100	J
91-20-3	Naphthalene		0.0200	0.100	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	34.52	69.0	34 - 167	
Terphenyl-d14	50.00	41.25	82.5	34 - 167	

LCS / LCS DUPLICATE RECOVERY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Matrix:	Water		
Batch:	0127031	Laboratory ID:	0127031-BS1
Preparation:	EXT_3510	Initial/Final:	1000 mL / 1 mL

ANALYTE	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC.	QC LIMITS REC.
Benzo(a)anthracene	1.000	0.8970	89.7	58 - 141
Benzo(a)pyrene	1.000	1.067	107	31 - 142
Benzo(b)fluoranthene	1.000	1.056	106	42 - 156
Benzo(k)fluoranthene	1.000	1.027	103	49 - 165
Chrysene	1.000	0.9148	91.5	51 - 155
Dibenz(a,h)anthracene	1.000	1.068	107	28 - 153
Indeno(1,2,3-cd)pyrene	1.000	1.040	104	20 - 167
Naphthalene	1.000	0.7664	76.6	39 - 125

ANALYTE	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS	
					RPD	REC.
Benzo(a)anthracene	1.000	0.9577	95.8	6.55	30	58 - 141
Benzo(a)pyrene	1.000	1.071	107	0.383	30	31 - 142
Benzo(b)fluoranthene	1.000	1.077	108	1.94	30	42 - 156
Benzo(k)fluoranthene	1.000	1.091	109	6.05	30	49 - 165
Chrysene	1.000	0.9407	94.1	2.79	30	51 - 155
Dibenz(a,h)anthracene	1.000	1.033	103	3.30	30	28 - 153
Indeno(1,2,3-cd)pyrene	1.000	1.084	108	4.10	30	20 - 167
Naphthalene	1.000	0.8248	82.5	7.34	30	39 - 125

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0I27207	Instrument:	MS-BNA4
		Calibration:	0237003

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (0I27207-CCV1)			Lab File ID: SEQ-CCV1.D			Analyzed: 09/28/10 12:24			
Phenanthrene-d10	141622	9.779	81910	10.091	173	50 - 200	-0.3120	+/-0.50	
Phenanthrene-d10	141622	9.779	81910	10.091	173	50 - 200	-0.3120	+/-0.50	
Perylene-d12	102149	14.176	58089	14.73	176	50 - 200	-0.5540	+/-0.50	
Perylene-d12	102149	14.176	58089	14.73	176	50 - 200	-0.5540	+/-0.50	
LCS (0I27031-BS1)			Lab File ID: I27031L1.D			Analyzed: 09/28/10 12:54			
Phenanthrene-d10	166234	9.779	141622	9.779	117	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	166234	9.779	141622	9.779	117	50 - 200	0.0000	+/-0.50	
Perylene-d12	92343	14.176	102149	14.176	90	50 - 200	0.0000	+/-0.50	
Perylene-d12	92343	14.176	102149	14.176	90	50 - 200	0.0000	+/-0.50	
LCS Dup (0I27031-BSD1)			Lab File ID: I27031L2.D			Analyzed: 09/28/10 13:22			
Phenanthrene-d10	166044	9.779	141622	9.779	117	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	166044	9.779	141622	9.779	117	50 - 200	0.0000	+/-0.50	
Perylene-d12	92551	14.176	102149	14.176	91	50 - 200	0.0000	+/-0.50	
Perylene-d12	92551	14.176	102149	14.176	91	50 - 200	0.0000	+/-0.50	
Blank (0I27031-BLK1)			Lab File ID: I27031B1.D			Analyzed: 09/28/10 13:51			
Phenanthrene-d10	164630	9.779	141622	9.779	116	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	164630	9.779	141622	9.779	116	50 - 200	0.0000	+/-0.50	
Perylene-d12	90450	14.176	102149	14.176	89	50 - 200	0.0000	+/-0.50	
Perylene-d12	90450	14.176	102149	14.176	89	50 - 200	0.0000	+/-0.50	
LCS (0I24729-BS1)			Lab File ID: I24729L1.D			Analyzed: 09/28/10 14:19			
Phenanthrene-d10	145874	9.779	141622	9.779	103	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	145874	9.779	141622	9.779	103	50 - 200	0.0000	+/-0.50	
Perylene-d12	92789	14.176	102149	14.176	91	50 - 200	0.0000	+/-0.50	
Perylene-d12	92789	14.176	102149	14.176	91	50 - 200	0.0000	+/-0.50	
Blank (0I24729-BLK1)			Lab File ID: I24729B1.D			Analyzed: 09/28/10 14:47			
Phenanthrene-d10	157150	9.779	141622	9.779	111	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	157150	9.779	141622	9.779	111	50 - 200	0.0000	+/-0.50	
Perylene-d12	85325	14.167	102149	14.176	84	50 - 200	-0.0090	+/-0.50	
Perylene-d12	85325	14.167	102149	14.176	84	50 - 200	-0.0090	+/-0.50	
32GW-04 (1009179-01)			Lab File ID: 0917901.D			Analyzed: 09/28/10 15:15			
Phenanthrene-d10	178387	9.779	141622	9.779	126	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	178387	9.779	141622	9.779	126	50 - 200	0.0000	+/-0.50	
Perylene-d12	99883	14.167	102149	14.176	98	50 - 200	-0.0090	+/-0.50	
Perylene-d12	99883	14.167	102149	14.176	98	50 - 200	-0.0090	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0I27207	Instrument:	MS-BNA4
		Calibration:	0237003

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
32GW-05 (1009179-02)			Lab File ID: 0917902.D			Analyzed: 09/28/10 15:43			
Phenanthrene-d10	160976	9.779	141622	9.779	114	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	160976	9.779	141622	9.779	114	50 - 200	0.0000	+/-0.50	
Perylene-d12	95382	14.167	102149	14.176	93	50 - 200	-0.0090	+/-0.50	
Perylene-d12	95382	14.167	102149	14.176	93	50 - 200	-0.0090	+/-0.50	
32GW-06 (1009179-03)			Lab File ID: 0917903.D			Analyzed: 09/28/10 16:11			
Phenanthrene-d10	150146	9.779	141622	9.779	106	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	150146	9.779	141622	9.779	106	50 - 200	0.0000	+/-0.50	
Perylene-d12	86931	14.167	102149	14.176	85	50 - 200	-0.0090	+/-0.50	
Perylene-d12	86931	14.167	102149	14.176	85	50 - 200	-0.0090	+/-0.50	
32GW-FD092210-01 (1009179-04)			Lab File ID: 0917904.D			Analyzed: 09/28/10 16:39			
Phenanthrene-d10	178223	9.779	141622	9.779	126	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	178223	9.779	141622	9.779	126	50 - 200	0.0000	+/-0.50	
Perylene-d12	100738	14.167	102149	14.176	99	50 - 200	-0.0090	+/-0.50	
Perylene-d12	100738	14.167	102149	14.176	99	50 - 200	-0.0090	+/-0.50	
32SD-04-0006 (1009166-01)			Lab File ID: 0916601.D			Analyzed: 09/28/10 20:49			
Phenanthrene-d10	138118	9.779	141622	9.779	98	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	138118	9.779	141622	9.779	98	50 - 200	0.0000	+/-0.50	
Perylene-d12	89851	14.176	102149	14.176	88	50 - 200	0.0000	+/-0.50	
Perylene-d12	89851	14.176	102149	14.176	88	50 - 200	0.0000	+/-0.50	
32SD-05-0006 (1009166-02)			Lab File ID: 0916602.D			Analyzed: 09/28/10 21:17			
Phenanthrene-d10	145867	9.779	141622	9.779	103	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	145867	9.779	141622	9.779	103	50 - 200	0.0000	+/-0.50	
Perylene-d12	94386	14.176	102149	14.176	92	50 - 200	0.0000	+/-0.50	
Perylene-d12	94386	14.176	102149	14.176	92	50 - 200	0.0000	+/-0.50	
32SD-FD092110-01 (1009166-03)			Lab File ID: 0916603.D			Analyzed: 09/28/10 21:45			
Phenanthrene-d10	134058	9.779	141622	9.779	95	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	134058	9.779	141622	9.779	95	50 - 200	0.0000	+/-0.50	
Perylene-d12	88185	14.176	102149	14.176	86	50 - 200	0.0000	+/-0.50	
Perylene-d12	88185	14.176	102149	14.176	86	50 - 200	0.0000	+/-0.50	
Matrix Spike (0I24729-MS1)			Lab File ID: 0916601M.D			Analyzed: 09/28/10 22:40			
Phenanthrene-d10	159994	9.779	141622	9.779	113	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	159994	9.779	141622	9.779	113	50 - 200	0.0000	+/-0.50	
Perylene-d12	104742	14.176	102149	14.176	103	50 - 200	0.0000	+/-0.50	
Perylene-d12	104742	14.176	102149	14.176	103	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOF273_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTOF273 NSA Crane SMU32
Sequence:	0I27207	Instrument:	MS-BNA4
		Calibration:	0237003

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (0I24729-MSD1)			Lab File ID: 0916601S.D			Analyzed: 09/28/10 23:07			
Phenanthrene-d10	148502	9.779	141622	9.779	105	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	148502	9.779	141622	9.779	105	50 - 200	0.0000	+/-0.50	
Perylene-d12	97864	14.167	102149	14.176	96	50 - 200	-0.0090	+/-0.50	
Perylene-d12	97864	14.167	102149	14.176	96	50 - 200	-0.0090	+/-0.50	

SAMPLE ID 32SD-FD092110-01

SAMPLE CALC IS AREA	DILUTION	COMPOUND OF INTEREST	IS AMOUNT (NG)	Final Extract Volume (UL)	AVE RRF	CONCENTRATION PPB
88185	1	3532	1	1000	1.4725	2.24
		% Solids		**Sample Volume (Grams)**		
		0.8107		15		

Benzo(k)fluoranthene = 2.22 ug/kg

Data File: \\ELABNSH05\TARGET\chem\bna4.i\092810B4.b\0916603.D
Report Date: 29-Sep-2010 10:10

Laboratory Name

Data file : \\ELABNSH05\TARGET\chem\bna4.i\092810B4.b\0916603.D
Lab Smp Id: 1009166-03 Client Smp ID: 32SD-FD092110-01
Inj Date : 28-SEP-2010 21:45 MS Autotune Date: 08-MAY-2010 13:24
Operator : MEC Inst ID: bna4.i
Smp Info : 1009166-03;1;15;1000;1;UG/KG;27-SEP-2010
Misc Info : ;0;;;;0I24729;pahsurmis.sub;
Comment :
Method : \\ELABNSH05\TARGET\chem\bna4.i\092810B4.b\IXBN4LOW.m
Meth Date : 29-Sep-2010 10:05 mcobb Quant Type: ISTD
Cal Date : 23-AUG-2010 16:04 Cal File: SEQ-CALB.D
Als bottle: 22
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: pahsurmis.sub
Target Version: 4.04
Processing Host: TARGET09_VM

Concentration Formula: Amt * DF * Uf * Vt*Vi/(Amt * Vi * (Solids/100))

Name	Value	Description
DF	1.000	Dilution Factor
Uf	1.000	ng unit correction factor
Vt	1000.000	Volume of final extract (uL)(1000 low, 2
Amt	15.000	Mass of initial extraction
Vi	1.000	Volume injected (uL)
Solids	100.000	Percent Solids

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng/ul)	FINAL (UG/KG)
* 102 Phenanthrene-d10	188	9.779	9.779	(1.000)	134058	1.00000	
$ 74 2-Fluorobiphenyl	172	7.697	7.697	(0.787)	3582065	26.7790	1785
$ 107 2,4,6-Tribromophenol	330	9.119	9.110	(0.933)	1991688	72.8467	4856
111 Phenanthrene	178	9.807	9.807	(1.003)	4145	0.02616	1.744(a)
112 Anthracene	178	9.853	9.853	(1.008)	3391	0.02176	1.451(a)
116 Fluoranthene	202	10.960	10.969	(1.121)	5381	0.03240	2.160(a)
134 Pyrene	202	11.183	11.183	(1.144)	5953	0.03455	2.304(a)
* 154 Perylene-d12	264	14.176	14.176	(1.000)	88185	1.00000	
$ 135 Terphenyl-d14	244	11.369	11.359	(1.163)	4210242	33.2752	2218
140 Bis(2-ethylhexyl)phthalate	149	12.456	12.456	(0.879)	10428	0.09688	6.459
156 Benzo(b)fluoranthene	252	13.646	13.646	(0.963)	3384	0.02527	1.685(aM)
157 Benzo(k)fluoranthene	252	13.674	13.683	(0.965)	3532	0.02720	1.813(aM)
159 Indeno(1,2,3-cd)pyrene	276	15.905	15.896	(1.122)	2256	0.02164	1.442(a)

9/29/
GLA
9/29/10

APPENDIX H – SUPPORTING DOCUMENTATION FOR THE HHRA

RISK ASSESSMENT GUIDANCE FOR SUPERFUND TABLES
EXAMPLE CALCULATION
UPPER CONFIDENCE LIMIT OUTPUT

RISK ASSESSMENT GUIDANCE FOR SUPERFUND TABLES

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA Residential RSL(2)	IDEM RISC(3)	COPC Flag	Rationale for Contaminant Deletion or Selection(4)
DECISION UNIT 1	**PAHs (ug/kg)**											
	56-55-3	**BENZO(A)ANTHRACENE**	16.8 J	3670	32SS-17-0002	6 / 35	1.44 - 16.3	3670	**150 C**	5000	YES	ASL
	50-32-8	**BENZO(A)PYRENE**	10.9 J	3450	32SS-64-0002	11 / 41	1.44 - 16.3	3450	**15 C**	**500**	YES	ASL
	205-99-2	**BENZO(B)FLUORANTHENE**	13.5	4140	32SS-17-0002	7 / 35	1.44 - 16.3	4140	**150 C**	5000	YES	ASL
	207-08-9	BENZO(K)FLUORANTHENE	33.6 J	1440	32SS-17-0002	3 / 35	1.44 - 16.3	1440	1500 C	50000	NO	BSL
	218-01-9	CHRYSENE	16.6 J	3980	32SS-17-0002	6 / 35	1.44 - 16.3	3980	15000 C	500000	NO	BSL
	53-70-3	**DIBENZO(A,H)ANTHRACENE**	10.7	595	32SS-17-0002	3 / 35	1.44 - 16.3	595	**15 C**	**500**	YES	ASL
	193-39-5	**INDENO(1,2,3-CD)PYRENE**	50.6 J	2530 J	32SS-17-0002	3 / 35	1.44 - 16.3	2530	**150 C**	5000	YES	ASL
	91-20-3	NAPHTHALENE	5.83 J	273	32SS-49-0002	9 / 35	1.44 - 16.3	273	3600 C	3200	NO	BSL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2 - USEPA RSL - Table, November, 2010. (Noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
3 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) residential direct contact for soil (IDEM, May 2009).
4 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Associated Samples:

32SS-01-0002	32SS-13-0002	32SS-46-0002	32SS-64-0002
32SS-02-0002	32SS-14-0002	32SS-47-0002	32SS-65-0002
32SS-03-0002	32SS-15-0002	32SS-48-0002	32SS-DW01-0002
32SS-04-0002	32SS-16-0002	32SS-49-0002	32SS-DW02-0002
32SS-05-0002	32SS-17-0002	32SS-50-0002	32SS-DW03-0002
32SS-06-0002	32SS-18-0002	32SS-51-0002	
32SS-07-0002	32SS-19-0002	32SS-52-0002	
32SS-08-0002	32SS-20-0002	32SS-53-0002	
32SS-09-0002	32SS-21-0002	32SS-60-0002	
32SS-10-0002	32SS-43-0002	32SS-61-0002	
32SS-11-0002	32SS-44-0002	32SS-62-0002	
32SS-12-0002	32SS-45-0002	32SS-63-0002	

Definitions
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

TABLE 2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - MIGRATION FROM SURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSWC CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA SSL Migration to Air(2)	USEPA SSL Migration to Groundwater(3)	IDEM RISC(4)	COPC Flag	Rationale for Contaminant Deletion or Selection(5)
DECISION UNIT 1	PAHs (ug/kg)												
	56-55-3	BENZO(A)ANTHRACENE	16.8 J	3670	32SS-17-0002	6 / 35	1.44 - 16.3	3670	NA	10	19000	YES	ASL
	50-32-8	BENZO(A)PYRENE	10.9 J	3450	32SS-64-0002	11 / 41	1.44 - 16.3	3450	NA	3.5	8200	YES	ASL
	205-99-2	BENZO(B)FLUORANTHENE	13.5	4140	32SS-17-0002	7 / 35	1.44 - 16.3	4140	NA	35	57000	YES	ASL
	207-08-9	BENZO(K)FLUORANTHENE	33.6 J	1440	32SS-17-0002	3 / 35	1.44 - 16.3	1440	NA	350	570000	YES	ASL
	218-01-9	CHRYSENE	16.6 J	3980	32SS-17-0002	6 / 35	1.44 - 16.3	3980	NA	1100	1900000	YES	ASL
	53-70-3	DIBENZO(A,H)ANTHRACENE	10.7	595	32SS-17-0002	3 / 35	1.44 - 16.3	595	NA	11	18000	YES	ASL
	193-39-5	INDENO(1,2,3-CD)PYRENE	50.6 J	2530 J	32SS-17-0002	3 / 35	1.44 - 16.3	2530	NA	120	160000	YES	ASL
	91-20-3	NAPHTHALENE	5.83 J	273	32SS-49-0002	9 / 35	1.44 - 16.3	273	17000	0.47	700	YES	ASL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2- EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm.
3 - USEPA RSL - Table, November, 2010.
4- Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) migration to groundwater for soil (IDEM, May 2009).
5- The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Definitions
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

Associated Samples:

32SS-01-0002	32SS-19-0002	32SS-37-0002	32SS-61-0002
32SS-02-0002	32SS-20-0002	32SS-38-0002	32SS-62-0002
32SS-03-0002	32SS-21-0002	32SS-39-0002	32SS-63-0002
32SS-04-0002	32SS-22-0002	32SS-40-0002	32SS-64-0002
32SS-05-0002	32SS-23-0002	32SS-41-0002	32SS-65-0002
32SS-06-0002	32SS-24-0002	32SS-42-0002	32SS-DW01-0002
32SS-07-0002	32SS-25-0002	32SS-43-0002	32SS-DW02-0002
32SS-08-0002	32SS-26-0002	32SS-44-0002	32SS-DW03-0002
32SS-09-0002	32SS-27-0002	32SS-45-0002	
32SS-10-0002	32SS-28-0002	32SS-46-0002	
32SS-11-0002	32SS-29-0002	32SS-47-0002	
32SS-12-0002	32SS-30-0002	32SS-48-0002	
32SS-13-0002	32SS-31-0002	32SS-49-0002	
32SS-14-0002	32SS-32-0002	32SS-50-0002	
32SS-15-0002	32SS-33-0002	32SS-51-0002	
32SS-16-0002	32SS-34-0002	32SS-52-0002	
32SS-17-0002	32SS-35-0002	32SS-53-0002	
32SS-18-0002	32SS-36-0002	32SS-60-0002	

TABLE 2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SUBSURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Location of Max Detect	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening[1]	USEPA Residential RSL[2]	IDEM RISC[3]	COPC Flag	Rationale for Contaminant Deletion or Selection[4]
DECISION UNIT 1	**Volatile Organics (ug/kg)**												
	71-43-2	**BENZENE**	1.77 J	1810	32SO-06	32SB-06-0405	4 / 40	0.447 - 32.4	1810	**1100 C**	**34**	YES	ASL
	100-41-4	ETHYLBENZENE	0.972 J	304 J	32SO-45	32SB-45-0607	7 / 40	0.713 - 51.6	304	5400 C	13000	NO	BSL
	108-88-3	TOLUENE	64.4 J	112 J	32SO-06	32SB-06-0405	2 / 40	0.818 - 59.2	112	500000 N	12000	NO	BSL
	1330-20-7	TOTAL XYLENES	1.27 J	1200 J	32SO-45	32SB-45-0607	9 / 40	0.666 - 48.2	1200	63000 N	210000	NO	BSL
	PAHs (ug/kg)												
	56-55-3	**BENZO(A)ANTHRACENE**	3.77 J	213	32SO-37	32SB-17-0607	5 / 40	1.54 - 16.4	213	**150 C**	5000	YES	ASL
	50-32-8	**BENZO(A)PYRENE**	6.23	112	32SO-37	32SB-17-0607	6 / 40	1.54 - 16.4	112	**15 C**	500	YES	ASL
	205-99-2	BENZO(B)FLUORANTHENE	4.39 J	104	32SO-17	32SB-17-0607	6 / 40	1.54 - 16.4	104	150 C	5000	NO	BSL
	207-08-9	BENZO(K)FLUORANTHENE	4.37 J	34.5	32SO-15	32SB-15-0506	3 / 40	1.54 - 16.4	34.5	1500 C	50000	NO	BSL
	218-01-9	CHRYSENE	5 J	289	32SO-37	32SB-17-0607	5 / 40	1.54 - 16.4	289	15000 C	500000	NO	BSL
	53-70-3	DIBENZO(A,H)ANTHRACENE	9.23 J	9.23 J	32SOW01	32SB-DW01-0809	1 / 40	1.5 - 16.4	9.23	15 C	500	NO	BSL
	193-39-5	INDENO(1,2,3-CD)PYRENE	7.05 J	35.3	32SO-15	32SB-15-0506	2 / 40	1.5 - 16.4	35.3	150 C	5000	NO	BSL
	91-20-3	NAPHTHALENE	3.95 J	2470	32SO-17	32SB-17-0607	11 / 51	1.4 - 16.4	2470	3600 C	3200	NO	BSL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2 - USEPA RSL - Table, November, 2010. (Noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
3 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) residential direct contact for soil (IDEM, May 2009).
4 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Associated Samples:

32SB-01-0708	32SB-09-0607	32SB-17-0607	32SB-45-0607	32SB-52-0809	32SB-56-1011	32SB-ST01-0708
32SB-02-0607	32SB-10-0506	32SB-17-1112	32SB-46-0304	32SB-52-1415	32SB-56-1415	32SB-DW01-0809
32SB-03-0607	32SB-11-0607	32SB-18-0506	32SB-47-0506	32SB-53-0910	32SB-57-0708	32SB-DW02-0506
32SB-04-0506	32SB-12-0607	32SB-19-0506	32SB-48-0405	32SB-53-1415	32SB-58-0708	32SB-DW03-0304
32SB-05-0506	32SB-13-0607	32SB-20-0506	32SB-49-0405	32SB-54-0708	32SB-58-1112	
32SB-06-0405	32SB-14-0910	32SB-21-0506	32SB-50-0607	32SB-54-1112	32SB-59-0708	
32SB-07-0607	32SB-15-0506	32SB-43-0506	32SB-51-0708	32SB-55-0708	32SB-59-1112	
32SB-08-0607	32SB-16-0607	32SB-44-0506	32SB-51-1415	32SB-55-1112	32SB-ST01-0203	

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C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

TABLE 2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - MIGRATION FROM SUBSURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

TABLE 2.3

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA SSL Migration to Air(2)	USEPA SSL Migration to Groundwater(3)	IDEM RISC(4)	COPC Flag	Rationale for Contaminant Deletion or Selection(5)
DECISION UNIT 1	**Volatile Organics (ug/kg)**												
	71-43-2	**BENZENE**	1.77 J	1810	32SB-06-0405	4 / 40	0.447 - 32.4	1810	**830**	**0.21**	**34**	YES	ASL
	100-41-4	**ETHYLBENZENE**	0.972 J	304 J	32SB-45-0607	7 / 40	0.713 - 51.6	304	400000	**1.7**	13000	YES	ASL
	108-88-3	TOLUENE	64.4 J	112 J	32SB-06-0405	2 / 40	0.818 - 59.2	112	650000	1600	12000	NO	BSL
	1330-20-7	**TOTAL XYLENES**	1.27 J	1200 J	32SB-45-0607	9 / 40	0.666 - 48.2	1200	70000	**200**	210000	YES	ASL
	PAHs (ug/kg)												
	56-55-3	**BENZO(A)ANTHRACENE**	3.77 J	213	32SB-17-0607	5 / 40	1.54 - 16.4	213	NA	**10**	19000	YES	ASL
	50-32-8	**BENZO(A)PYRENE**	6.23	112	32SB-17-0607	6 / 40	1.54 - 16.4	112	NA	**3.5**	8200	YES	ASL
	205-99-2	**BENZO(B)FLUORANTHENE**	4.39 J	104	32SB-17-0607	6 / 40	1.54 - 16.4	104	NA	**35**	57000	YES	ASL
	207-08-9	BENZO(K)FLUORANTHENE	4.37 J	34.5	32SB-15-0506	3 / 40	1.54 - 16.4	34.5	NA	350	570000	NO	BSL
	218-01-9	CHRYSENE	5 J	289	32SB-17-0607	5 / 40	1.54 - 16.4	289	NA	1100	1900000	NO	BSL
	53-70-3	DIBENZO(A,H)ANTHRACENE	9.23 J	9.23 J	32SB-DW01-0809	1 / 40	1.5 - 16.4	9.23	NA	11	18000	NO	BSL
	193-39-5	INDENO(1,2,3-CD)PYRENE	7.05 J	35.3	32SB-15-0506	2 / 40	1.5 - 16.4	35.3	NA	120	160000	NO	BSL
	91-20-3	**NAPHTHALENE**	3.95 J	2470	32SB-17-0607	11 / 51	1.4 - 16.4	2470	17000	**0.47**	**700**	YES	ASL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2- EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm.
3 - USEPA RSL - Table, November, 2010.
4- Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) migration to groundwater for soil (IDEM, May 2009).
5- The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Definitions
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

Associated Samples:

32SB-01-0708	32SB-11-0607	32SB-20-0506	32SB-30-0506	32SB-40-0506	32SB-50-0607	32SB-55-1112	32SB-DW03-0304
32SB-02-0607	32SB-12-0607	32SB-21-0506	32SB-31-0607	32SB-41-0506	32SB-51-0708	32SB-56-1011	32SB-ST01-0203
32SB-03-0607	32SB-13-0607	32SB-22-0506	32SB-32-0506	32SB-42-0506	32SB-51-1415	32SB-56-1415	
32SB-04-0506	32SB-14-0910	32SB-23-0506	32SB-33-0506	32SB-43-0506	32SB-52-0809	32SB-57-0708	
32SB-05-0506	32SB-15-0506	32SB-24-0506	32SB-34-0607	32SB-44-0506	32SB-52-1415	32SB-58-0708	
32SB-06-0405	32SB-16-0607	32SB-25-0607	32SB-35-0507	32SB-45-0607	32SB-53-0910	32SB-58-1112	
32SB-07-0607	32SB-17-0607	32SB-26-0405	32SB-36-0506	32SB-46-0304	32SB-53-1415	32SB-59-0708	
32SB-08-0607	32SB-17-1112	32SB-27-0506	32SB-37-0506	32SB-47-0506	32SB-54-0708	32SB-59-1112	
32SB-09-0607	32SB-18-0506	32SB-28-0506	32SB-38-0506	32SB-48-0405	32SB-54-1112	32SB-DW01-0809	
32SB-10-0506	32SB-19-0506	32SB-29-0304	32SB-39-0507	32SB-49-0405	32SB-55-0708	32SB-DW02-0506	

TABLE 2.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening[1]	USEPA Residential RSL[2]	IDEM RISC[3]	COPC Flag	Rationale for Contaminant Deletion or Selection[4]
DECISION UNIT 2	**PAHs (ug/kg)**											
	56-55-3	BENZO(A)ANTHRACENE	4.57 J	5.24 J	32SS-26-0002	2 / 21	1.51 - 15.6	5.24	150 C	5000	NO	BSL
	50-32-8	**BENZO(A)PYRENE**	9.39	31.8	32SS-23-0002	3 / 21	1.51 - 15.6	31.8	**15 C**	500	YES	ASL
	205-99-2	BENZO(B)FLUORANTHENE	6.56 J	44.1	32SS-23-0002	3 / 21	1.51 - 15.6	44.1	150 C	5000	NO	BSL
	207-08-9	BENZO(K)FLUORANTHENE	11.4	16.2	32SS-23-0002	2 / 21	1.51 - 15.6	16.2	1500 C	50000	NO	BSL
	218-01-9	CHRYSENE	6.13 J	8.07	32SS-23-0002	2 / 21	1.51 - 15.6	8.07	15000 C	500000	NO	BSL
	53-70-3	DIBENZO(A,H)ANTHRACENE	6.41	6.41	32SS-23-0002	1 / 21	1.51 - 15.6	6.41	15 C	500	NO	BSL
	193-39-5	INDENO(1,2,3-CD)PYRENE	17.7	32.1	32SS-23-0002	2 / 21	1.51 - 15.6	32.1	150 C	5000	NO	BSL
	91-20-3	NAPHTHALENE	3.02 J	5.76 J	32SS-22-0002	3 / 21	1.51 - 15.6	5.76	3600 C	3200	NO	BSL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2 - USEPA RSL - Table, November, 2010. (Noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
3 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) residential direct contact for soil (IDEM, May 2009).
4 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Associated Samples:

32SS-22-0002	32SS-27-0002	32SS-32-0002	32SS-37-0002	32SS-42-0002
32SS-23-0002	32SS-28-0002	32SS-33-0002	32SS-38-0002	
32SS-24-0002	32SS-29-0002	32SS-34-0002	32SS-39-0002	
32SS-25-0002	32SS-30-0002	32SS-35-0002	32SS-40-0002	
32SS-26-0002	32SS-31-0002	32SS-36-0002	32SS-41-0002	

Definitions
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

TABLE 2.6
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - MIGRATION FROM SURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSWC CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA SSL Migration to Air(2)	USEPA SSL Migration to Groundwater(3)	IDEM RISC(4)	COPC Flag	Rationale for Contaminant Deletion or Selection(5)
DECISION UNIT 2	**PAHs (ug/kg)**												
	56-55-3	BENZO(A)ANTHRACENE	4.57 J	5.24 J	32SS-26-0002	2 / 21	1.51 - 15.6	5.24	NA	10	19000	NO	BSL
	50-32-8	**BENZO(A)PYRENE**	9.39	31.8	32SS-23-0002	3 / 21	1.51 - 15.6	31.8	NA	**3.5**	8200	YES	ASL
	205-99-2	**BENZO(B)FLUORANTHENE**	6.56 J	44.1	32SS-23-0002	3 / 21	1.51 - 15.6	44.1	NA	**35**	57000	YES	ASL
	207-08-9	BENZO(K)FLUORANTHENE	11.4	16.2	32SS-23-0002	2 / 21	1.51 - 15.6	16.2	NA	350	570000	NO	BSL
	218-01-9	CHRYSENE	6.13 J	8.07	32SS-23-0002	2 / 21	1.51 - 15.6	8.07	NA	1100	1900000	NO	BSL
	53-70-3	DIBENZO(A,H)ANTHRACENE	6.41	6.41	32SS-23-0002	1 / 21	1.51 - 15.6	6.41	NA	11	18000	NO	BSL
	193-39-5	INDENO(1,2,3-CD)PYRENE	17.7	32.1	32SS-23-0002	2 / 21	1.51 - 15.6	32.1	NA	120	160000	NO	BSL
	91-20-3	**NAPHTHALENE**	3.02 J	5.76 J	32SS-22-0002	3 / 21	1.51 - 15.6	5.76	17000	**0.47**	700	YES	ASL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2 - EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm.
3 - USEPA RSL - Table, November, 2010.
4- Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) migration to groundwater for soil (IDEM, May 2009).
5- The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Definitions
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

Associated Samples:

32SS-22-0002	32SS-27-0002	32SS-32-0002	32SS-37-0002	32SS-42-0002
32SS-23-0002	32SS-28-0002	32SS-33-0002	32SS-38-0002	
32SS-24-0002	32SS-29-0002	32SS-34-0002	32SS-39-0002	
32SS-25-0002	32SS-30-0002	32SS-35-0002	32SS-40-0002	
32SS-26-0002	32SS-31-0002	32SS-36-0002	32SS-41-0002	

TABLE 2.7
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SUBSURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA Residential RSL(2)	IDEM RISC(3)	COPC Flag	Rationale for Contaminant Deletion or Selection(4)
Decision Unit 2	**Volatile Organics (ug/kg)**											
	71-43-2	BENZENE	--	--	--	0 / 21	0.412 - 0.582	--	1100 C	34	NO	BSL
	100-41-4	ETHYLBENZENE	--	--	--	0 / 21	0.657 - 0.929	--	5400 C	13000	NO	BSL
	108-88-3	TOLUENE	--	--	--	0 / 21	0.754 - 1.06	--	500000 N	12000	NO	BSL
	1330-20-7	TOTAL XYLENES	1.72 J	1.72 J	32SB-40-0506	1 / 21	0.614 - 0.867	1.72	63000 N	210000	NO	BSL
	PAHs (ug/kg)											
	56-55-3	**BENZO(A)ANTHRACENE**	394 J	394 J	32SB-37-0506	1 / 21	1.51 - 1.75	394	**150 C**	5000	YES	ASL
	50-32-8	**BENZO(A)PYRENE**	10.4	121 J	32SB-37-0506	2 / 21	1.51 - 1.75	121	**15 C**	500	YES	ASL
	205-99-2	BENZO(B)FLUORANTHENE	6.9 J	6.9 J	32SB-22-0506	1 / 21	1.51 - 8.35	6.9	150 C	5000	NO	BSL
	207-08-9	BENZO(K)FLUORANTHENE	--	--	--	0 / 21	1.51 - 8.35	--	1500 C	50000	NO	BSL
	218-01-9	CHRYSENE	3.2 J	341 J	32SB-37-0506	2 / 21	1.51 - 1.75	341	15000 C	500000	NO	BSL
	53-70-3	DIBENZO(A,H)ANTHRACENE	--	--	--	0 / 21	1.51 - 8.35	--	15 C	500	NO	BSL
	193-39-5	INDENO(1,2,3-CD)PYRENE	--	--	--	0 / 21	1.51 - 8.35	--	150 C	5000	NO	BSL
	91-20-3	NAPHTHALENE	--	--	--	0 / 21	1.51 - 8.35	--	3600 C	3200	NO	BSL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2 - USEPA RSL - Table, November, 2010. (Noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
3 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) residential direct contact for soil (IDEM, May 2009).
4 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Associated Samples

32SB-22-0506	32SB-29-0304	32SB-36-0506
32SB-23-0506	32SB-30-0506	32SB-37-0506
32SB-24-0506	32SB-31-0607	32SB-38-0506
32SB-25-0607	32SB-33-0506	32SB-39-0507
32SB-26-0405	32SB-32-0506	32SB-40-0506
32SB-27-0506	32SB-34-0607	32SB-41-0506
32SB-28-0506	32SB-35-0507	32SB-42-0506

Definitions
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

TABLE 2.8
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - MIGRATION FROM SUBSURFACE SOIL
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA SSL Migration to Air(2)	USEPA SSL Migration to Groundwater(3)	IDEM RISC(4)	COPC Flag	Rationale for Contaminant Deletion or Selection(5)
Decision Unit 2	**Volatile Organics (ug/kg)**												
	1330-20-7	TOTAL XYLENES	1.72 J	1.72 J	32SB-40-0506	1 / 21	0.614 - 0.867	1.72	70000	200	210000	NO	BSL
	PAHs (ug/kg)												
	56-55-3	**BENZO(A)ANTHRACENE**	394 J	394 J	32SB-37-0506	1 / 21	1.51 - 1.75	394	NA	**10**	19000	YES	ASL
	50-32-8	**BENZO(A)PYRENE**	10.4	121 J	32SB-37-0506	2 / 21	1.51 - 1.75	121	NA	**3.5**	8200	YES	ASL
	205-99-2	BENZO(B)FLUORANTHENE	6.9 J	6.9 J	32SB-22-0506	1 / 21	1.51 - 8.35	6.9	NA	35	57000	NO	BSL
	218-01-9	CHRYSENE	3.2 J	341 J	32SB-37-0506	2 / 21	1.51 - 1.75	341	NA	1100	1900000	NO	BSL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2 - EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm.
3 - USEPA RSL - Table, November, 2010.
4- Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) migration to groundwater for soil (IDEM, May 2009).
5- The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Associated Samples

32SB-22-0506	32SB-29-0304	32SB-36-0506
32SB-23-0506	32SB-30-0506	32SB-37-0506
32SB-24-0506	32SB-31-0607	32SB-38-0506
32SB-25-0607	32SB-33-0506	32SB-39-0507
32SB-26-0405	32SB-32-0506	32SB-40-0506
32SB-27-0506	32SB-34-0607	32SB-41-0506
32SB-28-0506	32SB-35-0507	32SB-42-0506

Definitions
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

TABLE 2.9
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Maximum Detected Concentration	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA Tapwater RSL(2)	IDEM RISC(3)	Upgradient Concentration(4)	COPC Flag	Rationale for Contaminant Deletion or Selection(5)
		PAHs (ug/l)											
SWMU 32	56-55-3	**BENZO(A)ANTHRACENE**	0.0469 J	0.0469 J	32GW-06	1/5	0.0187 - 0.0189	0.0469	**0.029 C**	**0.0012**	NA	YES	ASL
	50-32-8	**BENZO(A)PYRENE**	0.0374 J	0.0374 J	32GW-06	1/5	0.0187 - 0.0189	0.0374	**0.0029 C**	**0.00012**	NA	YES	ASL
	205-99-2	**BENZO(B)FLUORANTHENE**	0.0558 J	0.0558 J	32GW-06	1/5	0.0187 - 0.0189	0.0558	**0.029 C**	**0.0012**	NA	YES	ASL
	207-08-9	**BENZO(K)FLUORANTHENE**	0.0562 J	0.0562 J	32GW-06	1/5	0.0187 - 0.0189	0.0562	0.29 C	**0.012**	NA	YES	ASL
	218-01-9	CHRYSENE	0.0514 J	0.0514 J	32GW-06	1/5	0.0187 - 0.0189	0.0514	2.9 C	0.12	NA	NO	BSL
	91-20-3	**NAPHTHALENE**	0.0402 J	0.0402 J	32GW-02	1/5	0.0187 - 0.0189	0.0402	0.14 C	**0.0083**	ND	YES	ASL

Footnotes
1 - The maximum detected concentraiton is used for screening purposes.
2 - USEPA RSL - Tapwater- Table, November, 2010. (Noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
3 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) residential groundwater (IDEM, May 2009).
4 - MW 1 is upgradient of SWMU 32
5 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Associated Samples:
32GW-02
32GW-03
32GW-04
32GW-05
32GW-06

Definitions
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value
NA = Not Available
ND = Non-detect

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level
BSL = Below Screening Level

TABLE 2.10
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SEDIMENT
SWMU 32 FORMER FUEL OIL TANK FARM
NSA CRANE
CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Parameter	Minimum Detected Concentration	Maximum Detected Concentration	Sample of Max Detect	Frequency of Detection	Range of Nondetects	Concentration Used for Screening(1)	USEPA Residential RSL(2)	IDEM RISC(3)	Upgradient Concentration(4)	COPC Flag	Rationale for Contaminant Deletion or Selection(5)
SWMU 32	**Volatile Organics (ug/kg)**												
	71-43-2	BENZENE	56.1 J	56.1 J	32SD-02-0006	1/4	0.526 0.58	56.1	11000 C	340	ND	NO	BSL
	100-41-4	ETHYLBENZENE	65.7 J	65.7 J	32SD-02-0006	1/4	0.84 0.93	65.7	54000 C	130000	ND	NO	BSL
	108-88-3	TOLUENE	62.6 J	62.6 J	32SD-02-0006	1/4	0.963 1.06	62.6	5000000 N	120000	ND	NO	BSL
	1330-20-7	TOTAL XYLENES	220 J	220 J	32SD-02-0006	1/4	0.784 0.87	220	630000 N	2100000	ND	NO	BSL
	PAHs (ug/kg)												
	56-55-3	BENZO(A)ANTHRACENE	6.59 J	11	32SD-03-0006	2/4	1.56 1.62	11	1500 C	50000	**2.81**	NO	BSL
	50-32-8	BENZO(A)PYRENE	16.7 J	20.1	32SD-03-0006	2/4	1.56 1.62	20.1	150 C	5000	**7.59**	NO	BSL
	205-99-2	BENZO(B)FLUORANTHENE	6.36 J	25.2	32SD-03-0006	3/4	1.62 1.62	25.2	1500 C	50000	ND	NO	BSL
	207-08-9	BENZO(K)FLUORANTHENE	7.67 J	8.07 J	32SD-02-0006	2/4	1.56 1.62	8.07	15000 C	500000	ND	NO	BSL
	218-01-9	CHRYSENE	6.69 J	21.5	32SD-03-0006	2/4	1.56 1.62	21.5	150000 C	5000000	**2.97**	NO	BSL
	193-39-5	INDENO(1,2,3-CD)PYRENE	3.88 J	9.62	32SD-03-0006	3/4	1.62 1.62	9.62	1500 C	50000	ND	NO	BSL

Footnotes
1 - The maximum detected concentration is used for screening purposes.
2 - USEPA RSL - Residential Soil multiplied by 10 for anticipated reduced exposure to sediment - Table, November, 2010. (Noncarcinogenic compounds are divided by 10 to correspond to a HI of 0.1).
3 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC) residential direct contact for soil (IDEM, May 2009).
4 - 32SD-01 is upgradient of SWMU 32
5 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Chemicals selected as COPCs are indicated by shaded chemical names.

Associated Samples:
32SD-02-0006
32SD-03-0006
32SD-04-0006
32SD-05-0006

Definitions
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value
N = Non-Carcinogen

Rationale Codes
For selection as a COPC:
ASL = Above Screening Level and Upgradient Concentration
BSL = Below Screening Level or Upgradient Concentration

TABLE 3.1.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 32 FORMER FUEL OIL TANK FARM

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Decision Unit 1	BENZO(A)ANTHRACENE	mg/kg	0.133	0.337 (G)	3.67	0.337	mg/kg	95% KM (T) UCL	PRO UCL 4.00.05
	BENZO(A)PYRENE	mg/kg	0.178	0.374 (G)	3.45	0.374	mg/kg	95% KM (T) UCL	PRO UCL 4.00.05
	BENZO(B)FLUORANTHENE	mg/kg	0.144	0.367 (G)	4.14000	0.367	mg/kg	95% KM (T) UCL	PRO UCL 4.00.05
	DIBENZO(A,H)ANTHRACENE	mg/kg	0.022	0.064 (N)	0.595	0.064	mg/kg	95% KM (T) UCL	PRO UCL 4.00.05
	INDENO(1,2,3-CD)PYRENE	mg/kg	0.880	0.278 (N)	2.53	0.278	mg/kg	95% KM (T) UCL	PRO UCL 4.00.05

G = Gamma
N = Normal

Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.

TABLE 3.2.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 32 FORMER FUEL OIL TANK FARM

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Decision Unit 2	BENZO(A)PYRENE	mg/kg	0.004	0.0136 (N)	0.0318	0.0136	mg/kg	95% KM (T) UCL	PRO UCL 4.00.05
	BENZO(B)FLUORANTHENE	mg/kg	0.005	0.0142 (N)	0.04410	0.014	mg/kg	95% KM (T) UCL	PRO UCL 4.00.05
	NAPHTHALENE	mg/kg	0.001	0.0037 (N)	0.00576	0.0037	mg/kg	95% KM (T) UCL	PRO UCL 4.00.05

G = Gamma
N = Normal

Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.

TABLE 3.3.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 32 FORMER FUEL OIL TANK FARM

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Decision Unit 1	BENZENE	mg/kg	0.058	0.144 (N)	1.81	0.144	mg/kg	95% KM (T)	PRO UCL 4.00.05
	BENZO(A)ANTHRACENE	mg/kg	0.0	0.022 (N)	0.213	0.022	mg/kg	95% KM (T)	PRO UCL 4.00.05
	BENZO(A)PYRENE	mg/kg	0.0	0.016 (G)	0.112	0.016	mg/kg	95% KM (T)	PRO UCL 4.00.05

G = Gamma
N = Normal

Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.

TABLE 3.4.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 32 FORMER FUEL OIL TANK FARM

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Decision Unit 2	BENZO(A)ANTHRACENE	mg/kg	NA	NA	0.394	0.394	mg/kg	MAXIMUM CONCENTRATION	(1)
	BENZO(A)PYRENE	mg/kg	NA	NA	0.121	0.121	mg/kg	MAXIMUM CONCENTRATION	(1)

G = Gamma
N = Normal
NA = Not Applicable
Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.
(1) There are less than three detected concentrations meaningful statistics cannot be computed.

TABLE 3.5.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
SWMU 32 FORMER FUEL OIL TANK FARM

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
SWMU 32	BENZO(A)ANTHRACENE	ug/L	NA	NA	0.0469	0.0469	ug/L	Maximum Detected Concentration	(1)
	BENZO(A)PYRENE	ug/L	NA	NA	0.0374	0.0374	ug/L	Maximum Detected Concentration	(1)
	BENZO(B)FLUORANTHENE	ug/L	NA	NA	0.0558	0.0558	ug/L	Maximum Detected Concentration	(1)
	BENZO(K)FLUORANTHENE	ug/L	NA	NA	0.0562	0.0562	ug/L	Maximum Detected Concentration	(1)
	NAPHTHALENE	ug/L	NA	NA	0.0402	0.0402	ug/L	Maximum Detected Concentration	(1)

G - Gamma distribution.
N - Normal distribution.
NP = Nonparametric distribution.
NA = Not Applicable only one detected concentration meaningful statistics cannot be calculated.
1 - The maximum detected concentration is used as the exposure point concentration for groundwater.

TABLE 4.1.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - INDUSTRIAL WORKERS - SOIL

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Industrial Workers	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	50	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	USEPA, 1993	BW x AT
				EF	Exposure Frequency	219	days/year	USEPA, 1993	
				ED	Exposure Duration	9	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989	
Dermal	Industrial Workers	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.02	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	219	days/year	USEPA, 1993	
				ED	Exposure Duration	9	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 5.51E-08 Cancer Dermal Intake = 7.27E-08

Noncancer Ingestion Intake = 4.29E-07 Noncancer Dermal Intake = 5.66E-07

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.2.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES - ADULT RESIDENTS - GROUNDWATER
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Adult	#REF!	CGW	Chemical Concentration in Groundwater	Max or 95% UCL	ug/L	U.S. EPA , 2002	Chronic Daily Intake (CDI) (mg/kg/day) =
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	1	L/day	(1)	CGW x CF x IR-GW x EF x ED
				EF	Exposure Frequency	219	days/year	U.S. EPA, 1993	BW x AT
				ED	Exposure Duration	9	years	U.S. EPA, 1993	
				BW	Body Weight	70	kg	U.S. EPA, 1993	
				AT-C	Averaging Time (Cancer)	25550	days	U.S. EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3285	days	U.S. EPA, 1989	
Dermal	Residents	Adult	#REF!	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	- -	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	0.167	hr/event	USEPA, 2004	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	For organics if tevent <= t*
				SA	Skin Surface Available for Contact	18,000	cm2	USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	219	days/year	USEPA, 1993	
				ED	Exposure Duration	2	years	USEPA, 1993	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				BW	Body Weight	70	kg	USEPA, 1989	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1993	
				AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989	

Notes
(1) - Professional judgement.
Sources:
U.S. EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.
U.S. EPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
U.S. EPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.
U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)
Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake = 1.10E-06 Cancer Dermal Intake = 4.41E+00

Mutagenic Chemicals

Cancer Ingestion Intake ure Duration = 1.10E-06 Cancer Dermal Intake ure Duration = 4.41E+00
Cancer Ingestion Intake = 0.00E+00 Cancer Dermal Intake = 0.00E+00

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 8.57E-06 Noncancer Dermal Intake = 1.54E+02

Cancer risk from ingestion = Groundwater concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor
Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor
Hazard Index from ingestion = Groundwater concentration x Noncancer Ingestion Intake / Oral Reference Dose
Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.3.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - CONSTRUCTION WORKERS - SOILS

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Construction Workers	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	165	mg/day	(1)	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	USEPA, 2002b	BW x AT
				EF	Exposure Frequency	150	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
Dermal	Construction Workers	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2002b	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.1	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	150	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	

Notes:

1 - Professional judgment. For some factors, CTE is assumed to be 50 percent of RME.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 2002a:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 1.38E-08 Cancer Dermal Intake = 2.77E-08

Noncancer Ingestion Intake = 9.69E-07 Noncancer Dermal Intake = 1.94E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.4.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - CONSTRUCTION WORKERS - SOILS TO AIR

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Construction Workers	Adult	Decision Unit 1	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	8	hours/day	(1)	CA x ET x EF x ED
				EF	Exposure Frequency	150	days/year	(1)	AT x 24 hours/day
				ED	Exposure Duration	1	years	(1)	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
				PEF	Particulate Emission Factor	1.49E+06	m3/kg	USEPA, 2002a	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	

Notes:

1 - Professional judgment. For some factors, CTE is assumed to be 50 percent of RME.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

Unit Intake Calculations

Unit Exposure Concentration = (ET x EF x ED)/(AT x 24 hours/day)

Cancer Inhalation Intake = 1.96E-03 Noncancer Inhalation Intake = 1.37E-01

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.5.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - CONSTRUCTION WORKERS - GROUNDWATER

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Construction Workers	Adult	SWMU 32	CGW	Chemical Concentration in Groundwater	Max or 95% UCL	ug/L	USEPA, 1992	Chronic Daily Intake (CDI) (mg/kg/day) =
				CF	Conversion Factor	0.001	mg/ug	USEPA, 1991	
				IR-GW	Ingestion Rate of Groundwater	0.01	L/day	(1)	CGW x CF x IR-GW x EF x ED
				EF	Exposure Frequency	150	days/year	(1)	BW x AT
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
Dermal	Construction Workers	Adult	SWMU 32	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	- -	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	1.5	hr/event	(1)	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	For organics if tevent <= t*
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	(1)	
				EF	Exposure Frequency	150	days/year	(1)	For organics if tevent > t*
				ED	Exposure Duration	1	years	(1)	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				BW	Body Weight	70	kg	USEPA, 1989	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	

Notes

1 - Professional judgment. For some factors, CTE is assumed to be 50 percent of RME.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Dermal Intake = 2.77E-01 Noncancer Dermal Intake = 1.94E+01

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.6.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - ADOLESCENT TRESPASSERS - SOILS

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Trespassers	Adolescent	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	50	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	CSs x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	USEPA, 1993	BW x AT
				EF	Exposure Frequency	13	days/year	(1)	
				ED	Exposure Duration	11	years	(2)	
				BW	Body Weight	43	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	4015	days	USEPA, 1989	
Dermal	Trespassers	Adolescent	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3100	cm2	(3)	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.04	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	13	days/year	(1)	
				ED	Exposure Duration	10	years	(2)	
				BW	Body Weight	43	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3650	days	USEPA, 1989	

Notes:

1 - Assume one day a week in warm weather months for RME and one day every other week for CTE.

2 - Older child from age 7 to 16.

3 - Assumes head, hands, forearms, lower legs, and feet are exposed (USEPA, 2004).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 6.51E-09 Cancer Dermal Intake = 1.47E-08

Noncancer Ingestion Intake = 4.14E-08 Noncancer Dermal Intake = 1.03E-07

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.7.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - CHILD RECREATIONAL USERS - SOILS

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Child	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	CSs x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	0.5	unitless	(1)	BW x AT
				EF	Exposure Frequency	26	days/year	(2)	
				ED1	Exposure Duration (Age 0 - 2)	2	years	USEPA, 1989	
				ED2	Exposure Duration (Age 2 - 6)	0	years	USEPA, 1989	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989	
Dermal	Recreational User	Child	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3,300	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.04	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	26	days/year	(2)	
				ED1	Exposure Duration (Age 0 - 2)	2	years	USEPA, 1989	
				ED2	Exposure Duration (Age 2 - 6)	0	years	USEPA, 1989	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989	

Notes:

1 - The child recreational user is assumed to be at the site only a portion of the day.

2 - Assume 2 days a week in warm weather months for RME and one day a week for CTE.

3 - Children will be evaluated as one age group (0 - 6 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, children recreational users will be evaluated as two age groups, 0 - 2 years and 2 - 6 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake = 6.78E-09 Cancer Dermal Intake = 1.79E-08

Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 2) = 6.78E-09 Cancer Dermal Intake (Age 0 - 2) = 1.79E-08

Cancer Ingestion Intake (Age 2 - 6) = 0.00E+00 Cancer Dermal Intake (Age 2 - 6) = 0.00E+00

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 2.37E-07 Noncancer Dermal Intake = 6.27E-07

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.8.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - CHILD RESIDENTS - GROUNDWATER

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Child	SWMU 32	CGW	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) =
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	1	L/day	(1)	CGW x CF x IR-GW x EF x ED
				EF	Exposure Frequency	26	days/year	(2)	BW x AT
				ED1	Exposure Duration (Age 0 - 2)	1	years	(1), USEPA, 1989, ~~~~	
				ED2	Exposure Duration (Age 2 - 6)	1	years	(1), USEPA, 1989, ~~~~	
				BW	Body Weight	15	kg	USEPA, 1993	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989	
Dermal	Residents	Child	SWMU 32	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	- -	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	0.167	hr/event	(1)	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	For organics if tevent <= t*
				SA	Skin Surface Available for Contact	3,300	cm2	(3)	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	(1)	
				EF	Exposure Frequency	26	days/year	(2)	For organics if tevent > t*
				ED1	Exposure Duration (Age 0 - 2)	1	years	(1), USEPA, 1989, ~~~~	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				ED2	Exposure Duration (Age 2 - 6)	1	years	(1), USEPA, 1989, ~~~~	
				BW	Body Weight	15	kg	USEPA, 1993	$2 \times \tau + (1 + 3B + 3B^2)/(1+B^2)$
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989	

Notes:

1 - Professional judgment.

2 - Professional judgment. Assumes two days a week in warm weather months for RME and one day a week for CTE.

3 - Assumes that 50 percent of the total body surface area is exposed. U.S. EPA, 2004.

Sources:

U.S. EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

U.S. EPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

U.S. EPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.

U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake = 1.36E-07 Cancer Dermal Intake = 4.48E-01

Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 2) = 6.78E-08 Cancer Dermal Intake (Age 0 - 2) = 2.24E-01

Cancer Ingestion Intake (Age 2 - 6) = 6.78E-08 Cancer Dermal Intake (Age 2 - 6) = 2.24E-01

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 4.75E-06 Noncancer Dermal Intake = 1.57E+01

Cancer risk from ingestion = Groundwater concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from ingestion = Groundwater concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.9.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - ADULT RECREATIONAL USERS - SOILS

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	50	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	0.5	unitless	(1)	BW x AT
				EF	Exposure Frequency	26	days/year	(1)	
				ED1	Exposure Duration (Age 6 - 16)	7	years	(3), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	0	years	(3), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	
Dermal	Recreational User	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	9,070	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.01	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	26	days/year	(1)	
				ED1	Exposure Duration (Age 6 - 16)	7	years	(3), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	0	years	(3), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	

Notes:

1 - The adult recreational user is assumed to be at the site only a portion of the day.

2 - Assume two days a week in warm weather months for RME and one day a week for CTE.

3 - Adults will be evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, adult recreational users will be evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake = 2.54E-09 Cancer Dermal Intake = 9.23E-09

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 2.54E-09 Cancer Dermal Intake (Age 6 - 16) = 9.23E-09

Cancer Ingestion Intake Age 16 - 30) = 0.00E+00 Cancer Dermal Intake (Age 16 - 30) = 0.00E+00

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 2.54E-08 Noncancer Dermal Intake = 9.23E-08

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.10.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - ADULT RESIDENTS - GROUNDWATER

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Adult	#REF!	CGW	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) =
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	1	L/day	(1)	CGW x CF x IR-GW x EF x ED
				EF	Exposure Frequency	26	days/year	(2)	BW x AT
				ED1	Exposure Duration (Age 6 - 16)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	5	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1983	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	
Dermal	Residents	Adult	#REF!	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	- -	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	0.167	hr/event	(1)	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	For organics if tevent <= t*
				SA	Skin Surface Available for Contact	9,070	cm2	(3)	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	(1)	
				EF	Exposure Frequency	26	days/year	(2)	
				ED1	Exposure Duration (Age 6 - 16)	2	years	(1), USEPA, 1989, 2005	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				ED2	Exposure Duration (Age 16 - 30)	5	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1983	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	

Notes:

1 - Adults will be evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential adults will be evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake = 1.02E-07 Cancer Dermal Intake = 9.23E-01

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 2.91E-08 Cancer Dermal Intake (Age 6 - 16) = 2.64E-01

Cancer Ingestion Intake (Age 16 - 30) = 7.27E-08 Cancer Dermal Intake (Age 16 - 30) = 6.59E-01

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 1.02E-06 Noncancer Dermal Intake = 9.23E+00

Cancer risk from ingestion = Groundwater concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from ingestion = Groundwater concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.11.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - CHILD RESIDENTS - SOILS

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Resident	Child	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	USEPA, 1993	BW x AT
				EF	Exposure Frequency	234	days/year	USEPA, 1993	
				ED1	Exposure Duration (Age 0 - 2)	1	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	1	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989	
Dermal	Resident	Child	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	2,800	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.04	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	234	days/year	USEPA, 1993	
				ED1	Exposure Duration (Age 0 - 2)	1	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	1	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989	

Notes:

1 - Children will be evaluated as one age group (0 - 6 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential children will be evaluated as two age groups, 0 - 2 years and 2 - 6 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake = 1.22E-07 Cancer Dermal Intake = 1.37E-07

Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 2) = 6.11E-08 Cancer Dermal Intake (Age 0 - 2) = 6.84E-08

Cancer Ingestion Intake (Age 2 - 6) = 6.11E-08 Cancer Dermal Intake (Age 2 - 6) = 6.84E-08

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 4.27E-06 Noncancer Dermal Intake = 4.79E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.12.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES - CHILD RESIDENTS - GROUNDWATER
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Child	SWMU 32	CGW	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) =
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	0.66	L/day	USEPA, 1997	CGW x CF x IR-GW x EF x ED
				EF	Exposure Frequency	234	days/year	USEPA, 1993	BW x AT
				ED1	Exposure Duration (Age 0 - 2)	1	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	1	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1993	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989	
Dermal	Residents	Child	SWMU 32	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	- -	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	0.167	hr/event	USEPA, 1997	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	For organics if tevent <= t*
				SA	Skin Surface Available for Contact	6,600	cm2	USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	234	days/year	USEPA, 1993	For organics if tevent > t*
				ED1	Exposure Duration (Age 0 - 2)	1	years	(1), USEPA, 1989, 2005	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				ED2	Exposure Duration (Age 2 - 6)	1	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1993	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989	

Notes:

1 - Children will be evaluated as one age group (0 - 6 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential children will be evaluated as two age groups, 0 - 2 years and 2 - 6 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake = 8.06E-07 Cancer Dermal Intake = 8.06E+00

Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 2) = 4.03E-07 Cancer Dermal Intake (Age 0 - 2) = 4.03E+00

Cancer Ingestion Intake (Age 2 - 6) = 4.03E-07 Cancer Dermal Intake (Age 2 - 6) = 4.03E+00

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 2.82E-05 Noncancer Dermal Intake = 2.82E+02

Cancer risk from ingestion = Groundwater concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from ingestion = Groundwater concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.13.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - ADULT RESIDENTS - SOILS

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Resident	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	50	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	USEPA, 1993	BW x AT
				EF	Exposure Frequency	234	days/year	USEPA, 1993	
				ED1	Exposure Duration (Age 6 - 16)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	5	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	
Dermal	Resident	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.01	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	234	days/year	USEPA, 1993	
				ED1	Exposure Duration (Age 6 - 16)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	5	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	

Notes:

1 - Adults will be evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential adults will be evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake = 4.58E-08 Cancer Dermal Intake = 5.22E-08

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 1.31E-08 Cancer Dermal Intake (Age 6 - 16) = 1.49E-08

Cancer Ingestion Intake (Age 16 - 30) = 3.27E-08 Cancer Dermal Intake (Age 16 - 30) = 3.73E-08

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 4.58E-07 Noncancer Dermal Intake = 5.22E-07

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.14.CTE

VALUES USED FOR DAILY INTAKE CALCULATIONS

CENTRAL TENDENCY EXPOSURES - ADULT RESIDENTS - GROUNDWATER

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Adult	#REF!	CGW	Chemical Concentration in Groundwater	95% UCL or Max	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) =
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	1.4	L/day	USEPA, 1994	CGW x CF x IR-GW x EF x ED
				EF	Exposure Frequency	234	days/year	USEPA, 1993	BW x AT
				ED1	Exposure Duration (Age 6 - 16)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	5	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	
Dermal	Residents	Adult	#REF!	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	- -	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	0.167	hr/event	USEPA, 1997	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	For organics if tevent <= t*
				SA	Skin Surface Available for Contact	18,000	cm2	USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	234	days/year	USEPA, 1994	
				ED1	Exposure Duration (Age 6 - 16)	2	years	(1), USEPA, 1989, 2005	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				ED2	Exposure Duration (Age 16 - 30)	5	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)]
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	

Notes:

1 - Adults will be evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential adults will be evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake = 1.28E-06 Cancer Dermal Intake = 1.65E+01

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 3.66E-07 Cancer Dermal Intake (Age 6 - 16) = 4.71E+00

Cancer Ingestion Intake (Age 16 - 30) = 9.16E-07 Cancer Dermal Intake (Age 16 - 30) = 1.18E+01

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 1.28E-05 Noncancer Dermal Intake = 1.65E+02

Cancer risk from ingestion = Groundwater concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from ingestion = Groundwater concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - OCCUPATIONAL WORKERS - SOIL

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Industrial Workers	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	USEPA, 2002b	BW x AT
				EF	Exposure Frequency	250	days/year	USEPA, 1993	
				ED	Exposure Duration	25	years	USEPA, 2002b	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989	
Dermal	Industrial Workers	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	250	days/year	USEPA, 1993	
				ED	Exposure Duration	25	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 1993; Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 2002a:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 3.49E-07 Cancer Dermal Intake = 2.31E-06

Noncancer Ingestion Intake = 9.78E-07 Noncancer Dermal Intake = 6.46E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.2.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - OCCUPATIONAL WORKER - GROUNDWATER

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Adult	SWMU 32	CGW	Chemical Concentration in Groundwater	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) =
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	1	L/day	(1)	CGW x CF x IR-GW x EF x ED
				EF	Exposure Frequency	250	days/year	U.S. EPA, 1993	BW x AT
				ED	Exposure Duration	25	years	U.S. EPA, 1993	
				BW	Body Weight	70	kg	U.S. EPA, 1993	
				AT-C	Averaging Time (Cancer)	25,550	days	U.S. EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	U.S. EPA, 1989	
Dermal	Residents	Adult	SWMU 32	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	DAevent x EV x EF x ED x SA
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	BW x AT
				CF	Conversion factor	0.001	L/cm^3	- -	
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	For inorganics
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	
				tevent	Duration of event	0.25	hr/event	USEPA, 2004	For organics if tevent <= t*
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				SA	Skin Surface Available for Contact	18,000	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	250	days/year	USEPA, 1993	For organics if tevent > t*
				ED	Exposure Duration	25	years	USEPA, 1993	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1989	

Notes

(1) - Professional judgement.

Sources:

U.S. EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

U.S. EPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

U.S. EPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.

U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 30) = 3.49E-06 Cancer Dermal Intake (Age 6 - 30) = 6.29E+01

Mutagenic Chemicals

Cancer Ingestion Intake ure Duration = 3.49E-06 Cancer Dermal Intake ure Duration = 6.29E+01

Cancer Ingestion Intake = 0.00E+00 Cancer Dermal Intake = 0.00E+00

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 9.78E-06 Noncancer Dermal Intake = 1.76E+02

Cancer risk from ingestion = Groundwater concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from ingestion = Groundwater concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.3.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CONSTRUCTION WORKERS- SOILS

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Construction Workers	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	330	mg/day	USEPA, 2002b	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	USEPA, 2002b	BW x AT
				EF	Exposure Frequency	150	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
Dermal	Construction Workers	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.3	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	150	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	

Notes:

1 - Professional judgment.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 2002a:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 2.77E-08 Cancer Dermal Intake = 8.30E-08

Noncancer Ingestion Intake = 1.94E-06 Noncancer Dermal Intake = 5.81E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.4.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CONSTRUCTION WORKERS - SOILS TO AIR

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Construction Workers	Adult	Decision Unit 1	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	8	hours/day	(1)	CA x ET x EF x ED
				EF	Exposure Frequency	150	days/year	(1)	AT x 24 hours/day
				ED	Exposure Duration	1	years	(1)	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
				PEF	Particulate Emission Factor	1.49E+06	m3/kg	USEPA, 2002a	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	

Notes:

1 - Professional judgment.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

Unit Intake Calculations

Unit Exposure Concentration = (ET x EF x ED)/(AT x 24 hours/day)

Cancer Inhalation Intake = 1.96E-03 Noncancer Inhalation Intake = 1.37E-01

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.5.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CONSTRUCTION WORKERS - GROUNDWATER

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Construction Workers	Adult	SWMU 32	CGW	Chemical Concentration in Groundwater	Max or 95% UCL	ug/L	USEPA, 1992	Chronic Daily Intake (CDI) (mg/kg/day) =
				CF	Conversion Factor	0.001	mg/ug	USEPA, 1991	
				IR-GW	Ingestion Rate of Groundwater	0.01	L/day	(1)	CGW x CF x IR-GW x EF x ED
				EF	Exposure Frequency	150	days/year	(1)	BW x AT
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
Dermal	Construction Workers	Adult	SWMU 32	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	- -	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	2	hr/event	(1)	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	For organics if tevent <= t*
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	(1)	
				EF	Exposure Frequency	150	days/year	(1)	For organics if tevent > t*
				ED	Exposure Duration	1	years	(1)	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				BW	Body Weight	70	kg	USEPA, 1989	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	

Notes

1 - Professional judgment.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Dermal Intake = 2.77E-01 Noncancer Dermal Intake = 1.94E+01

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.6.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - ADOLESCENT TRESPASSERS - SOILS

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Trespassers	Adolescent	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	USEPA, 1991	BW x AT
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	11	years	(2)	
				BW	Body Weight	43	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	4015	days	USEPA, 1989	
Dermal	Trespassers	Adolescent	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3820	cm2	(3)	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	11	years	(2)	
				BW	Body Weight	43	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	4015	days	USEPA, 1989	

Notes:

For chemicals that act via the mutagenic mode of action the intake will be multiplied by the appropriate age-dependent adjustment factor in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

1 - Assume one day a week in warm weather months for RME and one day every other week for CTE.

2 - Older child from age 7 to 16.

3 - Assumes head, hands, forearms, lower legs, and feet are exposed (USEPA, 2004).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 2.60E-08 Cancer Dermal Intake = 1.99E-07

Noncancer Ingestion Intake = 1.66E-07 Noncancer Dermal Intake = 1.27E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.7.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CHILD RECREATIONAL USERS - SOILS

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Child	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	200	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	0.5	unitless	(1)	BW x AT
				EF	Exposure Frequency	52	days/year	(2)	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(3), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(3), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2190	days	USEPA, 1989	
Dermal	Recreational User	Child	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3,300	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	52	days/year	(2)	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(3), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(3), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2190	days	USEPA, 1989	

Notes:

1 - The child recreational user is assumed to be at the site only a portion of the day.

2 - Assume two days a week in warm weather months for RME and one days a week for CTE.

3 - Children will be evaluated as one age group (0 - 6 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, children recreational users will be evaluated as two age groups, 0 - 2 years and 2 - 6 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 6) = 8.14E-08 Cancer Dermal Intake (Age 0 - 6) = 5.37E-07

Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 2) = 2.71E-08 Cancer Dermal Intake (Age 0 - 2) = 1.79E-07

Cancer Ingestion Intake (Age 2 - 6) = 5.43E-08 Cancer Dermal Intake (Age 2 - 6) = 3.58E-07

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 9.50E-07 Noncancer Dermal Intake = 6.27E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.8.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CHILD RESIDENTS - GROUNDWATER

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Child	SWMU 32	CGW	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) =
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	1	L/day	(1)	CGW x CF x IR-GW x EF x ED
				EF	Exposure Frequency	52	days/year	(2)	BW x AT
				ED1	Exposure Duration (Age 0 - 2)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1993	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989	
Dermal	Residents	Child	SWMU 32	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	- -	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	0.25	hr/event	(1)	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	For organics if tevent <= t*
				SA	Skin Surface Available for Contact	3,300	cm2	(3)	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	(1)	
				EF	Exposure Frequency	52	days/year	(2)	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(1), USEPA, 1989, 2005	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				ED2	Exposure Duration (Age 2 - 6)	4	years	(1), USEPA, 1989, 2005	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				BW	Body Weight	15	kg	USEPA, 1993	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989	

Notes:

1 - Professional judgment.

2 - Professional judgment. Assumes two days a week in warm weather months for RME and one day a week for CTE.

3 - Assumes that 50 percent of the total body surface area is exposed. U.S. EPA, 2004.

Sources:

U.S. EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

U.S. EPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

U.S. EPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.

U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 6) = 8.14E-07 Cancer Dermal Intake Time (Age 0 - 6) = 2.69E+00

Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 2) = 2.71E-07 Cancer Dermal Intake (Age 0 - 2) = 8.95E-01

Cancer Ingestion Intake (Age 2 - 6) = 5.43E-07 Cancer Dermal Intake (Age 2 - 6) = 1.79E+00

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 9.50E-06 Noncancer Dermal Intake = 3.13E+01

Cancer risk from ingestion = Groundwater concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from ingestion = Groundwater concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.9.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - ADULT RECREATIONAL USERS - SOILS

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Current/Future
Medium: Surface Soil/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	0.5	unitless	(1)	BW x AT
				EF	Exposure Frequency	52	days/year	(2)	
				ED1	Exposure Duration (Age 6 - 16)	10	years	(3), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(3), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	
Dermal	Recreational User	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	9,070	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	52	days/year	(2)	
				ED1	Exposure Duration (Age 6 - 16)	10	years	(3), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(3), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	

Notes:

1 - The adult recreational user is assumed to be at the site only a portion of the day.

2 - Assume two days a week in warm weather months for RME and one day a week for CTE.

3 - Adults will be evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, adult recreational users will be evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 30) = 3.49E-08 Cancer Dermal Intake (Age 6 - 30) = 4.43E-07

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 1.45E-08 Cancer Dermal Intake (Age 6 - 16) = 1.85E-07

Cancer Ingestion Intake Age 16 - 30) = 2.04E-08 Cancer Dermal Intake (Age 16 - 30) = 2.58E-07

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 1.02E-07 Noncancer Dermal Intake = 1.29E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.10.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - ADULT RESIDENTS - GROUNDWATER

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Adult	SWMU 32	CGW	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) =
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	1	L/day	(1)	CGW x CF x IR-GW x EF x ED
				EF	Exposure Frequency	52	days/year	(2)	BW x AT
				ED1	Exposure Duration (Age 6 - 16)	10	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1983	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	
Dermal	Residents	Adult	SWMU 32	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	DAevent x EV x EF x ED x SA
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	BW x AT
				CF	Conversion factor	0.001	L/cm^3	- -	
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	For inorganics
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	
				tevent	Duration of event	0.25	hr/event	(1)	For organics if tevent <= t*
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				SA	Skin Surface Available for Contact	9,070	cm2	(3)	
				EV	Event Frequency	1	events/day	(1)	
				EF	Exposure Frequency	52	days/year	(2)	For organics if tevent > t*
				ED1	Exposure Duration (Age 6 - 16)	10	years	(1), USEPA, 1989, 2005	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				ED2	Exposure Duration (Age 16 - 30)	14	years	(1), USEPA, 1989, 2005	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				BW	Body Weight	70	kg	USEPA, 1983	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	

Notes:

1 - Professional judgment.

2 - Professional judgment. Assumes two days a week in warm weather months for RME and one day a week for CTE.

3 - Assumes that head, arms, hands, lower legs, and feet are exposed, U.S. EPA, 1997.

Sources:

U.S. EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

U.S. EPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

U.S. EPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.

U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 30) = 6.98E-07 Cancer Dermal Intake (Age 6 - 30) = 6.33E+00

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 2.91E-07 Cancer Dermal Intake (Age 6 - 16) = 2.64E+00

Cancer Ingestion Intake (Age 16 - 30) = 4.07E-07 Cancer Dermal Intake (Age 16 - 30) = 3.69E+00

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 2.04E-06 Noncancer Dermal Intake = 1.85E+01

Cancer risk from ingestion = Groundwater concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from ingestion = Groundwater concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.11.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CHILD RESIDENTS - SOILS

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Surface Soil/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Resident	Child	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	200	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	USEPA, 1991	BW x AT
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989	
Dermal	Resident	Child	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	2,800	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989	

Notes:

1 - Children will be evaluated as one age group (0 - 6 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential children will be evaluated as two age groups, 0 - 2 years and 2 - 6 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 2002a:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 6) = 1.10E-06 Cancer Dermal Intake (Age 0 - 6) = 3.07E-06

Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 2) = 3.65E-07 Cancer Dermal Intake (Age 0 - 2) = 1.02E-06

Cancer Ingestion Intake (Age 2 - 6) = 7.31E-07 Cancer Dermal Intake (Age 2 - 6) = 2.05E-06

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 1.28E-05 Noncancer Dermal Intake = 3.58E-05

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.12.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE - CHILD RESIDENTS - GROUNDWATER
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Child	SWMU 32	CGW	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	Chronic Daily Intake (CDI) (mg/kg/day) =
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	1.5	L/day	USEPA, 1997	CGW x CF x IR-GW x EF x ED
				EF	Exposure Frequency	350	days/year	USEPA, 1994	BW x AT
				ED1	Exposure Duration (Age 0 - 2)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989	
Dermal	Residents	Child	SWMU 32	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	- -	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	0.25	hr/event	USEPA, 1997	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	For organics if tevent <= t*
				SA	Skin Surface Available for Contact	6,600	cm2	USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 1994	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(1), USEPA, 1989, 2005	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				ED2	Exposure Duration (Age 2 - 6)	4	years	(1), USEPA, 1989, 2005	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				BW	Body Weight	15	kg	USEPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989	

Notes:

1 - Children will be evaluated as one age group (0 - 6 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential children will be evaluated as two age groups, 0 - 2 years and 2 - 6 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa

USEPA, 2002:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 6) = 8.22E-06 Cancer Dermal Intake Time (Age 0 - 6) = 3.62E+01

Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 2) = 2.74E-06 Cancer Dermal Intake (Age 0 - 2) = 1.21E+01

Cancer Ingestion Intake (Age 2 - 6) = 5.48E-06 Cancer Dermal Intake (Age 2 - 6) = 2.41E+01

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 9.59E-05 Noncancer Dermal Intake = 4.22E+02

Cancer risk from ingestion = Groundwater concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from ingestion = Groundwater concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.13.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - ADULT RESIDENTS - SOILS

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Surface Soil/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Resident	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	USEPA, 1991	BW x AT
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED1	Exposure Duration (Age 6 - 16)	10	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	
Dermal	Resident	Adult	Decision Unit 1	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED1	Exposure Duration (Age 6 - 16)	10	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	

Notes:

1 - Adults will be evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential adults will be evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 2002:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 30) = 4.70E-07 Cancer Dermal Intake (Age 6 - 30) = 1.87E-06

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 1.96E-07 Cancer Dermal Intake (Age 6 - 16) = 7.81E-07

Cancer Ingestion Intake (Age 16 - 30) = 2.74E-07 Cancer Dermal Intake (Age 16 - 30) = 1.09E-06

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 1.37E-06 Noncancer Dermal Intake = 5.47E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.14.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - ADULT RESIDENTS - GROUNDWATER

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE, INDIANA

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Adult	SWMU 32	CGW	Chemical Concentration in Groundwater	95% UCL or Max	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) =
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	2	L/day	USEPA, 1994	CGW x CF x IR-GW x EF x ED
				EF	Exposure Frequency	350	days/year	USEPA, 1994	BW x AT
				ED1	Exposure Duration (Age 6 - 16)	10	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	
Dermal	Residents	Adult	SWMU 32	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	DAevent x EV x EF x ED x SA
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	BW x AT
				CF	Conversion factor	0.001	L/cm^3	- -	
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	For inorganics
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	
				tevent	Duration of event	0.25	hr/event	USEPA, 1997	For organics if tevent <= t*
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				SA	Skin Surface Available for Contact	18,000	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 1994	For organics if tevent > t*
				ED1	Exposure Duration (Age 6 - 16)	10	years	(1), USEPA, 1989, 2005	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				ED2	Exposure Duration (Age 16 - 30)	14	years	(1), USEPA, 1989, 2005	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	

Notes:

1 - Adults will be evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential adults will be evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 30) = 9.39E-06 Cancer Dermal Intake (Age 6 - 30) = 8.45E+01

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 3.91E-06 Cancer Dermal Intake (Age 6 - 16) = 3.52E+01

Cancer Ingestion Intake (Age 16 - 30) = 5.48E-06 Cancer Dermal Intake (Age 16 - 30) = 4.93E+01

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 2.74E-05 Noncancer Dermal Intake = 2.47E+02

Cancer risk from ingestion = Groundwater concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from ingestion = Groundwater concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 7.1.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FULE OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 1	Ingestion	BENZO(A)ANTHRACENE	0.337	mg/kg	1.9E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.4E-08	1.4E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	2.1E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.5E-07	1.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	2.0E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.5E-08	1.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	3.5E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.6E-08	2.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	1.5E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.1E-08	1.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								2.2E-07					--
			Dermal	BENZO(A)ANTHRACENE	0.337	mg/kg	3.2E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.3E-09	2.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	3.5E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.6E-08	2.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	3.5E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.5E-09	2.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	6.1E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	4.4E-09	4.7E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	2.6E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.9E-09	2.0E-08	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								3.7E-08					--
		Exposure Point Total									2.5E-07					--
	Exposure Medium Total										2.5E-07					--
Medium Total											2.5E-07					--
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	5.2E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	3.8E-08	4.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	4.1E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	3.0E-07	3.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	6.1E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	4.5E-08	4.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	6.2E-08	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	4.5E-09	4.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	4.4E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	3.4E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00002
			Exp. Route Total								3.9E-07					0.00002
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	3.0E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	2.2E-08	1.1E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	7.0E-09	(mg/kg/day)	NA	(mg/kg/day)-1	- -	2.4E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00001
			Exp. Route Total								2.2E-08					0.00001
		Exposure Point Total									4.1E-07					0.00003
	Exposure Medium Total										4.1E-07					0.00003
Medium Total											4.1E-07					0.00003
										Total of Receptor Risks Across All Media	6.6E-07			Total of Receptor Hazards Across All Media		0.00003

TABLE 7.2.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FULE OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 2	Ingestion	BENZO(A)PYRENE	0.014	mg/kg	7.5E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	5.5E-09	5.8E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	7.8E-10	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	5.7E-10	6.1E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	2.0E-10	(mg/kg/day)	NA	(mg/kg/day)-1	- -	1.6E-09	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000008
			Exp. Route Total								6.0E-09					0.00000008
			Dermal	BENZO(A)PYRENE	0.014	mg/kg	1.3E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	9.4E-10	1.0E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	1.3E-10	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	9.8E-11	1.0E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	3.5E-11	(mg/kg/day)	NA	(mg/kg/day)-1	- -	2.7E-10	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000001
			Exp. Route Total								1.0E-09					0.00000001
		Exposure Point Total									7.1E-09					0.00000009
	Exposure Medium Total										7.1E-09					0.00000009
Medium Total											7.1E-09					0.00000009
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	5.2E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	3.8E-08	4.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	4.1E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	3.0E-07	3.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	6.1E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	4.5E-08	4.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	6.2E-08	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	4.5E-09	4.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	4.4E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	3.4E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00002
			Exp. Route Total								3.9E-07					0.00002
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	3.0E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	2.2E-08	1.1E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	7.0E-09	(mg/kg/day)	NA	(mg/kg/day)-1	- -	2.4E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00001
			Exp. Route Total								2.2E-08					0.00001
		Exposure Point Total									4.1E-07					0.00003
	Exposure Medium Total										4.1E-07					0.00003
Medium Total											4.1E-07					0.00003
										Total of Receptor Risks Across All Media	4.2E-07				Total of Receptor Hazards Across All Media	0.00003

TABLE 7.3.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FULE OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 1	Ingestion	BENZO(A)ANTHRACENE	0.337	mg/kg	4.7E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	3.4E-09	3.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	5.2E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	3.8E-08	3.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	5.1E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	3.7E-09	3.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	8.9E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	6.5E-09	6.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	3.8E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.8E-09	2.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								5.4E-08					--
			Dermal	BENZO(A)ANTHRACENE	0.337	mg/kg	1.2E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	8.9E-10	8.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	1.3E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	9.8E-09	9.4E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	1.3E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	9.6E-10	9.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	2.3E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.7E-09	1.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	1.0E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	7.3E-10	7.0E-08	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								1.4E-08					--
		Exposure Point									6.8E-08					--
	Exposure Medium Total										6.8E-08					--
Medium Total											6.8E-08					--
Subsurface Soil	Subsurface Soil	Decision Unit 1	Ingestion	BENZENE	0.144	mg/kg	2.0E-09	(mg/kg/day)	5.5E-02	(mg/kg/day)-1	1.1E-10	1.4E-07	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.00003
				BENZO(A)ANTHRACENE	0.022	mg/kg	3.0E-10	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.2E-10	2.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.016	mg/kg	2.2E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.6E-09	1.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								1.9E-09					0.00003
			Dermal	BENZENE	0.144	mg/kg	0.0E+00	(mg/kg/day)	5.5E-02	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	4.0E-03	(mg/kg/day)	--
				BENZO(A)ANTHRACENE	0.022	mg/kg	7.9E-11	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	5.8E-11	5.5E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.016	mg/kg	5.8E-11	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	4.2E-10	4.0E-09	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								4.8E-10					--
		Exposure Point									2.4E-09					0.00003
	Exposure Medium Total										2.4E-09					0.00003
	Air	Decision Unit 1	Inhalation	BENZENE	0.004	mg/m3	6.9E-06	(mg/m3)	7.8E-06	(ug/m3)-1	5.4E-08	4.8E-04	(mg/m3)	3.0E-02	(mg/m3)	0.02
				BENZO(A)ANTHRACENE	1.5E-8	mg/m3	2.9E-11	(mg/m3)	1.1E-04	(ug/m3)-1	3.2E-12	2.0E-09	(mg/m3)	NA	(mg/m3)	--
				BENZO(A)PYRENE	1.1E-8	mg/m3	2.1E-11	(mg/m3)	1.1E-03	(ug/m3)-1	2.3E-11	1.5E-09	(mg/m3)	NA	(mg/m3)	--
			Exp. Route								5.4E-08					0.02
		Exposure Point									5.4E-08					0.02
	Exposure Medium Total										5.4E-08					0.02
Medium Total											5.6E-08					0.02
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.0469	ug/L		(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -		(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								- -					--
		SWMU 32	Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	5.7E-08	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	4.2E-09	4.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.3E-09	(mg/kg/day)	NA	(mg/kg/day)-1	- -	9.4E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000005
			Exp. Route								4.2E-09					0.000005
		Exposure Point									4.2E-09					0.000005
	Exposure Medium Total										4.2E-09					0.000005
Medium Total											4.2E-09					0.000005
										Total of Receptor Risks Across All Media	1.3E-07				Total of Receptor Hazards Across All Media	0.02

TABLE 7.4.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FULE OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 2	Ingestion	BENZO(A)PYRENE	0.014	mg/kg	1.9E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.4E-09	1.3E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	2.0E-10	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.4E-10	1.4E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	5.1E-11	(mg/kg/day)	NA	(mg/kg/day)-1	- -	3.6E-09	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000002
			Exp. Route								1.5E-09					0.0000002
			Dermal	BENZO(A)PYRENE	0.014	mg/kg	4.9E-11	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	3.6E-10	3.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	5.1E-11	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	3.7E-11	3.6E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	1.3E-11	(mg/kg/day)	NA	(mg/kg/day)-1	- -	9.3E-10	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000005
			Exp. Route								3.9E-10					0.00000005
		Exposure Point Total									1.9E-09					0.0000002
	Exposure Medium Total										1.9E-09					0.0000002
Medium Total											1.9E-09					0.0000002
Subsurface Soil	Subsurface Soil	Decision Unit 2	Ingestion	BENZO(A)ANTHRACENE	0.394	mg/kg	5.5E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	4.0E-09	3.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.121	mg/kg	1.7E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.2E-08	1.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								1.6E-08					--
			Dermal	BENZO(A)ANTHRACENE	0.394	mg/kg	1.4E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.0E-09	9.9E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.121	mg/kg	4.4E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	3.2E-09	3.0E-08	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								4.2E-09					--
		Exposure Point Total									2.0E-08					--
	Exposure Medium Total										2.0E-08					--
	Air	Decision Unit 2	Inhalation	BENZO(A)ANTHRACENE		mg/m3		(mg/m3)	1.1E-04	(ug/m3)-1	- -		(mg/m3)	NA	(mg/m3)	--
			Exp. Route								- -					--
		Exposure Point Total									- -					--
	Exposure Medium Total										- -					--
Medium Total											2.0E-08					--
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.0469	ug/L		(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -		(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								- -					--
		SWMU 32	Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	5.7E-08	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	4.2E-09	4.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.3E-09	(mg/kg/day)	NA	(mg/kg/day)-1	- -	9.4E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000005
			Exp. Route								4.2E-09					0.000005
		Exposure Point Total									4.2E-09					0.000005
	Exposure Medium Total										4.2E-09					0.000005
Medium Total											4.2E-09					0.000005
										Total of Receptor Risks Across All Media	2.7E-08				Total of Receptor Hazards Across All Media	0.000005

TABLE 7.5.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FULE OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 1	Ingestion	BENZO(A)ANTHRACENE	0.337	mg/kg	6.6E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-	4.8E-09	1.4E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	7.3E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-	5.3E-08	1.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	7.2E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-	5.2E-09	1.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	1.2E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-	9.1E-09	2.7E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	5.4E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-	4.0E-09	1.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								7.6E-08					0.00000000
			Dermal	BENZO(A)ANTHRACENE	0.337	mg/kg	1.9E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-	1.4E-09	4.5E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	2.1E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-	1.6E-08	5.0E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	2.1E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-	1.5E-09	4.9E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	3.7E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-	2.7E-09	8.5E-10	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	1.6E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-	1.2E-09	3.7E-09	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								2.2E-08					0.00000000
		Exposure Point Total									9.9E-08					0.0000000
Medium Total											9.9E-08					0.0000000
										Total of Receptor Risks Across All Media	9.9E-08				Total of Receptor Hazards Across All Media	0.0000000

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.6.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FULE OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 2	Ingestion	BENZO(A)PYRENE	0.014	mg/kg	2.7E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-	1.9E-09	5.6E-10	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	2.8E-10	(mg/kg/day)	7.3E-01	(mg/kg/day)-	2.0E-10	5.9E-10	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	2.4E-11	(mg/kg/day)	NA	(mg/kg/day)-	- -	1.5E-10	(mg/kg/day)	2.0E-02	(mg/kg/day)	7.6617E-09
			Exp. Route Total								2.1E-09					7.6617E-09
			Dermal	BENZO(A)PYRENE	0.014	mg/kg	7.8E-11	(mg/kg/day)	7.3E+00	(mg/kg/day)-	5.7E-10	1.8E-10	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	8.1E-11	(mg/kg/day)	7.3E-01	(mg/kg/day)-	5.9E-11	1.9E-10	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	7.1E-12	(mg/kg/day)	NA	(mg/kg/day)-	- -	4.9E-11	(mg/kg/day)	2.0E-02	(mg/kg/day)	2.4701E-09
			Exp. Route Total								6.3E-10					2.4701E-09
		Exposure Point Total									2.8E-09					0.00000001
	Exposure Medium Total										2.8E-09					0.00000001
										Total of Receptor Risks Across All Media	2.8E-09				Total of Receptor Hazards Across All Media	0.00000001

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.7.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FULE OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 1	Ingestion	BENZO(A)ANTHRACENE	0.337	mg/kg	2.3E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.7E-08	8.0E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	2.5E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.9E-07	8.9E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	2.5E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.8E-08	8.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								2.2E-07					0.0000000
			Dermal	BENZO(A)ANTHRACENE	0.337	mg/kg	7.8E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	5.7E-09	2.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	8.7E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	6.4E-08	3.0E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	8.5E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	6.2E-09	3.0E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								7.6E-08					0.0000000
		Exposure Point Total									3.0E-07					0.0000000
	Exposure Medium Total										3.0E-07					0.0000000
	Air	Decision Unit 1	Inhalation	BENZO(A)ANTHRACENE		mg/m3		(mg/m3)	1.1E-04	(ug/m3)-1	- -		(mg/m3)	NA	(mg/m3)	--
			Exp. Route Total								- -					--
		Exposure Point Total									- -					--
	Exposure Medium Total										- -					--
Medium Total											3.0E-07					0.0000000
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	4.1E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	3.0E-08	2.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	3.3E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.4E-07	1.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	4.9E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	3.6E-08	2.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	5.0E-08	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	3.6E-09	2.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	5.5E-09	(mg/kg/day)	NA	(mg/kg/day)-1	- -	1.9E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00001
			Exp. Route Total								3.1E-07					0.00001
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	2.0E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	1.5E-08	1.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	7.1E-10	(mg/kg/day)	NA	(mg/kg/day)-1	- -	2.5E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000
			Exp. Route Total								1.5E-08					0.00000
		Exposure Point Total									3.3E-07					0.00001
	Exposure Medium Total										3.3E-07					0.00001
Medium Total											3.3E-07					0.00001
										Total of Receptor Risks Across All Media	6.2E-07				Total of Receptor Hazards Across All Media	0.00001

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.8.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FULE OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 2	Ingestion	BENZO(A)PYRENE	0.014	mg/kg	9.2E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	6.7E-09	3.2E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	9.6E-10	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	7.0E-10	3.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	2.5E-11	(mg/kg/day)	NA	(mg/kg/day)-1	- -	8.8E-10	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000004
			Exp. Route Total								7.4E-09					0.00000004
			Dermal	BENZO(A)PYRENE	0.014	mg/kg	3.2E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.3E-09	1.1E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	3.3E-10	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.4E-10	1.2E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	8.6E-12	(mg/kg/day)	NA	(mg/kg/day)-1	- -	3.0E-10	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000002
			Exp. Route Total								2.6E-09					0.00000002
		Exposure Point Total									1.0E-08					0.00000006
	Exposure Medium Total										1.0E-08					0.00000006
	Air	Decision Unit 2	Inhalation	BENZO(A)PYRENE		mg/m3		(mg/m3)	1.1E-03	(ug/m3)-1	- -		(mg/m3)	NA	(mg/m3)	--
			Exp. Route Total								- -					--
		Exposure Point Total									- -					--
	Exposure Medium Total										- -					--
Medium Total											1.0E-08					0.00000006
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	4.1E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	3.0E-08	2.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	3.3E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.4E-07	1.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	4.9E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	3.6E-08	2.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	5.0E-08	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	3.6E-09	2.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	5.5E-09	(mg/kg/day)	NA	(mg/kg/day)-1	- -	1.9E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000010
			Exp. Route Total								3.1E-07					0.000010
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	2.0E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	1.5E-08	1.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	7.1E-10	(mg/kg/day)	NA	(mg/kg/day)-1	- -	2.5E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000001
			Exp. Route Total								1.5E-08					0.000001
		Exposure Point Total									3.3E-07					0.00001
	Exposure Medium Total										3.3E-07					0.00001
										Total of Receptor Risks Across All Media	3.4E-07				Total of Receptor Hazards Across All Media	0.00001

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.9.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FULE OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 1	Ingestion	BENZO(A)ANTHRACENE	0.337	mg/kg	2.6E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.9E-09	8.6E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	2.9E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.1E-08	9.5E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	2.8E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.0E-09	9.3E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								2.5E-08					0.0000000
			Dermal	BENZO(A)ANTHRACENE	0.337	mg/kg	1.2E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	8.9E-10	4.0E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	1.3E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	9.8E-09	4.5E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	1.3E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	9.6E-10	4.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								1.2E-08					0.0000000
		Exposure Point									3.6E-08					0.000000
	Exposure Medium Total										3.6E-08					0.000000
	Air	Decision Unit 1	Inhalation	BENZO(A)ANTHRACENE		mg/m3		(mg/m3)	1.1E-04	(ug/m3)-1	- -		(mg/m3)	NA	(mg/m3)	--
			Exp. Route Total								- -					--
		Exposure Point									- -					--
	Exposure Medium Total										- -					--
Medium Total											3.6E-08					0.000000
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	7.5E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	5.5E-09	4.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	6.0E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	4.4E-08	3.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	8.9E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	6.5E-09	5.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	9.0E-09	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	6.6E-10	5.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	4.1E-09	(mg/kg/day)	NA	(mg/kg/day)-1	- -	4.1E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000
			Exp. Route Total								5.6E-08					0.00000
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	1.0E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	7.3E-09	6.4E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.5E-09	(mg/kg/day)	NA	(mg/kg/day)-1	- -	1.5E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000
			Exp. Route Total								7.3E-09					0.00000
		Exposure Point									6.4E-08					0.00000
	Exposure Medium Total										6.4E-08					0.00000
Medium Total											6.4E-08					0.00000
Medium Total											- -					--
										Total of Receptor Risks Across All Media	1.0E-07				Total of Receptor Hazards Across All Media	0.00000

TABLE 7.10.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FULE OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 2	Ingestion	BENZO(A)PYRENE	0.014	mg/kg	1.0E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	7.6E-10	3.5E-10	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	1.1E-10	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	7.9E-11	3.6E-10	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	9.4E-12	(mg/kg/day)	NA	(mg/kg/day)-1	- -	9.4E-11	(mg/kg/day)	2.0E-02	(mg/kg/day)	4.70646E-09
			Exp. Route Total								8.4E-10					4.70646E-09
			Dermal	BENZO(A)PYRENE	0.014	mg/kg	4.9E-11	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	3.6E-10	1.6E-10	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	5.1E-11	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	3.7E-11	1.7E-10	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	4.4E-12	(mg/kg/day)	NA	(mg/kg/day)-1	- -	4.4E-11	(mg/kg/day)	2.0E-02	(mg/kg/day)	2.21975E-09
			Exp. Route Total								3.9E-10					2.21975E-09
		Exposure Point									1.2E-09					6.92621E-09
	Exposure Medium Total										1.2E-09					6.92621E-09
	Air	Decision Unit 2	Inhalation	BENZO(A)PYRENE		mg/m3		(mg/m3)	1.1E-03	(ug/m3)-1	- -		(mg/m3)	NA	(mg/m3)	--
			Exp. Route Total								- -					--
		Exposure Point									- -					--
	Exposure Medium Total										- -					--
Medium Total											1.2E-09					6.92621E-09
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	7.5E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	5.5E-09	4.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	6.0E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	4.4E-08	3.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	8.9E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	6.5E-09	5.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	9.0E-09	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	6.6E-10	5.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	4.1E-09	(mg/kg/day)	NA	(mg/kg/day)-1	- -	4.1E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000002
			Exp. Route Total								5.6E-08					0.000002
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	1.0E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	7.3E-09	6.4E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.5E-09	(mg/kg/day)	NA	(mg/kg/day)-1	- -	1.5E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000007
			Exp. Route Total								7.3E-09					0.0000007
		Exposure Point									6.4E-08					0.000003
	Exposure Medium Total										6.4E-08					0.000003
	Air	SWMU 32	Inhalation	BENZO(A)ANTHRACENE		mg/m3		(mg/m3)	1.1E-04	(ug/m3)-1	- -		(mg/m3)	NA	(mg/m3)	--
			Exp. Route Total								- -					--
		Exposure Point									- -					--
	Exposure Medium Total										- -					--
Medium Total											6.4E-08					0.000003
										Total of Receptor Risks Across All Media	6.5E-08				Total of Receptor Hazards Across All Media	0.000003

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.11.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FULE OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 1	Ingestion	BENZO(A)ANTHRACENE	0.337	mg/kg	2.7E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.0E-07	1.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	3.0E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.2E-06	1.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	2.9E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.1E-07	1.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	5.1E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	3.7E-07	2.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	2.2E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.6E-07	1.2E-06	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								3.1E-06					0.000000
			Dermal	BENZO(A)ANTHRACENE	0.337	mg/kg	3.9E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.8E-08	2.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	4.3E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	3.2E-07	2.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	4.2E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	3.1E-08	2.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	7.4E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	5.4E-08	4.0E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	3.2E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.3E-08	1.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								4.5E-07					0.000000
		Exposure Point									3.6E-06					0.00000
	Exposure Medium Total										3.6E-06					0.00000
	Air	Decision Unit 1	Inhalation	BENZO(A)ANTHRACENE		mg/m3		(mg/m3)	1.1E-04	(ug/m3)-1	- -		(mg/m3)	NA	(mg/m3)	--
			Exp. Route Total								- -					--
		Exposure Point									- -					--
	Exposure Medium Total										- -					--
Medium Total											3.6E-06					0.00000
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	2.5E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.8E-07	1.3E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	2.0E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.4E-06	1.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	2.9E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.1E-07	1.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	2.9E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	2.1E-08	1.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	3.2E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	1.1E-06	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00006
			Exp. Route Total								1.8E-06					0.00006
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	3.6E-06	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	2.6E-07	1.9E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.3E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	4.5E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00002
			Exp. Route Total								2.6E-07					0.00002
		Exposure Point									2.1E-06					0.00008
	Exposure Medium Total										2.1E-06					0.00008
Medium Total											2.1E-06					0.00008
										Total of Receptor Risks Across All Media	5.7E-06				Total of Receptor Hazards Across All Media	0.00008

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.12.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FULE OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 2	Ingestion	BENZO(A)PYRENE	0.014	mg/kg	1.1E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	7.9E-08	5.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	1.1E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	8.2E-09	6.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	4.5E-10	(mg/kg/day)	NA	(mg/kg/day)-1	- -	1.6E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000008
			Exp. Route								8.7E-08					0.0000008
			Dermal	BENZO(A)PYRENE	0.014	mg/kg	1.6E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.1E-08	8.5E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	1.6E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.2E-09	8.8E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	6.6E-11	(mg/kg/day)	NA	(mg/kg/day)-1	- -	2.3E-09	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000001
			Exp. Route								1.3E-08					0.0000001
		Exposure Point									1.0E-07					0.0000009
	Exposure Medium Total										1.0E-07					0.0000009
	Air	Decision Unit 2	Inhalation	BENZO(A)PYRENE		mg/m3		(mg/m3)	1.1E-03	(ug/m3)-1	- -		(mg/m3)	NA	(mg/m3)	--
			Exp. Route								- -					--
		Exposure Point									- -					--
	Exposure Medium Total										- -					--
Medium Total											1.0E-07					0.0000009
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	2.5E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.8E-07	1.3E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	2.0E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.4E-06	1.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	2.9E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.1E-07	1.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	2.9E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	2.1E-08	1.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	3.2E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	1.1E-06	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00006
			Exp. Route								1.8E-06					0.00006
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	3.6E-06	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	2.6E-07	1.9E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.3E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	4.5E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00002
			Exp. Route								2.6E-07					0.00002
		Exposure Point Total									2.1E-06					0.00008
	Exposure Medium Total										2.1E-06					0.00008
Medium Total											2.1E-06					0.00008
										Total of Receptor Risks Across All Media	2.2E-06				Total of Receptor Hazards Across All Media	0.00008

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.13.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FULE OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 1	Ingestion	BENZO(A)ANTHRACENE	0.337	mg/kg	2.4E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.8E-08	1.5E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	2.7E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.0E-07	1.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	2.6E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.9E-08	1.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	4.6E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	3.4E-08	2.9E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	2.0E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.5E-08	1.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								2.8E-07					0.0000000
			Dermal	BENZO(A)ANTHRACENE	0.337	mg/kg	3.6E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.6E-09	2.3E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	4.0E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.9E-08	2.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	3.9E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.9E-09	2.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	6.8E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	5.0E-09	4.3E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	3.0E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.2E-09	1.9E-08	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								4.2E-08					0.0000000
		Exposure Point									3.2E-07					0.000000
	Exposure Medium Total										3.2E-07					0.000000
	Air	Decision Unit 1	Inhalation	BENZO(A)ANTHRACENE		mg/m3		(mg/m3)	1.1E-04	(ug/m3)-1	- -		(mg/m3)	NA	(mg/m3)	--
			Exp. Route Total								- -					--
		Exposure Point									- -					--
	Exposure Medium Total										- -					--
Medium Total											3.2E-07					0.000000
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	9.4E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	6.9E-08	6.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	7.5E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	5.5E-07	4.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	1.1E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	8.2E-08	7.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	1.1E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	8.3E-09	7.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	5.2E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	5.2E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000
			Exp. Route Total								7.1E-07					0.0000
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	1.8E-06	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	1.3E-07	1.1E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	2.6E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	2.6E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000
			Exp. Route Total								1.3E-07					0.0000
		Exposure Point Total									8.4E-07					0.0000
	Exposure Medium Total										8.4E-07					0.0000
Medium Total											8.4E-07					0.0000
										Total of Receptor Risks Across All Media	1.2E-06				Total of Receptor Hazards Across All Media	0.0000

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.14.CTE
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FULE OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 2	Ingestion	BENZO(A)PYRENE	0.014	mg/kg	9.8E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	7.1E-09	6.2E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	1.0E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	7.5E-10	6.5E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	1.7E-10	(mg/kg/day)	NA	(mg/kg/day)-1	- -	1.7E-09	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000008
			Exp. Route Total								7.9E-09					0.00000008
			Dermal	BENZO(A)PYRENE	0.014	mg/kg	1.5E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.1E-09	9.2E-10	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	1.5E-10	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.1E-10	9.6E-10	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	2.5E-11	(mg/kg/day)	NA	(mg/kg/day)-1	- -	2.5E-10	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000001
			Exp. Route Total								1.2E-09					0.00000001
		Exposure Point									9.1E-09					0.00000010
	Exposure Medium Total										9.1E-09					0.00000010
	Air	Decision Unit 2	Inhalation	BENZO(A)PYRENE		mg/m3		(mg/m3)	1.1E-03	(ug/m3)-1	- -		(mg/m3)	NA	(mg/m3)	--
			Exp. Route Total								- -					--
		Exposure Point									- -					--
	Exposure Medium Total										- -					--
Medium Total											9.1E-09					0.00000010
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	9.4E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	6.9E-08	6.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	7.5E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	5.5E-07	4.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	1.1E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	8.2E-08	7.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	1.1E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	8.3E-09	7.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	5.2E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	5.2E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00003
			Exp. Route Total								7.1E-07					0.00003
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	1.8E-06	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	1.3E-07	1.1E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	2.6E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	2.6E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00001
			Exp. Route Total								1.3E-07					0.00001
		Exposure Point									8.4E-07					0.00004
	Exposure Medium Total										8.4E-07					0.00004
Medium Total											8.4E-07					0.00004
										Total of Receptor Risks Across All Media	8.5E-07				Total of Receptor Hazards Across All Media	0.00004

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.1.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 1	Ingestion	BENZO(A)ANTHRACENE	0.337	mg/kg	1.2E-07	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	8.6E-08	3.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	1.3E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	9.5E-07	3.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	1.3E-07	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	9.4E-08	3.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	2.2E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.6E-07	6.3E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	9.7E-08	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	7.1E-08	2.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								1.4E-06					--
			Dermal	BENZO(A)ANTHRACENE	0.337	mg/kg	1.0E-07	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	7.4E-08	2.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	1.1E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	8.2E-07	3.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	1.1E-07	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	8.0E-08	3.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	1.9E-08	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.4E-07	5.4E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	8.3E-08	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	6.1E-08	2.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								1.2E-06					--
		Exposure Point Total									2.5E-06					--
	Exposure Medium Total										2.5E-06					--
	Air	Decision Unit 1	Inhalation	BENZO(A)ANTHRACENE		mg/m^3		(mg/m^3)	1.1E-04	$(ug/m^3)^{-1}$	- -		(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								- -					--
		Exposure Point Total									- -					--
	Exposure Medium Total										- -					--
Medium Total											2.5E-06					--
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	1.6E-07	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	1.2E-07	4.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	1.3E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	9.5E-07	3.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	1.9E-07	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	1.4E-07	5.5E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	2.0E-07	(mg/kg/day)	7.3E-02	$(mg/kg/day)^{-1}$	1.4E-08	5.5E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.4E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.9E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00002
			Exp. Route Total								1.2E-06					0.00002
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	5.3E-06	(mg/kg/day)	7.3E-02	$(mg/kg/day)^{-1}$	3.9E-07	1.5E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.2E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.4E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00002
			Exp. Route Total								3.9E-07					0.00002
		Exposure Point Total									1.6E-06					0.00004
	Exposure Medium Total										1.6E-06					0.00004
Medium Total											1.6E-06					0.00004
										Total of Receptor Risks Across All Media	4.2E-06				Total of Receptor Hazards Across All Media	0.00004

TABLE 7.2.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentratio		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 2	Ingestion	BENZO(A)PYRENE	0.014	mg/kg	4.8E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.5E-08	1.3E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	5.0E-09	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	3.6E-09	1.4E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	1.3E-09	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.6E-09	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000002
			Exp. Route Total								3.8E-08					0.0000002
			Dermal	BENZO(A)PYRENE	0.014	mg/kg	4.1E-09	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	3.0E-08	1.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	4.3E-09	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	3.1E-09	1.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	1.1E-09	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.1E-09	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000002
			Exp. Route Total								3.3E-08					0.0000002
		Exposure Point Total									7.1E-08					0.0000003
	Exposure Medium Total										7.1E-08					0.0000003
	Air	Decision Unit 2	Inhalation	BENZO(A)PYRENE		mg/m^3		(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	- -		(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								- -					--
		Exposure Point Total									- -					--
	Exposure Medium Total										- -					--
Medium Total											7.1E-08					0.0000003
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	1.6E-07	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	1.2E-07	4.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	1.3E-07	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	9.5E-07	3.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	1.9E-07	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	1.4E-07	5.5E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	2.0E-07	(mg/kg/day)	7.3E-02	$(mg/kg/day)^{-1}$	1.4E-08	5.5E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.4E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.9E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00002
			Exp. Route Total								1.2E-06					0.00002
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	$(mg/kg/day)^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	5.3E-06	(mg/kg/day)	7.3E-02	$(mg/kg/day)^{-1}$	3.9E-07	1.5E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.2E-07	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	- -	3.4E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00002
			Exp. Route Total								3.9E-07					0.00002
		Exposure Point Total									1.6E-06					0.00004
	Exposure Medium Total										1.6E-06					0.00004
	Air	SWMU 32	Inhalation	BENZO(A)ANTHRACENE		mg/m^3		(mg/m^3)	1.1E-04	$(ug/m^3)^{-1}$	- -		(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								- -					--
		Exposure Point Total									- -					--
	Exposure Medium Total										- -					--
Medium Total											1.6E-06					0.00004
Medium Total											- -					--
										Total of Receptor Risks Across All Media	1.7E-06	Total of Receptor Hazards Across All Media				0.00004

TABLE 7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentratio		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 1	Ingestion	BENZO(A)ANTHRACENE	0.337	mg/kg	9.3E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)$^{-1}$	6.8E-09	6.5E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	1.0E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	7.6E-08	7.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	1.0E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)$^{-1}$	7.4E-09	7.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	1.8E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	1.3E-08	1.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	7.7E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)$^{-1}$	5.6E-09	5.4E-07	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								1.1E-07					--
			Dermal	BENZO(A)ANTHRACENE	0.337	mg/kg	3.6E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)$^{-1}$	2.7E-09	2.5E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	4.0E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	2.9E-08	2.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	4.0E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)$^{-1}$	2.9E-09	2.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	6.9E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	5.0E-09	4.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	3.0E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)$^{-1}$	2.2E-09	2.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								4.2E-08					--
		Exposure Point									1.5E-07					--
	Exposure Medium Total										1.5E-07					--
Medium Total											1.5E-07					--
Subsurface S	Subsurface Soil	Decision Unit 1	Ingestion	BENZENE	0.144	mg/kg	4.0E-09	(mg/kg/day)	5.5E-02	(mg/kg/day)$^{-1}$	2.2E-10	2.8E-07	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.00007
				BENZO(A)ANTHRACENE	0.022	mg/kg	6.1E-10	(mg/kg/day)	7.3E-01	(mg/kg/day)$^{-1}$	4.4E-10	4.3E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.016	mg/kg	4.4E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	3.2E-09	3.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								3.9E-09					0.00007
			Dermal	BENZENE	0.144	mg/kg	0.0E+00	(mg/kg/day)	5.5E-02	(mg/kg/day)$^{-1}$	- -	0.0E+00	(mg/kg/day)	4.0E-03	(mg/kg/day)	--
				BENZO(A)ANTHRACENE	0.022	mg/kg	2.4E-10	(mg/kg/day)	7.3E-01	(mg/kg/day)$^{-1}$	1.7E-10	1.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.016	mg/kg	1.7E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	1.3E-09	1.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								1.4E-09					--
		Exposure Point									5.3E-09					0.00007
	Exposure Medium Total										5.3E-09					0.00007
	Air	Decision Unit 1	Inhalation	BENZENE	0.004	mg/m^3	6.9E-06	(mg/m^3)	7.8E-06	(ug/m^3)$^{-1}$	5.4E-08	4.8E-04	(mg/m^3)	3.0E-02	(mg/m^3)	0.02
				BENZO(A)ANTHRACENE	1.5E-8	mg/m^3	2.9E-11	(mg/m^3)	1.1E-04	(ug/m^3)$^{-1}$	3.2E-12	2.0E-09	(mg/m^3)	NA	(mg/m^3)	--
				BENZO(A)PYRENE	1.1E-8	mg/m^3	2.1E-11	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	2.3E-11	1.5E-09	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route								5.4E-08					0.02
		Exposure Point									5.4E-08					0.02
	Exposure Medium Total										5.4E-08					0.02
Medium Total											5.9E-08					0.02
Groundwater	Groundwater	SWMU 32	Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)$^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)$^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	6.6E-08	(mg/kg/day)	7.3E-02	(mg/kg/day)$^{-1}$	4.8E-09	4.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.6E-09	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	1.1E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000005
			Exp. Route								4.8E-09					0.000005
		Exposure Point									4.8E-09					0.000005
	Exposure Medium Total										4.8E-09					0.000005
Medium Total											4.8E-09					0.000005

TABLE 7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentratio		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 2	Ingestion	BENZO(A)PYRENE	0.014	mg/kg	3.8E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.7E-09	2.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	3.9E-10	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.9E-10	2.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	1.0E-10	(mg/kg/day)	NA	(mg/kg/day)-1	- -	7.2E-09	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000004
			Exp. Route								3.0E-09					0.0000004
			Dermal	BENZO(A)PYRENE	0.014	mg/kg	1.5E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.1E-09	1.0E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	1.5E-10	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.1E-10	1.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	4.0E-11	(mg/kg/day)	NA	(mg/kg/day)-1	- -	2.8E-09	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000001
			Exp. Route								1.2E-09					0.0000001
		Exposure Point									4.2E-09					0.0000005
	Exposure Medium Total										4.2E-09					0.0000005
Medium Total											4.2E-09					0.0000005
Subsurface Soil	Subsurface Soil	Decision Unit 2	Ingestion	BENZO(A)ANTHRACENE	0.394	mg/kg	1.1E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	8.0E-09	7.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.121	mg/kg	3.3E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.4E-08	2.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								3.2E-08					--
			Dermal	BENZO(A)ANTHRACENE	0.394	mg/kg	4.3E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	3.1E-09	3.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.121	mg/kg	1.3E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	9.5E-09	9.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								1.3E-08					--
		Exposure Point									4.5E-08					--
	Exposure Medium Total										4.5E-08					--
Medium Total											4.5E-08					--
Groundwater	Groundwater	SWMU 32	Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	6.6E-08	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	4.8E-09	4.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.6E-09	(mg/kg/day)	NA	(mg/kg/day)-1	- -	1.1E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000005
			Exp. Route								4.8E-09					0.000005
		Exposure Point									4.8E-09					0.000005
	Exposure Medium Total										4.8E-09					0.000005
Medium Total											4.8E-09					0.000005
										Total of Receptor Risks Across All Media	5.4E-08				Total of Receptor Hazards Across All Media	0.000006

TABLE 7.5.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 1	Ingestion	BENZO(A)ANTHRACENE	0.337	mg/kg	2.6E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.9E-08	5.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	2.9E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.1E-07	6.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	2.9E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.1E-08	6.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	5.0E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	3.6E-08	1.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	2.2E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.6E-08	4.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								3.1E-07					0.0000000
			Dermal	BENZO(A)ANTHRACENE	0.337	mg/kg	2.6E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.9E-08	5.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	2.9E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.1E-07	6.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	2.8E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.1E-08	6.0E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	5.0E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	3.6E-08	1.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	2.2E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.6E-08	4.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								3.0E-07					0.0000000
		Exposure Point									6.1E-07					0.0000000
Medium Total											6.1E-07					0.0000000
										Total of Receptor Risks Across All Media	6.1E-07				Total of Receptor Hazards Across All Media	0.0000000

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.6.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 2	Ingestion	BENZO(A)PYRENE	0.014	mg/kg	1.1E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	7.8E-09	2.3E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	1.1E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	8.1E-10	2.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	9.6E-11	(mg/kg/day)	NA	(mg/kg/day)-1	- -	6.1E-10	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000003
			Exp. Route Total								8.6E-09					0.00000003
			Dermal	BENZO(A)PYRENE	0.014	mg/kg	1.1E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	7.7E-09	2.2E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	1.1E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	8.0E-10	2.3E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	9.6E-11	(mg/kg/day)	NA	(mg/kg/day)-1	- -	6.1E-10	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000003
			Exp. Route Total								8.5E-09					0.00000003
		Exposure Point									1.7E-08					0.00000006
	Exposure Medium Total										1.7E-08					0.00000006
Medium Total											1.7E-08					0.00000006
										Total of Receptor Risks Across All Media	1.7E-08				Total of Receptor Hazards Across All Media	0.00000006

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.7.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	take/Exposure Concentratio		CSF/Unit Risk		Cancer Risk	take/Exposure Concentratio		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 1	Ingestion	BENZO(A)ANTHRACENE	0.337	mg/kg	1.5E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-	1.1E-07	3.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	1.6E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)-	1.2E-06	3.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	1.6E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-	1.2E-07	3.5E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								1.4E-06					0.000000
			Dermal	BENZO(A)ANTHRACENE	0.337	mg/kg	1.3E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-	9.2E-08	2.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	1.4E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)-	1.0E-06	3.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	1.4E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-	1.0E-07	3.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								1.2E-06					0.000000
		Exposure Point Total									2.6E-06					0.000000
Medium Total											2.6E-06					0.000000
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	2.0E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-	1.5E-07	4.5E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	1.6E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)-	1.2E-06	3.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	2.4E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-	1.8E-07	5.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	2.4E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-	1.8E-08	5.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	3.3E-08	(mg/kg/day)	NA	(mg/kg/day)-	- -	3.8E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00002
			Exp. Route Total								1.5E-06					0.00002
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	1.2E-06	(mg/kg/day)	7.3E-02	(mg/kg/day)-	8.8E-08	2.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	5.2E-09	(mg/kg/day)	NA	(mg/kg/day)-	- -	6.1E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000003
			Exp. Route Total								8.8E-08					0.000003
		Exposure Point Total									1.6E-06					0.00002
Medium Total											1.6E-06					0.00002
										Total of Receptor Risks Across All Media	4.2E-06				Total of Receptor Hazards Across All Media	0.00002

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.8.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentratio		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 2	Ingestion	BENZO(A)PYRENE	0.014	mg/kg	5.9E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	4.3E-08	1.3E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	6.2E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	4.5E-09	1.3E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	3.0E-10	(mg/kg/day)	NA	(mg/kg/day)-1	- -	3.5E-09	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000002
			Exp. Route								4.8E-08					0.0000002
			Dermal	BENZO(A)PYRENE	0.014	mg/kg	5.1E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	3.7E-08	1.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	5.3E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	3.9E-09	1.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	2.6E-10	(mg/kg/day)	NA	(mg/kg/day)-1	- -	3.0E-09	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000002
			Exp. Route								4.1E-08					0.0000002
		Exposure Point									8.8E-08					0.0000003
	Exposure Medium Total										8.8E-08					0.0000003
Medium Total											8.8E-08					0.0000003
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	2.0E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.5E-07	4.5E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	1.6E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.2E-06	3.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	2.4E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.8E-07	5.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	2.4E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	1.8E-08	5.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	3.3E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	3.8E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00002
			Exp. Route								1.5E-06					0.00002
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	1.2E-06	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	8.8E-08	2.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	5.2E-09	(mg/kg/day)	NA	(mg/kg/day)-1	- -	6.1E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000003
			Exp. Route								8.8E-08					0.000003
		Exposure Point									1.6E-06					0.00002
	Exposure Medium Total										1.6E-06					0.00002
Medium Total											1.6E-06					0.00002
										Total of Receptor Risks Across All Media	1.7E-06			Total of Receptor Hazards Across All Media		0.00002

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.9.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentratio		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 1	Ingestion	BENZO(A)ANTHRACENE	0.337	mg/kg	2.2E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.6E-08	3.4E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	2.4E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.7E-07	3.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	2.3E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.7E-08	3.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								2.1E-07					0.000000
			Dermal	BENZO(A)ANTHRACENE	0.337	mg/kg	3.6E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.6E-08	5.7E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	3.9E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.9E-07	6.3E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	3.9E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.8E-08	6.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.000	mg/kg	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								3.4E-07					0.000000
		Exposure Point									5.5E-07					0.000000
	Exposure Medium Total										5.5E-07					0.000000
Medium Total											5.5E-07					0.000000
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	6.0E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	4.4E-08	9.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	4.8E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	3.5E-07	7.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	7.1E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	5.2E-08	1.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	7.2E-08	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	5.2E-09	1.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	2.8E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	8.2E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000
			Exp. Route Total								4.5E-07					0.00000
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	9.8E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	7.2E-08	1.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.2E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	3.6E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000
			Exp. Route Total								7.2E-08					0.00000
		Exposure Point									5.2E-07					0.00001
	Exposure Medium Total										5.2E-07					0.00001
Medium Total											5.2E-07					0.00001
										Total of Receptor Risks Across All Media	1.1E-06			Total of Receptor Hazards Across All Media		0.00001

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.10.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentratio		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentratio		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 2	Ingestion	BENZO(A)PYRENE	0.014	mg/kg	8.7E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	6.4E-09	1.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	9.1E-10	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	6.6E-10	1.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	1.3E-10	(mg/kg/day)	NA	(mg/kg/day)-1	- -	3.8E-10	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000002
			Exp. Route Total								7.0E-09					0.00000002
			Dermal	BENZO(A)PYRENE	0.014	mg/kg	1.4E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.0E-08	2.3E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	1.5E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.1E-09	2.4E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	2.1E-10	(mg/kg/day)	NA	(mg/kg/day)-1	- -	6.2E-10	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00000003
			Exp. Route Total								1.2E-08					0.00000003
		Exposure Point Total									1.9E-08					0.00000005
	Exposure Medium Total										1.9E-08					0.00000005
Medium Total											1.9E-08					0.00000005
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	6.0E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	4.4E-08	9.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	4.8E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	3.5E-07	7.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	7.1E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	5.2E-08	1.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	7.2E-08	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	5.2E-09	1.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	2.8E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	8.2E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000004
			Exp. Route Total								4.5E-07					0.000004
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	9.8E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	7.2E-08	1.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.2E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	3.6E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000002
			Exp. Route Total								7.2E-08					0.000002
		Exposure Point Total									5.2E-07					0.000006
	Exposure Medium Total										5.2E-07					0.000006
Medium Total											5.2E-07					0.000006
Total of Receptor Risks Across All Media											5.4E-07	Total of Receptor Hazards Across All Media				0.000006

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.11.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Medium	Exposure Point	Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentratio		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentratio		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 1	Ingestion	BENZO(A)ANTHRACENE	0.337	mg/kg	2.0E-06	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.4E-06	4.3E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	2.2E-06	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.6E-05	4.8E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	2.1E-06	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.6E-06	4.7E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	3.7E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.7E-06	8.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	1.6E-06	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.2E-06	3.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								2.3E-05					0.00000
			Dermal	BENZO(A)ANTHRACENE	0.337	mg/kg	7.2E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	5.2E-07	1.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	8.0E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	5.8E-06	1.7E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	7.8E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	5.7E-07	1.7E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	1.4E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	9.9E-07	3.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	5.9E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	4.3E-07	1.3E-06	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								8.3E-06					0.00000
		Exposure Point									3.1E-05					0.00000
Exposure Medium Total											3.1E-05					0.00000
Medium Total											3.1E-05					0.00000
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	2.1E-06	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.5E-06	4.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	1.6E-06	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.2E-05	3.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	2.4E-06	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.8E-06	5.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	2.5E-06	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	1.8E-07	5.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	3.3E-07	(mg/kg/day)	NA	(mg/kg/day)-1	- -	3.9E-06	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0002
			Exp. Route								1.5E-05					0.0002
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	1.6E-05	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	1.2E-06	3.6E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	7.0E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	8.2E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00004
			Exp. Route								1.2E-06					0.00004
		Exposure Point									1.7E-05					0.0002
Exposure Medium Total											1.7E-05					0.0002
Medium Total											1.7E-05					0.0002
Total of Receptor Risks Across All Media											4.8E-05	Total of Receptor Hazards Across All Media				0.0002

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.12.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentratio		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 2	Ingestion	BENZO(A)PYRENE	0.014	mg/kg	7.9E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	5.8E-07	1.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	8.3E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	6.1E-08	1.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	4.1E-09	(mg/kg/day)	NA	(mg/kg/day)-1	- -	4.7E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000002
			Exp. Route								6.4E-07					0.000002
			Dermal	BENZO(A)PYRENE	0.014	mg/kg	2.9E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.1E-07	6.3E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	3.0E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.2E-08	6.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	1.5E-09	(mg/kg/day)	NA	(mg/kg/day)-1	- -	1.7E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000009
			Exp. Route								2.3E-07					0.0000009
		Exposure Point									8.7E-07					0.000003
	Exposure Medium Total										8.7E-07					0.000003
	Air	Decision Unit 2	Inhalation	BENZO(A)PYRENE		mg/m3		(mg/m3)	1.1E-03	(ug/m3)-1	- -		(mg/m3)	NA	(mg/m3)	--
			Exp. Route								- -					--
		Exposure Point									- -					--
	Exposure Medium Total										- -					--
Medium Total											8.7E-07					0.000003
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	2.1E-06	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.5E-06	4.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	1.6E-06	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.2E-05	3.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	2.4E-06	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.8E-06	5.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	2.5E-06	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	1.8E-07	5.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	3.3E-07	(mg/kg/day)	NA	(mg/kg/day)-1	- -	3.9E-06	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0002
			Exp. Route								1.5E-05					0.0002
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	1.6E-05	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	1.2E-06	3.6E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	7.0E-08	(mg/kg/day)	NA	(mg/kg/day)-1	- -	8.2E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00004
			Exp. Route								1.2E-06					0.00004
		Exposure Point									1.7E-05					0.0002
	Exposure Medium Total										1.7E-05					0.0002
Medium Total											1.7E-05					0.0002
										Total of Receptor Risks Across All Media	1.7E-05				Total of Receptor Hazards Across All Media	0.0002

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.13.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentratio		RfD/RfC		Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 1	Ingestion	BENZO(A)ANTHRACENE	0.337	mg/kg	2.9E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.1E-07	4.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	3.2E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.4E-06	5.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	3.2E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	2.3E-07	5.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	5.5E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	4.0E-07	8.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	2.4E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.7E-07	3.8E-07	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								3.4E-06					0.000000
			Dermal	BENZO(A)ANTHRACENE	0.337	mg/kg	1.5E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.1E-07	2.4E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.374	mg/kg	1.7E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	1.2E-06	2.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.367	mg/kg	1.6E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	1.2E-07	2.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				DIBENZO(A,H)ANTHRACENE	0.064	mg/kg	2.9E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.1E-07	4.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				INDENO(1,2,3-CD)PYRENE	0.278	mg/kg	1.2E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	9.1E-08	2.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route								1.7E-06					0.000000
		Exposure Point Total									5.1E-06					0.000000
	Exposure Medium Total										5.1E-06					0.000000
Medium Total											5.1E-06					0.000000
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	8.1E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	5.9E-07	1.3E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	6.4E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	4.7E-06	1.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	9.6E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	7.0E-07	1.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	9.7E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	7.1E-08	1.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	3.8E-07	(mg/kg/day)	NA	(mg/kg/day)-1	- -	1.1E-06	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00006
			Exp. Route								6.1E-06					0.00006
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	1.3E-05	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	9.6E-07	2.1E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.6E-07	(mg/kg/day)	NA	(mg/kg/day)-1	- -	4.8E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00002
			Exp. Route								9.6E-07					0.00002
		Exposure Point Total									7.0E-06					0.00008
	Exposure Medium Total										7.0E-06					0.00008
Medium Total											7.0E-06					0.00008
										Total of Receptor Risks Across All Media	1.2E-05				Total of Receptor Hazards Across All Media	0.00008

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.14.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURES

SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentratio		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentratio		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Decision Unit 2	Ingestion	BENZO(A)PYRENE	0.014	mg/kg	1.2E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	8.5E-08	1.9E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	1.2E-08	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	8.9E-09	1.9E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	1.7E-09	(mg/kg/day)	NA	(mg/kg/day)-1	- -	5.1E-09	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000003
			Exp. Route								9.4E-08					0.0000003
			Dermal	BENZO(A)PYRENE	0.014	mg/kg	6.1E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	4.4E-08	9.7E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.014	mg/kg	6.3E-09	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	4.6E-09	1.0E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.004	mg/kg	9.0E-10	(mg/kg/day)	NA	(mg/kg/day)-1	- -	2.6E-09	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0000001
			Exp. Route								4.9E-08					0.0000001
		Exposure Point									1.4E-07					0.0000004
	Exposure Medium Total										1.4E-07					0.0000004
Medium Total											1.4E-07					0.0000004
Groundwater	Groundwater	SWMU 32	Ingestion	BENZO(A)ANTHRACENE	0.047	ug/L	8.1E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	5.9E-07	1.3E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	6.4E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	4.7E-06	1.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	9.6E-07	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	7.0E-07	1.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	9.7E-07	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	7.1E-08	1.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	3.8E-07	(mg/kg/day)	NA	(mg/kg/day)-1	- -	1.1E-06	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00006
			Exp. Route								6.1E-06					0.00006
			Dermal	BENZO(A)ANTHRACENE	0.047	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(A)PYRENE	0.037	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(B)FLUORANTHENE	0.056	ug/L	0.0E+00	(mg/kg/day)	7.3E-01	(mg/kg/day)-1	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				BENZO(K)FLUORANTHENE	0.056	ug/L	1.3E-05	(mg/kg/day)	7.3E-02	(mg/kg/day)-1	9.6E-07	2.1E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				NAPHTHALENE	0.040	ug/L	1.6E-07	(mg/kg/day)	NA	(mg/kg/day)-1	- -	4.8E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00002
			Exp. Route								9.6E-07					0.00002
		Exposure Point									7.0E-06					0.00008
	Exposure Medium Total										7.0E-06					0.00008
Medium Total											7.0E-06					0.00008
										Total of Receptor Risks Across All Media	7.2E-06			Total of Receptor Hazards Across All Media		0.00008

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 9.1.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 1	BENZO(A)ANTHRACENE	1E-08	--	2E-09	--	2E-08	NA	--	- -	--	--
			BENZO(A)PYRENE	2E-07	--	3E-08	--	2E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	1E-08	--	3E-09	--	2E-08	NA	--	- -	--	--
			DIBENZO(A,H)ANTHRACENE	3E-08	--	4E-09	--	3E-08	NA	--	- -	--	--
			INDENO(1,2,3-CD)PYRENE	1E-08	--	2E-09	--	1E-08	NA	--	- -	--	--
			Chemical Total	2E-07	--	4E-08	--	3E-07		--	--	--	--
		Exposure Point Total						3E-07					--
	Exposure Medium Total							3E-07					--
Medium Total								3E-07					--
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	4E-08	--	- -	--	4E-08	NA	--	- -	--	--
			BENZO(A)PYRENE	3E-07	--	- -	--	3E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	4E-08	--	- -	--	4E-08	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	5E-09	--	2E-08	--	3E-08	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00002	- -	0.00001	0.00003
			Chemical Total	4E-07	--	2E-08	--	4E-07		0.00002	--	0.00001	0.00003
		Exposure Point Total						4E-07					0.00003
	Exposure Medium Total							4E-07					0.00003
Medium Total								4E-07					0.00003
Receptor Total							Receptor Risk Total	7E-07				Receptor HI Total	0.00003

Total Body Weight HI 0.00003

TABLE 9.2.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 2	BENZO(A)PYRENE	5E-09	--	9E-10	--	6E-09	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	6E-10	--	1E-10	--	7E-10	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00000008	- -	0.00000001	0.00000009
			Chemical Total	6E-09	--	1E-09	--	7E-09		0.00000008	--	0.00000001	0.00000009
		Exposure Point Total						7E-09					0.00000009
	Exposure Medium Total							7E-09					0.00000009
Medium Total								7E-09					0.00000009
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	4E-08	--	- -	--	4E-08	NA	--	- -	--	--
			BENZO(A)PYRENE	3E-07	--	- -	--	3E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	4E-08	--	- -	--	4E-08	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	5E-09	--	2E-08	--	3E-08	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00002	- -	0.00001	0.00003
			Chemical Total	4E-07	--	2E-08	--	4E-07		0.00002	--	0.00001	0.00003
		Exposure Point Total						4E-07					0.00003
	Exposure Medium Total							4E-07					0.00003
Medium Total								4E-07					0.00003
Receptor Total							Receptor Risk Total	4E-07				Receptor HI Total	0.00003

Total Body Weight HI 0.00003

TABLE 9.3.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 1	BENZO(A)ANTHRACENE	3E-09	--	9E-10	--	4E-09	NA	--	- -	--	--
			BENZO(A)PYRENE	4E-08	--	1E-08	--	5E-08	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	4E-09	--	1E-09	--	5E-09	NA	--	- -	--	--
			DIBENZO(A,H)ANTHRACENE	6E-09	--	2E-09	--	8E-09	NA	--	- -	--	--
			INDENO(1,2,3-CD)PYRENE	3E-09	--	7E-10	--	4E-09	NA	--	- -	--	--
			Chemical Total	5E-08	--	1E-08	--	7E-08		--	--	--	--
		Exposure Point Total						7E-08					--
	Exposure Medium Total							7E-08					--
Medium Total								7E-08					--
Subsurface Soil	Subsurface Soil	Decision Unit 1	BENZENE	1E-10	--	- -	--	1E-10	Blood	0.00003	- -	--	0.00003
			BENZO(A)ANTHRACENE	2E-10	--	6E-11	--	3E-10	NA	--	- -	--	--
			BENZO(A)PYRENE	2E-09	--	4E-10	--	2E-09	NA	--	- -	--	--
			Chemical Total	2E-09	--	5E-10	--	2E-09		0.00003	--	--	0.00003
		Exposure Point Total						2E-09					0.00003
	Exposure Medium Total							2E-09					0.00003
	Air	Decision Unit 1	BENZENE	--	5E-08	--	--	5E-08	Blood	- -	0.02	- -	0.02
			BENZO(A)ANTHRACENE	--	3E-12	--	--	3E-12	NA	- -	--	- -	--
			BENZO(A)PYRENE	--	2E-11	--	--	2E-11	NA	- -	--	- -	--
			Chemical Total	--	5E-08	--	--	5E-08		- -	0.02	- -	0.02
		Exposure Point Total						5E-08					0.02
	Exposure Medium Total							5E-08					0.02
Medium Total								6E-08					0.02
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	- -	--	- -	--	- -	NA	--	- -	--	--
			BENZO(A)PYRENE	- -	--	- -	--	- -	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	- -	--	- -	--	- -	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	- -	--	4E-09	--	4E-09	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	--	- -	0.000005	0.000005
			Chemical Total	- -	--	4E-09	--	4E-09		--	--	0.000005	0.000005
		Exposure Point Total						4E-09					0.000005
	Exposure Medium Total							4E-09					0.000005
Medium Total								4E-09					0.000005
Receptor Total							Receptor Risk Total	1E-07				Receptor HI Total	0.02

Total Blood HI	0.02
Total Body Weight HI	0.000005

TABLE 9.4.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 2	BENZO(A)PYRENE	1E-09	--	4E-10	--	2E-09	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	1E-10	--	4E-11	--	2E-10	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.0000002	- -	0.00000005	0.0000002
			Chemical Total	2E-09	--	4E-10	--	2E-09		0.0000002	--	0.00000005	0.0000002
		Exposure Point Total						2E-09					0.0000002
	Exposure Medium Total							2E-09					0.0000002
Medium Total								2E-09					0.0000002
Subsurface Soil	Subsurface Soil	Decision Unit 2	BENZO(A)ANTHRACENE	4E-09	--	1E-09	--	5E-09	NA	--	- -	--	--
			BENZO(A)PYRENE	1E-08	--	3E-09	--	2E-08	NA	--	- -	--	--
			Chemical Total	2E-08	--	4E-09	--	2E-08		--	--	--	--
		Exposure Point Total						2E-08					--
	Exposure Medium Total							2E-08					--
Medium Total								2E-08					--
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	- -	--	- -	--	- -	NA	--	- -	--	--
			BENZO(A)PYRENE	- -	--	- -	--	- -	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	- -	--	- -	--	- -	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	- -	--	4E-09	--	4E-09	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	--	- -	0.000005	0.000005
			Chemical Total	- -	--	4E-09	--	4E-09		--	--	0.000005	0.000005
		Exposure Point Total						4E-09					0.000005
	Exposure Medium Total							4E-09					0.000005
Medium Total								4E-09					0.000005
Receptor Total							Receptor Risk Total	3E-08				Receptor HI Total	0.000005

Total Body Weight HI 0.000005

TABLE 9.5.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 1	BENZO(A)ANTHRACENE	5E-09	--	1E-09	--	6E-09	NA	--	- -	--	--
			BENZO(A)PYRENE	5E-08	--	2E-08	--	7E-08	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	5E-09	--	2E-09	--	7E-09	NA	--	- -	--	--
			DIBENZO(A,H)ANTHRACENE	9E-09	--	3E-09	--	1E-08	NA	--	- -	--	--
			INDENO(1,2,3-CD)PYRENE	4E-09	--	1E-09	--	5E-09	NA	--	- -	--	--
			Chemical Total	8E-08	--	2E-08	--	1E-07		0.00000000	--	0.00000000	0.0000000
		Exposure Point Total						1E-07					0.0000000
	Exposure Medium Total							1E-07					0.0000000
Medium Total								1E-07					0.0000000
Receptor Total							Receptor Risk Total	1E-07				Receptor HI Total	0.0000000

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.0000000

TABLE 9.6.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 2	BENZO(A)PYRENE	2E-09	--	6E-10	--	3E-09	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	2E-10	--	6E-11	--	3E-10	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	7.6617E-09	- -	2.4701E-09	0.00000001
			Chemical Total	2E-09	--	6E-10	--	3E-09		7.6617E-09	--	2.4701E-09	0.00000001
		Exposure Point Total						3E-09					0.00000001
	Exposure Medium Total							3E-09					0.00000001
Medium Total								3E-09					0.00000001
Receptor Total							Receptor Risk Total	3E-09				Receptor HI Total	0.00000001

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.00000001

TABLE 9.7.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 1	BENZO(A)ANTHRACENE	2E-08	--	6E-09	--	2E-08	NA	--	- -	--	--
			BENZO(A)PYRENE	2E-07	--	6E-08	--	2E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	2E-08	--	6E-09	--	2E-08	NA	--	- -	--	--
			DIBENZO(A,H)ANTHRACENE	- -	--	- -	--	- -	NA	--	- -	--	--
			INDENO(1,2,3-CD)PYRENE	- -	--	- -	--	- -	NA	--	- -	--	--
			Chemical Total	2E-07	--	8E-08	--	3E-07		0.0000000	--	0.0000000	0.0000000
		Exposure Point Total						3E-07					0.0000000
	Exposure Medium Total							3E-07					0.0000000
Medium Total								3E-07					0.0000000
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	3E-08	--	- -	--	3E-08	NA	--	- -	--	--
			BENZO(A)PYRENE	2E-07	--	- -	--	2E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	4E-08	--	- -	--	4E-08	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	4E-09	--	1E-08	--	2E-08	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00001	- -	0.00000	0.00001
			Chemical Total	3E-07	--	1E-08	--	3E-07		0.00001	--	0.00000	0.00001
		Exposure Point Total						3E-07					0.00001
	Exposure Medium Total							3E-07					0.00001
Medium Total								3E-07					0.00001
Receptor Total							Receptor Risk Total	6E-07				Receptor HI Total	0.00001

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.00001

TABLE 9.8.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 2	BENZO(A)PYRENE	7E-09	--	2E-09	--	9E-09	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	7E-10	--	2E-10	--	9E-10	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00000004	- -	0.00000002	0.00000006
			Chemical Total	7E-09	--	3E-09	--	1E-08		0.00000004	--	0.00000002	0.00000006
		Exposure Point Total						1E-08					0.00000006
	Exposure Medium Total							1E-08					0.00000006
Medium Total								1E-08					0.00000006
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	3E-08	--	- -	--	3E-08	NA	--	- -	--	--
			BENZO(A)PYRENE	2E-07	--	- -	--	2E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	4E-08	--	- -	--	4E-08	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	4E-09	--	1E-08	--	2E-08	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.000010	- -	0.000001	0.00001
			Chemical Total	3E-07	--	1E-08	--	3E-07		0.000010	--	0.000001	0.00001
		Exposure Point Total						3E-07					0.00001
	Exposure Medium Total							3E-07					0.00001
Medium Total								3E-07					0.00001
Receptor Total							Receptor Risk Total	3E-07				Receptor HI Total	0.00001

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.00001

TABLE 9.9.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 1	BENZO(A)ANTHRACENE	2E-09	--	9E-10	--	3E-09	NA	--	- -	--	--
			BENZO(A)PYRENE	2E-08	--	1E-08	--	3E-08	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	2E-09	--	1E-09	--	3E-09	NA	--	- -	--	--
			DIBENZO(A,H)ANTHRACENE	- -	--	- -	--	- -	NA	--	- -	--	--
			INDENO(1,2,3-CD)PYRENE	- -	--	- -	--	- -	NA	--	- -	--	--
			Chemical Total	2E-08	--	1E-08	--	4E-08		0.0000000	--	0.0000000	0.000000
		Exposure Point Total						4E-08					0.000000
	Exposure Medium Total							4E-08					0.000000
Medium Total								4E-08					0.000000
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	5E-09	--	- -	--	5E-09	NA	--	- -	--	--
			BENZO(A)PYRENE	4E-08	--	- -	--	4E-08	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	7E-09	--	- -	--	7E-09	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	7E-10	--	7E-09	--	8E-09	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00000	- -	0.00000	0.00000
			Chemical Total	6E-08	--	7E-09	--	6E-08		0.00000	--	0.00000	0.00000
		Exposure Point Total						6E-08					0.00000
	Exposure Medium Total							6E-08					0.00000
Medium Total								6E-08					0.00000
Receptor Total							Receptor Risk Total	1E-07				Receptor HI Total	0.00000

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.00000

TABLE 9.10.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 2	BENZO(A)PYRENE	6E-09	--	1E-08	--	2E-08	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	7E-10	--	1E-09	--	2E-09	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00000002	- -	0.00000003	0.00000005
			Chemical Total	7E-09	--	1E-08	--	2E-08		0.00000002	--	0.00000003	0.00000005
		Exposure Point Total						2E-08					0.00000005
	Exposure Medium Total							2E-08					0.00000005
Medium Total								2E-08					0.00000005
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	4E-08	--	- -	--	4E-08	NA	--	- -	--	--
			BENZO(A)PYRENE	3E-07	--	- -	--	3E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	5E-08	--	- -	--	5E-08	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	5E-09	--	7E-08	--	8E-08	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.000004	- -	0.000002	0.000006
			Chemical Total	5E-07	--	7E-08	--	5E-07		0.000004	--	0.000002	0.000006
		Exposure Point Total						5E-07					0.000006
	Exposure Medium Total							5E-07					0.000006
Medium Total								5E-07					0.000006
Receptor Total							Receptor Risk Total	5E-07				Receptor HI Total	0.000006

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.000006

TABLE 9.11.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 1	BENZO(A)ANTHRACENE	2E-07	--	3E-08	--	2E-07	NA	--	- -	--	--
			BENZO(A)PYRENE	2E-06	--	3E-07	--	2E-06	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	2E-07	--	3E-08	--	2E-07	NA	--	- -	--	--
			DIBENZO(A,H)ANTHRACENE	4E-07	--	5E-08	--	4E-07	NA	--	- -	--	--
			INDENO(1,2,3-CD)PYRENE	2E-07	--	2E-08	--	2E-07	NA	--	- -	--	--
			Chemical Total	3E-06	--	5E-07	--	4E-06		0.000000	--	0.000000	0.00000
		Exposure Point Total						4E-06					0.00000
	Exposure Medium Total							4E-06					0.00000
Medium Total								4E-06					0.00000
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	2E-07	--	- -	--	2E-07	NA	--	- -	--	--
			BENZO(A)PYRENE	1E-06	--	- -	--	1E-06	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	2E-07	--	- -	--	2E-07	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	2E-08	--	3E-07	--	3E-07	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00006	- -	0.00002	0.00008
			Chemical Total	2E-06	--	3E-07	--	2E-06		0.00006	--	0.00002	0.00008
		Exposure Point Total						2E-06					0.00008
	Exposure Medium Total							2E-06					0.00008
	Exposure Medium Total							- -					--
Medium Total								2E-06					0.00008
Receptor Total							Receptor Risk Total	6E-06				Receptor HI Total	0.00008

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.00008

TABLE 9.12.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 2	BENZO(A)PYRENE	8E-08	--	1E-08	--	9E-08	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	8E-09	--	1E-09	--	9E-09	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.0000008	- -	0.0000001	0.0000009
			Chemical Total	9E-08	--	1E-08	--	1E-07		0.0000008	--	0.0000001	0.0000009
		Exposure Point Total						1E-07					0.0000009
	Exposure Medium Total							1E-07					0.0000009
Medium Total								1E-07					0.0000009
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	2E-07	--	- -	--	2E-07	NA	--	- -	--	--
			BENZO(A)PYRENE	1E-06	--	- -	--	1E-06	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	2E-07	--	- -	--	2E-07	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	2E-08	--	3E-07	--	3E-07	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00006	- -	0.00002	0.00008
			Chemical Total	2E-06	--	3E-07	--	2E-06		0.00006	--	0.00002	0.00008
		Exposure Point Total						2E-06					0.00008
	Exposure Medium Total							2E-06					0.00008
Medium Total								2E-06					0.00008
Receptor Total							Receptor Risk Total	2E-06				Receptor HI Total	0.00008

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.00008

TABLE 9.13.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 1	BENZO(A)ANTHRACENE	2E-08	--	3E-09	--	2E-08	NA	--	- -	--	--
			BENZO(A)PYRENE	2E-07	--	3E-08	--	2E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	2E-08	--	3E-09	--	2E-08	NA	--	- -	--	--
			DIBENZO(A,H)ANTHRACENE	3E-08	--	5E-09	--	4E-08	NA	--	- -	--	--
			INDENO(1,2,3-CD)PYRENE	1E-08	--	2E-09	--	2E-08	NA	--	- -	--	--
			Chemical Total	3E-07	--	4E-08	--	3E-07		0.0000000	--	0.0000000	0.000000
		Exposure Point Total						3E-07					0.000000
	Exposure Medium Total							3E-07					0.000000
Medium Total								3E-07					0.000000
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	7E-08	--	- -	--	7E-08	NA	--	- -	--	--
			BENZO(A)PYRENE	6E-07	--	- -	--	6E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	8E-08	--	- -	--	8E-08	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	8E-09	--	1E-07	--	1E-07	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.0000	- -	0.0000	0.0000
			Chemical Total	7E-07	--	1E-07	--	8E-07		0.0000	--	0.0000	0.0000
		Exposure Point Total						8E-07					0.0000
	Exposure Medium Total							8E-07					0.0000
Medium Total								8E-07					0.0000
Receptor Total							Receptor Risk Total	1E-06				Receptor HI Total	0.0000

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.0000

TABLE 9.14.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 2	BENZO(A)PYRENE	7E-09	--	1E-09	--	8E-09	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	7E-10	--	1E-10	--	9E-10	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00000008	- -	0.00000001	0.00000010
			Chemical Total	8E-09	--	1E-09	--	9E-09		0.00000008	--	0.00000001	0.00000010
		Exposure Point Total						9E-09					0.00000010
	Exposure Medium Total							9E-09					0.00000010
Medium Total								9E-09					0.00000010
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	7E-08	--	- -	--	7E-08	NA	--	- -	--	--
			BENZO(A)PYRENE	6E-07	--	- -	--	6E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	8E-08	--	- -	--	8E-08	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	8E-09	--	1E-07	--	1E-07	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00003	- -	0.00001	0.00004
			Chemical Total	7E-07	--	1E-07	--	8E-07		0.00003	--	0.00001	0.00004
		Exposure Point Total						8E-07					0.00004
	Exposure Medium Total							8E-07					0.00004
Medium Total								8E-07					0.00004
Receptor Total							Receptor Risk Total	8E-07				Receptor HI Total	0.00004

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.00004

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 1	BENZO(A)ANTHRACENE	9E-08	--	7E-08	--	2E-07	NA	--	- -	--	--
			BENZO(A)PYRENE	1E-06	--	8E-07	--	2E-06	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	9E-08	--	8E-08	--	2E-07	NA	--	- -	--	--
			DIBENZO(A,H)ANTHRACENE	2E-07	--	1E-07	--	3E-07	NA	--	- -	--	--
			INDENO(1,2,3-CD)PYRENE	7E-08	--	6E-08	--	1E-07	NA	--	- -	--	--
			Chemical Total	1E-06	--	1E-06	--	3E-06		--	--	--	--
		Exposure Point Total						3E-06					--
	Exposure Medium Total							3E-06					--
Medium Total								3E-06					--
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	1E-07	--	- -	--	1E-07	NA	--	- -	--	--
			BENZO(A)PYRENE	1E-06	--	- -	--	1E-06	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	1E-07	--	- -	--	1E-07	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	1E-08	--	4E-07	--	4E-07	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00002	- -	0.00002	0.00004
			Chemical Total	1E-06	--	4E-07	--	2E-06		0.00002	--	0.00002	0.00004
		Exposure Point Total						2E-06					0.00004
	Exposure Medium Total							2E-06					0.00004
Receptor Total							Receptor Risk Total	4E-06				Receptor HI Total	0.00004

Total Body Weight HI 0.00004

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 2	BENZO(A)PYRENE	3E-08	--	3E-08	--	6E-08	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	4E-09	--	3E-09	--	7E-09	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.0000002	- -	0.0000002	0.0000003
			Chemical Total	4E-08	--	3E-08	--	7E-08		0.0000002	--	0.0000002	0.0000003
		Exposure Point Total						7E-08					0.0000003
	Exposure Medium Total							7E-08					0.0000003
Medium Total								7E-08					0.0000003
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	1E-07	--	- -	--	1E-07	NA	--	- -	--	--
			BENZO(A)PYRENE	1E-06	--	- -	--	1E-06	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	1E-07	--	- -	--	1E-07	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	1E-08	--	4E-07	--	4E-07	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00002	- -	0.00002	0.00004
			Chemical Total	1E-06	--	4E-07	--	2E-06		0.00002	--	0.00002	0.00004
		Exposure Point Total						2E-06					0.00004
	Exposure Medium Total							2E-06					0.00004
Medium Total								2E-06					0.00004
Receptor Total							Receptor Risk Total	2E-06				Receptor HI Total	0.00004

Total Body Weight HI 0.00004

TABLE 9.3.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 1	BENZO(A)ANTHRACENE	7E-09	--	3E-09	--	9E-09	NA	--	- -	--	--
			BENZO(A)PYRENE	8E-08	--	3E-08	--	1E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	7E-09	--	3E-09	--	1E-08	NA	--	- -	--	--
			DIBENZO(A,H)ANTHRACENE	1E-08	--	5E-09	--	2E-08	NA	--	- -	--	--
			INDENO(1,2,3-CD)PYRENE	6E-09	--	2E-09	--	8E-09	NA	--	- -	--	--
			Chemical Total	1E-07	--	4E-08	--	2E-07		--	--	--	--
		Exposure Point Total						2E-07					--
	Exposure Medium Total							2E-07					--
Subsurface Soil	Subsurface Soil	Decision Unit 1	BENZENE	2E-10	--	- -	--	2E-10	Blood	0.00007	- -	--	0.00007
			BENZO(A)ANTHRACENE	4E-10	--	2E-10	--	6E-10	NA	--	- -	--	--
			BENZO(A)PYRENE	3E-09	--	1E-09	--	4E-09	NA	--	- -	--	--
			Chemical Total	4E-09	--	1E-09	--	5E-09		0.00007	--	--	0.00007
		Exposure Point Total						5E-09					0.00007
	Exposure Medium Total							5E-09					0.00007
	Air	Decision Unit 1	BENZENE	--	5E-08	--	--	5E-08	Blood	- -	0.02	- -	0.02
			BENZO(A)ANTHRACENE	--	3E-12	--	--	3E-12	NA	- -	--	- -	--
			BENZO(A)PYRENE	--	2E-11	--	--	2E-11	NA	- -	--	- -	--
			Chemical Total	--	5E-08	--	--	5E-08		- -	0.02	- -	0.02
		Exposure Point Total						5E-08					0.02
	Exposure Medium Total							5E-08					0.02
Medium Total								6E-08					0.02
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	- -	--	- -	--	- -	NA	--	- -	--	--
			BENZO(A)PYRENE	- -	--	- -	--	- -	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	- -	--	- -	--	- -	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	- -	--	5E-09	--	5E-09	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	--	- -	0.000005	0.000005
			Chemical Total	- -	--	5E-09	--	5E-09		--	--	0.000005	0.000005
		Exposure Point Total						5E-09					0.000005
	Exposure Medium Total							5E-09					0.000005
Medium Total								5E-09					0.000005
Receptor Total							Receptor Risk Total	2E-07				Receptor HI Total	0.02

Total Blood HI	0.02
Total Body Weight HI	0.000005

TABLE 9.4.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 2	BENZO(A)PYRENE	3E-09	--	1E-09	--	4E-09	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	3E-10	--	1E-10	--	4E-10	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.0000004	- -	0.0000001	0.0000005
			Chemical Total	3E-09	--	1E-09	--	4E-09		0.0000004	--	0.0000001	0.0000005
		Exposure Point Total						4E-09					0.0000005
	Exposure Medium Total							4E-09					0.0000005
Medium Total								4E-09					0.0000005
Subsurface Soil	Subsurface Soil	Decision Unit 2	BENZO(A)ANTHRACENE	8E-09	--	3E-09	--	1E-08	NA	--	- -	--	--
			BENZO(A)PYRENE	2E-08	--	1E-08	--	3E-08	NA	--	- -	--	--
			Chemical Total	3E-08	--	1E-08	--	5E-08		--	--	--	--
		Exposure Point Total						5E-08					--
	Exposure Medium Total							5E-08					--
Medium Total								5E-08					--
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	- -	--	- -	--	- -	NA	--	- -	--	--
			BENZO(A)PYRENE	- -	--	- -	--	- -	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	- -	--	- -	--	- -	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	- -	--	5E-09	--	5E-09	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	--	- -	0.000005	0.000005
			Chemical Total	- -	--	5E-09	--	5E-09		--	--	0.000005	0.000005
		Exposure Point Total						5E-09					0.000005
	Exposure Medium Total							5E-09					0.000005
Medium Total								5E-09					0.000005
Receptor Total							Receptor Risk Total	5E-08				Receptor HI Total	0.000006

Total Body Weight HI 0.000006

TABLE 9.5.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 1	BENZO(A)ANTHRACENE	2E-08	--	2E-08	--	4E-08	NA	--	- -	--	--
			BENZO(A)PYRENE	2E-07	--	2E-07	--	4E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	2E-08	--	2E-08	--	4E-08	NA	--	- -	--	--
			DIBENZO(A,H)ANTHRACENE	4E-08	--	4E-08	--	7E-08	NA	--	- -	--	--
			INDENO(1,2,3-CD)PYRENE	2E-08	--	2E-08	--	3E-08	NA	--	- -	--	--
			Chemical Total	3E-07	--	3E-07	--	6E-07		0.0000000	--	0.0000000	0.0000000
		Exposure Point Total						6E-07					0.0000000
	Exposure Medium Total							6E-07					0.0000000
Medium Total								6E-07					0.0000000
Receptor Total							Receptor Risk Total	6E-07				Receptor HI Total	0.0000000

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.0000000

TABLE 9.6.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 2	BENZO(A)PYRENE	8E-09	--	8E-09	--	2E-08	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	8E-10	--	8E-10	--	2E-09	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00000003	- -	0.00000003	0.00000006
			Chemical Total	9E-09	--	9E-09	--	2E-08		0.00000003	--	0.00000003	0.00000006
		Exposure Point Total						2E-08					0.00000006
	Exposure Medium Total							2E-08					0.00000006
Medium Total								2E-08					0.00000006
Receptor Total							Receptor Risk Total	2E-08				Receptor HI Total	0.00000006

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.00000006

TABLE 9.7.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 1	BENZO(A)ANTHRACENE	1E-07	--	9E-08	--	2E-07	NA	--	- -	--	--
			BENZO(A)PYRENE	1E-06	--	1E-06	--	2E-06	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	1E-07	--	1E-07	--	2E-07	NA	--	- -	--	--
			DIBENZO(A,H)ANTHRACENE	- -	--	- -	--	- -	NA	--	- -	--	--
			INDENO(1,2,3-CD)PYRENE	- -	--	- -	--	- -	NA	--	- -	--	--
			Chemical Total	1E-06	--	1E-06	--	3E-06		0.000000	--	0.000000	0.000000
		Exposure Point Total						3E-06					0.000000
	Exposure Medium Total							3E-06					0.000000
Medium Total								3E-06					0.000000
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	1E-07	--	- -	--	1E-07	NA	--	- -	--	--
			BENZO(A)PYRENE	1E-06	--	- -	--	1E-06	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	2E-07	--	- -	--	2E-07	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	2E-08	--	9E-08	--	1E-07	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00002	- -	0.000003	0.00002
			Chemical Total	2E-06	--	9E-08	--	2E-06		0.00002	--	0.000003	0.00002
		Exposure Point Total						2E-06					0.00002
	Exposure Medium Total							2E-06					0.00002
Medium Total								2E-06					0.00002
Receptor Total							Receptor Risk Total	4E-06				Receptor HI Total	0.00002

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.00002

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 2	BENZO(A)PYRENE	4E-08	--	4E-08	--	8E-08	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	5E-09	--	4E-09	--	8E-09	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.0000002	- -	0.0000002	0.0000003
			Chemical Total	5E-08	--	4E-08	--	9E-08		0.0000002	--	0.0000002	0.0000003
		Exposure Point Total						9E-08					0.0000003
	Exposure Medium Total							9E-08					0.0000003
Medium Total								9E-08					0.0000003
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	1E-07	--	- -	--	1E-07	NA	--	- -	--	--
			BENZO(A)PYRENE	1E-06	--	- -	--	1E-06	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	2E-07	--	- -	--	2E-07	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	2E-08	--	9E-08	--	1E-07	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00002	- -	0.000003	0.00002
			Chemical Total	2E-06	--	9E-08	--	2E-06		0.00002	--	0.000003	0.00002
		Exposure Point Total						2E-06					0.00002
	Exposure Medium Total							2E-06					0.00002
Medium Total								2E-06					0.00002
Receptor Total							Receptor Risk Total	2E-06				Receptor HI Total	0.00002

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.00002

TABLE 9.9.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 1	BENZO(A)ANTHRACENE	2E-08	--	3E-08	--	4E-08	NA	--	- -	--	--
			BENZO(A)PYRENE	2E-07	--	3E-07	--	5E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	2E-08	--	3E-08	--	5E-08	NA	--	- -	--	--
			DIBENZO(A,H)ANTHRACENE	- -	--	- -	--	- -	NA	--	- -	--	--
			INDENO(1,2,3-CD)PYRENE	- -	--	- -	--	- -	NA	--	- -	--	--
			Chemical Total	2E-07	--	3E-07	--	6E-07		0.000000	--	0.000000	0.000000
		Exposure Point Total						6E-07					0.000000
	Exposure Medium Total							6E-07					0.000000
Medium Total								6E-07					0.000000
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	4E-08	--	- -	--	4E-08	NA	--	- -	--	--
			BENZO(A)PYRENE	3E-07	--	- -	--	3E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	5E-08	--	- -	--	5E-08	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	5E-09	--	7E-08	--	8E-08	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.000004	- -	0.000002	0.00001
			Chemical Total	5E-07	--	7E-08	--	5E-07		0.000004	--	0.000002	0.00001
		Exposure Point Total						5E-07					0.00001
	Exposure Medium Total							5E-07					0.00001
Medium Total								5E-07					0.00001
Receptor Total							Receptor Risk Total	1E-06				Receptor HI Total	0.00001

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.00001

TABLE 9.10.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 2	BENZO(A)PYRENE	6E-09	--	1E-08	--	2E-08	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	7E-10	--	1E-09	--	2E-09	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00000002	- -	0.00000003	0.00000005
			Chemical Total	7E-09	--	1E-08	--	2E-08		0.00000002	--	0.00000003	0.00000005
		Exposure Point Total						2E-08					0.00000005
	Exposure Medium Total							2E-08					0.00000005
Medium Total								2E-08					0.00000005
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	4E-08	--	- -	--	4E-08	NA	--	- -	--	--
			BENZO(A)PYRENE	3E-07	--	- -	--	3E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	5E-08	--	- -	--	5E-08	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	5E-09	--	7E-08	--	8E-08	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.000004	- -	0.000002	0.000006
			Chemical Total	5E-07	--	7E-08	--	5E-07		0.000004	--	0.000002	0.000006
		Exposure Point Total						5E-07					0.000006
	Exposure Medium Total							5E-07					0.000006
Medium Total								5E-07					0.000006
Receptor Total							Receptor Risk Total	5E-07				Receptor HI Total	0.000006

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.000006

TABLE 9.11.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 1	BENZO(A)ANTHRACENE	1E-06	--	5E-07	--	2E-06	NA	--	- -	--	--
			BENZO(A)PYRENE	2E-05	--	6E-06	--	2E-05	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	2E-06	--	6E-07	--	2E-06	NA	--	- -	--	--
			DIBENZO(A,H)ANTHRACENE	3E-06	--	1E-06	--	4E-06	NA	--	- -	--	--
			INDENO(1,2,3-CD)PYRENE	1E-06	--	4E-07	--	2E-06	NA	--	- -	--	--
			Chemical Total	2E-05	--	8E-06	--	3E-05		0	--	0	0
		Exposure Point Total						3E-05					0
	Exposure Medium Total							3E-05					0
Medium Total								3E-05					0
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	2E-06	--	- -	--	2E-06	NA	0	--	0	0
			BENZO(A)PYRENE	1E-05	--	- -	--	1E-05	NA	0	--	0	0
			BENZO(B)FLUORANTHENE	2E-06	--	- -	--	2E-06	NA	0	--	0	0
			BENZO(K)FLUORANTHENE	2E-07	--	1E-06	--	1E-06	NA	0	--	0	0
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00019274	--	4.0807E-05	0.000233547
			Chemical Total	2E-05	--	1E-06	--	2E-05		0.00019274	--	4.0807E-05	0.000233547
		Exposure Point Total						2E-05					0.0002
	Exposure Medium Total							2E-05					0.0002
Medium Total								2E-05					0.0002
Receptor Total							Receptor Risk Total	5E-05				Receptor HI Total	0.0002

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.0002

TABLE 9.12.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 2	BENZO(A)PYRENE	6E-07	--	2E-07	--	8E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	6E-08	--	2E-08	--	8E-08	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.000002	- -	0.0000009	0.000003
			Chemical Total	6E-07	--	2E-07	--	9E-07		0.000002	--	0.0000009	0.000003
		Exposure Point Total						9E-07					0.000003
	Exposure Medium Total							9E-07					0.000003
Medium Total								9E-07					0.000003
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	2E-06	--	- -	--	2E-06	NA	--	- -	--	--
			BENZO(A)PYRENE	1E-05	--	- -	--	1E-05	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	2E-06	--	- -	--	2E-06	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	2E-07	--	1E-06	--	1E-06	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.0002	- -	0.00004	0.0002
			Chemical Total	2E-05	--	1E-06	--	2E-05		0.0002	--	0.00004	0.0002
		Exposure Point Total						2E-05					0.0002
	Exposure Medium Total							2E-05					0.0002
Medium Total								2E-05					0.0002
Receptor Total							Receptor Risk Total	2E-05				Receptor HI Total	0.0002

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.0002

TABLE 9.13.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 1	BENZO(A)ANTHRACENE	2E-07	--	1E-07	--	3E-07	NA	--	- -	--	--
			BENZO(A)PYRENE	2E-06	--	1E-06	--	4E-06	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	2E-07	--	1E-07	--	4E-07	NA	--	- -	--	--
			DIBENZO(A,H)ANTHRACENE	4E-07	--	2E-07	--	6E-07	NA	--	- -	--	--
			INDENO(1,2,3-CD)PYRENE	2E-07	--	9E-08	--	3E-07	NA	--	- -	--	--
			Chemical Total	3E-06	--	2E-06	--	5E-06		0.000000	--	0.000000	0.000000
		Exposure Point Total						5E-06					0.000000
	Exposure Medium Total							5E-06					0.000000
Medium Total								5E-06					0.000000
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	6E-07	--	- -	--	6E-07	NA	--	- -	--	--
			BENZO(A)PYRENE	5E-06	--	- -	--	5E-06	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	7E-07	--	- -	--	7E-07	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	7E-08	--	1E-06	--	1E-06	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00006	- -	0.00002	0.00008
			Chemical Total	6E-06	--	1E-06	--	7E-06		0.00006	--	0.00002	0.00008
		Exposure Point Total						7E-06					0.00008
	Exposure Medium Total							7E-06					0.00008
Medium Total								7E-06					0.00008
Receptor Total							Receptor Risk Total	1E-05				Receptor HI Total	0.00008

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.00008

TABLE 9.14.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
SWMU 32 FORMER FUEL OIL TANK FARM, NSA CRANE, CRANE INDIANA

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Decision Unit 2	BENZO(A)PYRENE	9E-08	--	4E-08	--	1E-07	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	9E-09	--	5E-09	--	1E-08	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.0000003	- -	0.0000001	0.0000004
			Chemical Total	9E-08	--	5E-08	--	1E-07		0.0000003	--	0.0000001	0.0000004
		Exposure Point Total						1E-07					0.0000004
	Exposure Medium Total							1E-07					0.0000004
Medium Total								1E-07					0.0000004
Groundwater	Groundwater	SWMU 32	BENZO(A)ANTHRACENE	6E-07	--	- -	--	6E-07	NA	--	- -	--	--
			BENZO(A)PYRENE	5E-06	--	- -	--	5E-06	NA	--	- -	--	--
			BENZO(B)FLUORANTHENE	7E-07	--	- -	--	7E-07	NA	--	- -	--	--
			BENZO(K)FLUORANTHENE	7E-08	--	1E-06	--	1E-06	NA	--	- -	--	--
			NAPHTHALENE	- -	--	- -	--	- -	Body Weight	0.00006	- -	0.00002	0.00008
			Chemical Total	6E-06	--	1E-06	--	7E-06		0.00006	--	0.00002	0.00008
		Exposure Point Total						7E-06					0.00008
	Exposure Medium Total							7E-06					0.00008
Medium Total								7E-06					0.00008
Receptor Total							Receptor Risk Total	7E-06				Receptor HI Total	0.00008

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI 0.00008

EXAMPLE CALCULATION

Calculation Worksheet

CLIENT: NSA Crane		Job Number: 02111
SUBJECT: Calculation of DA Event		
BASED ON: USEPA, DECEMBER 1989		
BY: A.M. CHRISTIAN	CHECKED BY: [illegible]	DATE: 1-10-11

PURPOSE: Example Calculation of DA Event for Benzo(k)fluoranthene and Naphthalene

$$If\ tevent \le t^*, then: DAevent = 2 \times FA \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times tau \times tevent}{\pi}}$$

$$If\ tevent > t^*, then: DAevent = FA \times Kp \times Cw \times CF \times \left[\frac{tevent}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right]$$

DAevent = :		Chemical specific absorbed dose per event (mg/cm^2-event)
Cw = :		Concentration of chemical in water (ug/L)
tevent = :	0.25	duration of event (hr/event)
tau = :		Chemical specific lag time (hr)
t* = :		Chemical specific time it takes to reach steady state (hr)
B = :		Chemical specific dimensionless constant
Kp = :		Chemical specific permeability constant (cm/hr)
CF = :	1.0E-06	(L/cm3)(mg/ug)
FA = :		Fraction absorbed (dimensionless)

Example Calculation Benzo(K)Fluoranthene

Cw = :	0.0562	ug/L
tevent = :	0.25	hr/event
tau = :	2.72	hr
t* = :	11.7	hr
B = :	4.03	
Kp = :	0.66	cm/hr
CF = :	1.0E-06	(L/cm3)(mg/ug)
FA = :	1	

DA = 2 X 1 X 0.66 (cm/hr) X 0.0562 (ug/L) X 0.000001 (L/cm3)(mg/ug)X sqrt(6 X 2.72 hr X 0.25hr/event)/π)

DA = 8.5E-08 (mg/cm2-event)

Example Calculation Naphthalene

Cw = :	0.0402	ug/L
tevent = :	0.25	hr/event
tau = :	0.558	hr
t* = :	1.34	hr
B = :	0.203	
Kp = :	0.0466	cm/hr
CF = :	1.0E-06	(L/cm3)(mg/ug)
FA = :	1	

DA = 2 X 1 X 0.0466 (cm/hr) X 0.0402 (ug/L) X 0.000001 (L/cm3)(mg/ug)X sqrt(6 X 0.558 hr X 0.25hr/event)/π)

DA = 1.9E-09 (mg/cm2-event)

Calculation Worksheet

CLIENT: NSA Crane		Job Number: 02111
SUBJECT: Calculation of intake/risk from ingestion associated with SWMU 32 groundwater Industrial Worker		
BASED ON: USEPA, DECEMBER 1989		
BY: A.M. CHRISTIAN	CHECKED BY: Jeanne Dan	DATE: 1-10-11

PURPOSE: To estimate intake, carcinogenic risk and noncarcinogenic hazard index from incidental ingestion of SWMU 32 Groundwater

EQUATIONS:

Intakes: Intake Factor (IF) = $\frac{Cw \times IRG \times CF \times EF \times ED}{BW \times AT}$

Risks:

Incremental lifetime cancer risk (ILCR) = IFc X CSFo

Hazard Index:

Hazard Quotient (HQ, noncancer) = IFn/ RfDo

Where:

IFc	=	intake factor for calculating cancer risks (mg/kg-day)
IFn	=	intake factor for calculating noncancer hazard indices (mg/kg-day)
IRG	=	incidental groundwater ingestion rate (L/day)
CF	=	conversion factor (0.001 mg/ug)
EF	=	exposure frequency (days/year)
ED	=	exposure duration used to evaluate noncancer effects (years)
BW	=	body weight (kg)
ATc	=	averaging time for calculating cancer risks (days)
ATn	=	averaging time for calculating noncancer hazard index (days)
Intake-c	=	intake for calculating cancer risks (mg/kg-day)
Intake-n	=	intake for calculating noncancer hazard indices (mg/kg-day)
Cw	=	Chemical concentration in groundwater (ug/L)
CSFo	=	oral carcinogenic slope factor ($(mg/kg/day)^{-1}$)
RfDo	=	oral noncarcinongenic reference dose (mg/kg/day)

ASSUMPTIONS:

Cw	=	0.047	ug/L	Chemical: Benzo(a)anthracene
Cw	=	0.04	ug/L	Chemical: Naphthalene
IRG	=	1	L/day	
CF	=	1.00E-03	mg/ug	
EF	=	250	days/year	
ED	=	25	years	
BW	=	70	kg	
AT_C	=	25550	days	
ATn	=	9125	days	
CSFo	=	7.30E-01	$(mg/kg/day)^{-1}$	Chemical: Benzo(a)anthracene
RfDo	=	2.00E-02	mg/kg/day	Chemical: Naphthalene

Calculation Worksheet

CLIENT: NSA Crane		**Job Number:** 02111
SUBJECT: Calculation of intake/risk from ingestion associated with SWMU 32 groundwater Industrial Worker		
BASED ON: USEPA, DECEMBER 1989		
BY: A.M. CHRISTIAN	**CHECKED BY:** Leanna Sanor	**DATE:** 1-10-11

Example Cancer Risk Calculation

Chemical: Benzo(a)anthracene

$$IFc = \frac{0.047\ ug/L \times 0.001\ mg/ug \times 1\ L/day \times 250\ days/year \times 25\ years}{70\ kg \times 25550\ days}$$

IFc = 1.6E-07 mg/kg/day

ILCR = 1.6E-07 mg/kg/day X .73 $(mg/kg/day)^{-1}$

ILCR = 1.2E-07

Example Noncancer Risk Calculation

Chemical: Naphthalene

$$IFn = \frac{0.04\ ug/L \times 0.001\ mg/ug \times 1\ L/day \times 250\ days/year \times 25\ years}{70\ kg \times 9125\ days}$$

IFn = 3.9E-07 mg/kg/day

$$HQ = \frac{3.9E\text{-}7\ mg/kg/day}{0.02\ mg/kg/day}$$

HQ = 0.00002

Calculation Worksheet

CLIENT: NSA Crane		Job Number: 02111
SUBJECT: Calculation of intake/risk from dermal contact associated with SWMU 32 groundwater		
BASED ON: USEPA, DECEMBER 1989		
BY: A.M. CHRISTIAN	CHECKED BY: Joanne Dao	DATE: 1-10-11

PURPOSE: To estimate intake, carcinogenic risks and noncarcinogenic hazard index from dermal contact with groundwater

EQUATIONS:

Intakes:

Intake Factor (IF) = $\frac{SA \times EV \times EF \times ED}{BW \times AT}$

Intake-c = [DAevent X IFc (6-16 years) X ADAF1] + [DAevent X IFc (16-30 years) X ADAF2]

Intake-n = IF X DAevent

Risks:

Incremental lifetime cancer risk (ILCR) = Intake-c X CSFd

Hazard Index:

Hazard Quotient (HQ, noncancer) = Intake-n / RfDd

Where:

IFc	=	intake factor for calculating cancer risks (mg/kg/day)
IFn	=	intake factor for calculating noncancer hazard indicies (mg/kg/day)
SA	=	skin available for contact (cm^2)
EV	=	event frequency (events/day)
EF	=	exposure frequency (days/year)
ED1	=	exposure duration in 6-16 year age group (years)
ED2	=	exposure duration in 16-30 year age group (years)
EDn	=	ED1 + ED2, exposure duration used to evaluate noncancer effects (years)
BW	=	body weight (kg)
ATc	=	averaging time for calculating cancer risks (days)
ATn	=	averaging time for calculating noncancer hazard index (days)
Intake-c	=	intake for calculating cancer risks (mg/kg-day)
Intake-n	=	intake for calculating noncancer hazard indices (mg/kg-day)
DAevent	=	Dermally Absorbed Dose per Event (mg/cm^2-event)
ADAF1	=	Age Dependent Adjustment Factor age 6-16
ADAF2	=	Age Dependent Adjustment Factor age 16-30
CSFd	=	dermal carcinogenic slope factor ($(mg/kg/day)^{-1}$)
RfDd	=	dermal noncarcinongenic reference dose (mg/kg/day)

ASSUMPTIONS:

DAevent	=	8.454E-08 mg/cm^2-event	Chemical: Benzo(k)fluoranthene
DAevent	=	1.934E-09 mg/cm^2-event	Chemical: Naphthalene
SA	=	9070 cm^2	
EV	=	1 event/day	
EF	=	52 days/year	
ED1	=	10 years	
ED2	=	14 years	
EDn	=	24 years	
BW	=	70 kg	
AT_C	=	25550 days	
ATn	=	8760 days	
ADAF1	=	3	
ADAF2	=	1	
CSFd	=	7.30E-02 $(mg/kg/day)^{-1}$	
RfDd	=	2.00E-02 mg/kg/day	

Example Cancer Risk Calculation

Chemical: Benzo(k)fluoranthene

IFc (age 6-16) = $\frac{9070\ cm^2 \times 1\ event/day \times 52\ days/year \times 10\ years}{70\ kg \times 25550\ days}$

Calculation Worksheet

CLIENT: NSA Crane		Job Number: 02111
SUBJECT: Calculation of intake/risk from dermal contact associated with SWMU 32 groundwater		
BASED ON: USEPA, DECEMBER 1989		
BY: A.M. CHRISTIAN	CHECKED BY: Jeanne Sass	DATE: 1-10-11

IFc (age 6-16) = 2.64E+00 cm^2/kg-day

$$IFc\ (age\ 16\text{-}30) = \frac{9070\ cm^2 \times 1\ event/day \times 52\ days/year \times 14\ years}{70\ kg \times 25550\ days}$$

IFc (age 16-30) = 3.69E+00 cm^2/kg-day

Intake-c = [8.45E-08 mg/cm2-event X 2.64 cm2/kg-day X 3] + [8.45E-08 mg/cm2-event X 3.69 cm2/kg-day X 1]

Intake-c = 9.8E-07 mg/kg-day

ILCR = 9.8E-07 mg/kg/day X 0.073 $(mg/kg/day)^{-1}$

ILCR = 7.2E-08

Example Noncancer Risk Calculation

Chemical: Naphthalene

$$IFn = \frac{9070\ cm^2 \times 1\ event/day \times 52\ days/year \times 24\ years}{70\ kg \times 8760\ days}$$

IFn = 1.85E+01 cm^2/kg-day

Intake-n = 18.5 cm^2/kg-day x 1.93E-09 mg/cm^2-event

Intake-n = 3.57E-08 mg/kg/day

$$HQ = \frac{3.57\ E\text{-}08\ mg/kg/day}{0.02\ mg/kg/day}$$

HQ = 0.000002

Calculation Worksheet

CLIENT: NSA Crane		Job Number: 02111
SUBJECT: Calculation of intake/risk from ingestion associated with surface soil in Decision Unit 2 Adolescent Tresspasser		
BASED ON: USEPA, DECEMBER 1989		
BY: A.M. CHRISTIAN	CHECKED BY: Leanne Gamon	DATE: 1-10-11

PURPOSE: To estimate intake, carcinogenic risk and noncarcinogenic hazard index from incidental ingestion of surface soil from Decision Unit 2

EQUATIONS:

Intakes:

Intake Factor c (IF) $\frac{Cs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT} \times ADAF$

Intake Factor n (IF) $\frac{Cs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$

Risks:

Incremental lifetime cancer risk (ILCR) = IFc X CSFo

Hazard Index:

Hazard Quotient (HQ, noncancer) = IFn/ RfDo

Where:

IFc	=	intake factor for calculating cancer risks (mg/kg-day)
IFn	=	intake factor for calculating noncancer hazard indices (mg/kg-day)
IRS	=	incidental soil ingestion rate (mg/day)
CF3	=	conversion factor (1E-06 kg/mg)
FI	=	fraction ingested from contaminated source (unitless)
EF	=	exposure frequency (days/year)
ED	=	exposure duration used to evaluate noncancer effects (years)
BW	=	body weight (kg)
ATc	=	averaging time for calculating cancer risks (days)
ATn	=	averaging time for calculating noncancer hazard index (days)
Intake-c	=	intake for calculating cancer risks (mg/kg-day)
Intake-n	=	intake for calculating noncancer hazard indices (mg/kg-day)
Cs	=	Chemical concentration in soil (mg)
ADAF	=	Age Dependent Adjustment Factor (6-16 years)
CSFo	=	oral carcinogenic slope factor ($(mg/kg/day)^{-1}$)
RfDo	=	oral noncarcinongenic reference dose (mg/kg/day)

ASSUMPTIONS:

Cs	=	0.014 mg/kg	Chemical: Benzo(a)pyrene
Cs	=	0.004 mg/kg	Chemical: Naphthalene
IRS	=	100 mg/day	
CF3	=	1.00E-06 kg/mg	
FI	=	1	
EF	=	26 days/year	
ED	=	11 years	
BW	=	43 kg	
AT_C	=	25550 days	
ATn	=	4015 days	
ADAF	=	3	
CSFo	=	7.30E+00 $(mg/kg/day)^{-1}$	Chemical: Benzo(a)pyrene
RfDo	=	2.00E-02 mg/kg/day	Chemical: Naphthalene

Calculation Worksheet

CLIENT: NSA Crane		Job Number: 02111
SUBJECT: Calculation of intake/risk from ingestion associated with surface soil in Decision Unit 2 Adolescent Tresspasser		
BASED ON: USEPA, DECEMBER 1989		
BY: A.M. CHRISTIAN	CHECKED BY: Leanne Brown	DATE: 1-10-11

Example Cancer Risk Calculation

Chemical: Benzo(a)pyrene

$$IFc = \frac{0.014\ mg/kg \times 100\ mg/day \times 1E\text{-}06\ kg/mg \times 1 \times 26\ days/year \times 11\ years \times 3}{43\ kg \times 25550\ days}$$

IFc = 1.1E-09 mg/kg/day

ILCR = 1.1E-9 mg/kg/day X 7.3 $(mg/kg/day)^{-1}$

ILCR = 7.98E-09

Example Noncancer Risk Calculation

Chemical:

$$IFn = \frac{0.004\ mg/kg \times 100\ mg/day \times 1E\text{-}06\ kg/mg \times 1 \times 26\ days/year \times 11\ years}{43\ kg \times 4015\ days}$$

IFn = 6.6E-10 mg/kg/day

$$HQ = \frac{6.6E\text{-}10\ mg/kg/day}{0.02\ mg/kg/day}$$

HQ = 3.3E-08

Calculation Worksheet

CLIENT: NSA Crane		Job Number: 02111
SUBJECT: Calculation of intake/risk from dermal contact associated with surface soil in Decision Unit 2 Child Resident		
BASED ON: USEPA, DECEMBER 1989		
BY: A.M. CHRISTIAN	CHECKED BY: [signature]	DATE: 1-10-11

PURPOSE: To estimate intake, carcinogenic risks and noncarcinogenic hazard index from dermal contact with Decision Unit 2 surface soil.

EQUATIONS:

Intakes:

Intake Factor (IF) = $\frac{CF3 \times SA \times SSAF \times EV \times EF \times ED}{BW \times AT}$

Intake-c = [Cs X IFc (0-2 years) X DABS X ADAF1] + [Cs X IFc (2-6 years) X DABS X ADAF2]

Intake-n = Cs X IFn X DABS

Risks:

Incremental lifetime cancer risk (ILCR) = Intake-c X CSFd

Hazard Index:

Hazard Quotient (HQ, noncancer) = Intake-n / RfDd

Where:

IFc	=	intake factor for calculating cancer risks (mg/kg/day)
IFn	=	intake factor for calculating noncancer hazard indicies (mg/kg/day)
CF3	=	conversion factor (1E-06 kg/mg)
SA	=	skin available for contact (cm^2)
SSAF	=	soil to skin adherence factor (mg/cm^2/event)
EV	=	event frequency (events/day)
EF	=	exposure frequency (days/year)
ED1	=	exposure duration in 0-2 year age group (years)
ED2	=	exposure duration in 2-6 year age group (years)
EDn	=	ED1 + ED2, exposure duration used to evaluate noncancer effects (years)
BW	=	body weight (kg)
ATc	=	averaging time for calculating cancer risks (days)
ATn	=	averaging time for calculating noncancer hazard index (days)
Intake-c	=	intake for calculating cancer risks (mg/kg-day)
Intake-n	=	intake for calculating noncancer hazard indices (mg/kg-day)
Cs	=	chemical concentration in soil (mg/kg)
ADAF1	=	Age Dependent Adjustment Factor age 0-2
ADAF2	=	Age Dependent Adjustment Factor age 2-6
DABS	=	dermal absorption factor (mg-absorbed/mg-contacted)
CSFd	=	dermal carcinogenic slope factor ($(mg/kg/day)^{-1}$)
RfDd	=	dermal noncarcinongenic reference dose (mg/kg/day)

ASSUMPTIONS:

Cs	=	0.014 mg/kg	Chemical: Benzo(a)pyrene
Cs	=	0.004 mg/kg	Chemical: Naphthalene
CF3	=	1.00E-06 kg/mg	
SA	=	2800 cm^2	
SSAF	=	0.2 mg/cm^2/event	
EV	=	1 event/day	
EF	=	350 days/year	
ED1	=	2 years	
ED2	=	4 years	
EDn	=	6 years	
BW	=	15 kg	
AT_c	=	25550 days	
ATn	=	2190 days	
ADAF1	=	10	
ADAF2	=	3	
DABS	=	0.13	
CSFd	=	7.30E+00 $(mg/kg/day)^{-1}$	
RfDd	=	2.00E-02 mg/kg/day	

Calculation Worksheet

CLIENT: NSA Crane		Job Number: 02111
SUBJECT: Calculation of intake/risk from dermal contact associated with surface soil in Decision Unit 2 Child Resident		
BASED ON: USEPA, DECEMBER 1989		
BY: A.M. CHRISTIAN	CHECKED BY: Jeanne Dwyer	DATE: 1-10-11

Example Cancer Risk Calculation

Chemical: Benzo(a)pyrene

$$IFc\ (age\ 0\text{-}2) = \frac{1E\text{-}06\ kg/mg \times 2800\ cm^2 \times 0.2\ mg/cm^2/event \times 1\ event/day \times 350\ days/year \times 2\ years}{15\ kg \times 25550\ days}$$

IFc (age 0-2) = 1.00E-06 kg/kg-day

$$IFc\ (age\ 2\text{-}6) = \frac{1E\text{-}06\ kg/mg \times 2800\ cm^2 \times 0.2\ mg/cm^2/event \times 1\ event/day \times 350\ days/year \times 4\ years}{15\ kg \times 25550\ days}$$

IFc (age 2-6) = 2.05E-06 kg/kg-day

Intake-c = [0.014 mg/kg X 1.0E-06 $days^{-1}$ X 0.13 X 10] + [0.014 mg/kg X 2.1E-06 days-1 X 0.13 X 3]

Intake-c = 2.9E-08 mg/kg/day

ILCR = 2.9E-08 mg/kg/day X 7.3 $(mg/kg/day)^{-1}$

ILCR = 2.10E-07

Example Noncancer Risk Calculation

Chemical: Naphthalene

$$IFn = \frac{1E\text{-}06\ kg/mg \times 2800\ cm^2 \times 0.2\ mg/cm^2/event \times 1\ event/day \times 350\ days/year \times 6\ years}{15\ kg \times 2190\ days}$$

IFn = 3.58E-05 kg/kg-day

Intake-n = [0.004 mg/kg X 3.6E-05 kg/kg-day x 0.13]

Intake-n = 1.86E-08 mg/kg/day

$$HQ = \frac{1.86\ E\text{-}08\ mg/kg/day}{0.02\ mg/kg/day}$$

HQ = 0.0000009

Calculation Worksheet

CLIENT: NSA Crane		Job Number: 02111
SUBJECT: Calculation of intake/risk from inhalation associated with subsurface soil in Decision Unit 1 Construction Worker		
BASED ON: USEPA, DECEMBER 1989		
BY: A.M. CHRISTIAN	CHECKED BY: Leanne Dawn	DATE: 1-10-11

PURPOSE: To estimate exposure concentrations, carcinogenic risk and noncarcinogenic hazard index from inhalation of chemicals emitted from subsurface soil to outdoor air from Decision Unit 1

EQUATIONS:

Exposure Concentration:

$$EC = \frac{CA \times ET \times EF \times ED}{24 \text{ hours/day} \times AT}$$

$$CA = Cs \times ((1/PEF) + (1/VF))$$

Risks:

Incremental lifetime cancer risk (ILCR) = EC X IUR X CF1

Hazard Index:

Hazard Quotient (HQ, noncancer) = EC-n / RfCi

Where:

IFc	=	intake factor for calculating cancer risks
IFn	=	intake factor for calculating noncancer hazard indicies
ET	=	exposure time (hours/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration
ATc	=	averaging time for calculating cancer risks (days)
ATn	=	averaging time for calculating noncancer hazard index (days)
CA	=	calculated chemcial concentration in air (mg/m^3)
Cs	=	chemical concentration in soil (mg)
VF	=	Volatilization Factor (m^3/kg)
PEF	=	Particulate Emission Factor (m^3/kg)
IUR	=	inhalation unit risk $(ug/m^3)^{-1}$
RfCi	=	inhalation reference concentration (mg/m^3)
CF1	=	conversion factor (1000 ug/mg)

ASSUMPTIONS:

Cs	=	0.144 mg/kg	Chemical:Benzene
ET	=	8 hours/day	
EF	=	150 days/year	
ED	=	1 year	
AT_C	=	25550 days	
ATn	=	365 days	
VF	=	40.8 m^3/kg	
PEF	=	1.49E+06 m^3/kg	
CF1	=	1.0E+03 ug/mg	
IUR	=	7.80E-06 $(ug/m^3)^{-1}$	
RfCi	=	3.00E-02 mg/m^3	

Calculation Worksheet

CLIENT: NSA Crane		Job Number: 02111
SUBJECT: Calculation of intake/risk from inhalation associated with subsurface soil in Decision Unit 1 Construction Worker		
BASED ON: USEPA, DECEMBER 1989		
BY: A.M. CHRISTIAN	CHECKED BY: [signature]	DATE: 1-10-11

Example Cancer Risk Calculation:

CA = (1/1.49E6 m^3/kg + 1/40.8 m^3/kg) x 0.144 mg/kg

CA = 0.0035 (mg/m^3)

$$EC = \frac{0.0035\ (mg/m^3)\ X\ 8\ (hours/day)\ X\ 150\ (days/year)\ X\ 1\ (year)}{25550\ days\ X\ 24\ hours/day}$$

EC = 6.85E-6 (mg/m^3)

ILCR = 6.85E-6 (mg/m^3) x 7.8E-6 (ug/m^3) x 1000 (ug/mg)

ILCR = 5.4E-08

Example Non-Cancer Risk Calculation:

CA = (1/1.49E6 m^3/kg + 1/40.8 m^3/kg) x 0.144 mg/kg

CA = 0.0035 (mg/m^3)

$$EC = \frac{0.0035\ (mg/m^3)\ X\ 8\ (hours/day)\ X\ 150\ (days/year)\ X\ 1\ (year)}{365\ days\ X\ 24\ hours/day}$$

EC = 4.8 E-4 (mg/m^3)

HQ = 4.8E-4(mg/m^3) /3,0E-02(mg/m^3)

HQ = 1.5E-02

UPPER CONFIDENCE LIMIT OUTPUT

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Data Sets with Non-Detects								
2			User Selected Options									
3			From File	Sheet1.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	BENZO(A)ANTHRACENE											
10												
11						General Statistics						
12						Number of Valid Data	35			Number of Detected Data		6
13						Number of Distinct Detected Data	6			Number of Non-Detect Data		29
14										Percent Non-Detects		82.86%
15												
16				Raw Statistics						Log-transformed Statistics		
17						Minimum Detected	16.8			Minimum Detected		2.821
18						Maximum Detected	3670			Maximum Detected		8.208
19						Mean of Detected	763.2			Mean of Detected		5.032
20						SD of Detected	1447			SD of Detected		1.964
21						Minimum Non-Detect	1.44			Minimum Non-Detect		0.365
22						Maximum Non-Detect	16.3			Maximum Non-Detect		2.791
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		29
25	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		6
26	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		82.86%
27												
28						Warning: There are only 6 Detected Values in this data						
29						Note: It should be noted that even though bootstrap may be performed on this data set						
30						the resulting calculations may not be reliable enough to draw conclusions						
31												
32						It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.						
33												
34												
35						UCL Statistics						
36				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
37						Shapiro Wilk Test Statistic	0.61			Shapiro Wilk Test Statistic		0.897
38						5% Shapiro Wilk Critical Value	0.788			5% Shapiro Wilk Critical Value		0.788
39						Data not Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
40												
41						Assuming Normal Distribution				Assuming Lognormal Distribution		
42						DL/2 Substitution Method				DL/2 Substitution Method		
43						Mean	132.6			Mean		1.036
44						SD	626.5			SD		2.156
45						95% DL/2 (t) UCL	311.6			95% H-Stat (DL/2) UCL		133
46												
47						Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method		
48						MLE yields a negative mean				Mean in Log Scale		-2.686
49										SD in Log Scale		3.927
50										Mean in Original Scale		130.9

	A	B	C	D	E	F	G	H	I	J	K	L
51											SD in Original Scale	626.8
52											95% t UCL	310
53											95% Percentile Bootstrap UCL	337
54											95% BCA Bootstrap UCL	462.9
55												
56				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
57					k star (bias corrected)	0.315				Data Follow Appr. Gamma Distribution at 5% Significance Level		
58					Theta Star	2420						
59					nu star	3.785						
60												
61					A-D Test Statistic	0.664				Nonparametric Statistics		
62					5% A-D Critical Value	0.75					Kaplan-Meier (KM) Method	
63					K-S Test Statistic	0.75					Mean	144.7
64					5% K-S Critical Value	0.352					SD	614.9
65				Data follow Appr. Gamma Distribution at 5% Significance Level							SE of Mean	113.9
66											95% KM (t) UCL	337.3
67				Assuming Gamma Distribution							95% KM (z) UCL	332
68					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	298.8
69					Minimum	1E-12					95% KM (bootstrap t) UCL	5143
70					Maximum	4468					95% KM (BCA) UCL	492.4
71					Mean	893.9					95% KM (Percentile Bootstrap) UCL	372.6
72					Median	181.8					95% KM (Chebyshev) UCL	641
73					SD	1537					97.5% KM (Chebyshev) UCL	855.8
74					k star	0.127					99% KM (Chebyshev) UCL	1278
75					Theta star	7033						
76					Nu star	8.897				Potential UCLs to Use		
77					AppChi2	3.265					95% KM (t) UCL	337.3
78					95% Gamma Approximate UCL	2436						
79					95% Adjusted Gamma UCL	2562						
80	Note: DL/2 is not a recommended method.											
81												
82				Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.								
83				These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).								
84				For additional insight, the user may want to consult a statistician.								
85												
86												
87	BENZO(A)PYRENE											
88												
89				General Statistics								
90					Number of Valid Data	41					Number of Detected Data	11
91					Number of Distinct Detected Data	11					Number of Non-Detect Data	30
92											Percent Non-Detects	73.17%
93												
94				Raw Statistics						Log-transformed Statistics		
95					Minimum Detected	10.9					Minimum Detected	2.389
96					Maximum Detected	3450					Maximum Detected	8.146
97					Mean of Detected	658.3					Mean of Detected	4.48
98					SD of Detected	1259					SD of Detected	2.143
99					Minimum Non-Detect	1.44					Minimum Non-Detect	0.365
100					Maximum Non-Detect	16.3					Maximum Non-Detect	2.791

	A–E	F	G–K	L
101				
102	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
103	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	7
104	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	82.93%
105				
106	**UCL Statistics**			
107	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
108	Shapiro Wilk Test Statistic	0.576	Shapiro Wilk Test Statistic	0.862
109	5% Shapiro Wilk Critical Value	0.85	5% Shapiro Wilk Critical Value	0.85
110	**Data not Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**	
111				
112	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	
113	DL/2 Substitution Method		DL/2 Substitution Method	
114	Mean	178.1	Mean	1.346
115	SD	695	SD	2.328
116	95% DL/2 (t) UCL	360.9	95% H-Stat (DL/2) UCL	262.3
117				
118	Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
119	**MLE yields a negative mean**		Mean in Log Scale	-0.84
120			SD in Log Scale	3.55
121			Mean in Original Scale	176.7
122			SD in Original Scale	695.3
123			95% t UCL	359.6
124			95% Percentile Bootstrap UCL	370.8
125			95% BCA Bootstrap UCL	480.4
126				
127	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
128	k star (bias corrected)	0.305	**Data Follow Appr. Gamma Distribution at 5% Significance Level**	
129	Theta Star	2155		
130	nu star	6.72		
131				
132	A-D Test Statistic	1.09	**Nonparametric Statistics**	
133	5% A-D Critical Value	0.813	Kaplan-Meier (KM) Method	
134	K-S Test Statistic	0.813	Mean	184.6
135	5% K-S Critical Value	0.275	SD	684.8
136	**Data follow Appr. Gamma Distribution at 5% Significance Level**		SE of Mean	112.2
137			95% KM (t) UCL	373.5
138	**Assuming Gamma Distribution**		95% KM (z) UCL	369.1
139	Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	366.5
140	Minimum	10.9	95% KM (bootstrap t) UCL	1523
141	Maximum	3450	95% KM (BCA) UCL	381
142	Mean	674.7	95% KM (Percentile Bootstrap) UCL	382.7
143	Median	650.6	95% KM (Chebyshev) UCL	673.5
144	SD	634.5	97.5% KM (Chebyshev) UCL	885.1
145	k star	0.991	99% KM (Chebyshev) UCL	1301
146	Theta star	680.6		
147	Nu star	81.29	**Potential UCLs to Use**	
148	AppChi2	61.51	95% KM (t) UCL	373.5
149	95% Gamma Approximate UCL	891.6		
150	95% Adjusted Gamma UCL	900.8		

	A	B	C	D	E	F	G	H	I	J	K	L
151	Note: DL/2 is not a recommended method.											
152												
153	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
154	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
155	For additional insight, the user may want to consult a statistician.											
156												
157												
158	BENZO(B)FLUORANTHENE											
159												
160	General Statistics											
161					Number of Valid Data	35			Number of Detected Data			7
162					Number of Distinct Detected Data	7			Number of Non-Detect Data			28
163									Percent Non-Detects			80.00%
164												
165	Raw Statistics						Log-transformed Statistics					
166					Minimum Detected	13.5			Minimum Detected			2.603
167					Maximum Detected	4140			Maximum Detected			8.328
168					Mean of Detected	713.4			Mean of Detected			4.385
169					SD of Detected	1531			SD of Detected			2.247
170					Minimum Non-Detect	1.44			Minimum Non-Detect			0.365
171					Maximum Non-Detect	16.3			Maximum Non-Detect			2.791
172												
173	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			30
174	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			5
175	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			85.71%
176												
177	Warning: There are only 7 Detected Values in this data											
178	Note: It should be noted that even though bootstrap may be performed on this data set											
179	the resulting calculations may not be reliable enough to draw conclusions											
180												
181	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
182												
183												
184	UCL Statistics											
185	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
186					Shapiro Wilk Test Statistic	0.553			Shapiro Wilk Test Statistic			0.825
187					5% Shapiro Wilk Critical Value	0.803			5% Shapiro Wilk Critical Value			0.803
188	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
189												
190	Assuming Normal Distribution						Assuming Lognormal Distribution					
191					DL/2 Substitution Method				DL/2 Substitution Method			
192					Mean	144.4			Mean			1.055
193					SD	704.9			SD			2.103
194					95% DL/2 (t) UCL	345.9			95% H-Stat (DL/2) UCL			113
195												
196					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
197	MLE yields a negative mean								Mean in Log Scale			-2.752
198									SD in Log Scale			3.942
199									Mean in Original Scale			142.7
200									SD in Original Scale			705.3

	A	B	C	D	E	F	G	H	I	J	K	L
201											95% t UCL	344.3
202											95% Percentile Bootstrap UCL	376.1
203											95% BCA Bootstrap UCL	517.6
204												
205	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
206					k star (bias corrected)	0.274	Data Follow Appr. Gamma Distribution at 5% Significance Level					
207					Theta Star	2601						
208					nu star	3.84						
209												
210					A-D Test Statistic	0.864	Nonparametric Statistics					
211					5% A-D Critical Value	0.782					Kaplan-Meier (KM) Method	
212					K-S Test Statistic	0.782					Mean	153.5
213					5% K-S Critical Value	0.335					SD	692.9
214	Data follow Appr. Gamma Distribution at 5% Significance Level										SE of Mean	126.5
215											95% KM (t) UCL	367.4
216	Assuming Gamma Distribution										95% KM (z) UCL	361.6
217				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	354.2
218					Minimum	1E-12					95% KM (bootstrap t) UCL	6823
219					Maximum	4907					95% KM (BCA) UCL	391.6
220					Mean	720.7					95% KM (Percentile Bootstrap) UCL	389.2
221					Median	142.3					95% KM (Chebyshev) UCL	704.9
222					SD	1555					97.5% KM (Chebyshev) UCL	943.5
223					k star	0.0969					99% KM (Chebyshev) UCL	1412
224					Theta star	7435						
225					Nu star	6.785	Potential UCLs to Use					
226					AppChi2	2.053					95% KM (t) UCL	367.4
227					95% Gamma Approximate UCL	2381						
228					95% Adjusted Gamma UCL	2530						
229	Note: DL/2 is not a recommended method.											
230												
231	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
232	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
233	For additional insight, the user may want to consult a statistician.											
234												
235												
236	BENZO(K)FLUORANTHENE											
237												
238	General Statistics											
239					Number of Valid Data	35					Number of Detected Data	3
240					Number of Distinct Detected Data	3					Number of Non-Detect Data	32
241											Percent Non-Detects	91.43%
242												
243	Raw Statistics						Log-transformed Statistics					
244					Minimum Detected	33.6					Minimum Detected	3.515
245					Maximum Detected	1440					Maximum Detected	7.272
246					Mean of Detected	570.9					Mean of Detected	5.421
247					SD of Detected	759.7					SD of Detected	1.88
248					Minimum Non-Detect	1.44					Minimum Non-Detect	0.365
249					Maximum Non-Detect	16.3					Maximum Non-Detect	2.791
250												

	A	B	C	D	E	F	G	H	I	J	K	L
251	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	32
252	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	3
253	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	91.43%
254												
255	**Warning: There are only 3 Distinct Detected Values in this data set**											
256	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
257	**Those methods will return a 'N/A' value on your output display!**											
258												
259	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
260	**However, results obtained using 4 to 9 distinct values may not be reliable.**											
261	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
262												
263												
264	**UCL Statistics**											
265	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
266	Shapiro Wilk Test Statistic					0.857	Shapiro Wilk Test Statistic					0.999
267	5% Shapiro Wilk Critical Value					0.767	5% Shapiro Wilk Critical Value					0.767
268	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
269												
270	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
271	DL/2 Substitution Method						DL/2 Substitution Method					
272	Mean					50.75	Mean					0.617
273	SD					245.1	SD					1.77
274	95% DL/2 (t) UCL					120.8	95% H-Stat (DL/2) UCL					25.93
275												
276	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
277	**MLE yields a negative mean**						Mean in Log Scale					-7.049
278							SD in Log Scale					4.497
279							Mean in Original Scale					48.93
280							SD in Original Scale					245.4
281							95% t UCL					119.1
282							95% Percentile Bootstrap UCL					130.3
283							95% BCA Bootstrap UCL					205.7
284												
285	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
286	k star (bias corrected)					N/A	**Data appear Normal at 5% Significance Level**					
287	Theta Star					N/A						
288	nu star					N/A						
289												
290	A-D Test Statistic					N/A	**Nonparametric Statistics**					
291	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
292	K-S Test Statistic					N/A	Mean					79.65
293	5% K-S Critical Value					N/A	SD					235.8
294	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					48.81
295							95% KM (t) UCL					162.2
296	**Assuming Gamma Distribution**						95% KM (z) UCL					159.9
297	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					218.9
298	Minimum					N/A	95% KM (bootstrap t) UCL					269.4
299	Maximum					N/A	95% KM (BCA) UCL					1440
300	Mean					N/A	95% KM (Percentile Bootstrap) UCL					1440

	A–E	F	G–K	L
301	Median	N/A	95% KM (Chebyshev) UCL	292.4
302	SD	N/A	97.5% KM (Chebyshev) UCL	384.5
303	k star	N/A	99% KM (Chebyshev) UCL	565.3
304	Theta star	N/A		
305	Nu star	N/A	**Potential UCLs to Use**	
306	AppChi2	N/A	95% KM (t) UCL	162.2
307	95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	1440
308	95% Adjusted Gamma UCL	N/A		
309	**Note: DL/2 is not a recommended method.**			
310				
311	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**			
312	**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**			
313	**For additional insight, the user may want to consult a statistician.**			
314				
315				
316	**CHRYSENE**			
317				
318	**General Statistics**			
319	Number of Valid Data	35	Number of Detected Data	6
320	Number of Distinct Detected Data	6	Number of Non-Detect Data	29
321			Percent Non-Detects	82.86%
322				
323	**Raw Statistics**		**Log-transformed Statistics**	
324	Minimum Detected	16.6	Minimum Detected	2.809
325	Maximum Detected	3980	Maximum Detected	8.289
326	Mean of Detected	788.6	Mean of Detected	4.605
327	SD of Detected	1582	SD of Detected	2.263
328	Minimum Non-Detect	1.44	Minimum Non-Detect	0.365
329	Maximum Non-Detect	16.3	Maximum Non-Detect	2.791
330				
331	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	29
332	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	6
333	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	82.86%
334				
335	**Warning: There are only 6 Detected Values in this data**			
336	**Note: It should be noted that even though bootstrap may be performed on this data set**			
337	**the resulting calculations may not be reliable enough to draw conclusions**			
338				
339	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**			
340				
341				
342	**UCL Statistics**			
343	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
344	Shapiro Wilk Test Statistic	0.593	Shapiro Wilk Test Statistic	0.824
345	5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
346	**Data not Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**	
347				
348	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	
349	DL/2 Substitution Method		DL/2 Substitution Method	
350	Mean	136.9	Mean	0.963

	A	B	C	D	E	F	G	H	I	J	K	L
351					SD	677.2					SD	2.064
352					95% DL/2 (t) UCL	330.5					95% H-Stat (DL/2) UCL	90.46
353												
354				Maximum Likelihood Estimate(MLE) Method		N/A					Log ROS Method	
355				**MLE yields a negative mean**							Mean in Log Scale	-4.268
356											SD in Log Scale	4.515
357											Mean in Original Scale	135.2
358											SD in Original Scale	677.6
359											95% t UCL	328.9
360											95% Percentile Bootstrap UCL	359.8
361											95% BCA Bootstrap UCL	569.7
362												
363				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
364					k star (bias corrected)	0.276				**Data appear Gamma Distributed at 5% Significance Level**		
365					Theta Star	2862						
366					nu star	3.307						
367												
368					A-D Test Statistic	0.744				**Nonparametric Statistics**		
369					5% A-D Critical Value	0.762					Kaplan-Meier (KM) Method	
370					K-S Test Statistic	0.762					Mean	148.9
371					5% K-S Critical Value	0.356					SD	665.1
372				**Data appear Gamma Distributed at 5% Significance Level**							SE of Mean	123.2
373											95% KM (t) UCL	357.2
374				**Assuming Gamma Distribution**							95% KM (z) UCL	351.5
375					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	340
376					Minimum	1E-12					95% KM (bootstrap t) UCL	12193
377					Maximum	4720					95% KM (BCA) UCL	410.9
378					Mean	932.8					95% KM (Percentile Bootstrap) UCL	393.8
379					Median	150.4					95% KM (Chebyshev) UCL	685.8
380					SD	1664					97.5% KM (Chebyshev) UCL	918
381					k star	0.124					99% KM (Chebyshev) UCL	1374
382					Theta star	7498						
383					Nu star	8.708				**Potential UCLs to Use**		
384					AppChi2	3.151					95% KM (t) UCL	357.2
385					95% Gamma Approximate UCL	2577						
386					95% Adjusted Gamma UCL	2713						
387	**Note: DL/2 is not a recommended method.**											
388												
389				**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**								
390				**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**								
391				**For additional insight, the user may want to consult a statistician.**								
392												
393												
394	**DIBENZO(A,H)ANTHRACENE**											
395												
396					**General Statistics**							
397					Number of Valid Data	35					Number of Detected Data	3
398					Number of Distinct Detected Data	3					Number of Non-Detect Data	32
399											Percent Non-Detects	91.43%
400												

	A–E	F	G–K	L
401	**Raw Statistics**		**Log-transformed Statistics**	
402	Minimum Detected	10.7	Minimum Detected	2.37
403	Maximum Detected	595	Maximum Detected	6.389
404	Mean of Detected	231	Mean of Detected	4.409
405	SD of Detected	317.6	SD of Detected	2.01
406	Minimum Non-Detect	1.44	Minimum Non-Detect	0.365
407	Maximum Non-Detect	16.3	Maximum Non-Detect	2.791
408				
409	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	33
410	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
411	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	94.29%
412				
413	**Warning: There are only 3 Distinct Detected Values in this data set**			
414	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**			
415	**Those methods will return a 'N/A' value on your output display!**			
416				
417	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**			
418	**However, results obtained using 4 to 9 distinct values may not be reliable.**			
419	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**			
420				
421				
422	**UCL Statistics**			
423	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
424	Shapiro Wilk Test Statistic	0.846	Shapiro Wilk Test Statistic	0.999
425	5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
426	**Data appear Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**	
427				
428	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	
429	DL/2 Substitution Method		DL/2 Substitution Method	
430	Mean	21.61	Mean	0.53
431	SD	100.8	SD	1.545
432	95% DL/2 (t) UCL	50.43	95% H-Stat (DL/2) UCL	13.08
433				
434	Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
435	**MLE method failed to converge properly**		Mean in Log Scale	-6.595
436			SD in Log Scale	3.969
437			Mean in Original Scale	19.8
438			SD in Original Scale	101.2
439			95% t UCL	48.72
440			95% Percentile Bootstrap UCL	51.61
441			95% BCA Bootstrap UCL	85.31
442				
443	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
444	k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**	
445	Theta Star	N/A		
446	nu star	N/A		
447				
448	A-D Test Statistic	N/A	**Nonparametric Statistics**	
449	5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
450	K-S Test Statistic	N/A	Mean	29.58

	A–E	F	G–K	L
451	5% K-S Critical Value	N/A	SD	97.8
452	**Data not Gamma Distributed at 5% Significance Level**		SE of Mean	20.25
453			95% KM (t) UCL	63.82
454	**Assuming Gamma Distribution**		95% KM (z) UCL	62.88
455	Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	82.17
456	Minimum	N/A	95% KM (bootstrap t) UCL	117.1
457	Maximum	N/A	95% KM (BCA) UCL	595
458	Mean	N/A	95% KM (Percentile Bootstrap) UCL	595
459	Median	N/A	95% KM (Chebyshev) UCL	117.8
460	SD	N/A	97.5% KM (Chebyshev) UCL	156
461	k star	N/A	99% KM (Chebyshev) UCL	231
462	Theta star	N/A		
463	Nu star	N/A	**Potential UCLs to Use**	
464	AppChi2	N/A	95% KM (t) UCL	63.82
465	95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	595
466	95% Adjusted Gamma UCL	N/A		
467	**Note: DL/2 is not a recommended method.**			
468				
469	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**			
470	**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**			
471	**For additional insight, the user may want to consult a statistician.**			
472				
473				
474	**INDENO(1,2,3-CD)PYRENE**			
475				
476	**General Statistics**			
477	Number of Valid Data	35	Number of Detected Data	3
478	Number of Distinct Detected Data	3	Number of Non-Detect Data	32
479			Percent Non-Detects	91.43%
480				
481	**Raw Statistics**		**Log-transformed Statistics**	
482	Minimum Detected	50.6	Minimum Detected	3.924
483	Maximum Detected	2530	Maximum Detected	7.836
484	Mean of Detected	1005	Mean of Detected	5.945
485	SD of Detected	1334	SD of Detected	1.959
486	Minimum Non-Detect	1.44	Minimum Non-Detect	0.365
487	Maximum Non-Detect	16.3	Maximum Non-Detect	2.791
488				
489	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	32
490	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
491	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	91.43%
492				
493	**Warning: There are only 3 Distinct Detected Values in this data set**			
494	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**			
495	**Those methods will return a 'N/A' value on your output display!**			
496				
497	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**			
498	**However, results obtained using 4 to 9 distinct values may not be reliable.**			
499	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**			
500				

	A	B	C	D	E	F	G	H	I	J	K	L
501												
502						UCL Statistics						
503					Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only		
504						Shapiro Wilk Test Statistic	0.863				Shapiro Wilk Test Statistic	0.997
505						5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value	0.767
506					Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
507												
508					Assuming Normal Distribution					Assuming Lognormal Distribution		
509						DL/2 Substitution Method					DL/2 Substitution Method	
510						Mean	87.97				Mean	0.662
511						SD	431.2				SD	1.902
512						95% DL/2 (t) UCL	211.2				95% H-Stat (DL/2) UCL	39.99
513												
514						Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method	
515					MLE yields a negative mean						Mean in Log Scale	-6.985
516											SD in Log Scale	4.663
517											Mean in Original Scale	86.16
518											SD in Original Scale	431.6
519											95% t UCL	209.5
520											95% Percentile Bootstrap UCL	219.8
521											95% BCA Bootstrap UCL	327.9
522												
523					Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only		
524						k star (bias corrected)	N/A			Data appear Normal at 5% Significance Level		
525						Theta Star	N/A					
526						nu star	N/A					
527												
528						A-D Test Statistic	N/A			Nonparametric Statistics		
529						5% A-D Critical Value	N/A				Kaplan-Meier (KM) Method	
530						K-S Test Statistic	N/A				Mean	132.4
531						5% K-S Critical Value	N/A				SD	416.1
532					Data not Gamma Distributed at 5% Significance Level						SE of Mean	86.15
533											95% KM (t) UCL	278.1
534					Assuming Gamma Distribution						95% KM (z) UCL	274.1
535						Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL	391.4
536						Minimum	N/A				95% KM (bootstrap t) UCL	438.2
537						Maximum	N/A				95% KM (BCA) UCL	N/A
538						Mean	N/A				95% KM (Percentile Bootstrap) UCL	2530
539						Median	N/A				95% KM (Chebyshev) UCL	507.9
540						SD	N/A				97.5% KM (Chebyshev) UCL	670.4
541						k star	N/A				99% KM (Chebyshev) UCL	989.6
542						Theta star	N/A					
543						Nu star	N/A			Potential UCLs to Use		
544						AppChi2	N/A				95% KM (t) UCL	278.1
545						95% Gamma Approximate UCL	N/A				95% KM (Percentile Bootstrap) UCL	2530
546						95% Adjusted Gamma UCL	N/A					
547	Note: DL/2 is not a recommended method.											
548												
549					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
550					These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).							

	A	B	C	D	E	F	G	H	I	J	K	L
551	For additional insight, the user may want to consult a statistician.											
552												
553												
554	NAPHTHALENE											
555												
556	General Statistics											
557	Number of Valid Data					35	Number of Detected Data					9
558	Number of Distinct Detected Data					9	Number of Non-Detect Data					26
559							Percent Non-Detects					74.29%
560												
561	Raw Statistics						Log-transformed Statistics					
562	Minimum Detected					5.83	Minimum Detected					1.763
563	Maximum Detected					273	Maximum Detected					5.609
564	Mean of Detected					81.01	Mean of Detected					3.535
565	SD of Detected					103.2	SD of Detected					1.471
566	Minimum Non-Detect					1.44	Minimum Non-Detect					0.365
567	Maximum Non-Detect					16.3	Maximum Non-Detect					2.791
568												
569	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					29
570	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					6
571	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					82.86%
572												
573	Warning: There are only 9 Detected Values in this data											
574	Note: It should be noted that even though bootstrap may be performed on this data set											
575	the resulting calculations may not be reliable enough to draw conclusions											
576												
577	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
578												
579												
580	UCL Statistics											
581	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
582	Shapiro Wilk Test Statistic					0.747	Shapiro Wilk Test Statistic					0.923
583	5% Shapiro Wilk Critical Value					0.829	5% Shapiro Wilk Critical Value					0.829
584	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
585												
586	Assuming Normal Distribution						Assuming Lognormal Distribution					
587	DL/2 Substitution Method						DL/2 Substitution Method					
588	Mean					22.03	Mean					0.93
589	SD					61.23	SD					1.829
590	95% DL/2 (t) UCL					39.53	95% H-Stat (DL/2) UCL					42.1
591												
592	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
593	MLE yields a negative mean						Mean in Log Scale					-0.392
594							SD in Log Scale					2.577
595							Mean in Original Scale					21.02
596							SD in Original Scale					61.55
597							95% t UCL					38.61
598							95% Percentile Bootstrap UCL					39.16
599							95% BCA Bootstrap UCL					46.46
600												

	A	B	C	D	E	F	G	H	I	J	K	L
601	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
602					k star (bias corrected)	0.542	**Data appear Gamma Distributed at 5% Significance Level**					
603					Theta Star	149.4						
604					nu star	9.763						
605												
606					A-D Test Statistic	0.426	**Nonparametric Statistics**					
607					5% A-D Critical Value	0.755					Kaplan-Meier (KM) Method	
608					K-S Test Statistic	0.755					Mean	25.18
609					5% K-S Critical Value	0.29					SD	59.27
610	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	10.63
611											95% KM (t) UCL	43.14
612	**Assuming Gamma Distribution**										95% KM (z) UCL	42.66
613					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	42.25
614					Minimum	1E-12					95% KM (bootstrap t) UCL	83.29
615					Maximum	273					95% KM (BCA) UCL	52.39
616					Mean	72.97					95% KM (Percentile Bootstrap) UCL	45.17
617					Median	61.38					95% KM (Chebyshev) UCL	71.5
618					SD	80.54					97.5% KM (Chebyshev) UCL	91.54
619					k star	0.13					99% KM (Chebyshev) UCL	130.9
620					Theta star	561.3						
621					Nu star	9.101	**Potential UCLs to Use**					
622					AppChi2	3.388					95% KM (t) UCL	43.14
623					95% Gamma Approximate UCL	196						
624					95% Adjusted Gamma UCL	206						
625	**Note: DL/2 is not a recommended method.**											
626												
627	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**											
628	**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**											
629	**For additional insight, the user may want to consult a statistician.**											
630												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Data Sets with Non-Detects								
2			User Selected Options									
3			From File	Sheet1.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	BENZENE											
10												
11				General Statistics								
12			Number of Valid Data			40	Number of Detected Data					4
13			Number of Distinct Detected Data			4	Number of Non-Detect Data					36
14							Percent Non-Detects					90.00%
15												
16			Raw Statistics				Log-transformed Statistics					
17			Minimum Detected			1.77	Minimum Detected					0.571
18			Maximum Detected			1810	Maximum Detected					7.501
19			Mean of Detected			546.4	Mean of Detected					4.428
20			SD of Detected			854.6	SD of Detected					2.973
21			Minimum Non-Detect			0.447	Minimum Non-Detect					-0.805
22			Maximum Non-Detect			32.4	Maximum Non-Detect					3.478
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					37
25	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					3
26	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					92.50%
27												
28				Warning: There are only 4 Distinct Detected Values in this data								
29				Note: It should be noted that even though bootstrap may be performed on this data set								
30				the resulting calculations may not be reliable enough to draw conclusions								
31												
32				It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.								
33												
34												
35				UCL Statistics								
36			Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only					
37			Shapiro Wilk Test Statistic			0.759	Shapiro Wilk Test Statistic					0.976
38			5% Shapiro Wilk Critical Value			0.748	5% Shapiro Wilk Critical Value					0.748
39			Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level					
40												
41			Assuming Normal Distribution				Assuming Lognormal Distribution					
42			DL/2 Substitution Method				DL/2 Substitution Method					
43			Mean			57.64	Mean					0.0749
44			SD			288.8	SD					2.344
45			95% DL/2 (t) UCL			134.6	95% H-Stat (DL/2) UCL					84.34
46												
47			Maximum Likelihood Estimate(MLE) Method			N/A	Log ROS Method					
48			MLE yields a negative mean				Mean in Log Scale					-10.73
49							SD in Log Scale					5.614
50							Mean in Original Scale					54.64

	A–E	F	G–K	L
51			SD in Original Scale	289.4
52			95% t UCL	131.7
53			95% Percentile Bootstrap UCL	144
54			95% BCA Bootstrap UCL	226.3
55				
56	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
57	k star (bias corrected)	0.256	**Data appear Normal at 5% Significance Level**	
58	Theta Star	2135		
59	nu star	2.048		
60				
61	A-D Test Statistic	0.196	**Nonparametric Statistics**	
62	5% A-D Critical Value	0.697	Kaplan-Meier (KM) Method	
63	K-S Test Statistic	0.697	Mean	56.23
64	5% K-S Critical Value	0.416	SD	285.4
65	**Data appear Gamma Distributed at 5% Significance Level**		SE of Mean	52.11
66			95% KM (t) UCL	144
67	**Assuming Gamma Distribution**		95% KM (z) UCL	142
68	Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	120.2
69	Minimum	1E-12	95% KM (bootstrap t) UCL	309.2
70	Maximum	1810	95% KM (BCA) UCL	1810
71	Mean	54.64	95% KM (Percentile Bootstrap) UCL	401.2
72	Median	1E-12	95% KM (Chebyshev) UCL	283.4
73	SD	289.4	97.5% KM (Chebyshev) UCL	381.7
74	k star	0.0462	99% KM (Chebyshev) UCL	574.7
75	Theta star	1183		
76	Nu star	3.694	**Potential UCLs to Use**	
77	AppChi2	0.605	95% KM (t) UCL	144
78	95% Gamma Approximate UCL	333.8	95% KM (Percentile Bootstrap) UCL	401.2
79	95% Adjusted Gamma UCL	N/A		
80	**Note: DL/2 is not a recommended method.**			
81				
82	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**			
83	**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**			
84	**For additional insight, the user may want to consult a statistician.**			
85				
86				
87	ETHYLBENZENE			
88				
89	**General Statistics**			
90	Number of Valid Data	40	Number of Detected Data	7
91	Number of Distinct Detected Data	7	Number of Non-Detect Data	33
92			Percent Non-Detects	82.50%
93				
94	**Raw Statistics**		**Log-transformed Statistics**	
95	Minimum Detected	0.972	Minimum Detected	-0.0284
96	Maximum Detected	304	Maximum Detected	5.717
97	Mean of Detected	84.83	Mean of Detected	2.969
98	SD of Detected	107.6	SD of Detected	2.413
99	Minimum Non-Detect	0.713	Minimum Non-Detect	-0.338
100	Maximum Non-Detect	51.6	Maximum Non-Detect	3.944

	A	B	C	D	E	F	G	H	I	J	K	L
101												
102	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	36
103	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	4
104	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	90.00%
105												
106	**Warning: There are only 7 Detected Values in this data**											
107	**Note: It should be noted that even though bootstrap may be performed on this data set**											
108	**the resulting calculations may not be reliable enough to draw conclusions**											
109												
110	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
111												
112												
113	**UCL Statistics**											
114	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
115	Shapiro Wilk Test Statistic					0.794	Shapiro Wilk Test Statistic					0.844
116	5% Shapiro Wilk Critical Value					0.803	5% Shapiro Wilk Critical Value					0.803
117	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
118												
119	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
120	DL/2 Substitution Method						DL/2 Substitution Method					
121	Mean					19.07	Mean					0.545
122	SD					52.74	SD					2.13
123	95% DL/2 (t) UCL					33.12	95% H-Stat (DL/2) UCL					64.6
124												
125	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
126	**MLE method failed to converge properly**						Mean in Log Scale					-4.639
127							SD in Log Scale					3.825
128							Mean in Original Scale					14.85
129							SD in Original Scale					53.35
130							95% t UCL					29.06
131							95% Percentile Bootstrap UCL					30
132							95% BCA Bootstrap UCL					36.91
133												
134	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
135	k star (bias corrected)					0.347	**Data appear Gamma Distributed at 5% Significance Level**					
136	Theta Star					244.5						
137	nu star					4.857						
138												
139	A-D Test Statistic					0.485	**Nonparametric Statistics**					
140	5% A-D Critical Value					0.761	Kaplan-Meier (KM) Method					
141	K-S Test Statistic					0.761	Mean					15.67
142	5% K-S Critical Value					0.33	SD					52.45
143	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					8.957
144							95% KM (t) UCL					30.76
145	**Assuming Gamma Distribution**						95% KM (z) UCL					30.4
146	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					29.79
147	Minimum					1E-12	95% KM (bootstrap t) UCL					45.42
148	Maximum					304	95% KM (BCA) UCL					88.49
149	Mean					14.85	95% KM (Percentile Bootstrap) UCL					40.99
150	Median					1E-12	95% KM (Chebyshev) UCL					54.71

	A	B	C	D	E	F	G	H	I	J	K	L
151					SD	53.35				97.5% KM (Chebyshev) UCL		71.61
152					k star	0.05				99% KM (Chebyshev) UCL		104.8
153					Theta star	297.1						
154					Nu star	3.997				**Potential UCLs to Use**		
155					AppChi2	0.721				95% KM (t) UCL		30.76
156					95% Gamma Approximate UCL	82.35						
157					95% Adjusted Gamma UCL	88.24						
158	**Note: DL/2 is not a recommended method.**											
159												
160	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**											
161	**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**											
162	**For additional insight, the user may want to consult a statistician.**											
163												
164												
165	TOTAL XYLENES											
166												
167					**General Statistics**							
168					Number of Valid Data	40				Number of Detected Data		9
169					Number of Distinct Detected Data	9				Number of Non-Detect Data		31
170										Percent Non-Detects		77.50%
171												
172					**Raw Statistics**					**Log-transformed Statistics**		
173					Minimum Detected	1.27				Minimum Detected		0.239
174					Maximum Detected	1200				Maximum Detected		7.09
175					Mean of Detected	368.6				Mean of Detected		4.232
176					SD of Detected	436.4				SD of Detected		2.702
177					Minimum Non-Detect	0.666				Minimum Non-Detect		-0.406
178					Maximum Non-Detect	48.2				Maximum Non-Detect		3.875
179												
180	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		34
181	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		6
182	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		85.00%
183												
184	**Warning: There are only 9 Detected Values in this data**											
185	**Note: It should be noted that even though bootstrap may be performed on this data set**											
186	**the resulting calculations may not be reliable enough to draw conclusions**											
187												
188	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
189												
190												
191					**UCL Statistics**							
192					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
193					Shapiro Wilk Test Statistic	0.833				Shapiro Wilk Test Statistic		0.865
194					5% Shapiro Wilk Critical Value	0.829				5% Shapiro Wilk Critical Value		0.829
195					**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
196												
197					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
198					DL/2 Substitution Method					DL/2 Substitution Method		
199					Mean	85.99				Mean		0.776
200					SD	250.8				SD		2.636

	A	B	C	D	E	F	G	H	I	J	K	L
201					95% DL/2 (t) UCL	152.8				95% H-Stat (DL/2) UCL		522.3
202												
203				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
204				**MLE yields a negative mean**						Mean in Log Scale		-3.049
205										SD in Log Scale		4.294
206										Mean in Original Scale		82.95
207										SD in Original Scale		251.7
208										95% t UCL		150
209										95% Percentile Bootstrap UCL		154.2
210										95% BCA Bootstrap UCL		173
211												
212				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
213				k star (bias corrected)		0.336				**Data appear Normal at 5% Significance Level**		
214				Theta Star		1096						
215				nu star		6.052						
216												
217				A-D Test Statistic		0.424				**Nonparametric Statistics**		
218				5% A-D Critical Value		0.79				Kaplan-Meier (KM) Method		
219				K-S Test Statistic		0.79				Mean		83.97
220				5% K-S Critical Value		0.298				SD		248.2
221				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean		41.63
222										95% KM (t) UCL		154.1
223				**Assuming Gamma Distribution**						95% KM (z) UCL		152.4
224				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		150.8
225				Minimum		1.27				95% KM (bootstrap t) UCL		237.4
226				Maximum		1200				95% KM (BCA) UCL		185.8
227				Mean		401.9				95% KM (Percentile Bootstrap) UCL		166.6
228				Median		342.5				95% KM (Chebyshev) UCL		265.4
229				SD		295.8				97.5% KM (Chebyshev) UCL		343.9
230				k star		1.026				99% KM (Chebyshev) UCL		498.2
231				Theta star		391.8						
232				Nu star		82.05				**Potential UCLs to Use**		
233				AppChi2		62.18				95% KM (t) UCL		154.1
234				95% Gamma Approximate UCL		530.3				95% KM (Percentile Bootstrap) UCL		166.6
235				95% Adjusted Gamma UCL		535.9						
236	**Note: DL/2 is not a recommended method.**											
237												
238				**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**								
239				**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**								
240				**For additional insight, the user may want to consult a statistician.**								
241												
242												
243	BENZO(A)ANTHRACENE											
244												
245						**General Statistics**						
246				Number of Valid Data		40				Number of Detected Data		5
247				Number of Distinct Detected Data		5				Number of Non-Detect Data		35
248										Percent Non-Detects		87.50%
249												
250				**Raw Statistics**						**Log-transformed Statistics**		

	A–E	F	G–K	L
251	Minimum Detected	3.77	Minimum Detected	1.327
252	Maximum Detected	213	Maximum Detected	5.361
253	Mean of Detected	68.46	Mean of Detected	3.403
254	SD of Detected	85.22	SD of Detected	1.611
255	Minimum Non-Detect	1.54	Minimum Non-Detect	0.432
256	Maximum Non-Detect	16.4	Maximum Non-Detect	2.797
257				
258	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	37
259	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
260	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	92.50%
261				
262	**Warning: There are only 5 Detected Values in this data**			
263	**Note: It should be noted that even though bootstrap may be performed on this data set**			
264	**the resulting calculations may not be reliable enough to draw conclusions**			
265				
266	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**			
267				
268				
269	**UCL Statistics**			
270	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
271	Shapiro Wilk Test Statistic	0.812	Shapiro Wilk Test Statistic	0.964
272	5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
273	**Data appear Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**	
274				
275	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	
276	DL/2 Substitution Method		DL/2 Substitution Method	
277	Mean	10.36	Mean	0.601
278	SD	35.29	SD	1.45
279	95% DL/2 (t) UCL	19.76	95% H-Stat (DL/2) UCL	10.43
280				
281	Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
282	**MLE yields a negative mean**		Mean in Log Scale	-3.464
283			SD in Log Scale	3.284
284			Mean in Original Scale	8.604
285			SD in Original Scale	35.64
286			95% t UCL	18.1
287			95% Percentile Bootstrap UCL	18.57
288			95% BCA Bootstrap UCL	24.82
289				
290	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
291	k star (bias corrected)	0.425	**Data appear Normal at 5% Significance Level**	
292	Theta Star	161		
293	nu star	4.252		
294				
295	A-D Test Statistic	0.227	**Nonparametric Statistics**	
296	5% A-D Critical Value	0.699	Kaplan-Meier (KM) Method	
297	K-S Test Statistic	0.699	Mean	11.88
298	5% K-S Critical Value	0.367	SD	34.41
299	**Data appear Gamma Distributed at 5% Significance Level**		SE of Mean	6.083
300			95% KM (t) UCL	22.13

	A–E	F	G–K	L
301	**Assuming Gamma Distribution**		95% KM (z) UCL	21.89
302	Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	19.64
303	Minimum	1E-12	95% KM (bootstrap t) UCL	32.64
304	Maximum	383.7	95% KM (BCA) UCL	73.38
305	Mean	124.2	95% KM (Percentile Bootstrap) UCL	59.39
306	Median	103.9	95% KM (Chebyshev) UCL	38.4
307	SD	104	97.5% KM (Chebyshev) UCL	49.87
308	k star	0.48	99% KM (Chebyshev) UCL	72.41
309	Theta star	258.5		
310	Nu star	38.44	**Potential UCLs to Use**	
311	AppChi2	25.24	95% KM (t) UCL	22.13
312	95% Gamma Approximate UCL	189.2	95% KM (Percentile Bootstrap) UCL	59.39
313	95% Adjusted Gamma UCL	192.2		
314	**Note: DL/2 is not a recommended method.**			
315				
316	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**			
317	**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**			
318	**For additional insight, the user may want to consult a statistician.**			
319				
320				
321	**BENZO(A)PYRENE**			
322				
323	**General Statistics**			
324	Number of Valid Data	40	Number of Detected Data	6
325	Number of Distinct Detected Data	6	Number of Non-Detect Data	34
326			Percent Non-Detects	85.00%
327				
328	**Raw Statistics**		**Log-transformed Statistics**	
329	Minimum Detected	6.23	Minimum Detected	1.829
330	Maximum Detected	112	Maximum Detected	4.718
331	Mean of Detected	35.52	Mean of Detected	2.984
332	SD of Detected	41.99	SD of Detected	1.178
333	Minimum Non-Detect	1.54	Minimum Non-Detect	0.432
334	Maximum Non-Detect	16.4	Maximum Non-Detect	2.797
335				
336	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	37
337	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
338	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	92.50%
339				
340	**Warning: There are only 6 Detected Values in this data**			
341	**Note: It should be noted that even though bootstrap may be performed on this data set**			
342	**the resulting calculations may not be reliable enough to draw conclusions**			
343				
344	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**			
345				
346				
347	**UCL Statistics**			
348	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
349	Shapiro Wilk Test Statistic	0.778	Shapiro Wilk Test Statistic	0.899
350	5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788

	A–E	F	G–K	L
351	**Data not Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**	
352				
353	**Assuming Normal Distribution**		**Assuming Lognormal Distribution**	
354	DL/2 Substitution Method		DL/2 Substitution Method	
355	Mean	7.108	Mean	0.629
356	SD	19.45	SD	1.365
357	95% DL/2 (t) UCL	12.29	95% H-Stat (DL/2) UCL	8.915
358				
359	Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
360	**MLE yields a negative mean**		Mean in Log Scale	-1.311
361			SD in Log Scale	2.226
362			Mean in Original Scale	5.54
363			SD in Original Scale	19.72
364			95% t UCL	10.79
365			95% Percentile Bootstrap UCL	11.22
366			95% BCA Bootstrap UCL	14.39
367				
368	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
369	k star (bias corrected)	0.605	**Data appear Gamma Distributed at 5% Significance Level**	
370	Theta Star	58.75		
371	nu star	7.256		
372				
373	A-D Test Statistic	0.454	**Nonparametric Statistics**	
374	5% A-D Critical Value	0.715	Kaplan-Meier (KM) Method	
375	K-S Test Statistic	0.715	Mean	10.65
376	5% K-S Critical Value	0.341	SD	18.16
377	**Data appear Gamma Distributed at 5% Significance Level**		SE of Mean	3.145
378			95% KM (t) UCL	15.95
379	**Assuming Gamma Distribution**		95% KM (z) UCL	15.82
380	Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	14.89
381	Minimum	1E-12	95% KM (bootstrap t) UCL	33.47
382	Maximum	112	95% KM (BCA) UCL	57.99
383	Mean	36.97	95% KM (Percentile Bootstrap) UCL	19.46
384	Median	30.42	95% KM (Chebyshev) UCL	24.36
385	SD	31.31	97.5% KM (Chebyshev) UCL	30.29
386	k star	0.186	99% KM (Chebyshev) UCL	41.94
387	Theta star	198.9		
388	Nu star	14.87	**Potential UCLs to Use**	
389	AppChi2	7.171	95% KM (t) UCL	15.95
390	95% Gamma Approximate UCL	76.66		
391	95% Adjusted Gamma UCL	78.87		
392	**Note: DL/2 is not a recommended method.**			
393				
394	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**			
395	**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**			
396	**For additional insight, the user may want to consult a statistician.**			
397				
398				
399	**BENZO(B)FLUORANTHENE**			
400				

	A	B	C	D	E	F	G	H	I	J	K	L
401	General Statistics											
402					Number of Valid Data	40					Number of Detected Data	6
403					Number of Distinct Detected Data	6					Number of Non-Detect Data	34
404											Percent Non-Detects	85.00%
405												
406	Raw Statistics						Log-transformed Statistics					
407					Minimum Detected	4.39					Minimum Detected	1.479
408					Maximum Detected	104					Maximum Detected	4.644
409					Mean of Detected	37.04					Mean of Detected	2.972
410					SD of Detected	41.91					SD of Detected	1.281
411					Minimum Non-Detect	1.54					Minimum Non-Detect	0.432
412					Maximum Non-Detect	16.4					Maximum Non-Detect	2.797
413												
414	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	37
415	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	3
416	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	92.50%
417												
418	Warning: There are only 6 Detected Values in this data											
419	Note: It should be noted that even though bootstrap may be performed on this data set											
420	the resulting calculations may not be reliable enough to draw conclusions											
421												
422	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
423												
424												
425	UCL Statistics											
426	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
427					Shapiro Wilk Test Statistic	0.801					Shapiro Wilk Test Statistic	0.918
428					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
429	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
430												
431	Assuming Normal Distribution						Assuming Lognormal Distribution					
432					DL/2 Substitution Method						DL/2 Substitution Method	
433					Mean	7.336					Mean	0.627
434					SD	19.77					SD	1.374
435					95% DL/2 (t) UCL	12.6					95% H-Stat (DL/2) UCL	9.062
436												
437					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
438	MLE yields a negative mean										Mean in Log Scale	-1.709
439											SD in Log Scale	2.426
440											Mean in Original Scale	5.705
441											SD in Original Scale	20.07
442											95% t UCL	11.05
443											95% Percentile Bootstrap UCL	11.15
444											95% BCA Bootstrap UCL	14.12
445												
446	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
447					k star (bias corrected)	0.567	Data appear Normal at 5% Significance Level					
448					Theta Star	65.3						
449					nu star	6.806						
450												

	A–E	F	G–K	L
451	A-D Test Statistic	0.431	**Nonparametric Statistics**	
452	5% A-D Critical Value	0.717	Kaplan-Meier (KM) Method	
453	K-S Test Statistic	0.717	Mean	9.328
454	5% K-S Critical Value	0.342	SD	18.85
455	**Data appear Gamma Distributed at 5% Significance Level**		SE of Mean	3.265
456			95% KM (t) UCL	14.83
457	**Assuming Gamma Distribution**		95% KM (z) UCL	14.7
458	Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	13.62
459	Minimum	1E-12	95% KM (bootstrap t) UCL	34.11
460	Maximum	104	95% KM (BCA) UCL	74.4
461	Mean	37.94	95% KM (Percentile Bootstrap) UCL	19.75
462	Median	31.17	95% KM (Chebyshev) UCL	23.56
463	SD	31.66	97.5% KM (Chebyshev) UCL	29.72
464	k star	0.186	99% KM (Chebyshev) UCL	41.82
465	Theta star	203.8		
466	Nu star	14.89	**Potential UCLs to Use**	
467	AppChi2	7.185	95% KM (t) UCL	14.83
468	95% Gamma Approximate UCL	78.62	95% KM (Percentile Bootstrap) UCL	19.75
469	95% Adjusted Gamma UCL	80.88		
470	**Note: DL/2 is not a recommended method.**			
471				
472	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**			
473	**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**			
474	**For additional insight, the user may want to consult a statistician.**			
475				
476				
477	**NAPHTHALENE**			
478				
479	**General Statistics**			
480	Number of Valid Data	51	Number of Detected Data	11
481	Number of Distinct Detected Data	11	Number of Non-Detect Data	40
482			Percent Non-Detects	78.43%
483				
484	**Raw Statistics**		**Log-transformed Statistics**	
485	Minimum Detected	3.95	Minimum Detected	1.374
486	Maximum Detected	2470	Maximum Detected	7.812
487	Mean of Detected	659.8	Mean of Detected	4.691
488	SD of Detected	873.7	SD of Detected	2.485
489	Minimum Non-Detect	1.4	Minimum Non-Detect	0.336
490	Maximum Non-Detect	16.4	Maximum Non-Detect	2.797
491				
492	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	44
493	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	7
494	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	86.27%
495				
496	**UCL Statistics**			
497	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
498	Shapiro Wilk Test Statistic	0.767	Shapiro Wilk Test Statistic	0.885
499	5% Shapiro Wilk Critical Value	0.85	5% Shapiro Wilk Critical Value	0.85
500	**Data not Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**	

	A–F	G–L
501		
502	**Assuming Normal Distribution**	**Assuming Lognormal Distribution**
503	DL/2 Substitution Method	DL/2 Substitution Method
504	Mean 143.3	Mean 0.947
505	SD 477	SD 2.327
506	95% DL/2 (t) UCL 255.2	95% H-Stat (DL/2) UCL 143.2
507		
508	Maximum Likelihood Estimate(MLE) Method N/A	Log ROS Method
509	**MLE yields a negative mean**	Mean in Log Scale -2.578
510		SD in Log Scale 4.534
511		Mean in Original Scale 142.4
512		SD in Original Scale 477.2
513		95% t UCL 254.4
514		95% Percentile Bootstrap UCL 264.3
515		95% BCA Bootstrap UCL 289.8
516		
517	**Gamma Distribution Test with Detected Values Only**	**Data Distribution Test with Detected Values Only**
518	k star (bias corrected) 0.33	**Data appear Gamma Distributed at 5% Significance Level**
519	Theta Star 2001	
520	nu star 7.253	
521		
522	A-D Test Statistic 0.633	**Nonparametric Statistics**
523	5% A-D Critical Value 0.806	Kaplan-Meier (KM) Method
524	K-S Test Statistic 0.806	Mean 145.4
525	5% K-S Critical Value 0.273	SD 471.6
526	**Data appear Gamma Distributed at 5% Significance Level**	SE of Mean 69.26
527		95% KM (t) UCL 261.5
528	**Assuming Gamma Distribution**	95% KM (z) UCL 259.4
529	Gamma ROS Statistics using Extrapolated Data	95% KM (jackknife) UCL 256.4
530	Minimum 1E-12	95% KM (bootstrap t) UCL 364.9
531	Maximum 2470	95% KM (BCA) UCL 268.3
532	Mean 585.2	95% KM (Percentile Bootstrap) UCL 262.1
533	Median 643.1	95% KM (Chebyshev) UCL 447.3
534	SD 446.6	97.5% KM (Chebyshev) UCL 578
535	k star 0.368	99% KM (Chebyshev) UCL 834.6
536	Theta star 1592	
537	Nu star 37.49	**Potential UCLs to Use**
538	AppChi2 24.47	95% KM (t) UCL 261.5
539	95% Gamma Approximate UCL 896.6	
540	95% Adjusted Gamma UCL 908	
541	**Note: DL/2 is not a recommended method.**	
542		
543	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**	
544	**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**	
545	**For additional insight, the user may want to consult a statistician.**	
546		

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Data Sets with Non-Detects								
2			User Selected Options									
3			From File	Sheet1.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	Benzo(a)pyrene											
10												
11						General Statistics						
12						Number of Valid Data	21			Number of Detected Data		3
13						Number of Distinct Detected Data	3			Number of Non-Detect Data		18
14										Percent Non-Detects		85.71%
15												
16				Raw Statistics						Log-transformed Statistics		
17						Minimum Detected	9.39			Minimum Detected		2.24
18						Maximum Detected	31.8			Maximum Detected		3.459
19						Mean of Detected	21.43			Mean of Detected		2.946
20						SD of Detected	11.3			SD of Detected		0.633
21						Minimum Non-Detect	1.51			Minimum Non-Detect		0.412
22						Maximum Non-Detect	15.6			Maximum Non-Detect		2.747
23												
24				Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect		19
25				For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected		2
26				Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage		90.48%
27												
28						Warning: There are only 3 Distinct Detected Values in this data set						
29						The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.						
30						Those methods will return a 'N/A' value on your output display!						
31												
32						It is necessary to have 4 or more Distinct Values for bootstrap methods.						
33						However, results obtained using 4 to 9 distinct values may not be reliable.						
34						It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.						
35												
36												
37						UCL Statistics						
38				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
39						Shapiro Wilk Test Statistic	0.984			Shapiro Wilk Test Statistic		0.93
40						5% Shapiro Wilk Critical Value	0.767			5% Shapiro Wilk Critical Value		0.767
41						Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level		
42												
43						Assuming Normal Distribution				Assuming Lognormal Distribution		
44						DL/2 Substitution Method				DL/2 Substitution Method		
45						Mean	4.348			Mean		0.465
46						SD	8.168			SD		1.245
47						95% DL/2 (t) UCL	7.422			95% H-Stat (DL/2) UCL		7.782
48												
49						Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method		
50						MLE method failed to converge properly				Mean in Log Scale		0.307

	A–E	F	G–K	L
51			SD in Log Scale	1.31
52			Mean in Original Scale	4.014
53			SD in Original Scale	8.149
54			95% t UCL	7.081
55			95% Percentile Bootstrap UCL	7.138
56			95% BCA Bootstrap UCL	8.18
57				
58	**Gamma Distribution Test with Detected Values Only**		**Data Distribution Test with Detected Values Only**	
59	k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**	
60	Theta Star	N/A		
61	nu star	N/A		
62				
63	A-D Test Statistic	N/A	**Nonparametric Statistics**	
64	5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
65	K-S Test Statistic	N/A	Mean	11.11
66	5% K-S Critical Value	N/A	SD	5.469
67	**Data not Gamma Distributed at 5% Significance Level**		SE of Mean	1.462
68			95% KM (t) UCL	13.63
69	**Assuming Gamma Distribution**		95% KM (z) UCL	13.51
70	Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	19.88
71	Minimum	N/A	95% KM (bootstrap t) UCL	11.9
72	Maximum	N/A	95% KM (BCA) UCL	N/A
73	Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
74	Median	N/A	95% KM (Chebyshev) UCL	17.48
75	SD	N/A	97.5% KM (Chebyshev) UCL	20.24
76	k star	N/A	99% KM (Chebyshev) UCL	25.65
77	Theta star	N/A		
78	Nu star	N/A	**Potential UCLs to Use**	
79	AppChi2	N/A	95% KM (t) UCL	13.63
80	95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	N/A
81	95% Adjusted Gamma UCL	N/A		
82	**Note: DL/2 is not a recommended method.**			
83				
84	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**			
85	**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**			
86	**For additional insight, the user may want to consult a statistician.**			
87				
88				
89	**Benzo(b)fluoranthene**			
90				
91	**General Statistics**			
92	Number of Valid Data	21	Number of Detected Data	3
93	Number of Distinct Detected Data	3	Number of Non-Detect Data	18
94			Percent Non-Detects	85.71%
95				
96	**Raw Statistics**		**Log-transformed Statistics**	
97	Minimum Detected	6.56	Minimum Detected	1.881
98	Maximum Detected	44.1	Maximum Detected	3.786
99	Mean of Detected	28.49	Mean of Detected	3.072
100	SD of Detected	19.55	SD of Detected	1.039

	A	B	C	D	E	F	G	H	I	J	K	L
101					Minimum Non-Detect	1.51					Minimum Non-Detect	0.412
102					Maximum Non-Detect	15.6					Maximum Non-Detect	2.747
103												
104	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	19
105	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
106	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	90.48%
107												
108	**Warning: There are only 3 Distinct Detected Values in this data set**											
109	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
110	**Those methods will return a 'N/A' value on your output display!**											
111												
112	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
113	**However, results obtained using 4 to 9 distinct values may not be reliable.**											
114	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
115												
116												
117	**UCL Statistics**											
118	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
119					Shapiro Wilk Test Statistic	0.922					Shapiro Wilk Test Statistic	0.842
120					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
121	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
122												
123	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
124					DL/2 Substitution Method						DL/2 Substitution Method	
125					Mean	5.356					Mean	0.484
126					SD	11.61					SD	1.309
127					95% DL/2 (t) UCL	9.725					95% H-Stat (DL/2) UCL	9.221
128												
129					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
130	**MLE method failed to converge properly**										Mean in Log Scale	-0.981
131											SD in Log Scale	2.031
132											Mean in Original Scale	4.356
133											SD in Original Scale	11.84
134											95% t UCL	8.813
135											95% Percentile Bootstrap UCL	8.567
136											95% BCA Bootstrap UCL	10.56
137												
138	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
139					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
140					Theta Star	N/A						
141					nu star	N/A						
142												
143					A-D Test Statistic	N/A	**Nonparametric Statistics**					
144					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
145					K-S Test Statistic	N/A					Mean	9.692
146					5% K-S Critical Value	N/A					SD	9.761
147	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	2.609
148											95% KM (t) UCL	14.19
149	**Assuming Gamma Distribution**										95% KM (z) UCL	13.98
150					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	27.67

	A–E	F	G–K	L
151	Minimum	N/A	95% KM (bootstrap t) UCL	11.43
152	Maximum	N/A	95% KM (BCA) UCL	44.1
153	Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
154	Median	N/A	95% KM (Chebyshev) UCL	21.06
155	SD	N/A	97.5% KM (Chebyshev) UCL	25.98
156	k star	N/A	99% KM (Chebyshev) UCL	35.65
157	Theta star	N/A		
158	Nu star	N/A	**Potential UCLs to Use**	
159	AppChi2	N/A	95% KM (t) UCL	14.19
160	95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	N/A
161	95% Adjusted Gamma UCL	N/A		
162	**Note: DL/2 is not a recommended method.**			
163				
164	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**			
165	**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**			
166	**For additional insight, the user may want to consult a statistician.**			
167				
168				
169	**Naphthalene**			
170				
171	**General Statistics**			
172	Number of Valid Data	21	Number of Detected Data	3
173	Number of Distinct Detected Data	3	Number of Non-Detect Data	18
174			Percent Non-Detects	85.71%
175				
176	**Raw Statistics**		**Log-transformed Statistics**	
177	Minimum Detected	3.02	Minimum Detected	1.105
178	Maximum Detected	5.76	Maximum Detected	1.751
179	Mean of Detected	4.747	Mean of Detected	1.518
180	SD of Detected	1.503	SD of Detected	0.358
181	Minimum Non-Detect	1.51	Minimum Non-Detect	0.412
182	Maximum Non-Detect	15.6	Maximum Non-Detect	2.747
183				
184	Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	21
185	For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
186	Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
187				
188	**Warning: There are only 3 Distinct Detected Values in this data set**			
189	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**			
190	**Those methods will return a 'N/A' value on your output display!**			
191				
192	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**			
193	**However, results obtained using 4 to 9 distinct values may not be reliable.**			
194	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**			
195				
196				
197	**UCL Statistics**			
198	**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**	
199	Shapiro Wilk Test Statistic	0.831	Shapiro Wilk Test Statistic	0.812
200	5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767

	A	B	C	D	E	F	G	H	I	J	K	L
201	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
202												
203	Assuming Normal Distribution						Assuming Lognormal Distribution					
204					DL/2 Substitution Method						DL/2 Substitution Method	
205					Mean	1.963					Mean	0.259
206					SD	2.116					SD	0.851
207					95% DL/2 (t) UCL	2.759					95% H-Stat (DL/2) UCL	2.922
208												
209					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
210	MLE method failed to converge properly										Mean in Log Scale	0.0839
211											SD in Log Scale	0.731
212											Mean in Original Scale	1.476
213											SD in Original Scale	1.49
214											95% t UCL	2.037
215											95% Percentile Bootstrap UCL	2.008
216											95% BCA Bootstrap UCL	2.202
217												
218	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
219					k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level					
220					Theta Star	N/A						
221					nu star	N/A						
222												
223					A-D Test Statistic	N/A	Nonparametric Statistics					
224					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
225					K-S Test Statistic	N/A					Mean	3.308
226					5% K-S Critical Value	N/A					SD	0.815
227	Data not Gamma Distributed at 5% Significance Level										SE of Mean	0.235
228											95% KM (t) UCL	3.714
229	Assuming Gamma Distribution										95% KM (z) UCL	3.695
230					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	4.839
231					Minimum	N/A					95% KM (bootstrap t) UCL	3.516
232					Maximum	N/A					95% KM (BCA) UCL	N/A
233					Mean	N/A					95% KM (Percentile Bootstrap) UCL	5.76
234					Median	N/A					95% KM (Chebyshev) UCL	4.334
235					SD	N/A					97.5% KM (Chebyshev) UCL	4.778
236					k star	N/A					99% KM (Chebyshev) UCL	5.65
237					Theta star	N/A						
238					Nu star	N/A	Potential UCLs to Use					
239					AppChi2	N/A					95% KM (t) UCL	3.714
240					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	5.76
241					95% Adjusted Gamma UCL	N/A						
242	Note: DL/2 is not a recommended method.											
243												
244	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
245	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
246	For additional insight, the user may want to consult a statistician.											
247												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3			From File	Sheet1.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	BENZO(A)ANTHRACENE											
10												
11				General Statistics								
12			Number of Valid Data			21	Number of Detected Data					1
13			Number of Distinct Detected Data			1	Number of Non-Detect Data					20
14							Percent Non-Detects					95.24%
15												
16				Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!								
17				It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).								
18												
19				The data set for variable BENZO(A)ANTHRACENE was not processed!								
20												
21												
22												
23	BENZO(A)PYRENE											
24												
25				General Statistics								
26			Number of Valid Data			21	Number of Detected Data					2
27			Number of Distinct Detected Data			2	Number of Non-Detect Data					19
28							Percent Non-Detects					90.48%
29												
30			Raw Statistics				Log-transformed Statistics					
31			Minimum Detected			10.4	Minimum Detected					2.342
32			Maximum Detected			121	Maximum Detected					4.796
33			Mean of Detected			65.7	Mean of Detected					3.569
34			SD of Detected			78.21	SD of Detected					1.735
35			Minimum Non-Detect			1.51	Minimum Non-Detect					0.412
36			Maximum Non-Detect			1.75	Maximum Non-Detect					0.56
37												
38	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					19
39	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					2
40	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					90.48%
41												
42				Warning: Data set has only 2 Distinct Detected Values.								
43				This may not be adequate enough to compute meaningful and reliable test statistics and estimates.								
44				The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).								
45												
46				Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.								
47												
48				The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.								
49				Those methods will return a 'N/A' value on your output display!								
50												

	A	B	C	D	E	F	G	H	I	J	K	L
51	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
52	However, results obtained using 4 to 9 distinct values may not be reliable.											
53	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
54												
55												
56	UCL Statistics											
57	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
58					Shapiro Wilk Test Statistic	N/A				Shapiro Wilk Test Statistic		N/A
59					5% Shapiro Wilk Critical Value	N/A				5% Shapiro Wilk Critical Value		N/A
60	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
61												
62	Assuming Normal Distribution						Assuming Lognormal Distribution					
63					DL/2 Substitution Method					DL/2 Substitution Method		
64					Mean	6.969				Mean		0.123
65					SD	26.21				SD		1.21
66					95% DL/2 (t) UCL	16.83				95% H-Stat (DL/2) UCL		5.1
67												
68					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
69	MLE method failed to converge properly									Mean in Log Scale		N/A
70										SD in Log Scale		N/A
71										Mean in Original Scale		N/A
72										SD in Original Scale		N/A
73										95% t UCL		N/A
74										95% Percentile Bootstrap UCL		N/A
75										95% BCA Bootstrap UCL		N/A
76												
77	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
78					k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)					
79					Theta Star	N/A						
80					nu star	N/A						
81												
82					A-D Test Statistic	N/A	Nonparametric Statistics					
83					5% A-D Critical Value	N/A				Kaplan-Meier (KM) Method		
84					K-S Test Statistic	N/A				Mean		15.67
85					5% K-S Critical Value	N/A				SD		23.55
86	Data not Gamma Distributed at 5% Significance Level									SE of Mean		7.269
87										95% KM (t) UCL		28.2
88	Assuming Gamma Distribution									95% KM (z) UCL		27.62
89					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		88.88
90					Minimum	N/A				95% KM (bootstrap t) UCL		N/A
91					Maximum	N/A				95% KM (BCA) UCL		N/A
92					Mean	N/A				95% KM (Percentile Bootstrap) UCL		N/A
93					Median	N/A				95% KM (Chebyshev) UCL		47.35
94					SD	N/A				97.5% KM (Chebyshev) UCL		61.06
95					k star	N/A				99% KM (Chebyshev) UCL		87.99
96					Theta star	N/A						
97					Nu star	N/A	Potential UCLs to Use					
98					AppChi2	N/A				97.5% KM (Chebyshev) UCL		61.06
99					95% Gamma Approximate UCL	N/A						
100					95% Adjusted Gamma UCL	N/A						

	A	B	C	D	E	F	G	H	I	J	K	L
101	Note: DL/2 is not a recommended method.											
102												
103	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
104	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
105	For additional insight, the user may want to consult a statistician.											
106												
107												
108	BENZO(B)FLUORANTHENE											
109												
110	General Statistics											
111	Number of Valid Data					21	Number of Detected Data					1
112	Number of Distinct Detected Data					1	Number of Non-Detect Data					20
113							Percent Non-Detects					95.24%
114												
115	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
116	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
117												
118	The data set for variable BENZO(B)FLUORANTHENE was not processed!											
119												
120												

APPENDIX I – SUPPORTING DOCUMENTATION FOR THE ERA

CHEMICAL TOXICITY INFORMATION
RECEPTOR PROFILES
BIOACCUMULATION FACTORS

CHEMICAL TOXICITY INFORMATION

This appendix presents a discussion of the different chemical classes detected at the sites, including toxicity information, potential food chain and trophic transfer, and bioaccumulation potential.

Volatile Organic Compounds

VOCs are usually very mobile in the environment because they are poorly adsorbed to soil and sediment particles. Also, because they are very volatile, they typically are only detected in surface water, surface soil, and sediment at low concentrations.

Most VOCs have very little potential to bioaccumulate in ecological receptors; therefore, biomagnification through the food chain does not appear to be significant. VOCs are not expected to biomagnify in plants and are typically only toxic to ecological receptors at relatively high concentrations.

Polynuclear Aromatic Hydocarbons

Polynuclear aromatic hydocarbons (PAHs) are a diverse group of compounds consisting of two or more substituted and unsubstituted polynuclear aromatic rings formed by the incomplete combustion of carbonaceous materials. PAHs are ubiquitous in the modern environment and are common constituents of coal tar, soot, vehicle exhaust, cigarette smoke, certain petroleum products, road tar, mineral oils, creosote, and many cooked foods. PAHs also are released to the environment through natural sources such as volcanoes and forest fires.

PAHs are transferred from surface water by volatilization and sorption to settling particles. The compounds are transformed in surface water by photooxidation, chemical oxidation, and microbial metabolism (ATSDR, 1989). In soil and sediments, microbial metabolism is the major process for degradation of PAHs (ATSDR, 1989). Although PAHs accumulate in terrestrial and aquatic plants, many organisms are able to metabolize and eliminate these compounds. Vertebrates can readily metabolize PAHs, but lower forms (insects and worms) cannot metabolize PAHs as quickly. However, food chain uptake does not appear to be a major exposure source to PAHs for aquatic animals (ATSDR, 1989).

PAHs vary substantially in their toxicity to aquatic organisms. In general, toxicity increases as molecular weight increases, with the exception of some high molecular weight PAHs that have

low acute toxicity. Most species of aquatic organisms rapidly accumulate PAHs that occur at low concentrations in the ambient medium. However, uptake of PAHs is highly species-specific, it is higher in algae, mollusks, and other species that are incapable of metabolizing PAHs (Eisler, 1987). The ability of fish to metabolize PAHs may explain why benzo(a)pyrene is frequently not detected or is found at only very low levels in fish from environments heavily contaminated with PAHs (ATSDR, 1989).

References:

Agency for Toxic Substances and Disease Registry (ATSDR). 1989. Toxicological Profile for Polycyclic Aromatic Hydrocarbons. U.S. Public Health Service. Atlanta, Georgia. October.

Eisler, Ronald. 1987. Polycyclic Aromatic Hydrocarbon Hazards to Fish, Wildlife, and Invertebrates: A Synoptic Review. US Department of Interior - Fish and Wildlife Service. Biological Report 85 (1.11). May

RECEPTOR PROFILES

APPENDIX I

RECEPTOR PROFILES
SWMU 32
NSA CRANE, CRANE, INDIANA

The following sections present the receptor profiles for the representative herbivorous, insectivorous, and piscivorous receptors chosen for food chain modeling at SWMU 32. The majority of the information for the profiles was obtained from the Wildlife Exposure Factors Handbook (U.S. EPA, 1993). The data for the incidental soil ingestion rates were obtained from the U.S. EPA Ecological Soil Screening Guidance (U.S. EPA, 2005).

The food and water ingestion rates are listed in g/g (of body weight)-day on a wet weight basis but were converted to dry weight for the ERA using the exposure factors presented below. The home ranges are presented in hectares in U.S. EPA (1993) but were converted to acres by multiplying the number of hectares by 2.471. Also note that the estimated percent of soil in the diets are listed in dry weight.

Short-Tailed Shrew (*Blarina brevicauda*)

Shrews inhabit a wide variety of habitats and are common in areas with abundant vegetative cover. They need cool, moist habitats because of their high metabolic and water-loss rates. The short-tailed shrew is primarily carnivorous, eating insects and other invertebrates such as earthworms, slugs, and snails.

The adult body weight for the short-tailed shrew in various habitats ranged from 0.015 to 0.01921 kg with an average of 0.0169 kg. The listed food ingestion rates for shrews are between 0.43 and 0.96 g/g-day (wet-weight). The food ingestion rate in kg/day was calculated as shown on Table I.6. The food ingestion rate was then multiplied by 0.16 in the food chain model, which is the percent solids of worms (Sample et al., 1997) to convert the ingestion rate from a wet-weight value to a dry-weight value. The incidental soil ingestion rate was calculated by multiplying the ingestion rate by the percentage of soil that is incidentally ingested (3% for conservative food chain model and 0.9% for the average food chain model) from U. S. EPA (2007). 3% is the 90th percentile value and 0.9% is the 50th percentile value from U. S. EPA (2007). The only available home range for the shrew (0. 9699 acres) was calculated using data from a tamarack bog in Manitoba (only value available).

American Woodcock (*Scolopax minor*)

Woodcocks inhabit both woodlands and abandoned fields, particularly those with rich and moderately to poorly drained loamy soils, which tend to support abundant earthworm populations. They feed primarily on invertebrates found in moist upland soils by probing the soil with their long prehensile-tipped bill. Earthworms are their preferred diet, but seeds and other plant matter may also be consumed.

The adult body weight for the woodcock ranges from 0.166 to 0.213 kg with an average of 0.190 kg. The

listed food ingestion rates for the woodcock are between 0.73 and 1.0 g/g-day (wet-weight). The food ingestion rate in kg/day was calculated as shown in Table I.6. The food ingestion rate was then multiplied by 0.16 in the food chain model, which is the percent solids of worms (Sample et al., 1997) to convert the ingestion rate from a wet-weight value to a dry-weight value. The incidental soil ingestion rate was calculated by multiplying the ingestion rate by the percentage of soil that is incidentally ingested (assumed 16.4% for conservative food chain model and 6.4% for the average food chain model) from U. S. EPA (2007). 16.4% is the 90th percentile value and 6.4% is the 50th percentile value from U. S. EPA (2007).

The range of home range sizes for the woodcock is 7.66 to 182 acres with an average home range of 61 acres.

Meadow Vole (*Microtus pennsylvanicus*)

Meadow voles inhabit grassy fields, marshes, and bogs; however, they prefer fields with more grass, more cover, and fewer woody plants. They typically consume green succulent vegetation, sedges, seeds, roots, bark, fungi, insects, and animal matter. However, green succulent vegetation makes up the majority of their diet.

The adult body weight for the vole ranges from 0.0329 to 0.0391 kg with an average of 0.0366 kg. The only listed food ingestion rates for voles range from 0.30 to 0.35 g/g-day (wet-weight), with an average of 0.325 g/g-day. The food ingestion rate in kg/day was calculated as shown in Table I.6. The food ingestion rate was then multiplied by 0.15 in the food chain model, which is the percent solids of plant foliage (U.S. EPA, 2007), to convert the ingestion rate from a wet-weight value to a dry-weight value. The incidental soil ingestion rate was calculated by multiplying the ingestion rate by the percentage of soil that is incidentally ingested (assumed 3.2% for conservative food chain model and 1.2% for the average food chain model) from U. S. EPA (2007). 3.2% is the 90th percentile value and 1.2% is the 50th percentile value from U. S. EPA (2007).

The range of home range sizes for the meadow vole is 0.0297 to 1.06 acres with an average home range of 0.16 acres.

Northern Bobwhite Quail (*Colinus virginianus*)

Quails inhabit grasslands, idle fields, pastures, and large clumps of grasses. Bobwhite quails forage in areas with open vegetation, some bare ground, and light litter. Seeds from weeds, woody plants, and

grasses comprise the majority of an adult's diet, although green vegetation has been found to dominate the diet of this species in winter in the southern areas of the United States.

The adult body weight for the bobwhite quail ranges from 0.162 to 0.186 kg with an average of 0.177 kg. The listed food ingestion rates for quails range from 0.067 to 0.093 g/g-day (wet-weight), with an average of 0.082 g/g-day. The food ingestion rate in kg/day was calculated as shown on Table I.5. The food ingestion rate was then multiplied by 0.15 in the food chain model, which is the percent solids of plant foliage (U.S. EPA, 2007), to convert the ingestion rate from a wet-weight value to a dry-weight value. The incidental soil ingestion rate was calculated by multiplying the ingestion rate by the percentage of soil that is incidentally ingested (assumed 13.9% for conservative food chain model and 6.1% for the average food chain model) from U. S. EPA (2007). 13.9% is the 90th percentile value and 6.1% is the 50th percentile value for the mourning dove from U. S. EPA (2007).

The home range for the quail ranges from 16 to 41 acres with an average home range of 29 acres.

References:

Sample, B.E., M.S. Aplin, R.A. Efroymson, G.W., Suter II, and C.J.E. Welsh. 1997. Methods and Tools for Estimation of the Exposure of Terrestrial Wildlife to Contaminants. Oak Ridge National Laboratory. October. ORNL/TM-13391.

U.S. EPA (U.S. Environmental Protection Agency), 1993. Wildlife Exposure Factors Handbook. U.S. Environmental Protection Agency. Office of Research and Development. Washington, D.C. December 1993. EPA/600/R-93/187a.

U.S. EPA (U.S. Environmental Protection Agency), 2007. Guidance for Developing Ecological Soil Screening Level, Attachment 4-1, Exposure Factors and Bioaccumulation Models for Derivation of Wildlife Eco-SSLs. Office of Solid Waste and Emergency and Response. OSWER Directive 9285.7-55. April.

TABLE I.1

EXPOSURE PARAMETERS FOR THE TERRESTRIAL WILDLIFE MODEL
NSA CRANE, INDIANA

Species/Exposure Inputs	Conservative Inputs		Average Inputs		Source
	Values	Units	Values	Units	
Meadow Vole					
Body Weight = BW	3.290E-02	kg	3.663E-02	kg	USEPA, 1993
Food Ingestion Rate = If	3.840E-03	kg/day	3.570E-03	kg/day	USEPA, 1993
Water Ingestion Rate = Iw	7.700E-03	L/day	6.400E-03	L/day	USEPA, 1993
Soil Ingestion Rate - Is	1.229E-04	kg/day	4.284E-05	kg/day	Beyer, 1993
Home Range = HR	Assume 100% on site		1.640E-01	acres	USEPA, 1993
Short-Tailed Shrew					
Body Weight = BW	1.525E-02	kg	1.687E-02	kg	USEPA, 1993
Food Ingestion Rate = If	2.592E-03	kg/day	1.648E-03	kg/day	USEPA, 1993
Water Ingestion Rate = Iw	4.300E-03	L/day	3.800E-03	L/day	USEPA, 1993
Soil Ingestion Rate - Is	7.776E-05	kg/day	1.483E-05	kg/day	Beyer, 1993
Home Range = HR	Assume 100% on site		9.700E-01	acres	USEPA, 1993
American Woodcock					
Body Weight = BW	1.660E-01	kg	1.895E-01	kg	USEPA, 1993
Food Ingestion Rate = If	3.032E-02	kg/day	2.526E-02	kg/day	USEPA, 1993
Water Ingestion Rate = Iw	1.900E-02	L/day	1.900E-02	L/day	USEPA, 1993
Soil Ingestion Rate - Is	4.972E-03	kg/day	1.617E-03	kg/day	Beyer, 1993
Home Range = HR	Assume 100% on site		6.133E+01	acres	USEPA, 1993
Bobwhite Quail					
Body Weight = BW	1.620E-01	kg	1.770E-01	kg	USEPA, 1993
Food Ingestion Rate = If	4.920E-03	kg/day	4.320E-03	kg/day	USEPA, 1993
Water Ingestion Rate = Iw	2.310E-02	L/day	1.840E-02	L/day	USEPA, 1993
Soil Ingestion Rate - Is	6.839E-04	kg/day	2.635E-04	kg/day	Beyer, 1993
Home Range = HR	Assume 100% on site		2.860E+01	acres	USEPA, 1993

Notes:
The exposure factors were derived as presented in Appendix I Table I.2.

The soil ingestion rates were calculated by multiplying the food ingestion rates by the following incidental soil ingestion rates:

Receptor	Conservative	Average	Source
Bobwhite quail	13.90%	6.10%	1, 2
Meadow Vole	3.20%	1.20%	1
American woodcock	16.40%	6.40%	1
Short-tailed Shrew	3%	0.90%	1

1 - USEPA (U.S. Environmental Protection Agency), 2005. Ecological Soil Screening Level Guidance, Office of Emergency and Remedial Response. February.
2 - Based on the mourning dove.

TABLE I.2

CALCULATION OF EXPOSURE PARAMETERS FOR SURROGATE WILDLIFE RECEPTORS
SWMU 32
NSA CRANE, CRANE INDIANA

Exposure Parameters	Meadow Vole		Short-Tailed Shrew		American Woodcock	Bobwhite Quail	
Body Weights (g)	32.9		17.61	16.87	168	180	181
	39.1		17.33	15.58	209	168	183
	35.5		19.21	15.7	166	162	179
	39		17.4	15.25	212	175	175
					169	178	183.2
					213	179	185.5
						180	173
						162.8	180.4
Minimum	***32.9***		***15.25***		***166***	***162***	
Maximum	***39.1***		***19.21***		***213***	***186***	
Average	***36.6***		***16.87***		***190***	***177***	
Food Ingestion Rate (g/g-day) (1)	0.3		0.49	0.77	1.0	0.067	0.079
	0.35		0.62	0.55	0.77	0.072	0.093
			0.43	0.96	0.73	0.09	0.089
			0.52	0.54			
Minimum	***0.3***		***0.43***		***0.73***	***0.067***	
Maximum	***0.35***		***0.96***		***1.0***	***0.093***	
Average	***0.325***		***0.61***		***0.8***	***0.082***	
Food Ingestion Rate (kg/day)							
Conservative	***1.28E-02***		***1.62E-02***		***1.90E-01***	***1.64E-02***	
Average	***1.19E-02***		***1.03E-02***		***1.58E-01***	***1.44E-02***	
Home Range (Ha)	0.43	0.1	0.3925		4.5	7.6	
	0.02	0.04			32.4	16.7	
	0.01	0.03			3.1	6.4	
	0.01	0.01			73.6	15.6	
	0.04	0.06			10.5		
	0.02	0.03					
	0.05	0.08					
	0.06	0.06					
Minimum (acres)	***0.0297***		***0.97***		***7.7***	***16***	
Maximum (acres)	***1.06***		***0.97***		***182***	***41***	
Average (acres)	***0.16***		***0.97***		***61***	***29***	

Notes:
Source of data is U.S. EPA (1993). If values from several studies are available, they are given. The minimum, maximum, and average values are derived from these studies.

Footnotes:
(1) - Ingestion Rates (kg/day or L/day) (if more than 1 ingestion rate is available)
- Conservative value = Max Ingestion Rate (g/g-day) * Avg. Body Weight
- Average value = Avg. Ingestion Rate (g/g-day) * Avg. Body Weight

Ingestion Rates (L/day) (if only 1 ingestion rate is available)
- Conservative value = Ingestion Rate (g/g-day) * Max. Body Weight
- Average value = Ingestion Rate (g/g-day) * Avg. Body Weight

BIOACCUMULATION FACTORS

APPENDIX I

BIOACCUMULATION FACTORS SOURCES
SWMU 32
NSA CRANE, CRANE, INDIANA

This appendix presents the bioaccumulation factors (BAFs) that were used in the food chain models, as noted in Table I.3. The following sources of BAFs were used in the ecological risk assessment for most of the chemicals:

- Plant and Soil Invertebrate BAFs: EPA Guidance for Developing Ecological Soil Screening Levels, Attachment 4-1 (U. S. EPA, 2007)

Appendix Table I.3 presents the BAFs that were used in the surrogate species' food-chain models for the individual constituents that were detected in the surface soil at SWMU 32. Note that dry weight BAFs were used for this ERA.

The EPA Guidance for Developing Ecological Soil Screening Levels (Eco SSLs) was the source of the BAFs for all chemicals. Several of the BAFs are actually regression equations that are used to calculate the tissue concentration from the soil concentration.

USEPA, 2007. Guidance for Developing Ecological Soil Screening Level, Attachment 4-1, Exposure Factors and Bioaccumulation Models for Derivation of Wildlife Eco-SSLs. Office of Solid Waste and Emergency and Response. OSWER Directive 9285.7-55. April.

TABLE I.3

DRY WEIGHT BAFS AND/OR BSAFS FOR PLANTS, EARTHWORMS, AND FISH

Chemical	Plant BAFs[1]		Earthworm BAFs[1]	
	Conservative[2]	Average[2]	Conservative[2]	Average[2]
Semivolatile Organics				
BENZO(A)ANTHRACENE	Regression from Eco SSL		1.59E+00	1.59E+00
BENZO(A)PYRENE	Regression from Eco SSL		1.33E+00	1.33E+00
BENZO(B)FLUORANTHENE	3.10E-01	3.10E-01	2.60E+00	2.60E+00
BENZO(K)FLUORANTHENE	Regression from Eco SSL		2.60E+00	2.60E+00
CHRYSENE	Regression from Eco SSL		2.29E+00	2.29E+00
DIBENZO(A,H)ANTHRACENE	1.30E-01	1.30E-01	2.31E+00	2.31E+00
INDENO(1,2,3-CD)PYRENE	1.10E-01	1.10E-01	2.86E+00	2.86E+00
NAPHTHALENE	1.22E+01	1.22E+01	4.40E+00	4.40E+00

Notes:

BAF - Bioaccumulation Factor

1 - Source of the BAFs is USEPA (2007), Attachment 4-1, Table 4b. Where "Regression of Eco SSL is listed, the value is calculated from listed BAF regression equation.

2 - Conservative and average refers to the exposure scenarios for which the uptake factors are used

TABLE I.4

TOXICITY REFERENCE VALUES FOR TERRESTRIAL FOOR CHAIN MODELS
SWMU 32
NSA CRANE, CRANE, INDIANA

PARAMETER	Mammal		Bird	
	NOAEL	LOAEL	NOAEL	LOAEL
SEMIVOLATILES				
Benzo(a)anthracene	0.615	38.4	2	20
Benzo(a)pyrene	0.615	38.4	2	20
Benzo(b)fluoranthene	0.615	38.4	2	20
Benzo(k)fluoranthene	0.615	38.4	2	20
Chrysene	0.615	38.4	2	20
Dibenzo(a,h)anthracene	0.615	38.4	2	20
Indeno(1,2,3-cd)pyrene	0.615	38.4	2	20
Naphthalene	65.6	356	2	20

Notes:

The sources of these NOAELS and LOAELS are presented in Table I.5 titled "Sources and Endpoints for NOAELS and LOAELS for Terrestrial Wildlife".

TABLE I.5

SOURCES AND ENDPOINTS FOR NOAELS AND LOAELS FOR TERRESTRIAL WILDLIFE
SWMU 32
NSA CRANE, CRANE, INDIANA

Parameters	Concentration (mg/kg-day)	Endpoint	Effect	Chronic/ Subchronic	Species	Primary Reference	Source of Reference
Semivolatiles Organics							
7,12-Dimethylbenz(a)anthracene	2	NOAEL	systemic	chronic	nestling/starlings	Trust et al., 1994	
7,12-Dimethylbenz(a)anthracene	20	LOAEL	systemic	chronic	nestling/starlings	Trust et al., 1994	
High Molecular Weight PAHs	0.615	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007	
High Molecular Weight PAHs	38.4	LOAEL	reproduction & growth	chronic	mammals	USEPA, 2007	
Low Molecular Weight PAHs	356	LOAEL	reproduction & growth	chronic	mammals	USEPA, 2007	
Low Molecular Weight PAHs	65.6	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007	

Notes:

NOAEL = No Observed Adverse Effects Level

LOAEL = Lowest Observed Adverse Effects Level

The NOAELS and LOAELS for the following PAHs are based on the High Molecular Weight PAH values: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, dibenzofuran, indeno(1,2,3-c,d)pyrene, and pyrene.

The NOAEL and LOAEL for naphthalene is based on the Low Molecular PAH values.

The NOAELS and LOAELS for the PAHs for birds were based on 7,12-dimethylbenz(a)anthracene.

References for the NOAELS and LOAELs are presented in this Appendix and Titled "Source and Endpoint References for NOAELs and LOAELs for Terrestrial Wildlife".

APPENDIX I

SOURCES AND ENPOINTS FOR NOAELS AND LOAELS FOR TERRESTRIAL WILDLIFE
SWMU 32
NSA CRANE, CRANE, INDIANA

Trust, K.A., A. Fairbrother, and M.J. Hooper. 1994. Effects of 7,12-Dimethylbenz(a)anthracene on Immune Function and Mixed-Function Oxygenase Activity in the European Starling. Environ. Tox. And Chem., Vol. 13, No. 5, pp. 821-830.

U. S. EPA, 2007. Ecological Soil Screening Level for PAHs, Interim Final. Office of Emergency and Remedial Response. OSWER Directive 9285.7-78. June.

APPENDIX I

CHEMICAL CONCENTRATIONS IN SURFACE SOIL AND TISSUE
SWMU 32
NSA CRANE, CRANE, INDIANA

Chemical	Surface Soil Concentrations (mg/kg)				Surface Water Concentrations (mg/L)		Earthworm Bioaccumulation Factors		Earthworm Concentrations (mg/kg)		Plant Bioaccumulation Factors		Plant Concentrations (mg/kg)	
	Maximum Detection	Average All	Average of Positive Detections	Average [1]	Maximum Detection	Average Concentration[1]	Conservative	Average	Maximum Detection	Average	Conservative	Average	Maximum Detection	Average
Semivolatile Organics														
BENZO(A)ANTHRACENE	3.67E+00	8.35E-02	5.74E-01	8.35E-02	0.00E+00	0.00E+00	1.59E+00	1.59E+00	5.84E+00	1.33E-01	Regression from Eco SSL		1.44E-01	1.52E-02
BENZO(A)PYRENE	3.45E+00	1.19E-01	5.22E-01	1.19E-01	0.00E+00	0.00E+00	1.33E+00	1.33E+00	4.59E+00	1.59E-01	Regression from Eco SSL		4.26E-01	1.60E-02
BENZO(B)FLUORANTHENE	4.14E+00	9.23E-02	5.08E-01	9.23E-02	0.00E+00	0.00E+00	2.60E+00	2.60E+00	1.08E+01	2.40E-01	3.10E-01	3.10E-01	1.28E+00	2.86E-02
BENZO(K)FLUORANTHENE	1.44E+00	3.27E-02	3.48E-01	3.27E-02	0.00E+00	0.00E+00	2.60E+00	2.60E+00	3.74E+00	8.50E-02	Regression from Eco SSL		1.58E-01	6.11E-03
CHRYSENE	3.98E+00	8.63E-02	5.93E-01	8.63E-02	0.00E+00	0.00E+00	2.29E+00	2.29E+00	9.11E+00	1.98E-01	Regression from Eco SSL		1.52E-01	1.55E-02
DIBENZO(A,H)ANTHRACENE	5.95E-01	1.41E-02	1.75E-01	1.41E-02	0.00E+00	0.00E+00	2.31E+00	2.31E+00	1.37E+00	3.26E-02	1.30E-01	1.30E-01	7.74E-02	1.84E-03
INDENO(1,2,3-CD)PYRENE	2.53E+00	5.64E-02	6.13E-01	5.64E-02	0.00E+00	0.00E+00	2.86E+00	2.86E+00	7.24E+00	1.61E-01	1.10E-01	1.10E-01	2.78E-01	6.20E-03
NAPHTHALENE	2.73E-01	1.45E-02	6.19E-02	1.45E-02	0.00E+00	0.00E+00	4.40E+00	4.40E+00	1.20E+00	6.38E-02	1.22E+01	1.22E+01	3.33E+00	1.77E-01

1 - If the average of all value is the greater than the maximum detection, the average of the positive detections was used as the average value.

MEADOW VOLE - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
SWMU 32
NSA CRANE, CRANE, INDIANA

Parameter	Max Soil Concentration (mg/kg)	Max SW Concentration (mg/L)	Vegetation Concentration (mg/kg)	Dose (mg/kg/day) from: Surface Soil	Surface Water	Vegetation	Total Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL EEQ	LOAEL EEQ
Semivolatile Organics											
BENZO(A)ANTHRACENE	3.67E+00	0.00E+00	1.44E-01	1.37E-02	0.00E+00	1.69E-02	3.06E-02	6.15E-01	3.84E+01	4.97E-02	7.96E-04
BENZO(A)PYRENE	3.45E+00	0.00E+00	4.26E-01	1.29E-02	0.00E+00	4.97E-02	6.26E-02	6.15E-01	3.84E+01	1.02E-01	1.63E-03
BENZO(B)FLUORANTHENE	4.14E+00	0.00E+00	1.28E+00	1.55E-02	0.00E+00	1.50E-01	1.65E-01	6.15E-01	3.84E+01	2.69E-01	4.30E-03
BENZO(K)FLUORANTHENE	1.44E+00	0.00E+00	1.58E-01	5.38E-03	0.00E+00	1.85E-02	2.38E-02	6.15E-01	3.84E+01	3.88E-02	6.21E-04
CHRYSENE	3.98E+00	0.00E+00	1.52E-01	1.49E-02	0.00E+00	1.77E-02	3.26E-02	6.15E-01	3.84E+01	5.29E-02	8.48E-04
DIBENZO(A,H)ANTHRACENE	5.95E-01	0.00E+00	7.74E-02	2.22E-03	0.00E+00	9.03E-03	1.13E-02	6.15E-01	3.84E+01	1.83E-02	2.93E-04
INDENO(1,2,3-CD)PYRENE	2.53E+00	0.00E+00	2.78E-01	9.45E-03	0.00E+00	3.25E-02	4.19E-02	6.15E-01	3.84E+01	6.82E-02	1.09E-03
NAPHTHALENE	2.73E-01	0.00E+00	3.33E+00	1.02E-03	0.00E+00	3.89E-01	3.90E-01	6.56E+01	3.56E+02	5.94E-03	1.09E-03

Cells are shaded if the EEQ is greater than 1.0.

Body Weight = (BW)	3.290E-02	kg
Food Ingestion Rate = (If)	3.840E-03	kg/day
Water Ingestion Rate = (Iw)	7.700E-03	L/day
Soil Ingestion Rate = (Is)	1.229E-04	kg/day
Home Range = (HR)	Assume 100% on site	
Contaminated Area = (CA)	Assume equal to home range	
H=HR/CA (Assume = to 1 for maximum exposure)		

Definitions:
EEQ - Ecological Effects Quotient
NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Cv = Contaminant conc. in vegetation (=soil conc. * Biotransfer Factor)

Dose (surface soil) = (Cs * Is)(H)/BW
Dose (surface water) = (Cw * Iw)(H)/BW
Dose (vegetation) = (Cv * If)(H)/BW
Total Dose = Dose (surface soil) + Dose (surface water) + Dose (vegetation)

BOBWHITE QUAIL - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
SWMU 32
NSA CRANE, CRANE, INDIANA

Parameter	Max Soil Concentration (mg/kg)	Max SW Concentration (mg/L)	Vegetation Concentration (mg/kg)	Dose (mg/kg/day) from: Surface Soil	Surface Water	Vegetation	Total Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL EEQ	LOAEL EEQ
Semivolatile Organics											
BENZO(A)ANTHRACENE	3.67E+00	0.00E+00	1.44E-01	1.55E-02	0.00E+00	4.39E-03	1.99E-02	2.00E+00	2.00E+01	9.94E-03	9.94E-04
BENZO(A)PYRENE	3.45E+00	0.00E+00	4.26E-01	1.46E-02	0.00E+00	1.29E-02	2.75E-02	2.00E+00	2.00E+01	1.37E-02	1.37E-03
BENZO(B)FLUORANTHENE	4.14E+00	0.00E+00	1.28E+00	1.75E-02	0.00E+00	3.90E-02	5.65E-02	2.00E+00	2.00E+01	2.82E-02	2.82E-03
BENZO(K)FLUORANTHENE	1.44E+00	0.00E+00	1.58E-01	6.08E-03	0.00E+00	4.80E-03	1.09E-02	2.00E+00	2.00E+01	5.44E-03	5.44E-04
CHRYSENE	3.98E+00	0.00E+00	1.52E-01	1.68E-02	0.00E+00	4.60E-03	2.14E-02	2.00E+00	2.00E+01	1.07E-02	1.07E-03
DIBENZO(A,H)ANTHRACENE	5.95E-01	0.00E+00	7.74E-02	2.51E-03	0.00E+00	2.35E-03	4.86E-03	2.00E+00	2.00E+01	2.43E-03	2.43E-04
INDENO(1,2,3-CD)PYRENE	2.53E+00	0.00E+00	2.78E-01	1.07E-02	0.00E+00	8.45E-03	1.91E-02	2.00E+00	2.00E+01	9.57E-03	9.57E-04
NAPHTHALENE	2.73E-01	0.00E+00	3.33E+00	1.15E-03	0.00E+00	1.01E-01	1.02E-01	2.00E+00	2.00E+01	5.12E-02	5.12E-03

Cells are shaded if the EEQ is greater than 1.0.

Body Weight = (BW)	1.620E-01	kg
Food Ingestion Rate = (If)	4.920E-03	kg/day
Water Ingestion Rate = (Iw)	2.310E-02	L/day
Soil Ingestion Rate = (Is)	6.839E-04	kg/day
Home Range = (HR)	Assume 100% on site	
Contaminated Area = (CA)	Assume equal to home range	

H=HR/CA (Assume = to 1 for maximum exposure)

Dose (surface soil) = (Cs * Is)(H)/BW
Dose (surface water) = (Cw * Iw)(H)/BW
Dose (vegetation) = (Cv * If)(H)/BW
Total Dose = Dose (surface soil) + Dose (surface water) + Dose (vegetation)

Definitions:
EEQ - Ecological Effects Quotient
NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Cv = Contaminant conc. in vegetation (=soil conc. * Biotransfer Factor)
NV = No value available
#VALUE! = Value not able to be calculated

SHORT-TAILED SHREW - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
SWMU 32
NSA CRANE, CRANE, INDIANA

Parameter	Max Soil Concentration (mg/kg)	Max SW Concentration (mg/L)	Invertebrate Concentration (mg/kg)	Dose (mg/kg/day) from: Surface Soil	Dose (mg/kg/day) from: Inverts.	Total Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL EEQ	LOAEL EEQ
Semivolatile Organics										
BENZO(A)ANTHRACENE	3.67E+00	0.00E+00	5.84E+00	1.87E-02	9.92E-01	1.01E+00	6.15E-01	3.84E+01	1.64E+00	2.63E-02
BENZO(A)PYRENE	3.45E+00	0.00E+00	4.59E+00	1.76E-02	7.80E-01	7.97E-01	6.15E-01	3.84E+01	1.30E+00	2.08E-02
BENZO(B)FLUORANTHENE	4.14E+00	0.00E+00	1.08E+01	2.11E-02	1.83E+00	1.85E+00	6.15E-01	3.84E+01	3.01E+00	4.82E-02
BENZO(K)FLUORANTHENE	1.44E+00	0.00E+00	3.74E+00	7.34E-03	6.36E-01	6.44E-01	6.15E-01	3.84E+01	1.05E+00	1.68E-02
CHRYSENE	3.98E+00	0.00E+00	9.11E+00	2.03E-02	1.55E+00	1.57E+00	6.15E-01	3.84E+01	2.55E+00	4.09E-02
DIBENZO(A,H)ANTHRACENE	5.95E-01	0.00E+00	1.37E+00	3.03E-03	2.34E-01	2.37E-01	6.15E-01	3.84E+01	3.85E-01	6.16E-03
INDENO(1,2,3-CD)PYRENE	2.53E+00	0.00E+00	7.24E+00	1.29E-02	1.23E+00	1.24E+00	6.15E-01	3.84E+01	2.02E+00	3.24E-02
NAPHTHALENE	2.73E-01	0.00E+00	1.20E+00	1.39E-03	2.04E-01	2.06E-01	6.56E+01	3.56E+02	3.13E-03	5.77E-04

Cells are shaded if the EEQ is greater than 1.0.

Body Weight = (BW)	1.525E-02	kg
Food Ingestion Rate = (If)	2.592E-03	kg/day
Water Ingestion Rate = (Iw)	4.300E-03	L/day
Soil Ingestion Rate = (Is)	7.776E-05	kg/day
Home Range = (HR)	Assume 100% on site	
Contaminated Area = (CA)	Assume equal to home range	
H=HR/CA (Assume = to 1 for maximum exposure)		

Definitions:
EEQ - Ecological Effects Quotient
NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Ci = Contaminant conc. in soil invertebrates (=soil conc. * Biotransfer Factor)

Dose (surface soil) = (Cs * Is)(H)/BW
Dose (surface water) = (Cw * Iw)(H)/BW
Dose (invertebrates) = (Ci * If)(H)/BW
Total Dose = Dose (surface soil) + Dose (surface water) + Dose (invertebrates)

SHORT-TAILED SHREW - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
SWMU 32
NSA CRANE, CRANE, INDIANA

Parameter	Avg Soil Concentration (mg/kg)	Avg SW Concentration (mg/L)	Invertebrate Concentration (mg/kg)	Dose (mg/kg/day) from: Surface Soil	Surface Water	Inverts.	Total Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL EEQ	LOAEL EEQ
Semivolatile Organics											
BENZO(A)ANTHRACENE	8.35E-02	0.00E+00	1.33E-01	7.34E-05	0.00E+00	1.30E-02	1.30E-02	6.15E-01	3.84E+01	2.12E-02	3.40E-04
BENZO(A)PYRENE	1.19E-01	0.00E+00	1.59E-01	1.05E-04	0.00E+00	1.55E-02	1.56E-02	6.15E-01	3.84E+01	2.54E-02	4.06E-04
BENZO(B)FLUORANTHENE	9.23E-02	0.00E+00	2.40E-01	8.11E-05	0.00E+00	2.34E-02	2.35E-02	6.15E-01	3.84E+01	3.82E-02	6.12E-04
BENZO(K)FLUORANTHENE	3.27E-02	0.00E+00	8.50E-02	2.88E-05	0.00E+00	8.31E-03	8.34E-03	6.15E-01	3.84E+01	1.36E-02	2.17E-04
CHRYSENE	8.63E-02	0.00E+00	1.98E-01	7.59E-05	0.00E+00	1.93E-02	1.94E-02	6.15E-01	3.84E+01	3.15E-02	5.05E-04
DIBENZO(A,H)ANTHRACENE	1.41E-02	0.00E+00	3.26E-02	1.24E-05	0.00E+00	3.19E-03	3.20E-03	6.15E-01	3.84E+01	5.21E-03	8.34E-05
INDENO(1,2,3-CD)PYRENE	5.64E-02	0.00E+00	1.61E-01	4.96E-05	0.00E+00	1.57E-02	1.58E-02	6.15E-01	3.84E+01	2.57E-02	4.11E-04
NAPHTHALENE	1.45E-02	0.00E+00	6.38E-02	1.28E-05	0.00E+00	6.24E-03	6.25E-03	6.56E+01	3.56E+02	9.52E-05	1.76E-05

Cells are shaded if the EEQ is greater than 1.0.

Body Weight = (BW)	1.687E-02	kg
Food Ingestion Rate = (If)	1.648E-03	kg/day
Water Ingestion Rate = (Iw)	3.800E-03	L/day
Soil Ingestion Rate = (Is)	1.483E-05	kg/day
Home Range = (HR)	9.700E-01	acres
Contaminated Area = (CA)	Assume equal to home range	
H=HR/CA (Assume = to 1 for maximum exposure)		

Definitions:
EEQ - Ecological Effects Quotient
NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Ci = Contaminant conc. in soil invertebrates (=soil conc. * Biotransfer Factor)

Dose (surface soil) = (Cs * Is)(H)/BW
Dose (surface water) = (Cw * Iw)(H)/BW
Dose (invertebrates) = (Ci * If)(H)/BW
Total Dose = Dose (surface soil) + Dose (surface water) + Dose (invertebrates)

AMERICAN WOODCOCK - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
SWMU 32
NSA CRANE, CRANE, INDIANA

Parameter	Max Soil Concentration (mg/kg)	Max SW Concentration (mg/L)	Invertebrate Concentration (mg/kg)	Dose (mg/kg/day) from: Surface Soil	Surface Water	Inverts.	Total Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL EEQ	LOAEL EEQ
Semivolatile Organics											
BENZO(A)ANTHRACENE	3.67E+00	0.00E+00	5.84E+00	1.10E-01	0.00E+00	1.07E+00	1.18E+00	2.00E+00	2.00E+01	5.88E-01	5.88E-02
BENZO(A)PYRENE	3.45E+00	0.00E+00	4.59E+00	1.03E-01	0.00E+00	8.38E-01	9.41E-01	2.00E+00	2.00E+01	4.71E-01	4.71E-02
BENZO(B)FLUORANTHENE	4.14E+00	0.00E+00	1.08E+01	1.24E-01	0.00E+00	1.97E+00	2.09E+00	2.00E+00	2.00E+01	1.05E+00	1.05E-01
BENZO(K)FLUORANTHENE	1.44E+00	0.00E+00	3.74E+00	4.31E-02	0.00E+00	6.84E-01	7.27E-01	2.00E+00	2.00E+01	3.63E-01	3.63E-02
CHRYSENE	3.98E+00	0.00E+00	9.11E+00	1.19E-01	0.00E+00	1.66E+00	1.78E+00	2.00E+00	2.00E+01	8.92E-01	8.92E-02
DIBENZO(A,H)ANTHRACENE	5.95E-01	0.00E+00	1.37E+00	1.78E-02	0.00E+00	2.51E-01	2.69E-01	2.00E+00	2.00E+01	1.34E-01	1.34E-02
INDENO(1,2,3-CD)PYRENE	2.53E+00	0.00E+00	7.24E+00	7.58E-02	0.00E+00	1.32E+00	1.40E+00	2.00E+00	2.00E+01	6.99E-01	6.99E-02
NAPHTHALENE	2.73E-01	0.00E+00	1.20E+00	8.18E-03	0.00E+00	2.19E-01	2.28E-01	2.00E+00	2.00E+01	1.14E-01	1.14E-02

Cells are shaded if the EEQ is greater than 1.0.

Body Weight = (BW)	1.660E-01	kg
Food Ingestion Rate = (If)	3.032E-02	kg/day
Water Ingestion Rate = (Iw)	1.900E-02	L/day
Soil Ingestion Rate = (Is)	4.972E-03	kg/day
Home Range = (HR)	Assume 100% on site	
Contaminated Area = (CA)	Assume equal to home range	

H=HR/CA (Assume = to 1 for maximum exposure)

Definitions:
EEQ - Ecological Effects Quotient
NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Ci = Contaminant conc. in soil invertebrates (=soil conc. * Biotransfer Factor)

Dose (surface soil) = (Cs * Is)(H)/BW
Dose (surface water) = (Cw * Iw)(H)/BW
Dose (invertebrates) = (Ci * If)(H)/BW
Total Dose = Dose (surface soil) + Dose (surface water) + Dose (invertebrates)

AMERICAN WOODCOCK - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
SWMU 32
NSA CRANE, CRANE, INDIANA

Parameter	Avg Soil Concentration (mg/kg)	Avg SW Concentration (mg/L)	Invertebrate Concentration (mg/kg)	Dose (mg/kg/day) from: Surface Soil	Surface Water	Inverts.	Total Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL EEQ	LOAEL EEQ
Semivolatile Organics											
BENZO(A)ANTHRACENE	8.35E-02	0.00E+00	1.33E-01	7.13E-04	0.00E+00	1.77E-02	1.84E-02	2.00E+00	2.00E+01	9.21E-03	9.21E-04
BENZO(A)PYRENE	1.19E-01	0.00E+00	1.59E-01	1.02E-03	0.00E+00	2.11E-02	2.22E-02	2.00E+00	2.00E+01	1.11E-02	1.11E-03
BENZO(B)FLUORANTHENE	9.23E-02	0.00E+00	2.40E-01	7.87E-04	0.00E+00	3.20E-02	3.28E-02	2.00E+00	2.00E+01	1.64E-02	1.64E-03
BENZO(K)FLUORANTHENE	3.27E-02	0.00E+00	8.50E-02	2.79E-04	0.00E+00	1.13E-02	1.16E-02	2.00E+00	2.00E+01	5.81E-03	5.81E-04
CHRYSENE	8.63E-02	0.00E+00	1.98E-01	7.37E-04	0.00E+00	2.64E-02	2.71E-02	2.00E+00	2.00E+01	1.35E-02	1.35E-03
DIBENZO(A,H)ANTHRACENE	1.41E-02	0.00E+00	3.26E-02	1.21E-04	0.00E+00	4.35E-03	4.47E-03	2.00E+00	2.00E+01	2.24E-03	2.24E-04
INDENO(1,2,3-CD)PYRENE	5.64E-02	0.00E+00	1.61E-01	4.81E-04	0.00E+00	2.15E-02	2.20E-02	2.00E+00	2.00E+01	1.10E-02	1.10E-03
NAPHTHALENE	1.45E-02	0.00E+00	6.38E-02	1.24E-04	0.00E+00	8.51E-03	8.63E-03	2.00E+00	2.00E+01	4.32E-03	4.32E-04

Cells are shaded if the EEQ is greater than 1.0.

Body Weight = (BW)	1.895E-01	kg
Food Ingestion Rate = (If)	2.526E-02	kg/day
Water Ingestion Rate = (Iw)	1.900E-02	L/day
Soil Ingestion Rate = (Is)	1.617E-03	kg/day
Home Range = (HR)	6.133E+01	acres
Contaminated Area = (CA)	Assume equal to home range	
H=HR/CA (Assume = to 1 for maximum exposure)		

Definitions:
EEQ - Ecological Effects Quotient
NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Ci = Contaminant conc. in soil invertebrates (=soil conc. * Biotransfer Factor)

Dose (surface soil) = (Cs * Is)(H)/BW
Dose (surface water) = (Cw * Iw)(H)/BW
Dose (invertebrates) = (Ci * If)(H)/BW
Total Dose = Dose (surface soil) + Dose (surface water) + Dose (invertebrates)