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SITE ASSESSMENT FOR BUILDING 436 NS MAYPORT FL
1/1/2001
TETRA TECH NUS

Site Assessment Report
for
Building 436

Naval Station Mayport
Mayport, Florida

Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0123

January 2001

PROFESSIONAL CERTIFICATION

Site Assessment Report
Building 436
Naval Station, Mayport, Florida

This Site Assessment Report was prepared in general accordance with FAC 62-770 under the direct supervision of the undersigned geologist using geologic and hydrogeologic principles standard to the profession at the time the report was prepared. If conditions are determined to exist that differ from those described, the undersigned geologist should be notified to evaluate the effects of additional information on the assessment described in this report. This report was developed specifically for the referenced site and should not be construed to apply to any other site.

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2/02/01

Date

Rev. 1
02/02/01

SITE ASSESSMENT REPORT
FOR
BUILDING 436

NAVAL STATION MAYPORT
MAYPORT, FLORIDA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION-NAVY (CLEAN) CONTRACT

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CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0123

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EXECUTIVE SUMMARY

Tetra Tech NUS, Inc. (TtNUS) has completed a Site Assessment (SA) for Building 436 at the Naval Station (NS), Mayport, Florida. The SA was conducted in accordance with the requirements of Chapter 62-770, Florida Administrative Code (FAC). The assessment report was submitted to the Florida Department of Environmental Protection (FDEP) for approval.

TtNUS performed the following tasks during the SA:

- Reviewed available Navy documents and identified potential sources and receptors for petroleum hydrocarbons in the vicinity, evaluated private potable wells within a 0.25-mile radius and public water supply wells within a 0.50-mile radius, located nearby surface water bodies, and determined surface hydrology and drainage.

- Conducted a site survey to identify utilities and constructed a site plan.

- Performed a direct-push investigation, which included the installation of 13 soil borings to collect soil for organic vapor analyzer (OVA) screening and groundwater samples for field screening for benzene, toluene, ethylbenzene and total xylenes (BTEX), methyl tertiary-butyl ether (MTBE) and naphthalene using a mobile laboratory.

- Collected seven confirmation soil samples from selected soil borings for laboratory analysis of the Kerosene Analytical Group (KAG) parameters which includes BTEX and MTBE, 1-methylnaphthalene, 2-methylnaphthalene, 16 Polynuclear Aromatic Hydrocarbons (PAHs) listed in 62-770 FAC Table A, and Total Recoverable Petroleum Hydrocarbons (TRPHs).

- Installed four shallow monitoring wells to approximately 15 feet below land surface (bls). Collected groundwater samples from four new wells and one existing well for laboratory analysis for KAG parameters. KAG parameters for groundwater include BTEX and MTBE, 1-methylnaphthalene, 2-methylnaphthalene, 16 PAHs listed in 62-770 FAC Table A, 1-2, dichloroethane and other listed Priority Pollutant Volatile Organic Halocarbons, 1,2-dibromoethane (EDB), total lead and TRPHs.

- Surveyed monitoring well top of casing elevations and collected depth to groundwater measurements.

- Evaluated groundwater flow direction and gradient.

The Groundwater Cleanup Target Levels (GCTLs) used for this site are from Table I from Chapter 62-777, FAC.

Laboratory analytical results from groundwater samples indicated that no KAG constituent exceeded GCTLs. In addition, field screening data and laboratory analytical results from soil samples indicate that "Excessively contaminated" soil, as defined by Chapter 62-770.200 FAC was not detected during the investigation. Hydrocarbon concentrations in the soil did not exceed the Soil Cleanup Target Levels (SCTLs) or leachability standards for groundwater protection established in Chapter 62-777, FAC (Table II). As a result, the site qualifies for no further action status under 62-770 FAC.

TABLE OF CONTENTS

SECTION		PAGE
EXECUTIVE SUMMARY		**ES-1**
ACRONYMS		**iii**
1.0	**INTRODUCTION**	**1-1**
1.1	PURPOSE AND SCOPE	1-1
1.2	SITE DESCRIPTION AND SETTING	1-2
1.2.1	Location	1-2
1.2.2	Site Description	1-2
1.2.3	Topography and Drainage	1-2
1.2.4	Regional Hydrogeology	1-2
1.2.5	Land Use	1-6
1.2.6	Potable Water Well Survey	1-6
1.3	SITE HISTORY	1-8
2.0	**SUBSURFACE INVESTIGATION METHODS**	**2-1**
2.1	QUALITY ASSURANCE	2-1
2.2	SOIL INVESTIGATON	2-1
2.2.1	Direct-Push Soil Borings	2-1
2.2.2	HSA Soil Borings	2-2
2.3	GROUNDWATER INVESTIGATION	2-2
2.3.1	Direct-Push Well Points	2-2
2.3.2	Direct-Push Micro- Well Installation	2-2
2.3.3	Monitoring Well Installation	2-2
2.4	MEDIA SAMPLING METHODOLOGY	2-3
2.4.1	Lithologic Sampling	2-3
2.4.2	Soil Vapor Screening	2-3
2.4.3	Soil Analytical Sampling	2-5
2.4.4	Groundwater Mobile Lab Screening	2-5
2.4.5	Groundwater Analytical Sampling	2-6
2.4.6	Free Product Sampling	2-6
2.5	HYDROLOGIC INVESTIGATION	2-7
2.5.1	Water Level Measurements	2-7
2.5.2	Aquifer Characteristics	2-8
3.0	**RESULTS OF INVESTIGATION**	**3-1**
3.1	SITE-SPECIFIC HYDROGEOLOGY	3-1
3.1.1	Lithology	3-1
3.1.2	Aquifer Classification	3-1
3.2	SOIL QUALITY	3-1
3.2.1	Soil Boring Investigation	3-1
3.2.2	Soil Analytical Sampling Results	3-4
3.3	WATER QUALITY	3-4
3.3.1	Temporary Well Point Sampling	3-4
3.3.2	Monitoring Well Sampling	3-4
4.0	**DISCUSSION**	**4-1**
5.0	**CONCLUSIONS AND RECOMMENDATION**	**5-1**

TABLE OF CONTENTS (Con't)

APPENDICES **PAGE**

A CAR SUMMARY SHEET A-1
B IDW RECORDS B-1
C SOIL BORING LOGS C-1
D MONITORING WELL COMPLETION LOGS D-1
E GROUNDWATER SAMPLING LOG SHEETS E-1
F LABORTORY ANALYTICAL REPORTS FOR SOIL F-1
G MOBILE LABORATORY ANALYTICAL REPORTS FOR GROUNDWATER G-1
H LABORATORY ANALYTICAL REPORTS FOR GROUNDWATER H-1
I U.S. GEOLOGICAL SURVEY REPORT 97-4262 ..... I-1

TABLES

NUMBER **PAGE**

1-1 Potable Water Well Survey Summary 1-7
2-1 Well Construction Details 2-4
3-1 Water Table Elevation and Monitoring Well Construction Data 3-2
3-2 Soil Vapor Screening Summary 3-5
3-3 Soil Analytical Summary – Fixed Based Laboratory 3-7
3-4 Groundwater Analytical Results – Mobile Laboratory 3-9
3-5 Groundwater Analytical Results – Fixed Based Laboratory 3-10

FIGURES

NUMBER **PAGE**

1-1 Regional Map 1-3
1-2 Site Location and Potable Water Wells 1-4
1-3 Site Plan 1-5
3-1 Groundwater Elevation Contour Map 3-3
3-2 Soil Boring/Temporary Well Location Map 3-6

ACRONYMS

AST	Above Ground Storage Tank
bls	Below Land Surface
BTEX	Benzene, Toluene, Ethylbenzene and Total Xylenes
CAR	Contamination Assessment Report
CLEAN III	Comprehensive Long-term Environmental Action Navy
CompQAP	Comprehensive Quality Assurance Plan
CTO	Contract Task Order
DPT	Direct-Push Technology
EDB	1,2-dibromoethane
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
feet/foot	Feet Per Foot
FID	Flame Ionization Detector
FL-PRO	Florida Petroleum Range Organics
ft/day	Feet Per Day
GCTLs	Groundwater Cleanup Target Levels
HSA	Hollow Stem Auger
ID	Inside Diameter
IDW	Investigative Derived Waste
KAG	Kerosene Analytical Group
MGD	Million Gallons Per Day
mg/kg	Milligrams Per Kilogram
mL	Milliliter
msl	Mean Sea Level
MTBE	Methyl Tertiary-butyl Ether
Navy	United States Navy
NGVD	National Geodetic Vertical Datum
NS	Naval Station
NSF	National Sanitation Foundation
OVA	Organic Vapor Analyzer
PAH	Polynuclear Aromatic Hydrocarbons
PE	Polyethylene
ppm	Parts Per Million
PRO	Petroleum Range Organics
PVC	Polyvinyl Chloride

ACRONYMS (Cont'd)

SA	Site Assessment
SAR	Site Assessment Report
SB	Soil Boring
SCTL	Soil Cleanup Target Level
SOP	Standard Operating Procedures
SOUTHNAVFACENGCOM	Southern Division Naval Facilities Engineering Command
SVOC	Semi-Volatile Organics
TRPH	Total Recoverable Petroleum Hydrocarbon
TtNUS	Tetra Tech NUS, Inc.
TW	Temporary Well
uohms/cm	Microohms Per Centimeter
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank
VOA	Volatile Organic Aromatic
µg/L	Micrograms Per Liter

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

A SA was conducted by TtNUS for the Navy, Southern Division Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) under Contract Task Order (CTO) 0123, for the Comprehensive Long-term Environmental Action Navy (CLEAN III), Contract Number N62467-94-D-0888. The SA was conducted at Building 436 (the site) located at the NS Mayport, Duval County, Florida. The FDEP Facility Identification Number is 168626008.

The purpose of this SA was to determine the nature and extent of petroleum hydrocarbon impacted soil and groundwater in accordance with the requirements of Chapter 62-770, FAC. Taking the following actions at Building 436 fulfilled this objective:

- Review of all available applicable documents such as closure reports, discharge reports, maintenance records, and construction plans.
- Survey of potential sources in the vicinity of Building 436.
- Survey of potential receptors in the vicinity of Building 436, including public and private water supplies and surface water bodies.
- Completion of a soil vapor survey and soil investigation, as well as an initial groundwater screening, using direct-push technology (DPT).
- Mobile laboratory screening of groundwater samples for BTEX, MTBE and Naphthalene to aid in determining the optimum number and location of permanent monitoring wells.
- Installation of shallow monitoring wells.
- Collection of soil and groundwater samples for laboratory analysis for KAG parameters.
- Determination of groundwater flow direction, hydraulic conductivity, hydraulic gradient, and transmissivity.

A Contamination Assessment Report Summary Sheet, as required by Chapter 62-770, FAC, is included in Appendix A.

1.2 SITE DESCRIPTION AND SETTING

1.2.1 Location

NS Mayport is located in eastern Duval County, approximately 16 miles northeast of downtown Jacksonville, Florida. NS Mayport is located in Township 1 South, Range 29 east, Section 38, as shown on the Mayport, Florida United States Geological Survey (USGS, 1982) Quadrangle (7.5 Minute Series) presented in Figure 1-1.

1.2.2 Site Description

Building 436 is located within the northwestern portion of the base. The building serves as the NS Mayport transmitter station. Building 436 is the location of two aboveground storage tanks (ASTs). Tank N436 is a 1,000 gallon AST containing heating oil used to heat the building. Tank NG-436 is a 560 gallon AST containing diesel fuel used to power the emergency generator for the building. The tanks are located approximately 15 feet east of the building situated on a concrete base. The location of Building 436 within NS Mayport is depicted on Figure 1-2.

Previously, an underground storage tank (UST) was located west of the facility's emergency generator. This UST was removed and replaced by the 560 gallon AST.

1.2.3 Topography and Drainage

The site is located in the southeastern Coastal Plain physiographic province. The topography is mostly low, gentle to flat and composed of a series of ancient marine terraces. NS Mayport is located within the Silver Bluff terrace. The average land surface elevation is between 8-10 feet above mean sea level (msl).

Building 436 is located on the western edge of the base and is bound by the St. John's River to the west and north. The St. John's River and the Atlantic Ocean, located to the east, dictate site surface drainage. Due to the low relief over much of the area, drainage is considered to be sluggish and not well defined. A Site Plan is shown in Figure 1-3.

1.2.4 Regional Hydrogeology

Northeast Florida is underlain by two main aquifer systems: the Surficial aquifer system and the Floridan aquifer system. The Southeastern Coastal Plain aquifer system underlies the Floridan aquifer system in portions of northeast Florida. The Surficial aquifer system in the vicinity of NS Mayport includes

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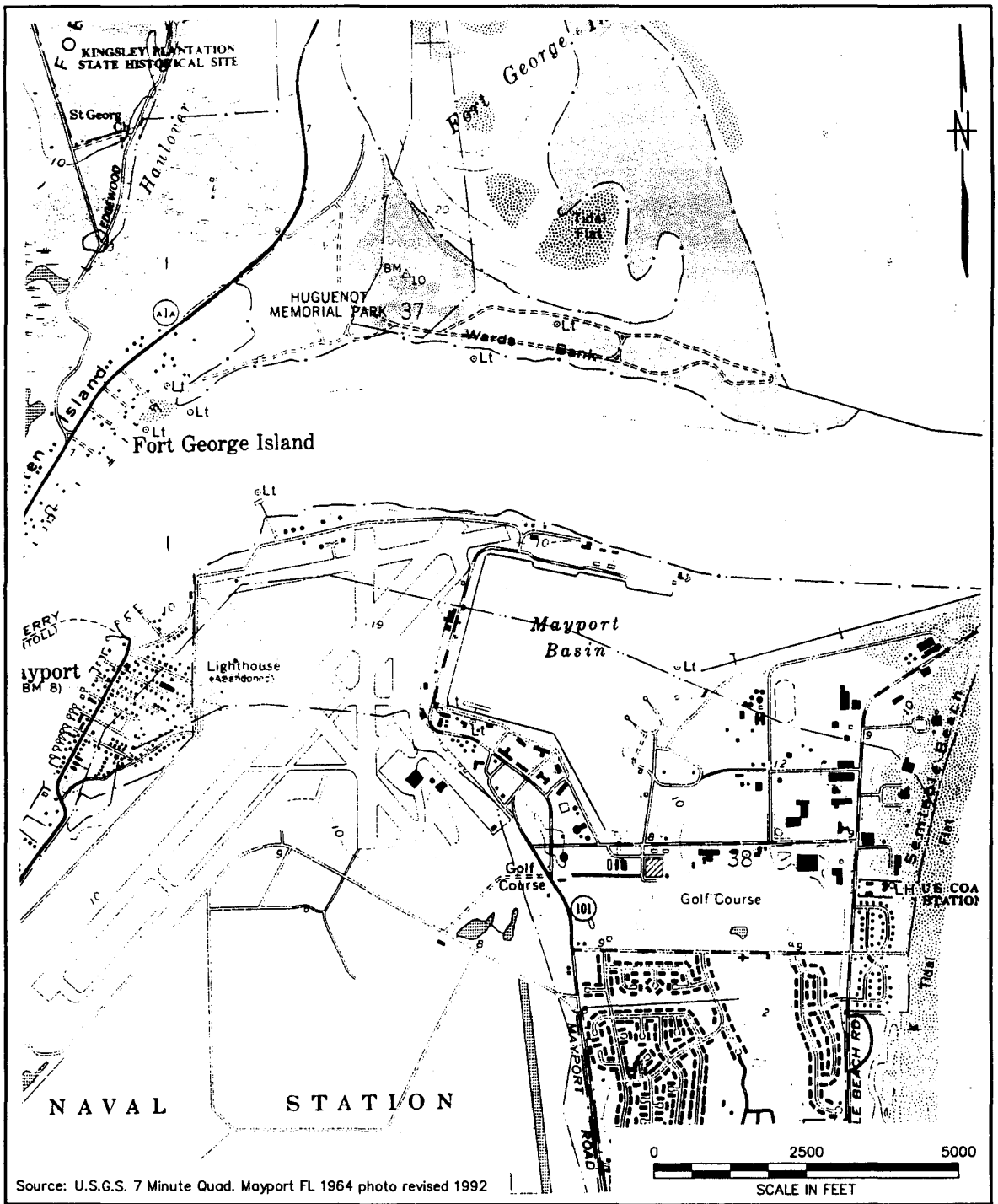

Source: U.S.G.S. 7 Minute Quad. Mayport FL 1964 photo revised 1992

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COST/SCHED-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1-1 / REV. 0

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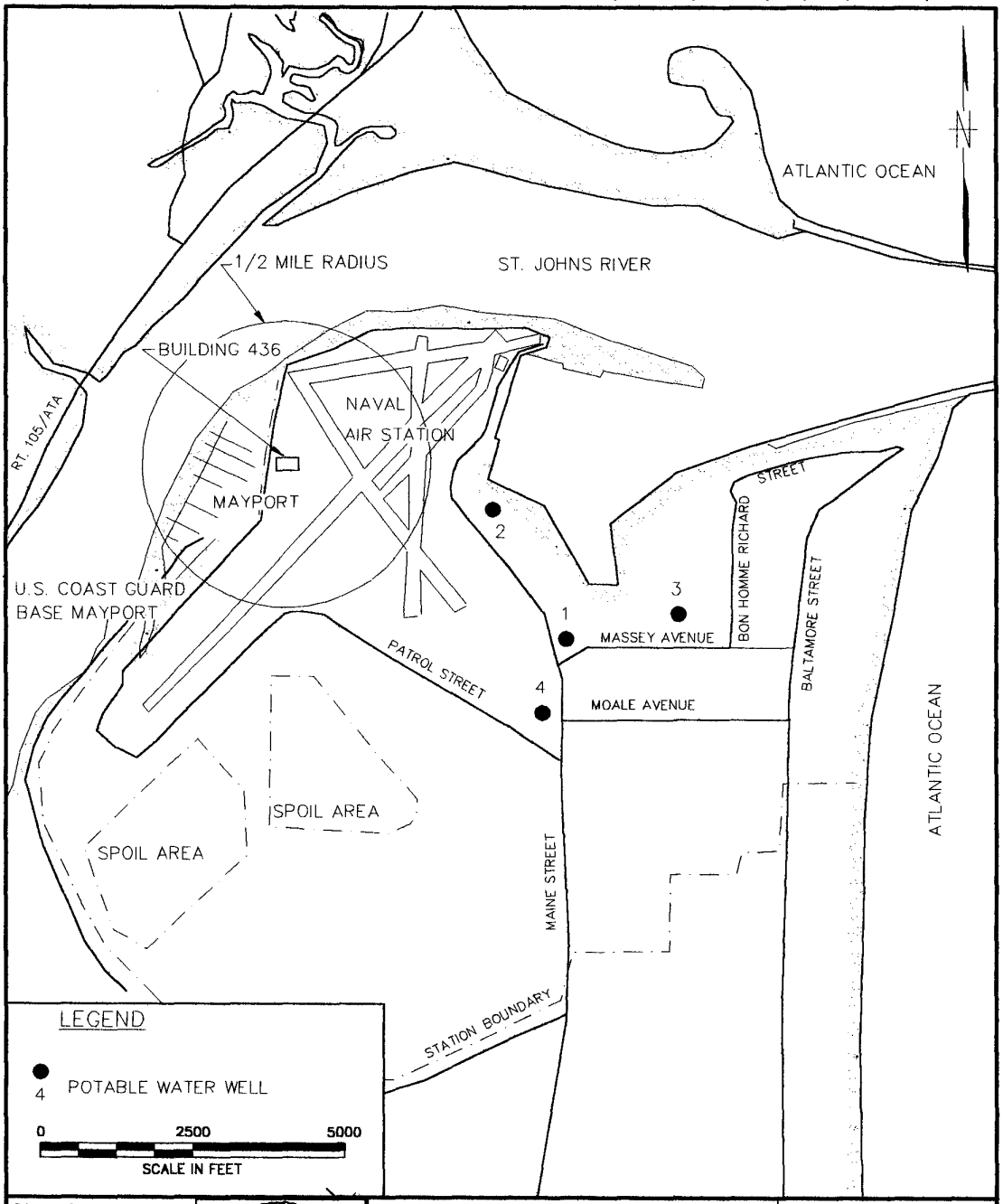

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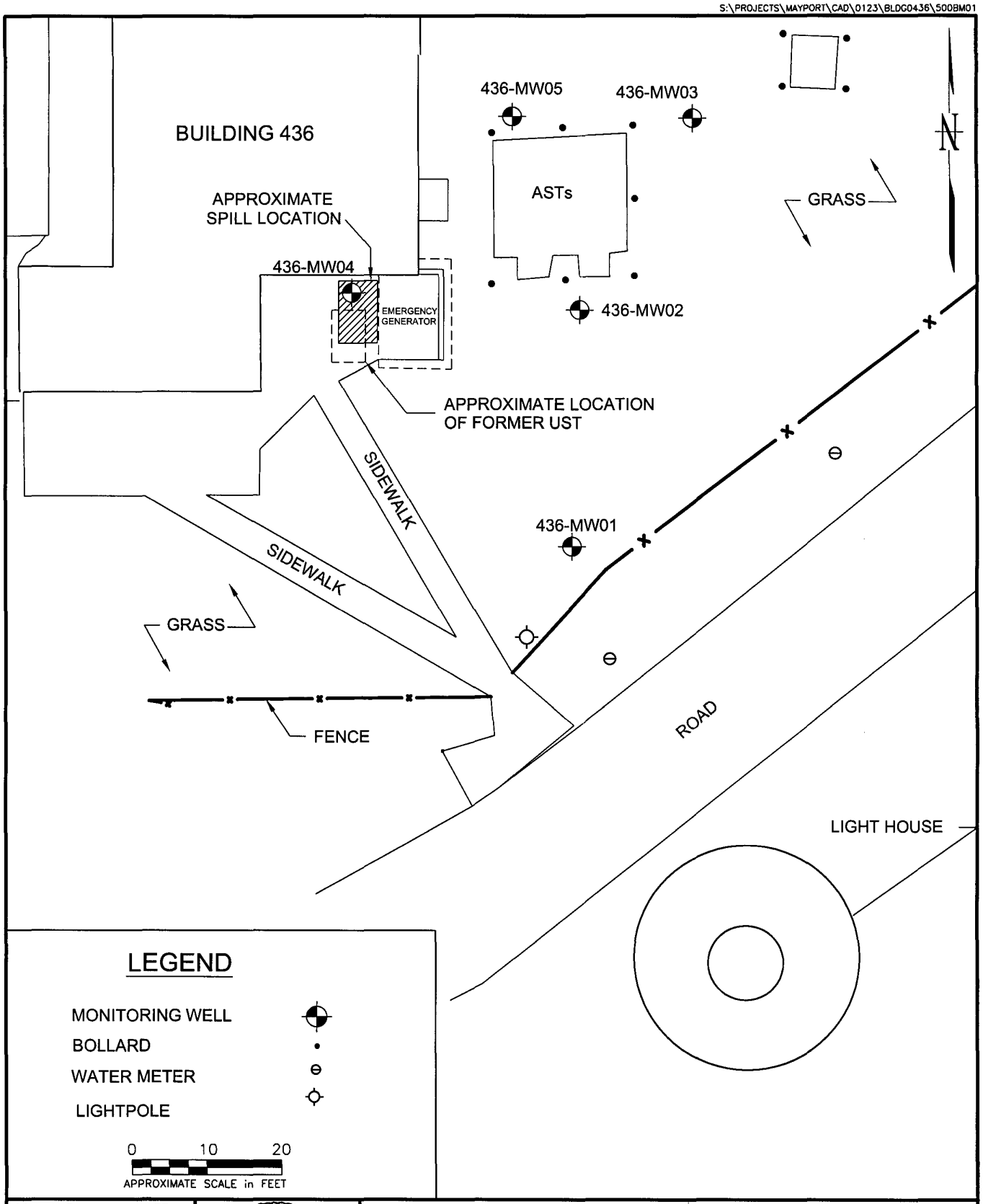

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sediments of Holocene to Miocene age. These undifferentiated surficial deposits extend from land surface to the top of the Hawthorn Group about 50 feet bls (USGS, 1997).

The Surficial aquifer system consists of fine-grained sands near the surface interspersed with thin (less than 1 foot) clay lenses and generally grades to a mixture of sand and coarse shell fragments from 30 to 50 feet bls. The base of the Surficial aquifer system is the intermediate confining unit which is a sequence of marine clays and discontinuous limestone stringers (Spechler, 1994).

The Floridan aquifer system is the principal source of groundwater for public drinking water in most of northern peninsular Florida. At NS Mayport, three potable water supply wells are currently producing water from this aquifer system. A fourth well is inactive. In the area of investigation, the system is comprised of (from oldest to youngest) the Oldsmar Formation, the Avon Park Formation, and the Ocala Limestone. The Hawthorn Group, which forms the confining zone, unconformably overlies the Floridan aquifer system.

1.2.5 Land Use

The site is located along the western boundary of the base, adjacent to the Village of Mayport, which lies to the north and west. South of the building is the St. John's River Lighthouse, beyond which is an office building and a low lying marshy area. Various office and storage buildings occupy the area to the east.

1.2.6 Potable Water Well Survey

The potable water supply information presented in this report was obtained from the Site 1330 Contamination Assessment Report (CAR) dated May 1992. The CAR was prepared by the U.S. Army Corps of Engineers for Site 1330 at NS Mayport. The base water treatment plant and the maintenance contractor, Lon Coleman Jones, were contacted to confirm the current accuracy of the water well information.

Potable water is supplied to NS Mayport by four on-base supply wells. Currently, three of the wells are active and one is inactive. The water supply is obtained from one 12-inch and two 16-inch diameter wells which draw water from the Floridan aquifer at depths ranging from approximately 420 to 1,000 feet. Well capacities range between 2.1 and 2.9 million gallons per day (MGD) with a combined total pumping capacity of 10.0 MGD. The water is treated by the on-base water treatment plant prior to distribution.

Table 1-1 summarizes the information gathered during the potable well survey. The locations of the potable wells are depicted on Figure 1-2. None of the wells are within a 0.50-mile radius of the site.

Table 1-1
Potable Water Well Survey Summary

Site Assessment Report for Building 436
Naval Station Mayport
Mayport, Florida

Well No.[1]	Usage	Total Depth (feet)	Casing Depth (feet)	Completion Date
1	Potable active	1001	435	10/06/61
2	Potable inactive	1000	435	04/03/58
3	Potable active	1000	433	07/20/79
4	Potable active	500	419	05/29/79

Notes:

1 = refer to Figure 1-2 for locations of potable wells.

1.3 SITE HISTORY

In April of 1995, a UST used to provide fuel oil to an emergency generator located at Building 436 was removed from service and replaced by a 560 gallon fuel oil AST. The UST was located west of the emergency generator as shown on Figure 1-3. During installation of the AST system, which is located northeast of the emergency generator, a piping connection to the emergency generator failed causing the release of an unknown quantity of fuel oil to the ground surface to the west of the emergency generator in the general location of the former UST. A soil removal effort was initiated to mitigate impacts from the release. Attached to this document in Appendix B is a "Tank Closure Assessment Report" prepared by MEI Environmental Services Incorporated that documents tank closure activities.

This site assessment effort was initiated to determine if the fuel oil spill had resulted in impacts to the environment.

This assessment was conducted in two phases. The first phase was conducted in May of 2000. A second phase was conducted in November of 2000 with follow-up sampling conducted in January of 2001. The purpose of the second phase was to fill data gaps that existed after completion of the first phase.

2.0 SUBSURFACE INVESTIGATION METHODS

2.1 QUALITY ASSURANCE

The site investigation was conducted in general accordance with the Standard Operating Procedures (SOP) prescribed by the FDEP Quality Assurance Section Document DER-001/92, and adopted by the TtNUS Comprehensive Quality Assurance Plan (CompQAP) Number 980038.

2.2 SOIL INVESTIGATON

A soil investigation at Building 436 was conducted by installing soil borings using two advancement methods: DPT and hollow stem auger (HSA). Prior to breaking ground, TtNUS reviewed utility drawings provided by the NS Mayport public works department and requested utility mark-outs from Lon Coleman Jones, the on-site contractor.

Soil boring advancement equipment was decontaminated prior to and following each installation according to TtNUS' CompQAP. Rinse water generated during the decontamination of equipment was containerized in 55-gallon drums, sampled, and removed for proper disposal.

In addition to liquid investigative derived waste (IDW), soil cuttings were also generated during soil boring installation. Soil cuttings were also placed in 55-gallon steel drums, sampled, and removed for proper disposal. Transport manifests and disposal records for IDW are provided in Appendix B. Soil boring lithologic logs are presented in Appendix C.

2.2.1 Direct-Push Soil Borings

TtNUS conducted a soil vapor assessment at Building 436 on May 3, 2000 (Phase I). DPT soil borings were advanced for the purpose of collecting soil and groundwater samples. Ten soil borings (436-TW01 through 436-TW-10) were advanced in the area around the AST system. The borings were advanced continuously and soil samples were collected at 2-foot intervals for the purpose of organic vapor screening, selection of soil samples for confirmation analyses, and for lithologic description. TtNUS conducted additional soil vapor assessment at Building 436 on November 29, 2000 (Phase II). Three additional soil borings were advanced using DPT technology for the purpose of collecting soil and groundwater samples. The samples were sent to a fixed based laboratory and analyzed for the KAG analytical group.

2.2.2 HSA Soil Borings

During Phase I on May 25, 2000, three soil borings were drilled by US Drilling using HSA drilling techniques. HSA soil borings were advanced for the installation of groundwater monitoring wells. Soil cuttings were used to characterize the site lithology and/or provide additional assessment data.

2.3 GROUNDWATER INVESTIGATION

2.3.1 Direct-Push Well Points

During the DPT investigation, soil borings were advanced approximately 5 feet into the water table and groundwater samples were collected from the surficial aquifer. The samples were collected at a total depth of approximately 11 feet bls and analyzed by a mobile lab for BTEX and naphthalene.

2.3.2 Direct-Push Micro- Well Installation

During Phase II on November 29, 2000 Groundwater Protection Inc. installed one shallow (micro) monitoring well for additional site assessment purposes. The pre-packed screens consist of 5-foot sections and have an outside diameter of 2 inches and an inside diameter of 0.5 inches. The inner component of the screen is 0.5-inch Schedule 40 PVC with 0.01-inch slots. The outer component of the screen is 2 inch Schedule 40 PVC with 0.01-inch slots. The screen is pre-packed with a 20-40 grade silica sand. Each section of well casing and screen is National Sanitation Foundation (NSF) approved.

2.3.3 Monitoring Well Installation

Monitoring wells were installed in conjunction with the HSA soil boring procedures discussed in Section 2.2.2. Prior to installation of the monitoring wells, the soil and groundwater screening data obtained during the DPT investigation was evaluated to determine the optimum number and location of the wells. Monitoring wells were designed to ensure that the screened interval was intersected by the surface of the water table. Monitoring well placements were selected to provide spatial coverage around the area of the release. Results of the sampling were used to evaluate if the groundwater in the area of the disconnect had been impacted by petroleum products.

The monitoring wells were installed with a Central Mining Equipment Model 55, truck-mounted drill rig using 4.25-inch ID HSAs. Each well was constructed of a 2-inch inside diameter (ID), flush-threaded, schedule 40 PVC riser and a 0.010-inch slot well screen with a 6-inch silt trap and well bottom cap. The

shallow wells were installed to approximately 15 feet bls with a 10 foot screen section. The annulus around each well were filled to approximately 1 foot above the screen with US Standard Sieve size 20/30 silica sand, followed by a 6-inch to 1-foot 30/65 fine sand seal. The remainder of the annulus was grouted to the surface. Each well was secured with a locking, watertight cap within an 8-inch diameter steel manhole. The manhole was set within a 24-inch square concrete apron finished slightly above grade. Monitoring well construction details are summarized on Table 2-1. Monitoring well completion logs are provided in Appendix D.

Each monitoring well was developed using a centrifugal pump. Field measurements of pH, temperature, and specific conductance were collected from the water generated during development. All monitoring wells were developed until such field measurements became stable and the purge water clear for a maximum of one hour. Stabilization of field measurements is based on the U.S. Environmental Protection Agency (USEPA) SOP (1997) which specifies the following criteria: temperature +/-5°C, pH +/-0.1 unit, and specific conductance +/-10 microohms per centimeter (uohms/cm). A TtNUS geologist supervised all monitoring well development. Development water was containerized as liquid IDW. Groundwater sampling log sheets are presented in Appendix E.

2.4 MEDIA SAMPLING METHODOLOGY

2.4.1 Lithologic Sampling

Representative soil samples were collected during the subsurface investigation in order to assess the shallow subsurface geologic conditions at the Building 436. Soil boring logs are provided in Appendix C.

2.4.2 Soil Vapor Screening

During DPT soil boring installation, a soil vapor assessment was conducted to determine the presence of hydrocarbon concentrations in the site vicinity. The assessment consisted of both visual inspection for petroleum staining and soil vapor screening using an OVA equipped with a flame ionization detector (FID). The soil vapor analysis was performed according to the headspace method prescribed in Rule 62-770.200(8) FAC. Using this method, two 16-ounce glass soil jars were half-filled with soil sample (duplicate samples). The soil jars were then sealed with aluminum foil. The soil samples were allowed to equilibrate to ambient temperature that was within the FDEP temperature range.

The samples were screened with a Heath Porta FID II OVA equipped with a FID. Prior to each day's activities, the OVA was field calibrated with 100 parts per million (ppm) methane in air, in accordance with the manufacturers specifications. Sample screening was performed by inserting the OVA probe through

Table 2-1
Well Construction Details

Site Assessment Report for Building 436
Naval Station Mayport
Mayport, Florida

Well No.	Date Installed	Installation Method	Top of Casing Elevation (feet msl)	Total Well Depth (feet)	Screened Interval (FBLS)	Well Diameter (inches)	LITHOLOGY OF SCREENED INTERVAL
436-MW1	25-May-00	HSA	12.02	15.00	5-15	2.00	Medium to fine sand
436-MW2	25-May-00	HSA	12.29	15.00	5-15	2.00	Medium to fine sand
436-MW3	25-May-00	HSA	12.36	15.00	5-15	2.00	Medium to fine sand
436-MW4*	N/A	N/A	NS	10.20	N/A	2.00	
436-MW5**	29-Nov-00	DPT	NS	13.00	3-13	1.00	Medium to fine sand

Notes:
* = existing monitoring well
** = newly installed micro well (installed in November 2000)
HSA = Hollow Stem Auger.
DPT = Direct Push Technology
FBLS = feet below land surface.
msl = mean sea level.
N/A = not available
NS= not surveyed

the foil sample cover and recording the highest OVA reading. Following collection of this OVA reading, the OVA was fitted with a granular activated carbon filter probe. The OVA was then used to test the headspace above the duplicate sample. Carbon absorbs petroleum hydrocarbons and thus the filtered reading is assumed to represent naturally occurring organic vapors.

Upon completion of the screening exercise, the carbon-filtered result was subtracted from the unfiltered result to obtain a net petroleum vapor value. In accordance with Rule 62-770.200(8) FAC, corrected headspace levels in excess of 50 ppm is defined as "excessively contaminated soil" for KAG parameters. Corrected headspace levels in excess of 10 ppm but less than 50 ppm is considered as contaminated, though not excessively contaminated.

2.4.3 Soil Analytical Sampling

To further assess the vadose zone at the site, a total of seven soil samples were collected from 6 soil borings (TW01, TW04, TW09, TW11, TW12, and TW13) via DPT methods for laboratory analysis. Soil samples were provided with the soil boring (SB) designation instead of the temporary well (TW) designation for identification purposes. The samples were collected from borings exhibiting the highest OVA readings or based on proximity to the source area and were analyzed for Volatile Organic Aromatic (VOA) compounds by USEPA Method 8260B, Semi-Volatile Organics (SVOCs) by USEPA Method 8270C, PAHs by USEPA method 8310, and TRPHs by Florida Petroleum Range Organics (FL-PRO). These analytical methods include all compounds in the KAG for soils comprised of BTEX and MTBE, 1-methylnaphthalene, 2-methylnaphthalene, sixteen PAH compounds (included in 62-770 FAC, Table A) and TRPHs. In addition TW01, TW04, and TW09 boring samples were analyzed for the metals arsenic, cadmium, and chromium. Sample 436-SS-SB01-05 from boring TW01 was analyzed for Total Organic Carbon, grain size, and leachability. Laboratory analytical reports are provided in Appendix F.

2.4.4 Groundwater Mobile Lab Screening

During the DPT portion of the field investigation, each soil boring was continued into the saturated zone in order to collect groundwater samples for mobile laboratory screening. The groundwater samples were collected using a detachable drive tip attached to a 24-inch long retractable stainless steel well screen encased in the lead probe tube. After this groundwater sampler was advanced into the water bearing zone, the probe tube was withdrawn 24 inches to allow the retractable screen open contact with the formation. A length of polyethylene (PE) tubing was then inserted into the probe and connected to a peristaltic pump. Several screen volumes of groundwater were extracted in order to reduce turbidity levels. After sufficient purging, groundwater samples were collected by pumping directly into 40-milliliter (mL) vials. These samples were taken to the on-site mobile laboratory and screened for BTEX, MTBE,

and Naphthalene. All purge water was placed in 55-gallon drums on-site for later sampling and disposal. The mobile laboratory screening results are presented in Appendix G.

2.4.5 Groundwater Analytical Sampling

Groundwater samples were collected from site monitoring wells to determine if the surficial aquifer in the vicinity of the line disconnect had been impacted by petroleum products. TtNUS personnel collected groundwater samples from site monitoring wells during Phase I on June 15, 2000 and during Phase II on November 30, 2000. Groundwater samples collected from each monitoring well were analyzed using USEPA Method 8021 for VOAs and volatile organic halocarbons, USEPA Method 8260B for 1,2-dibromoethane (EDB), USEPA Method 8310 for PAHs, USEPA Method 6010 for lead (unfiltered), and FL-PRO for TRPHs. In addition, one of the wells was sampled for anions, sulfide and methane. Groundwater laboratory analytical reports are presented in Appendix H.

The groundwater samples were collected by means of the low-flow quiescent purging and sampling method using new Teflon™ tubing and a peristaltic pump. Approximately five well volumes of groundwater were removed from each well using the peristaltic pump and Teflon™ tubing. Temperature, pH, specific conductance, turbidity measurements, and well purge volumes were recorded at the time of sample collection. Groundwater samples were placed on ice and shipped to Severn Trent Laboratories, Inc. in North Canton, Ohio. Groundwater sample log sheets are provided in Appendix E.

Sampling activities were performed in general accordance with the procedures prescribed in the FDEP Quality Assurance Section's SOPs for Laboratory Operations and Sample Collection Activities, (DER-001/92), adopted by TtNUS' CompQAP. Sample preservation was accomplished by obtaining pre-preserved containers from a laboratory with an approved CompQAP (Severn Trent Laboratories). During the groundwater sampling event, quality control samples (e.g. equipment blanks and trip blanks) were prepared and submitted to the laboratory as required by the approved CompQAP. Sampling activities were documented in a site-specific field logbook, and samples were transmitted under chain-of-custody protocols to the laboratory.

2.4.6 Free Product Sampling

Prior to groundwater sampling, TtNUS personnel checked each well for free product using an ORS™ oil/water interface probe. No free product was encountered during this investigation.

2.5 HYDROLOGIC INVESTIGATION

2.5.1 Water Level Measurements

Measurements were collected from the north rim of the top of well casings using an electronic water level indicator. The water level measurements were collected to determine the depth to water in the surficial aquifer.

Donald Garrett & Associates, Inc., a Florida registered surveyor, surveyed the elevation of the north rim for each top of well casing to the nearest 0.01 foot relative. Elevations are based on the National Geodetic Vertical Datum (NGVD) of 1929.

Groundwater elevations were determined by subtracting the measured depth to groundwater for each well from it's respective top of casing elevation.

The horizontal groundwater gradient across the site was evaluated from the average of water level measurements collected on June 15, 2000. The groundwater gradient was from contours developed from groundwater elevation data.

The groundwater flow gradient was determined using the following equation:

$$I = \frac{h_1 h_2}{d}$$

Where:

I = the hydraulic gradient
h_1 = the water elevation at point 1
h_2 = the water elevation at point 2
d = the distance between point 1 and point 2

Potential movement of groundwater at the site may be described in terms of transportation by natural flow in the saturated zone while assuming groundwater flow follows Darcy's Law. Darcy's Law may be expressed as:

$$V = \frac{(K x I)}{n}$$

Where:

V = average seepage velocity
K = hydraulic conductivity
n = effective porosity
I = average hydraulic gradient

Site Specific transmissivity is calculated using the following equation:

$T\text{-}Kb_e$

Where:

T = transmissivity
K= hydraulic conductivity
b_e = affected aquifer thickness

2.5.2 Aquifer Characteristics

Previous aquifer test data was used to estimate the hydraulic conductivity of the surficial aquifer system at the site. Based on data accumulated from hundreds of multi-well, single well and slug tests, the arithmetic mean hydraulic conductivity for the surficial aquifer was estimated at 10 feet per day (ft/day). A figure from the USGS report depicting lateral hydraulic conductivity across NS Mayport is provided in Appendix I.

3.0 RESULTS OF INVESTIGATION

3.1 SITE-SPECIFIC HYDROGEOLOGY

3.1.1 Lithology

The site is underlain by fill material to approximately 3 feet bls. The fill material was composed of pebbles and cobbles varying in size in a matrix of poorly sorted sand. Beneath the fill material was a mix of brown to dark brown fine sand that was well sorted and moderately to well consolidated. This lithology extends to at least 15 feet bls which was the maximum depth drilled during the investigation. Due to the homogeneity of the subsurface, no lithologic cross-section was constructed. Soil boring logs are included as Appendix C.

3.1.2 Aquifer Classification

The site is underlain by the surficial aquifer, which is classified as G-II by the state of Florida. Based on water level data collected from site monitoring wells on June 15, 2000, the depth to the shallow aquifer across the study area is approximately 6 to 8 feet bls. Groundwater elevations are presented in Table 3-1.

Using the groundwater flow gradient equation presented in Section 2.5.1, a hydraulic gradient of 0.002 feet per foot (feet/foot) to the north-northeast was calculated from the data collected on June 15, 2000. The groundwater flow direction is depicted in Figure 3-1.

Lithologic data and available literature indicate the effective porosity of the lithology comprising the surficial aquifer is approximately 0.30 or 30% (USGS, 1997).

Using a hydraulic conductivity of 4.34 ft/day, the hydraulic gradient of 0.002 feet/foot, an inferred effective porosity value of 0.30, and Darcy's Equation as stated in Section 2.5.2, the groundwater seepage velocity across the site was calculated at 0.02 ft/day in a north-northwest direction.

3.2 SOIL QUALITY

3.2.1 Soil Boring Investigation

The vertical and horizontal extent of petroleum impacted soil in the vadose zone was assessed through soil vapor analysis performed during the direct-push investigation and monitoring well installation as soil

Table 3-1
Water Table Elevation and Monitoring Well Construction Data

Site Assessment Report for Building 436
Naval Station Mayport
Mayport, Florida

Well Number	Total Well Depth (feet bls)	Screened Interval (feet bls)	Top of Casing Elevation (feet msl)	February 2001	
				Depth to Water below Top of Casing (feet)	Water Elevation (feet msl)
Building 436					
436-MW01	15.00	5-15	12.02	7.55	4.47
436-MW02	15.00	5-15	12.29	7.94	4.35
436-MW03	15.00	5-15	12.36	8.25	4.11
436-MW04*	10.20	N/A	NS	7.96	NA
436-MW05**	13.00	3-13	NS	8.08	NA

Notes:

* - existing monitoring well
** - newly installed micro well (installed in November 2000)
bls - below land surface.
msl - mean sea level.
N/A - not available
NS - not surveyed.

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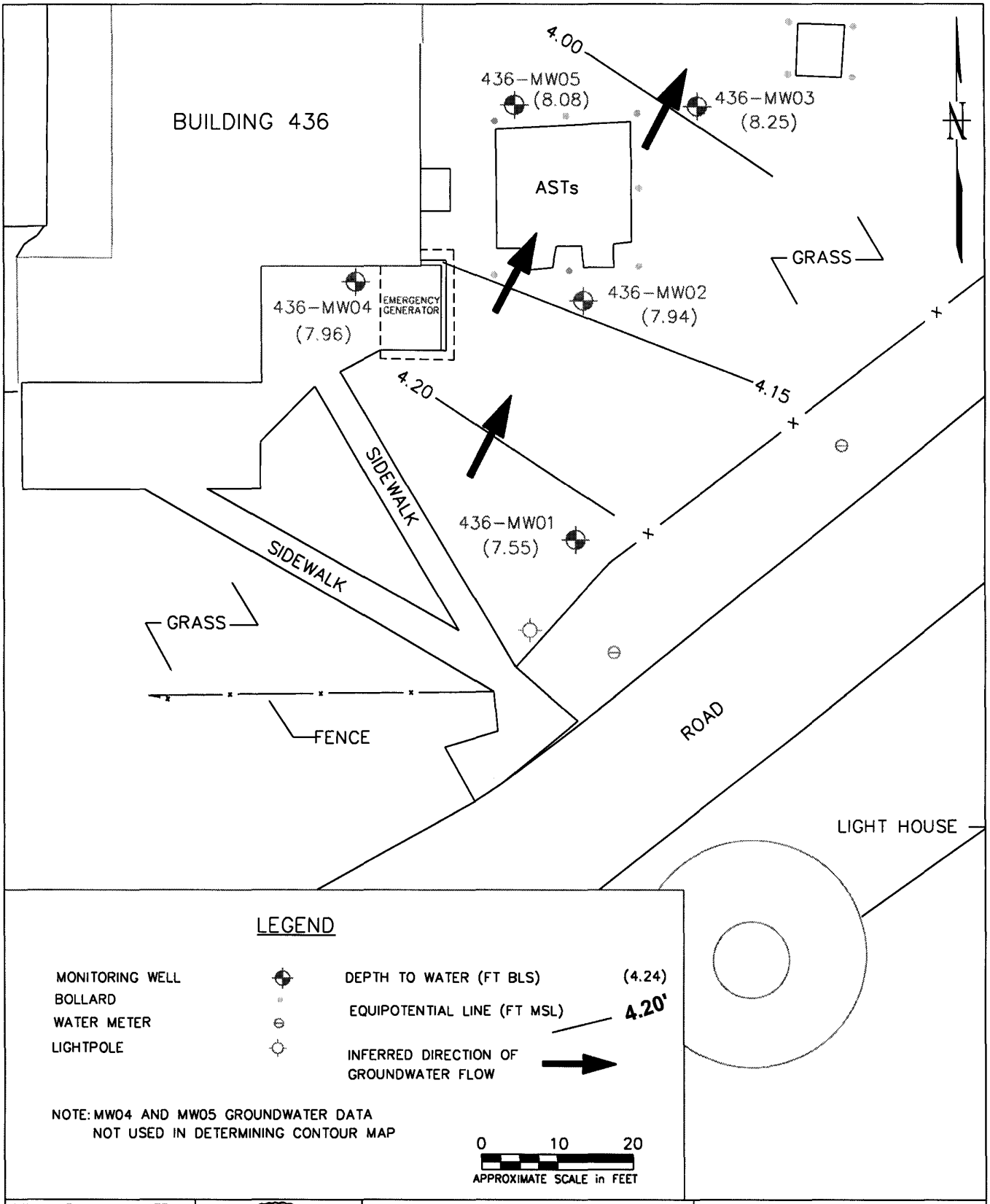

LEGEND

MONITORING WELL
BOLLARD
WATER METER
LIGHTPOLE

DEPTH TO WATER (FT BLS) (4.24)
EQUIPOTENTIAL LINE (FT MSL) 4.20'
INFERRED DIRECTION OF GROUNDWATER FLOW

NOTE: MW04 AND MW05 GROUNDWATER DATA NOT USED IN DETERMINING CONTOUR MAP

0 10 20
APPROXIMATE SCALE in FEET

DRAWN BY CW DATE 8/23/00	DEPARTMENT OF THE NAVY SOUTHERN DIV FACILITIES ENGINEERING COMD	GROUNDWATER ELEVATION CONTOUR MAP BUILDING 436 JUNE 14, 2000 U.S. NAVAL STATION MAYPORT MAYPORT, FLORIDA	CONTRACT NO. 0506
CHECKED BY DATE			APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 3-1 REV. 0

described in Section 2.0 of this report. Soils exhibiting an OVA response of greater than 50 ppm were not encountered in any of the borings across the site. These data indicate that "excessively contaminated" (greater than 50 ppm OVA response as defined by Chapter 62-770.200 FAC) is not present at the site. Soil vapor screening results are presented in Table 3-2. Soil vapor results are depicted on Figure 3-2.

3.2.2 Soil Analytical Sampling Results

Confirmation soil samples were collected from DPT borings from intervals with elevated headspace readings or from soil borings in the source area. The analytical data for the confirmatory laboratory samples indicated all KAG constituents were not present above SCTLs or leachability standards for groundwater protection. However, one non-KAG parameter (arsenic) was detected slightly above the SCTL value [0.8 milligram per kilogram (mg/kg)] at 1.2 and 1.8 mg/kg in two samples. Background for arsenic at NS Mayport has historically been encountered at levels exceeding the residential SCTL value. As a result, arsenic results are considered indicative of background. A summary of analytical results is presented in Table 3-3. Laboratory analytical reports can be found in Appendix F.

3.3 WATER QUALITY

3.3.1 Temporary Well Point Sampling

TtNUS personnel collected groundwater samples from Phase I soil borings during the DPT investigation. Ten groundwater samples were collected between May 2 and 3, 2000. The samples were analyzed for selected VOA constituents BTEX, MTBE and naphthalene by the mobile analytical laboratory. Toluene was detected at a concentration of 1.2 micrograms per liter (μg/L) in the sample collected from boring location 436-TW02. A summary of the mobile laboratory groundwater results can be found in Table 3-4. None of the constituents tested for were detected in any of the other borings sampled. Temporary well point locations can be found on Figure 3-2. Mobile results are presented in Appendix G.

3.3.2 Monitoring Well Sampling

TtNUS personnel collected groundwater samples from three monitoring wells during Phase I on June 14, 2000, one existing well on November 29, 2000, and a newly installed micro well on January 4, 2001. Parameters in the KAG were not detected above GCTLs. Monitoring well locations can be found on Figure 1-3. A summary of the groundwater results is shown in Table 3-5. Laboratory analytical reports can be found in Appendix H.

Review of Table 3-5 shows that no KAG constituents were detected during this investigation in excess of GCTL values.

Table 3-2
Soil Vapor Screening Summary

Site Assessment Report for Building 436
Naval Station Mayport
Mayport, Florida

Sample		OVA Headspace Results in ppm		
Location	Date	Unfiltered	Filtered	Total
436-TW-01	5/4/00	2.00	<1	2.00
436-TW-02	5/4/00	<1	<1	<1
436-TW-03	5/4/00	<1	<1	<1
436-TW-04	5/4/00	4.00	<1	4.00
436-TW-05	5/4/00	<1	<1	<1
436-TW-06	5/4/00	<1	<1	<1
436-TW-07	5/4/00	<1	<1	<1
436-TW-08	5/4/00	<1	<1	<1
436-TW-09	5/4/00	2.00	<1	2.00
436-TW-10	5/4/00	<1	<1	<1
436-TW-11	11/29/00	<1	<1	<1
436-TW-12	11/29/00	<1	<1	<1
436-TW-13	11/29/00	<1	<1	<1

Notes:

All samples collected from 4 to 5 feet in depth, or less, immediately above the water table.

ppm = parts per million

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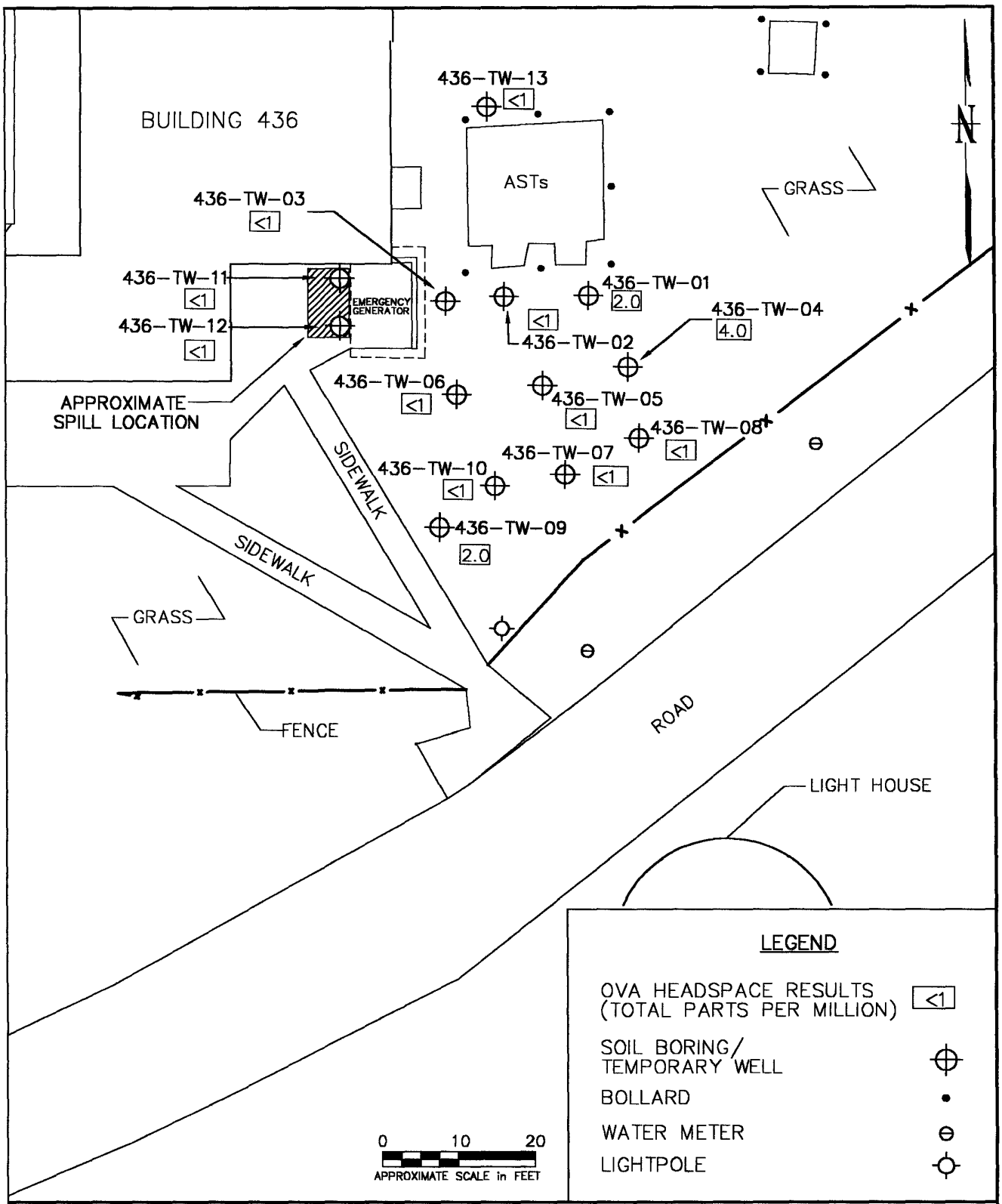

DRAWN BY CW DATE 8/24/00		HEAD-SPACE AND TEMPORARY WELL LOCATION MAP	CONTRACT NO. 0506
CHECKED BY DATE			APPROVED BY DATE
COST/SCHED-AREA		BUILDING 436 U.S. NAVAL STATION MAYPORT MAYPORT, FLORIDA	APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 3-2 REV. 0

Table 3-3
Soil Analytical Summary - Fixed Based Laboratory

Site Assessment Report for Building 436
Naval Station Mayport
Mayport, Florida

Detected Compounds	Residential SCTLs[1]	Leachability Standards for Groundwater Protection	436-SS-SB01	436-SS-SB04	436-SS-SB09
			5/24/00	5/24/00	5/24/00
Volatile Organic Aromatics USEPA Method 8260B (µg/kg)					
Benzene	1,100	7.0	<7.4	<7.4	<7.4
Toluene	380,000	500	0.32 J	0.33 J	0.31 J
Ethylbenzene	1,100,000	600	<7.4	<7.4	<7.4
Xylenes (total)	5,900,000	200	<15	<15	<15
1,1-dichloroethene	90	60	<7.4	<7.4	0.58J
Polynuclear Aromatic Hydrocarbons USEPA Method 8310 (µg/kg)					
Benzo(a)anthracene	1,400	3,200	<10	1.2J	<10
Chrysene	140,000	77,000	2 J	<5.2	<5.2
Pyrene	2,200,000	880,000	2.8 J	3.9 J	6.9
Metals (mg/kg)					
Arsenic	1	2.9	**1.2**	**1.8**	0.58
Cadmium	75**	8**	0.16 B	0.19 B	0.07 B
Chromium	210	38	3.8	2.7	1.6
Lead	400	**	12.5	3.2	1.9
OTHER (mg/kg)					
TRPH- FL PRO	340	340	<10	<10	<10
TOC	NA	NA	0.89	NS	NS

See notes at end of table.

Table 3-3 cont'd
Soil Analytical Summary - Fixed Based Laboratory

Site Assessment Report for Building 436
Naval Station Mayport
Mayport, Florida

Detected Compounds	Residential SCTLs[1]	Leachability Standards for Groundwater Protection	MPT-436-SS11-02	MPT-436-SS11-06	MPT-436-SS12-02	MPT-436-SS13-06
			11/29/00	11/29/00	11/29/00	11/29/00
Volatile Organic Aromatics USEPA Method 8260B (μg/kg)						
Benzene	1,100	7.0	<5.9	<5.9	<5.8	<5.9
Toluene	380,000	500	<5.9	<5.9	<5.8	<5.9
Ethylbenzene	1,100,000	600	<5.9	<5.9	<5.8	<5.9
Xylenes (total)	5,900,000	200	<12	<12	<12	<12
1,1-dichloroethene	90	60				
Polynuclear Aromatic Hydrocarbons USEPA Method 8310 (μg/kg)						
Acenaphthene	1,900,000	2,100	21 J	18 J	<53	<60
Anthracene	18,000,000	2,500,000	28 J	31 J	<53	<60
Benzo(a)anthracene	1,400	3,200	55	70	42	5.6 J
Benzo(a)pyrene	100	8,000	52	54	48	6.1
Benzo(b)fluoranthene	1,400	10,000	48	63	47	3.4 J
Benzo(g,h,i)perylene	2,300,000	32,000,000	38	48	45	3 J
Benzo(k)fluoranthene	15,000	25,000	35	43	24	2.2 J
Chrysene	140,000	77,000	63	100	52	7.2
Dibenz(a,h)anthracene	100	30,000	15	19	16	<6.0
Fluoranthene	2,900,000	1,200,000	170	250	110	13
Indeno(1,2,3,-cd)pyrene	1,500	28,000	44	54	49	<6.0
Phenanthrene	2,000,000	250,000	87	74 J	52	<60
Pyrene	2,200,000	880,000	100	150	73	8.4
Metals (mg/kg)						
Lead	400	**	5.9	4	7.3	0.67
OTHER (mg/kg)						
TRPH- FL PRO	340	340	<11	<11	26	<12

Notes:
[1] = Soil Cleanup Target Level.
* Value based on toxicity.
** Value for hexavalent chromium.
All samples colected from above the water table, 4 to 5 feet in depth.
< = below laboratory detection limit
mg/kg = milligrams per kilogram
μg/kg = micrograms per kilogram
NA = not applicable
NS = not sampled
J = estimated below practical quantitation limit

Table 3-4
Groundwater Analytical Results - Mobile Laboratory

Site Assessment Report for Building 436
Naval Station Mayport
Jacksonville, Florida

Compound	GCTLs[1]	436-GW-TW-01	436-GW-TW-02	436-GW-TW-03	436-GW-TW-04	436-GW-TW-05
		5/3/00	5/5/00	5/5/00	5/5/00	5/4/00
USEPA Method 8260B (µg/L)						
Benzene	1	ND	ND	ND	ND	ND
Toluene	40	ND	1.2	ND	ND	ND
Ethylbenzene	30	ND	ND	ND	ND	ND
Xylenes (total)	20	ND	ND	ND	ND	ND
MTBE	50	ND	ND	ND	ND	ND
Naphthalene	20	ND	ND	ND	ND	ND

Compound	GCTLs[1]	436-GW-TW-06	436-GW-TW-07	436-GW-TW-08	436-GW-TW-09	436-GW-TW-10
		5/4/00	5/3/00	5/5/00	5/5/00	5/5/00
USEPA Method 8260B (µg/L)						
Benzene	1	ND	ND	ND	ND	ND
Toluene	40	ND	ND	ND	ND	ND
Ethylbenzene	30	ND	ND	ND	ND	ND
Xylenes (total)	20	ND	ND	ND	ND	ND
MTBE	50	ND	ND	ND	ND	ND
Naphthalene	20	ND	ND	ND	ND	ND

Notes:
[1]Groundwater Clean-up Target Levels [FAC 62-777]
ND = non detect
USEPA = United States Environmental Protection Agency
µg/L = micrograms per liter

Table 3-5
Groundwater Analytical Results - Fixed Based Laboratory

Site Assessment Report for Building 436
Naval Station Mayport
Jacksonville, Florida

Compound	GCTLs[1]	436-MW-01	436-MW-02	436-MW-03	436-MW-04	436-MW-05
		6/14/00	6/14/00	6/14/00	11/2/00	1/4/01
Detected Volatile Organic Aromatics (USEPA Method 8260B)(µg/L)						
Acetone	**700**	2.1J	1.3J	1.3J	1.5J	NS
Benzene	**1**	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	**40**	0.067J	<1.0	<1.0	0.32 J	<1.0
Etheylbenzene	**30**	<1.0	<1.0	<1.0	<1.0	<1.0
Xylenes (total)	**20**	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl Tert-Butyl Ether	**50**	NS	NS	NS	<5.0	<5.0
1,2 Dibromoethane	**0.02**	<1.0	<1.0	<1.0	<0.02	<0.02
Mythylene Chloride	**5**	<1.0	<1.0	<1.0	0.27 J	<1.0
Semivolatile Organics (USEPA Method 8270B)(µg/L)						
Bis(2-ethylhexyl)phthalate	**6**	<1.0	5.3	4.2	NS	NS
Polynuclear Aromatic Hydrocarbons(µg/L)						
Naphthalene	**20**	<2.0	<2.0	<2.0	<2.0	<2.0
1- Methylnaphthalene	**20**	<2.0	<2.0	<2.0	<2.0	<2.0
2- Methylnaphthalene	**20**	<2.0	<2.0	<2.0	<2.0	<2.0
Inorganics (µg/L)						
Lead	**15**	<3.0	<3.0	<3.0	<3.0	<3.0
Total Recoverable Petroleum Hydrocarbons(µg/L)						
TRPH - FL Pro	**5000**	<0.50	<0.50	<0.50	0.29J	<0.50
Natural Attenuation Parameters)(mg/L)						
Nitrate/Nitrite	NA	NS	<0.1	<0.1	NS	NS
Sulfate	NA	NS	48	87	NS	NS
Sulfide	NA	NS	<1.0	<1.0	NS	NS
Methane	NA	NS	380	<1.0	NS	NS

Notes:
J = estimated
NA = Not Applicable
ND= Non Detect
NS = Not Sampled
µg/L = micrograms per liter
mg/L = milligrams per liter
1 Groundwater Clean-up Target Levels [FAC 62-777]

4.0 DISCUSSION

The source of the release at this site was identified as being a disconnected aboveground fuel line to the emergency generator. The release occurred on the ground surface in the vicinity of the UST that was located adjacent to the emergency generator. The line was repaired and the surrounding soil excavated. "Excessively contaminated" soil, as defined by Chapter 62-770.200 FAC, was not detected at the site during this assessment. Confirmatory soil samples collected from DPT borings indicate that no KAG parameters exceed SCTL or leachability standards for groundwater protection. The mobile laboratory results from the DPT investigation were used for determining placement of the permanent monitoring wells. Three shallow monitoring wells were installed and sampled in June 2000, one previously existing monitoring well was sampled in November 2000, and one newly installed (micro) monitoring well was installed in November 2000 and sampled in January 2001. No free product was encountered in the monitoring wells. Analytical results from DPT locations and from permanent monitoring wells indicated that all KAG parameters were either not detected or were below respective GCTL values.

5.0 CONCLUSIONS AND RECOMMENDATION

The results of the site assessment performed by TtNUS at Building 436 are summarized as follows:

- The site is underlain by a surficial aquifer comprised of fill material and sand. No confining layers were encountered within the upper 15 feet of the surficial aquifer.
- The surficial aquifer qualifies as a G-II aquifer.
- The direction of groundwater flow is to the north-northwest and the surficial aquifer flows at a calculated velocity of 0.02 ft/day or 7-3 feet/year.
- Free product was not found at the site during the course of this assessment.
- No private potable wells were found within a 0.25-mile radius of the site. No municipal wells were found within a 0.5-mile radius of the site.
- KAG constituents were either not detected in all soil and groundwater samples collected at the site or where the results were below respective SCTL, leachability standards, and GCTLs values.
- One non-KAG parameter, arsenic, slightly exceeded the SCTL value (0.8 mg/kg) in two soil samples at 1.2 and 1.8 mg/kg, respectively. Based on prior background studies, arsenic levels at NS Mayport have been documented above the SCTL value. As a result the arsenic levels at Building 436 are believed to be representative of background values.

Based upon the hydrogeological and chemical data presented in this Site Assessment Report (SAR) and supported by the criteria cited in Chapter 62-770 FAC, the site qualifies for No Further Action status. As a result, we recommend that FDEP grant No Further Action status to the site.

REFERENCES

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APPENDIX A

CAR SUMMARY SHEET

CONTAMINATION ASSESSMENT REPORT SUMMARY SHEET

Facility Name: Building 436, Naval Station Mayport Reimbursement Site: ☐

Location: Mayport, Florida State Contract Site: ☐

EDI #: _____ FAC I.D.# _____ Other: Non-Prog. ☑

Date Reviewed: _____ Local Government: _____

(1) Source of Spill: Break in piping system of AST Date of Spill: Unknown

(2) Type of Product:

Gasoline Group	Gallons Lost	Kerosene Group	Gallons Lost
☐ Leaded		☐ Kerosene	
☐ Unleaded Regular		☐ Diesel	
☐ Unleaded Premium		☐ JP-4 Jet Fuel	
☐ Gasohol		☑ Heating Fuel	unknown
☐ Undetermined		☐ Unknown	

(3) Description of IRA: Soil removed from area of line break.

☐ Free product Removal: _____ (gals)
☑ Soil Removal: unknown (cubic yds)
☐ Soil Incineration: _____ (cubic yds)

(4) Free Product still present (yes/no) No Maximum apparent product thickness: N/A (feet)

(5) Maximum Groundwater contamination levels (ppb): Total VOA: <1 benzene: <1 EDB: < 0.020
lead: <1 MTBE: <5.0 other: TRPH & PAHs

(6) Brief lithologic description: Medium to fine sand. No significant lithologic variations across site.

(7) Areal and vertical extent of soils contamination defined (yes/no) Yes

Highest current soil concentration (OVA: 2 ppm) or (EPA method 5030/8020: _____ ppb)

(8) Lower aquifer contaminated? (yes/no) No Depth of vertical contamination: N/A.

(9) Date of last complete round of groundwater sampling: 6/15/00 Date of last soil sampling: 11/29/00

(10) QAPP approved? (yes/no) Date: 8/24/98

(11) Direction (e.g. NNW) of surficial groundwater flow: NW (Fig. 3-1 on page _____)

(12) Average depth to groundwater: 7.5 (ft)

(13) Observed range of seasonal groundwater fluctuations: N/A (ft) (Based on water level data collected during the CAR investigation)

(14) Estimated rate of groundwater flow: 0.02 (ft/day)

(15) Hydraulic gradient across site: 0.002 (ft/ft)

(16) Aquifer characteristics:

	Values	Units	Method
Hydraulic conductivity	4.34	ft/day	Kasenow & Pare, 1995
Storage coefficient	-	ft/ft	-
Aquifer thickness	40	ft	Literature
Effective soil porosity	30	%	Literature
Transmissivity	1307	gal/day/ft	Specific Capacity Tests

(17) Other remarks: None

APPENDIX B

IDW RECORDS

Please print or type
(Form designed for use on elite (12-pitch) typewriter.)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. FLCESQG06730
Manifest Doc. No.
2. Page 1 of

GENERATOR

3. Generator's Name and Mailing Address
UNITED STATES NAVY
Naval Station Mayport
Jacksonville, FL 32228
4. Generator's Phone (904)-270-6730

5. Transporter 1 Company Name: CHEMICAL CONSERVATION CORP.
6. US EPA ID Number: FLD980559728
A. Transporter's Phone: 407-859-4441

7. Transporter 2 Company Name
8. US EPA ID Number
B. Transporter's Phone

9. Designated Facility Name and Site Address
CHEMICAL CONSERVATION CORP.
10100 Rocket Boulevard
Orlando, FL 32824
10. US EPA ID Number: FLD980559728
C. Facility's Phone: 407-859-4441

11. Waste Shipping Name and Description	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a. Non Regulated Material (Soil cuttings)		DM	0000	G
b. Non Regulated Material (Soil cuttings)		DM	0000	G
c. Non Regulated Material (PPE)		DM	0000	G
d.				

D. Additional Descriptions for Materials Listed Above
(a) UNIF6261 (OCB0006022)(NHAZS)
(b) UNIF6261 (OCB0006022)(NHAZS)
(c) UNIF6262 (OCB0006022)(NHAZS)(IDW-Decon Refuse)
(d)

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
EMERGENCY RESPONSE: Chem-Trec 1-800-424-9300
EMERGENCY CONTACT:

16. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name: JAN B BOVIER
Signature: Jan B Bovier
Month / Day / Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Month / Day / Year

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Month / Day / Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name
Signature
Month / Day / Year

Printed by J. J. KELLER & ASSOCIATES, INC.
Neenah, WI 54957-0368

COPY

APPENDIX C

SOIL BORING LOGS

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: NS MAYPORT
PROJECT NUMBER:
DRILLING COMPANY: US Drilling
DRILLING RIG: CME

BORING No.: 436-MW-1
DATE: 4/25/00
GEOLOGIST: Al + GTB
DRILLER: Mark James.

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**
							sand + gravel, cobbles - fill material - poorly sorted			00 ppm			
		5					↓			1 ppm			
							sand, dark brown, medium to fine grained, angular some secondaries wet						
		10					↓						
		15											

* 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: NS MAYPORT
PROJECT NUMBER:
DRILLING COMPANY: US Drilling
DRILLING RIG:

BORING No.: 436-MW-2
DATE: 4/25/00
GEOLOGIST: GB + AP.
DRILLER: Mark James.

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**
							sand, gravel cobbles - fill material, well compacted			0 ppm			
		5					↓			0 ppm			
							sand, dark brown, med to fine grained, well sorted						
		10					↓						
		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: NS MAYPORT
PROJECT NUMBER:
DRILLING COMPANY: US. Drilling
DRILLING RIG:

BORING No.: 436-MW3
DATE: 4/25/00
GEOLOGIST: GB + AP
DRILLER: Mark James.

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**
							sand + gravel fill material			0ppm			
		5					sand, dark brown med. to fine grained angular, some shell fragments			1ppm			
		10											
		1											
		15											

* 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. #:

APPENDIX D

MONITORING WELL COMPLETION LOGS

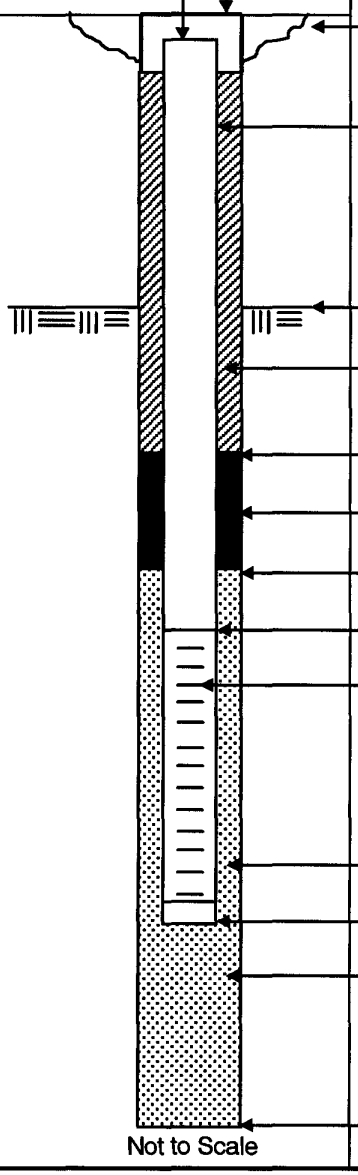
Tetra Tech NUS, Inc.

WELL No.: 436-MW01

MONITORING WELL SHEET

PROJECT:	NS Mayport	DRILLING Co.:	U.S. Drilling	BORING No.:	MW-01
PROJECT No.:	506	DRILLER:		DATE COMPLETED:	05/25/00
SITE:	Building 436	DRILLING METHOD:	HAS	NORTHING:	
GEOLOGIST:	G. Braganza	DEV. METHOD:	Submersible	EASTING:	

Ground Elevation =
Datum:



Elevation / Depth of Top of Riser:		N/A /
Elevation / Height of Top of Surface Casing:		Flush /
I.D. of Surface Casing:	8"	
Type of Surface Casing:	Steel	
Type of Surface Seal:	Grout cement	
I.D. of Riser:	2"	
Type of Riser:	PVC	
Borehole Diameter:	10"	
Elevation / Depth Top of Rock:		N/A/
Type of Backfill:	Grout cement	
Elevation / Depth of Seal:		3/
Type of Seal:	30/65 Sand	
Elevation / Depth of Top of Filter Pack:		4/
Elevation / Depth of Top of Screen:		5/
Type of Screen:	PVC	
Slot Size x Length:	0.01/10'	
I.D. of Screen:	2"	
Type of Filter Pack:	20/30 Sand	
Elevation / Depth of Bottom of Screen:		15/
Elevation / Depth of Bottom of Filter Pack:		15/
Type of Backfill Below Well:		
Elevation / Total Depth of Borehole:		15/

Tetra Tech NUS, Inc.

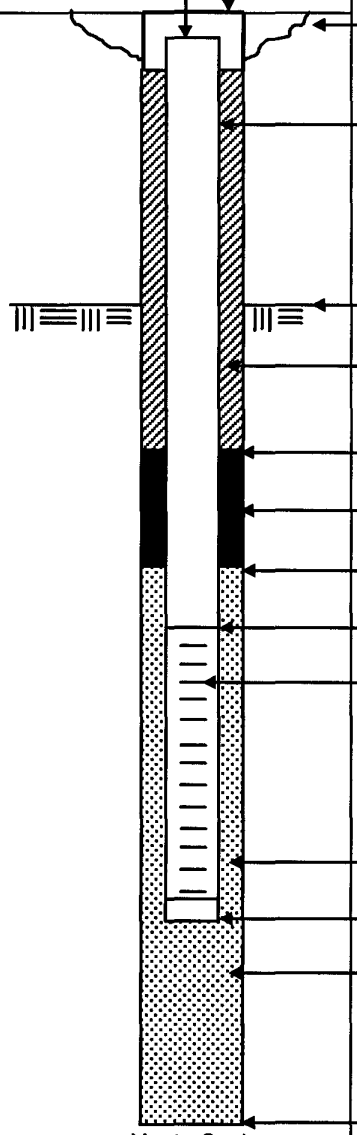
WELL No.: 436-MW02

MONITORING WELL SHEET

PROJECT:	NS Mayport	DRILLING Co.:	U.S. Drilling	BORING No.:	MW-02
PROJECT No.:	506	DRILLER:		DATE COMPLETED:	05/25/00
SITE:	Building 436	DRILLING METHOD:	HAS	NORTHING:	
GEOLOGIST:	G. Braganza	DEV. METHOD:	Submersible	EASTING:	

Ground Elevation =

Datum:



Not to Scale

Elevation / Depth of Top of Riser:		N/A /
Elevation / Height of Top of Surface Casing:		Flush /
I.D. of Surface Casing:	8"	
Type of Surface Casing:	Steel	
Type of Surface Seal:	Grout cement	
I.D. of Riser:	2"	
Type of Riser:	PVC	
Borehole Diameter:	10"	
Elevation / Depth Top of Rock:		N/A/
Type of Backfill:	Grout cement	
Elevation / Depth of Seal:		3'/
Type of Seal:	30/65 Sand	
Elevation / Depth of Top of Filter Pack:		4'/
Elevation / Depth of Top of Screen:		5'/
Type of Screen:	PVC	
Slot Size x Length:	0.01/10'	
I.D. of Screen:	2"	
Type of Filter Pack:	20/30 Sand	
Elevation / Depth of Bottom of Screen:		15'/
Elevation / Depth of Bottom of Filter Pack:		15'/
Type of Backfill Below Well:		
Elevation / Total Depth of Borehole:		15'/

Tetra Tech NUS, Inc.

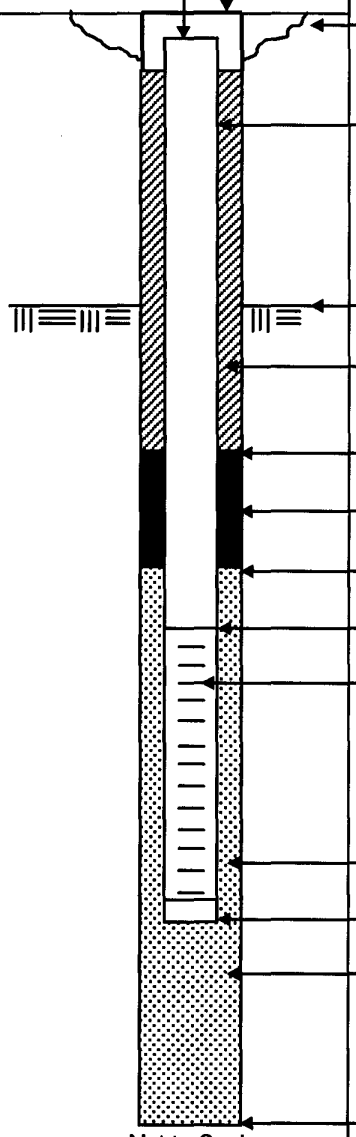
WELL No.: 436-MW03

MONITORING WELL SHEET

PROJECT:	NS Mayport	DRILLING Co.:	U.S. Drilling	BORING No.:	MW-03
PROJECT No.:	506	DRILLER:		DATE COMPLETED:	05/25/00
SITE:	Building 436	DRILLING METHOD:	HAS	NORTHING:	
GEOLOGIST:	G. Braganza	DEV. METHOD:	Submersible	EASTING:	

Ground Elevation =

Datum:



Not to Scale

Elevation / Depth of Top of Riser:		N/A /
Elevation / Height of Top of Surface Casing:		Flush /
I.D. of Surface Casing:	8"	
Type of Surface Casing:	Steel	
Type of Surface Seal:	Grout cement	
I.D. of Riser:	2"	
Type of Riser:	PVC	
Borehole Diameter:	10"	
Elevation / Depth Top of Rock:		N/A/
Type of Backfill:	Grout cement	
Elevation / Depth of Seal:		3'/
Type of Seal:	30/65 Sand	
Elevation / Depth of Top of Filter Pack:		4'/
Elevation / Depth of Top of Screen:		5'/
Type of Screen:	PVC	
Slot Size x Length:	0.01/10'	
I.D. of Screen:	2"	
Type of Filter Pack:	20/30 Sand	
Elevation / Depth of Bottom of Screen:		15'/
Elevation / Depth of Bottom of Filter Pack:		15'/
Type of Backfill Below Well:		
Elevation / Total Depth of Borehole:		15'/

Tetra Tech NUS, Inc.

WELL No.: 436-MW04

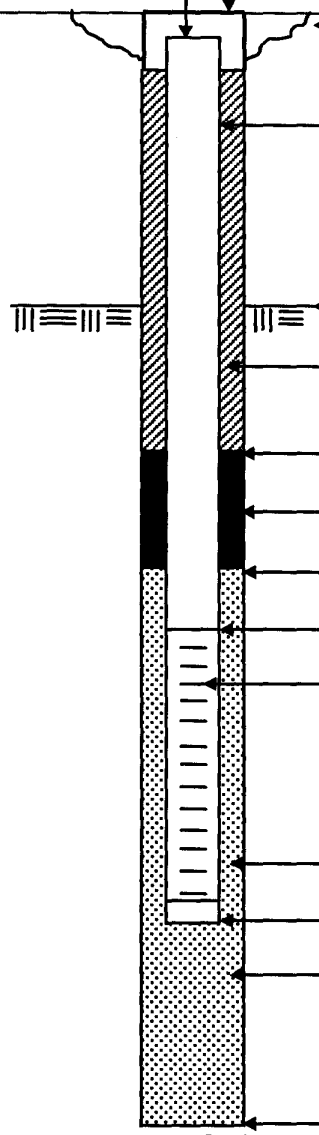
MONITORING WELL SHEET

PROJECT:	NS Mayport	DRILLING Co.:		BORING No.:	
PROJECT No.:	506	DRILLER:		DATE COMPLETED:	
SITE:	Building 436	DRILLING METHOD:	HAS	NORTHING:	
GEOLOGIST:		DEV. METHOD:		EASTING:	

Note: Existing MW - Construction Details Unavailable

Ground Elevation =

Datum:



Not to Scale

Elevation / Depth of Top of Riser:		N/A /
Elevation / Height of Top of Surface Casing:		Flush /
I.D. of Surface Casing:	6"	
Type of Surface Casing:	Steel	
Type of Surface Seal:	Grout cement	
I.D. of Riser:	2"	
Type of Riser:	PVC	
Borehole Diameter:		
Elevation / Depth Top of Rock:		N/A/
Type of Backfill:		
Elevation / Depth of Seal:		/
Type of Seal:		
Elevation / Depth of Top of Filter Pack:		/
Elevation / Depth of Top of Screen:		/
Type of Screen:	PVC	
Slot Size x Length:	0.01	
I.D. of Screen:	2"	
Type of Filter Pack:		
Elevation / Depth of Bottom of Screen:		10.20/
Elevation / Depth of Bottom of Filter Pack:		/
Type of Backfill Below Well:		
Elevation / Total Depth of Borehole:		/

Tetra Tech NUS, Inc.

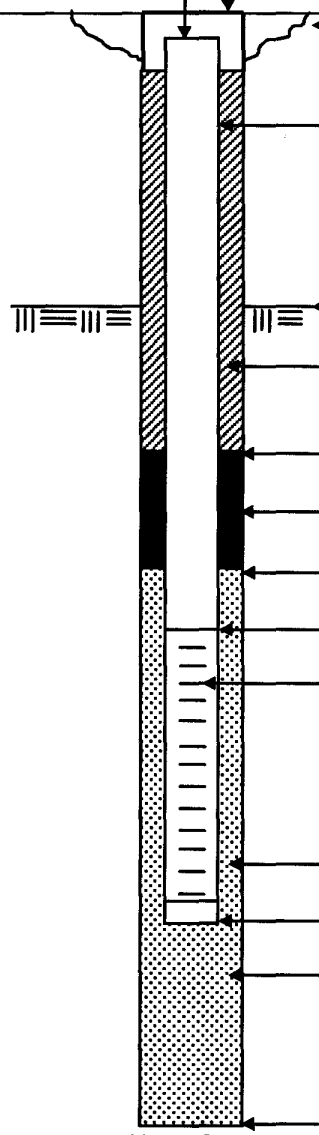
WELL No.: 436-MW05

MONITORING WELL SHEET

PROJECT:	NS Mayport	DRILLING Co.:	Groundwater Protection.	BORING No.:	SB13
PROJECT No.:	506	DRILLER:		DATE COMPLETED:	11/29/00
SITE:	Building 436	DRILLING METHOD:	DPT	NORTHING:	
GEOLOGIST:	A. Pate(Env. Scien)	DEV. METHOD:	Peristaltic	EASTING:	

Note: Micro Well

Ground Elevation =
Datum:



Not to Scale

Elevation / Depth of Top of Riser:	N/A /
Elevation / Height of Top of Surface Casing:	Flush /
I.D. of Surface Casing:	6"
Type of Surface Casing:	Steel
Type of Surface Seal:	Grout cement
I.D. of Riser:	1"
Type of Riser:	PVC
Borehole Diameter:	2"
Elevation / Depth Top of Rock:	N/A/
Type of Backfill:	
Elevation / Depth of Seal:	3'/
Type of Seal:	Grout cement
Elevation / Depth of Top of Filter Pack:	3'/
Elevation / Depth of Top of Screen:	3'/
Type of Screen:	PVC
Slot Size x Length:	0.01/10'
I.D. of Screen:	
Type of Filter Pack:	Prepacked screen
Elevation / Depth of Bottom of Screen:	13'/
Elevation / Depth of Bottom of Filter Pack:	13'/
Type of Backfill Below Well:	
Elevation / Total Depth of Borehole:	13'/

APPENDIX E

GROUNDWATER SAMPLING LOG SHEETS

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of___

Project Site Name: MAYPORT Bldg 436
Project No.: N05066

[] Domestic Well Data
[] Monitoring Well Data
[X] Other Well Type:
[] QA Sample Type:

Sample ID No.: 436-GW-MW01-RD1
Sample Location: 436-MW01
Sampled By: RP/ER
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: ~~6/14/00~~ 6/15/00	Color	pH	S.C.	Temp.	Turbidity	DO	Sal.	~~Other~~
Time:	Visual	Standard	mS/cm	°C	NTU	mg/l	%	ORP
Method: Peristaltic pump	Clear	7.16	0.406	24.6	8-10	0.55	~~0~~	-277

PURGE DATA:

Date: 6/15/00	TIME	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Volume
Method: Peristaltic pump								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 15								
Static Water Level (WL): 7.78								
One Casing Volume(gal/L):								
Start Purge (hrs): 1000								
End Purge (hrs): 1045								
Total Purge Time (min): 45								
Total Vol. Purged (gal/L): 4.0								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

Stick up of riser above ground level (AGL): FLUSH ft.

14 15.85
7.78
7.22

1.2g = 1 vol

1.2
3
3.6g = 3 vol

Circle if Applicable:

MS/MSD	Duplicate ID No.:	Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: MAYPORT Bldg 436
PROJECT NUMBER: N0506

WELL ID.: 436-MW01
DATE: 6/15/00

Time (hrs.)	Water Level (ft. below TOC)	Flow (ml/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
1000	7.78	—	—	—	—	—	—	—	
1005	7.84	—	7.15	1.02	-10	1.20	24.3	-283	Clear
1010	7.84	—	7.17	0.678	-10	0.69	24.2	-277	Clear
1015	7.84	—	7.19	0.628	-10	0.64	24.3	-275	Clear
1020	7.84	—	7.18	0.611	-10	0.57	24.5	-275	Clear
1025	7.84	—	7.18	0.606	-10	0.55	24.5	-274	Clear
1030	7.84	—	7.17	0.606	-10	0.55	24.6	-276	Clear
1035	7.84	—	7.16	0.605	-10	0.56	24.6	-276	Clear
1040	7.84	—	7.16	0.606	-10	0.56	24.6	-277	Clear
1045	7.84	—	7.16	0.606	-10	0.55	24.6	-277	Clear
END PURGE									

Page___ of ___

Tetra Tech NUS, Inc. **GROUNDWATER SAMPLE LOG SHEET**

Project Site Name: MAYPORT
Project No.: N0506

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 436-GW-MW2-001
Sample Location: 436 MW2
Sampled By: AP/ER
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 6-15-00 Time: 0918	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	Salinity %	~~Color~~ ORP
Method: Low Flow Peristaltic	Clear	7.16	1.09	24.5	-10	0.53	—	-292

PURGE DATA

Date: 6-15-00	Time	pH	S.C.	Temp (°C)	Turbidity	DO	Salinity	ORP
Method: Low Flow Peristaltic								
Monitor Reading (ppm):								
Well Casing Diameter: 2"								
Well Casing Material: PVC								
Total Well Depth (TD): 15.0								
Static Water Level (WL): 8.15								
One Casing Volume (gal/L): 1.1								
Start Purge (hrs): 0834								
End Purge (hrs): 0915								
Total Purge Time (min): 41								
Total Vol. Purged (gal/L): 3.5								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
PAH			YES
SVOC			YES
TRPH			YES
EDB			YES
VOC			YES
Methane			YES
Sulfide > NA PARAMETERS			YES
Anions			YES
Lead			YES
			~~[illegible]~~

OBSERVATIONS / NOTES

* DUPLICATE COLLECTED
436-GW-DUP01-001

Circle if Applicable: Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: MAYPORT
PROJECT NUMBER: N0506

WELL ID.: 436-MW2
DATE: 6-15-00

Time (hrs)	Water Level (ft. below TOC)	Flow (ml/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
0834	8.15	—	—	—	—	—	—	—	
0840	8.24	—	7.20	1.27	7.6	1.05	24.4	-270	Clear
0845	8.24	—	7.19	1.20	-10	0.86	24.5	-280	Clear
0850	8.24	—	7.18	1.14	-10	0.73	24.5	-286	Clear
0855	8.24	—	7.18	1.11	-10	0.66	24.5	-286	Clear
0900	8.24	—	7.17	1.10	-10	0.61	24.5	-288	Clear
0905	8.24	—	7.16	1.10	-10	0.56	24.5	-290	Clear
0910	8.24	—	7.16	1.09	-10	0.54	24.5	-291	Clear
0915	8.24	—	7.16	1.09	-10	0.53	24.5	-292	Clear
END PURGE									

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: MAYPORT Bldg 436
Project No.: N050xa

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 436-GW-MW03-001
Sample Location: 436-MW03
Sampled By: AP/GR
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 6/15/00 Time:	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	Salinity %	Other
Method: Low Flow Peristaltic								

PURGE DATA

Date: 6/15/00	Time	pH	S.C.	Temp (°C)	Turbidity	DO	Salinity	ORP
Method: Low Flow Peristaltic								
Monitor Reading (ppm):								
Well Casing Diameter: 2"								
Well Casing Material: PVC								
Total Well Depth (TD): 15								
Static Water Level (WL): 8.40								
One Casing Volume(gal/L): 1.0								
Start Purge (hrs): 1106								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
TRPH	HCL		YES
PAH			YES
SVOCs			YES
VOCs	HCL		YES
EDB	HCL		YES
LEAD	NO3		YES

OBSERVATIONS / NOTES

15.00
8.40
6.60

1.0g = 1 vol
3.0g = 3 vol

~~1.0~~ 3
~~3.0~~

Circle if Applicable:

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: MAYPORT Bldg 436
PROJECT NUMBER: N0506

WELL ID.: 436-MW03
DATE: 6/15/00

Time (Hrs)	Water Level (Ft Below TOC)	Flow (ml/Min)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
1106	8.40	–	–	–	–	–	–	–	
1110	8.45	–	7.24	0.550	-10	3.11	24.8	-233	clear
1115	8.46	–	7.28	0.515	-10	0.86	24.8	-233	clear
1120	8.46	–	7.25	0.502	-10	0.95	24.8	-225	clear
1125	8.45	–	7.25	0.497	-10	1.15	24.8	-217	clear
1130	8.46	–	7.25	0.497	-10	1.27	24.8	-221	clear
1135	8.46	–	7.25	0.497	-10	1.15	24.7	-227	clear
1140	8.46	–	7.24	0.498	-10	1.05	24.6	-232	clear
#1145	8.46	–	7.23	0.499	-10	0.93	24.6	-237	clear

Tetra Tech NUS, Inc. **GROUNDWATER SAMPLE LOG SHEET**

Project Site Name: ~~NAS J~~ AP MAYPORT
Project No.:

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 436-GW-MW04-001
Sample Location: MW04
Sampled By: AP
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 11/2/00	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	~~Other~~
Time: 1142	Visual	Standard	mS/cm	°C	NTU	mg/l	%	ORP
Method: Low Flow Peristaltic	Clear	2.83	0.410	26.5	-10	1.0	—	93

PURGE DATA

Date: 11/2/00	Time	pH	S.C.	Temp (°C)	Turbidity	DO	Salinity	ORP
Method: Low Flow Peristaltic	1120	—	—	—	—	—	—	—
Monitor Reading (ppm):	1125	3.38	0.419	~~AP 26.5~~	-10	1.6	—	255
Well Casing Diameter: 2"	1130	2.88	0.412	26.5	-10	1.0	—	159
Well Casing Material: PVC	1135	2.85	0.410	26.5	-10	1.0	—	95
Total Well Depth (TD): 10.2	1140	2.83	0.410	26.5	-10	1.0	—	93
Static Water Level (WL): 6.29	END	PURGE						
One Casing Volume(gal/L): 0.6								
Start Purge (hrs): 1120								
End Purge (hrs): 1140								
Total Purge Time (min): 20								
Total Vol. Purged (gal/L): 1.8								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
KAG GROUP			
~~3-40 ml VOAs~~ AP			
601, 602	HCL		
PAHs (8310)			
FL PRO	SULFURIC		
LEAD	NITRIC		
504	HCL		

OBSERVATIONS / NOTES

40.11
6.29
3.91

0.6
3
1.8 = 3 vols

Circle if Applicable:

Signature(s):

Tetra Tech NUS, Inc. **GROUNDWATER SAMPLE LOG SHEET**

Project Site Name: NS MAYPORT - Bldg 436
Project No.: N05006

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: 436-GW-MW05-001
Sample Location: MW5
Sampled By: AP
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	~~Salinity~~ ORP	Other
Date: 11/30 Time: 0708								
Method: Low Flow Peristaltic	Clear	7.49	0.35	22.9	-10	3.2	25	

PURGE DATA

Date: 11/30/00	Time	pH	S.C.	Temp (°C)	Turbidity	DO	Salinity	ORP
Method: Low Flow Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter: 1"								
Well Casing Material: PVC								
Total Well Depth (TD): 13'								
Static Water Level (WL): 7.05								
One Casing Volume(gal/L): 0.5								
Start Purge (hrs): 0635								
End Purge (hrs): 0705								
Total Purge Time (min): 30								
Total Vol. Purged (gal/L): 2.5								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
KAG GROUP			YES

OBSERVATIONS / NOTES

0.5
3
1.5

Circle if Applicable:

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NS MAYPORT Bldg 436
PROJECT NUMBER: 40506
WELL ID.: 436-MW05
DATE: 11/30/00

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
0635	7.05	–	–	–	–	–	–	–	
0640	7.29	300	6.95	0.36	9	5.0	22.6	108	CLEAR
0645	7.29	300	7.23	0.35	-1	3.7	22.7	78	"
0650	7.29	300	7.42	0.35	-10	3.3	22.8	47	"
0655	7.29	300	7.47	0.35	-10	3.2	22.8	29	"
0700	7.29	300	7.49	0.35	-10	3.3	22.9	26	"
0705	7.29	300	7.49	0.35	-10	3.2	22.9	25	"
	END PURGE	~~300~~ AP							

Alan Pate

APPENDIX F

LABORATORY ANALYTICAL REPORTS FOR SOIL

Tetra Tech NUS, Inc. **Internal Correspondence**

TO: **Mr. Rick Ofsanko** **DATE: July 10, 2000**

FROM: **William Howard Engle** **CC: File**

SUBJECT: **Inorganic Data Validation – Select Metals, TCLP Metals, and TOC**
CTO123 – NS Mayport
SDG MP007

SAMPLES: **8/Soils**

4252-SS-SB02-05*	**436-SS-SB04-05***
4252-SS-SB04-05*	**436-SS-SB09-05***
4252-SS-SB11-05*	**358-SS-SB05-04***
436-SS-SB01-05*	**358-SS-SB04-04***

OVERVIEW

The sample set for CTO123, SDG MP007; Naval Station Mayport, Jacksonville, Florida consists of eight (8) soil environmental samples. The samples designated with a * were analyzed for arsenic, cadmium, chromium, and lead using SW-846 6010B. Samples 358-SS-SB03-04 and 436-SS-SB01-05 were analyzed for TCLP metals using SW-846 6010B and 7470A. Samples 358-SS-SB04-04, 425-SS-SB11-05 and 436-SS-SB01-05 were analyzed for TOC using ASTM D 2874-84.

The samples were collected by Tetra Tech NUS on May 2-4, 2000 and analyzed by STL-No. Canton (formerly Quanterra) Laboratory. All analyses were performed in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria and analyzed according to SW-846 Method 6010B, 7470A, 1311, ASTM D2974-84, and ASTM D422-63 analytical and reporting protocols. The data in this SDG was validated with regard to the following parameters:

- * Data Completeness
- * Holding Times
- * Initial/continuing calibrations
- Laboratory method/field quality control blank results

The symbol (*) indicates that all quality control criteria were met for this parameter. Supporting documentation is presented in Appendix C. Qualified analytical results are presented in Appendix A. The original laboratory data is contained in Appendix B.

Metals and Mercury Fraction

Laboratory Blank Analysis

Affected samples: select metals

Analyte	Maximum Concentration (ug/L)	Action Level (ug/L)
chromium	0.083 [1]	0.415

[1] Contamination in the preparation blank.

An action level of 5x the maximum concentration has been used to evaluate the sample for contamination in continuing calibration blank and preparation blank. Dilution factors and sample aliquots were taken into consideration when evaluating for blank contamination. No validation action was required for chromium as the results were either greater than the blank action level.

All other quality control criteria were met.

TCLP Fraction

Laboratory Blank Analysis

Affected samples: TCLP metals

Analyte	Maximum Concentration (ug/L)	Action Level (ug/L)
barium	1.3 [1]	6.5

[1] Contamination in the preparation blank.

An action level of 5x the maximum concentration has been used to evaluate the sample for contamination in continuing calibration blank and preparation blank. Dilution factors and sample aliquots were taken into consideration when evaluating for blank contamination. No validation action was required for barium as the results were either greater than the blank action level or were nondetected

All other quality control criteria were met.

Total Organic Carbon Fraction

All quality control criteria were met for this parameter.

Notes

The incorrect sample ID was recorded on the Form 1s for sample 425s-SS-SB02-05. The ID was corrected by a data reviewer.

Requested hydrometer analyses could not be conducted due to quality of sample. See memo from laboratory in Appendix C.

Executive Summary

Laboratory performance:	Several analytes were detected in the laboratory blanks. No action was taken
Other factors affecting data quality:	None.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Inorganic Data Validation (February, 1994), and the NFESC guidelines "Navy IRCQM" (September, 1999). The text of the report has been formulated to address only those problems affecting data quality.

"I attest that the data referenced herein was validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

William Howard Engle

Project Chemist
Tetra Tech NUS, Inc.

Joseph A. Samchuck

Data Validation Quality Assurance Officer
Tetra Tech NUS, Inc.

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B – Results as reported by the laboratory
3. Appendix C – Supporting Documentation

CTO123-NS MAYPORT
SOIL DATA
QUANTERRA
SDG: MP007

SAMPLE NUMBER:	4252-SS-SB02-05	4252-SS-SB04-05	4252-SS-SB11-05	436-SS-SB01-05
SAMPLE DATE:	05/02/00	05/02/00	05/02/00	05/03/00
LABORATORY ID:	A0E030194001	A0E030194002	A0E030194003	A0E040160002
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	92.9 %	90.2 %	90.0 %	95.9 %
UNITS:	MG/KG	MG/KG	MG/KG	MG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ARSENIC	0.52	B		0.61	B		1.0	B		1.2		
CADMIUM	0.03	U		0.03	U		0.03	U		0.16	B	
CHROMIUM	1.8			1.6			2.8			3.8		
LEAD	0.85			1.1			1.4			12.5		

CTO123-NS MAYPORT
SOIL DATA
QUANTERRA
SDG: MP007

SAMPLE NUMBER:	436-SS-SB04-05	436-SS-SB09-05		
SAMPLE DATE:	05/03/00	05/03/00	/ /	/ /
LABORATORY ID:	A0E040160003	A0E040160004		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	94.9 %	94.7 %	100.0 %	100.0 %
UNITS:	MG/KG	MG/KG		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ARSENIC	1.8			0.58	B							
CADMIUM	0.19	B		0.07	B							
CHROMIUM	2.7			1.6								
LEAD	3.2			1.9								

CTO123-NS MAYPORT
LEACHATE DATA
QUANTERRA
SDG: MP007

SAMPLE NUMBER:	358-SS-SB05-04	436-SS-SB01-05		
SAMPLE DATE:	05/04/00	05/03/00	/ /	/ /
LABORATORY ID:	A0E050174004	A0E040160002		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ARSENIC	3.7	B		3.2	B							
BARIUM	40.4	B		79.6	B							
CADMIUM	0.4	B		1.7	B							
CHROMIUM	4.3	B		1.9	B							
LEAD	6.3	B		478	B							
MERCURY	0.66	B		1.6	B							
SELENIUM	4.9	U		4.9	U							
SILVER	1	U		1	U							

CTO123-NS MAYPORT
SOIL DATA
QUANTERRA
SDG: MP007

SAMPLE NUMBER:	358-SS-SB04-04	4252-SS-SB11-05	436-SS-SB01-05	
SAMPLE DATE:	05/04/00	05/02/00	05/03/00	/ /
LABORATORY ID:	A0E050174003	A0E030194003	A0E040160002	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	91.3 %	90.0 %	95.9 %	100.0 %
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
TOTAL ORGANIC CARBON(%)	0.45			2			0.89					

MP007

HOLDING TIME
06/06/00

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
UG/KG	358-SS-SB01-04	A0E050174002	NORMAL	MP007	APIXS	05/04/00	05/09/00	05/15/00	5	6	11
UG/KG	358-SS-SB04-04	A0E050174003	NORMAL	MP007	APIXS	05/04/00	05/09/00	05/15/00	5	6	11
UG/KG	358-SS-SB05-04	A0E050174004	NORMAL	MP007	APIXS	05/04/00	05/09/00	05/15/00	5	6	11
UG/KG	4252-SS-SB02-05	A0E030194001	NORMAL	MP007	APIXS	05/02/00	05/09/00	05/15/00	7	6	13
UG/KG	4252-SS-SB04-05	A0E030194002	NORMAL	MP007	APIXS	05/02/00	05/09/00	05/15/00	7	6	13
UG/KG	4252-SS-SB11-05	A0E030194003	NORMAL	MP007	APIXS	05/02/00	05/09/00	05/15/00	7	6	13
UG/KG	436-SS-SB01-05	A0E040160002	NORMAL	MP007	APIXS	05/03/00	05/09/00	05/15/00	6	6	12
UG/KG	436-SS-SB04-05	A0E040160003	NORMAL	MP007	APIXS	05/03/00	05/09/00	05/15/00	6	6	12
UG/KG	436-SS-SB09-05	A0E040160004	NORMAL	MP007	APIXS	05/03/00	05/09/00	05/15/00	6	6	12
UG/KG	358-SS-SB01-04	A0E050174002	NORMAL	MP007	APIXV	05/04/00	05/12/00	05/12/00	8	0	8
UG/KG	358-SS-SB04-04	A0E050174003	NORMAL	MP007	APIXV	05/04/00	05/12/00	05/12/00	8	0	8
UG/KG	358-SS-SB05-04	A0E050174004	NORMAL	MP007	APIXV	05/04/00	05/12/00	05/12/00	8	0	8
UG/KG	4252-SS-SB02-05	A0E030194001	NORMAL	MP007	APIXV	05/02/00	05/11/00	05/11/00	9	0	9
UG/KG	4252-SS-SB04-05	A0E030194002	NORMAL	MP007	APIXV	05/02/00	05/11/00	05/11/00	9	0	9
UG/KG	4252-SS-SB11-05	A0E050174001	NORMAL	MP007	APIXV	05/02/00	05/12/00	05/12/00	10	0	10
UG/KG	436-SS-SB01-05	A0E040160002	NORMAL	MP007	APIXV	05/03/00	05/11/00	05/11/00	8	0	8
UG/KG	436-SS-SB04-05	A0E040160003	NORMAL	MP007	APIXV	05/03/00	05/11/00	05/11/00	8	0	8
UG/KG	436-SS-SB09-05	A0E040160004	NORMAL	MP007	APIXV	05/03/00	05/11/00	05/11/00	8	0	8
MG/KG	4252-SS-SB02-05	A0E030194001	NORMAL	MP007	M	05/02/00	05/15/00	05/16/00	13	1	14
MG/KG	4252-SS-SB04-05	A0E030194002	NORMAL	MP007	M	05/02/00	05/15/00	05/16/00	13	1	14
MG/KG	4252-SS-SB11-05	A0E030194003	NORMAL	MP007	M	05/02/00	05/15/00	05/16/00	13	1	14
MG/KG	436-SS-SB01-05	A0E040160002	NORMAL	MP007	M	05/03/00	05/15/00	05/16/00	12	1	13
MG/KG	436-SS-SB04-05	A0E040160003	NORMAL	MP007	M	05/03/00	05/15/00	05/16/00	12	1	13
MG/KG	436-SS-SB09-05	A0E040160004	NORMAL	MP007	M	05/03/00	05/15/00	05/16/00	12	1	13
UG/KG	358-SS-SB01-04	A0E050174002	NORMAL	MP007	PAH	05/04/00	05/09/00	05/11/00	5	2	7

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
UG/KG	358-SS-SB04-04	A0E050174003	NORMAL	MP007	PAH	05/04/00	05/09/00	05/11/00	5	2	7
UG/KG	358-SS-SB05-04	A0E050174004	NORMAL	MP007	PAH	05/04/00	05/09/00	05/11/00	5	2	7
UG/KG	4252-SS-SB02-05	A0E030194001	NORMAL	MP007	PAH	05/02/00	05/09/00	05/11/00	7	2	9
UG/KG	4252-SS-SB04-05	A0E030194002	NORMAL	MP007	PAH	05/02/00	05/09/00	05/13/00	7	4	11
UG/KG	4252-SS-SB11-05	A0E030194003	NORMAL	MP007	PAH	05/04/00	05/09/00	05/13/00	5	4	9
UG/KG	436-SS-SB01-05	A0E040160002	NORMAL	MP007	PAH	05/03/00	05/09/00	05/11/00	6	2	8
UG/KG	436-SS-SB04-05	A0E040160003	NORMAL	MP007	PAH	05/03/00	05/09/00	05/11/00	6	2	8
UG/KG	436-SS-SB09-05	A0E040160004	NORMAL	MP007	PAH	05/03/00	05/09/00	05/11/00	6	2	8
UG/L	358-SS-SB05-04	A0E050174004	NORMAL	MP007	TCLPM	05/04/00	05/15/00	05/16/00	11	1	12
UG/L	436-SS-SB01-05	A0E040160002	NORMAL	MP007	TCLPM	05/03/00	05/15/00	05/16/00	12	1	13
MG/L	358-SS-SB05-04	A0E050174004	NORMAL	MP007	TCLPS	05/04/00	05/15/00	05/16/00	11	1	12
MG/L	436-SS-SB01-05	A0E040160002	NORMAL	MP007	TCLPS	05/03/00	05/15/00	05/16/00	12	1	13
MG/L	358-SS-SB05-04	A0E050174004	NORMAL	MP007	TCLPT	05/04/00	05/16/00	05/24/00	12	8	20
MG/L	436-SS-SB01-05	A0E040160002	NORMAL	MP007	TCLPT	05/03/00	05/16/00	05/24/00	13	8	21
MG/L	358-SS-SB05-04	A0E050174004	NORMAL	MP007	TCLPV	05/04/00	05/19/00	05/19/00	15	0	15
MG/L	436-SS-SB01-05	A0E040160002	NORMAL	MP007	TCLPV	05/03/00	05/19/00	05/19/00	16	0	16
%	358-SS-SB04-04	A0E050174003	NORMAL	MP007	TOC	05/04/00	05/22/00	05/23/00	18	1	19
%	4252-SS-SB11-05	A0E030194003	NORMAL	MP007	TOC	05/02/00	05/22/00	05/23/00	20	1	21
%	436-SS-SB01-05	A0E040160002	NORMAL	MP007	TOC	05/03/00	05/22/00	05/23/00	19	1	20
MG/KG	358-SS-SB01-04	A0E050174002	NORMAL	MP007	TPH	05/04/00	05/09/00	05/11/00	5	2	7
MG/KG	358-SS-SB04-04	A0E050174003	NORMAL	MP007	TPH	05/04/00	05/09/00	05/11/00	5	2	7
MG/KG	358-SS-SB05-04	A0E050174004	NORMAL	MP007	TPH	05/04/00	05/09/00	05/11/00	5	2	7
MG/KG	4252-SS-SB02-05	A0E030194001	NORMAL	MP007	TPH	05/02/00	05/09/00	05/10/00	7	1	8
MG/KG	4252-SS-SB04-05	A0E030194002	NORMAL	MP007	TPH	05/02/00	05/09/00	05/10/00	7	1	8
MG/KG	4252-SS-SB11-05	A0E030194003	NORMAL	MP007	TPH	05/04/00	05/09/00	05/11/00	5	2	7
MG/KG	436-SS-SB01-05	A0E040160002	NORMAL	MP007	TPH	05/03/00	05/09/00	05/11/00	6	2	8
MG/KG	436-SS-SB04-05	A0E040160003	NORMAL	MP007	TPH	05/03/00	05/09/00	05/11/00	6	2	8

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
MG/KG	436-SS-SB09-05	A0E040160004	NORMAL	MP007	TPH	05/03/00	05/09/00	05/11/00	6	2	8

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DCQ91 **Client ID:** 436-SS-SB01-05

Matrix: Soil **Units:** mg/kg **Prep Date:** 5/15/00 **Prep Batch:** 0136113

Weight: 1 **Volume:** 100 **Percent Moisture:** 4.13

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Arsenic	189.04	0.3	1	1.2		1	ICPST	5/16/00	10:18
Cadmium	226.50	0.031	0.21	0.16	B	1	ICPST	5/16/00	10:18
Chromium	267.72	0.083	0.52	3.8		1	ICPST	5/16/00	10:18
Lead	220.35	0.14	0.31	12.5		1	ICPST	5/16/00	10:18

Comments: Lot #: A0E040160 Sample #: 2

Version 3.62.1

U Result is less than the IDL
B Result is between IDL and RL

Form I Equivalent

TETRA TECH NUS, INC.

Client Sample ID: 436-SS-SB01-05

General Chemistry

Lot-Sample #...: A0E040160-002 Work Order #...: DCQ91 Matrix.....: SO
Date Sampled...: 05/03/00 13:00 Date Received..: 05/04/00
% Moisture.....: 4.1

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Solids	95.9	0.10	%	MCAWW 160.3 MOD	05/09-05/10/00	0130303
	Dilution Factor: 1					
Total Organic Carbon	0.89	0.10	%	ASTM D2974-84	05/22-05/23/00	0143377
	Dilution Factor: 1					

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DCQ95 **Client ID:** 436-SS-SB04-05

Matrix: Soil **Units:** mg/kg **Prep Date:** 5/15/00 **Prep Batch:** 0136113

Weight: 1 **Volume:** 100 **Percent Moisture:** 5.12

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Arsenic	189.04	0.31	1.1	1.8		1	ICPST	5/16/00	10:34
Cadmium	226.50	0.032	0.21	0.19	B	1	ICPST	5/16/00	10:34
Chromium	267.72	0.084	0.53	2.7		1	ICPST	5/16/00	10:34
Lead	220.35	0.14	0.32	3.2		1	ICPST	5/16/00	10:34

Comments: Lot #: A0E040160 Sample #: 3

Version 3.62.1

U Result is less than the IDL
B Result is between IDL and RL

Form 1 Equivalent

TETRA TECH NUS, INC.

Client Sample ID: 436-SS-SB04-05

General Chemistry

Lot-Sample #...: A0E040160-003 Work Order #...: DCQ95 Matrix.....: SO
Date Sampled...: 05/03/00 13:45 Date Received..: 05/04/00
% Moisture.....: 5.1

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Solids	94.9	0.10	%	MCANW 160.3 MOD	05/09-05/10/00	0130303

Dilution Factor: 1

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DCQ97 **Client ID:** 436-SS-SB09-05

Matrix: Soil **Units:** mg/kg **Prep Date:** 5/15/00 **Prep Batch:** 0136113

Weight: 1 **Volume:** 100 **Percent Moisture:** 5.28

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Arsenic	189.04	0.31	1.1	0.58	B	1	ICPST	5/16/00	10:51
Cadmium	226.50	0.032	0.21	0.068	B	1	ICPST	5/16/00	10:51
Chromium	267.72	0.085	0.53	1.6		1	ICPST	5/16/00	10:51
Lead	220.35	0.14	0.32	1.9		1	ICPST	5/16/00	10:51

Comments: Lot #: A0E040160 Sample #: 4

Version 3.62.1

U Result is less than the IDL
B Result is between IDL and RL

Form 1 Equivalent

TETRA TECH NUS, INC.

Client Sample ID: 436-SS-SB09-05

General Chemistry

Lot-Sample #...: A0E040160-004 Work Order #...: DCQ97 Matrix.....: SO
Date Sampled...: 05/03/00 14:40 Date Received..: 05/04/00
% Moisture.....: 5.3

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Solids	94.7	0.10	%	MCAWW 160.3 MOD	05/09-05/10/00	0130303

Dilution Factor: 1

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DCQ91T **Client ID:** 436-SS-SB01-05

Matrix: Water **Units:** ug/L **Prep Date:** 5/15/00 **Prep Batch:** 0136112

Weight: NA **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Arsenic	189.04	2.9	500	3.2	B	1	ICPST	5/16/00	11:12
Barium	493.41	0.3	10000	79.6	B	1	ICPST	5/16/00	11:12
Cadmium	226.50	0.3	100	1.7	B	1	ICPST	5/16/00	11:12
Chromium	267.72	0.8	500	1.9	B	1	ICPST	5/16/00	11:12
Lead	220.35	1.3	500	478	B	1	ICPST	5/16/00	11:12
Mercury	253.7	0.037	2	1.6	B	1	CVAA	5/16/00	15:13
Selenium	196.03	4.9	250	4.9	U	1	ICPST	5/16/00	11:12
Silver	328.07	1	500	1	U	1	ICPST	5/16/00	11:12

Comments:

Version 3.62.1

U Result is less than the IDL
B Result is between IDL and RL

Form 1 Equivalent

CASE NARRATIVE
METALS
MP007

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Samples which contain results between the Instrument Detection Limit (IDL) and the Reporting Limit (RL) are flagged with "B". There is the possibility of false positive results at these quantitation levels. The acceptance criteria for ICB, CCB, and Method Blank is ± the RL.

Holding Time Violation

All samples were prepared and analyzed within the method-specified holding time requirements.

Method Blank Contamination

All analytes in the method blank were less than the associated reporting limits.

MS/MSD/LCS/DCS Outside of QC Criteria

All spike recovery and RPD data met method-specific quality control criteria.

Calibrations

All calibrations and calibration verifications met method-specific quality control criteria.

STL North Canton

Metals Data Reporting Form

Preparation Blank Results

Lab Sample ID: DD6K5B

Matrix: Soil **Units:** mg/kg **Prep Date:** 5/15/00 **Prep Batch:** 0136113

Weight: 1 **Volume:** 100 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Arsenic	189.042	0.29	1	0.29	U	1	ICPST	5/16/00	9:48
Cadmium	226.502	0.03	0.2	0.03	U	1	ICPST	5/16/00	9:48
Chromium	267.716	0.08	0.5	0.083	B	1	ICPST	5/16/00	9:48
Lead	220.353	0.13	0.3	0.13	U	1	ICPST	5/16/00	9:48

Comments: Lot #: A0E040160

Version 3.62.1

U Result is less than the IDL

B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Continuing Calibration Blank Result

Instrument: ICPST **Units:** ug/L

Chart Number: i60516a.arc

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	CCB 5/16/00 9:43 AM		CCB 5/16/00 10:46 AM		CCB 5/16/00 11:49 AM					
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Arsenic	189.042	500	2.9	U	2.9	U	2.9	U				
Barium	493.409	10000	0.41	B	0.49	B	0.55	B				
Cadmium	226.502	100	0.3	U	0.3	U	0.3	U				
Chromium	267.716	500	0.8	U	0.8	U	0.8	U				
Lead	220.353	500	1.3	U	1.3	U	1.3	U				
Selenium	196.026	250	4.9	U	4.9	U	4.9	U				
Silver	328.068	500	1	U	1	U	1	U				

Version 3.62.1

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Preparation Blank Results

Lab Sample ID: DD4WVBT

Matrix: Water **Units:** ug/L **Prep Date:** 5/15/00 **Prep Batch:** 0136112

Weight: NA **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Arsenic	189.042	2.9	500	2.9	U	1	ICPST	5/16/00	11:07
Barium	493.409	0.3	10000	1.3	B	1	ICPST	5/16/00	11:07
Cadmium	226.502	0.3	100	0.3	U	1	ICPST	5/16/00	11:07
Chromium	267.716	0.8	500	0.8	U	1	ICPST	5/16/00	11:07
Lead	220.353	1.3	500	1.3	U	1	ICPST	5/16/00	11:07
Mercury	253.7	0.037	2	0.037	U	1	CVAA	5/16/00	15:09
Selenium	196.026	4.9	250	4.9	U	1	ICPST	5/16/00	11:07
Silver	328.068	1	500	1	U	1	ICPST	5/16/00	11:07

Comments: Lot #: A0E040160

Version 3.62.1

U Result is less than the IDL

B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Preparation Blank Results

Lab Sample ID: DD6K3BT

Matrix: Water **Units:** ug/L **Prep Date:** 5/15/00 **Prep Batch:** 0136112

Weight: NA **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Arsenic	189.042	2.9	500	2.9	U	1	ICPST	5/16/00	10:55
Barium	493.409	0.3	10000	0.7	B	1	ICPST	5/16/00	10:55
Cadmium	226.502	0.3	100	0.3	U	1	ICPST	5/16/00	10:55
Chromium	267.716	0.8	500	0.8	U	1	ICPST	5/16/00	10:55
Lead	220.353	1.3	500	1.3	U	1	ICPST	5/16/00	10:55
Mercury	253.7	0.037	2	0.037	U	1	CVAA	5/16/00	15:11
Selenium	196.026	4.9	250	4.9	U	1	ICPST	5/16/00	10:55
Silver	328.068	1	500	1	U	1	ICPST	5/16/00	10:55

Comments: Lot #: A0E040160

Version 3.62.1

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

CASE NARRATIVE
GENERAL CHEMISTRY
MP007

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Holding Time Violation

All samples were prepared and analyzed within the method-specified holding time requirements.

Method Blank Contamination

All analytes in the method blank were less than the associated reporting limits.

MS/MSD/LCS/DCS/Sample Duplicate Outside of QC Criteria

All spike recovery and RPD data met method-specific quality control criteria.

Calibrations

All calibrations and calibration verifications met method-specific quality control criteria.

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LABORATORY TEST REPORT

May 22, 2000

Project No. 00125-01

Mr. Denise Pohl
STL North Canton
41015 Huffel Drive NW
North Canton, Ohio 44720

RE: Soils Testing - Tetra Tech

Transmitted herein are the results of the soils testing performed for the above referenced project verified on the Project Verification Form, submitted May 5, 2000. The testing was performed in general accordance with the ASTM methods listed on the enclosed data sheets. Due to insufficient fines we unable to run the hydrometer analysis that was requested. The remaining sample materials for this project will be retained for a minimum of 90 days as directed by the Geotechnics' Quality Program.

Disclaimer

The test results are believed to be representative of the samples submitted but are indicative only of the specimens which were evaluated. Geotechnics has no direct knowledge of the origin of the samples, implies no position with regard to the disposition of the test results, i.e. pass/fail, and makes no claims as to the suitability of the material for its intended use.

The test data and all associated project information provided shall be held in strict confidence and disclosed to other parties only with authorization of the Client and Geotechnics. The test data submitted herein is considered integral with this report and is not to be reproduced except in whole and only with the authorization of the Client and Geotechnics.

We are pleased to provide these testing services. Should you have any questions or if we may be of further assistance, please do not hesitate to contact our office.

Respectively submitted,

David R. Backstrom
Laboratory Director

344 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999

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LABORATORY TEST REPORT

May 22, 2000

Project No. 00125-02

Mr. Denise Pohl
STL North Canton
41015 Huffel Drive NW
North Canton, Ohio 44720

RE: Soils Testing - Tetra Tech

Transmitted herein are the results of the soils testing performed for the above referenced project verified on the Project Verification Form, submitted May 8, 2000. The testing was performed in general accordance with the ASTM methods listed on the enclosed data sheets. Due to insufficient fines we unable to run the hydrometer analysis that was requested. The remaining sample materials for this project will be retained for a minimum of 90 days as directed by the Geotechnics' Quality Program.

Disclaimer

The test results are believed to be representative of the samples submitted but are indicative only of the specimens which were evaluated. Geotechnics has no direct knowledge of the origin of the samples, implies no position with regard to the disposition of the test results, i.e. pass/fail, and makes no claims as to the suitability of the material for its intended use.

The test data and all associated project information provided shall be held in strict confidence and disclosed to other parties only with authorization of the Client and Geotechnics. The test data submitted herein is considered integral with this report and is not to be reproduced except in whole and only with the authorization of the Client and Geotechnics.

We are pleased to provide these testing services. Should you have any questions or if we may be of further assistance, please do not hesitate to contact our office.

Respectively submitted,

David R. Backstrom
Laboratory Director

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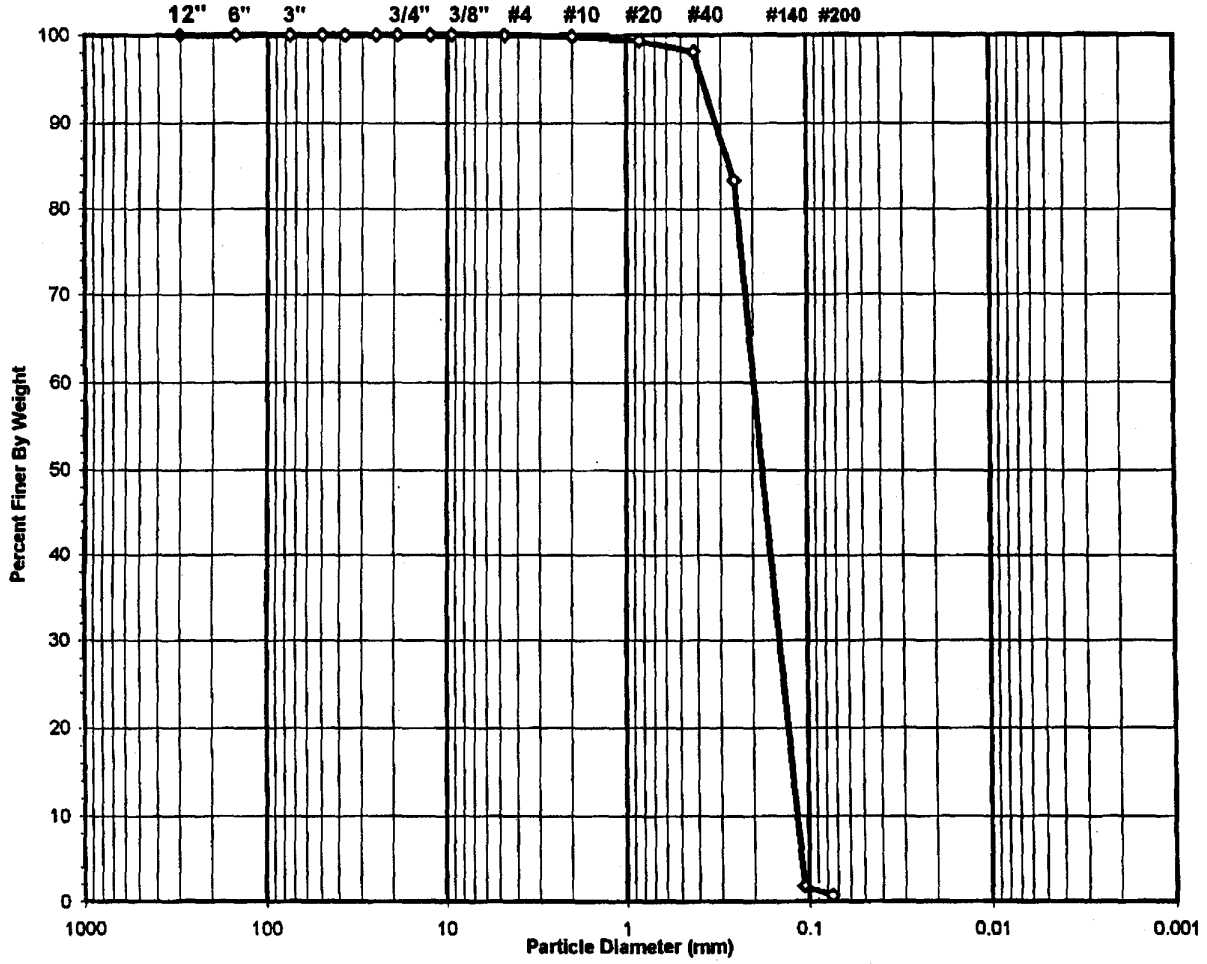
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	STL-NORTH CANTON	Boring No.	A0E040160-001
Client Reference	TETRA TECH	Depth (ft)	NA
Project No.	00125-01	Sample No.	DCQ8T-001
Lab ID	00125-01.001	Soil Color	**GRAYISH BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	**gravel**	**sand**	**silt and clay**



USCS Symbol	***sp, ASSUMED***	**D60 =**	**0.2**	**CC =**	**0.9**
USCS Classification	***POORLY GRADED SAND***	**D30 =**	**0.1**	**CU =**	**1.7**
	UNABLE TO RUN HYDRO				
		D10 =	**0.1**		

Tested By TO Date 5/16/00 Checked By LB Date 5-19-00

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	STL-NORTH CANTON	Boring No.	A0E040160-001
Client Reference	TETRA TECH	Depth (ft)	NA
Project No.	00125-01	Sample No.	DCQ8T-001
Lab ID	00125-01.001	Soil Color	**GRAYISH BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1621	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	723.60	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	699.90	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	101.01	Weight of Tare (gm)	NA
Weight of Water (gm)	23.70	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	598.89	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**4.0**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	598.89
Dry Weight - 3/4" Sample (gm)	595.1	Weight of minus #200 material (gm)	3.84
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	595.05
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.19	0.03	0.03	99.97	**99.97**
#10	2.00	0.81	0.14	0.17	99.83	**99.83**
#20	0.850	2.80	0.47	0.63	99.37	**99.37**
#40	0.425	7.66	1.28	1.91	98.09	**98.09**
#60	0.250	88.49	14.78	16.69	83.31	**83.31**
#140	0.106	488.00	81.48	98.17	1.83	**1.83**
#200	0.075	7.10	1.19	99.36	0.64	**0.64**
Pan	-	3.84	0.64	100.00	-	-

Tested By TO Date 5/16/00 Checked By LB Date 5-19-00

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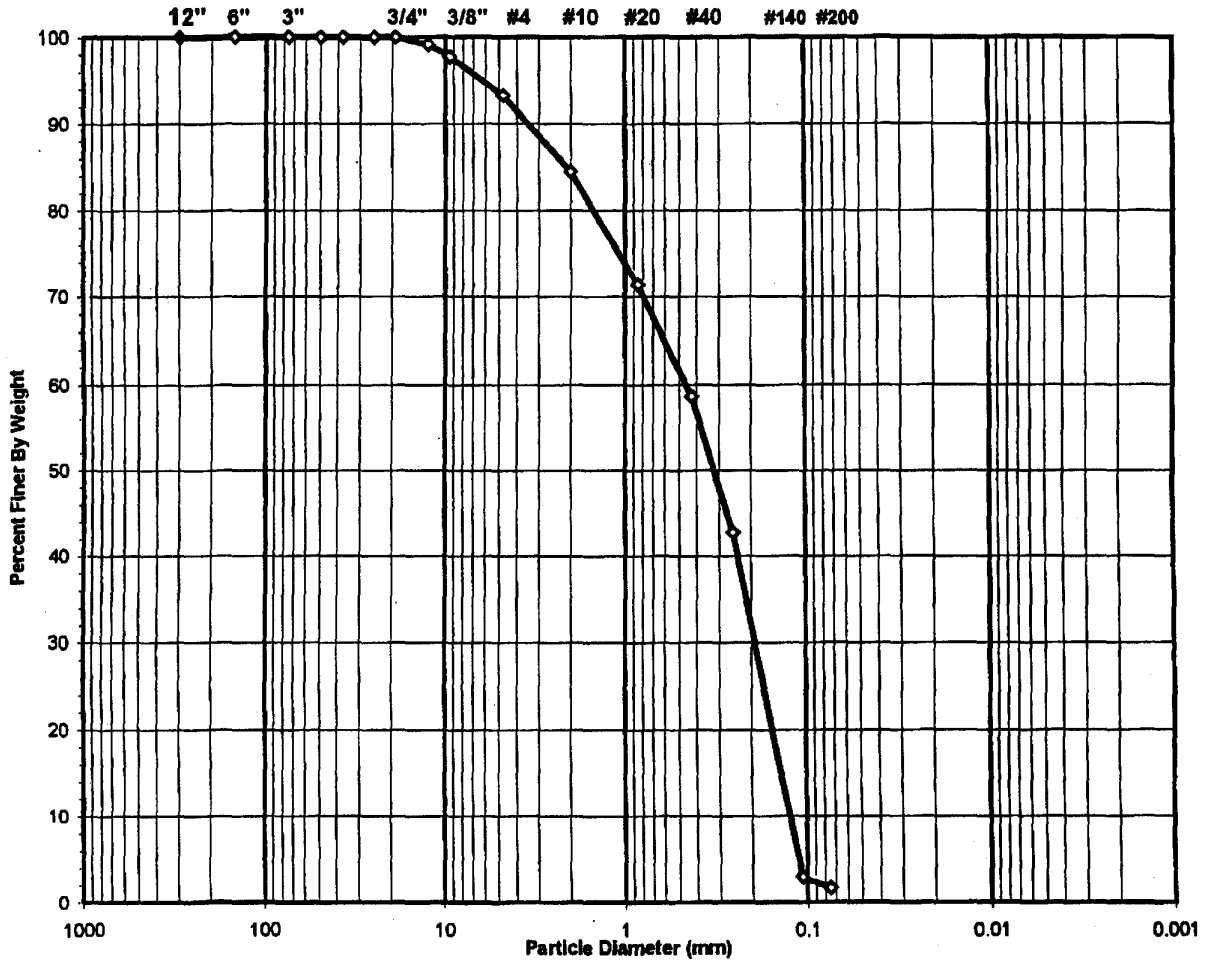
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	STL-NORTH CANTON	Boring No.	A0E040160-002
Client Reference	TETRA TECH	Depth (ft)	NA
Project No.	00125-01	Sample No.	DCQ91-010
Lab ID	00125-01.002	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay



USCS Symbol	*sp, ASSUMED*	D60 =	0.5	CC =	0.6
USCS Classification	*POORLY GRADED SAND*	D30 =	0.2	CU =	3.7
	UNABLE TO RUN HYDRO				
		D10 =	0.1		

Tested By TO Date 5/16/00 Checked By LB Date 5-19-00

page 1 of 2 DCN: CT-S3C DATE 6-25-98 REVISION: 2 C:\MY DOCUMENTS\PrintQ\D57.xls\Sheet1

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	STL-NORTH CANTON	Boring No.	A0E040160-002
Client Reference	TETRA TECH	Depth (ft)	NA
Project No.	00125-01	Sample No.	DCQ91-010
Lab ID	00125-01.002	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1631	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	649.90	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	625.10	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	95.00	Weight of Tare (gm)	NA
Weight of Water (gm)	24.80	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	530.10	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**4.7**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	530.10
Dry Weight - 3/4" Sample (gm)	521.3	Weight of minus #200 material (gm)	8.82
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	521.28
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100.00
6"	150	0.00	0.00	0.00	100.00	100.00
3"	75	0.00	0.00	0.00	100.00	100.00
2"	50	0.00	0.00	0.00	100.00	100.00
1 1/2"	37.5	0.00	0.00	0.00	100.00	100.00
1"	25.0	0.00	0.00	0.00	100.00	100.00
3/4"	19.0	0.00	0.00	0.00	100.00	100.00
1/2"	12.50	4.72	0.89	0.89	99.11	99.11
3/8"	9.50	7.40	1.40	2.29	97.71	97.71
#4	4.75	23.56	4.44	6.73	93.27	93.27
#10	2.00	46.79	8.83	15.56	84.44	84.44
#20	0.850	68.97	13.01	28.57	71.43	71.43
#40	0.425	67.68	12.77	41.34	58.66	58.66
#60	0.250	84.24	15.89	57.23	42.77	42.77
#140	0.106	211.15	39.83	97.06	2.94	2.94
#200	0.075	6.77	1.28	98.34	1.66	1.66
Pan	-	8.82	1.66	100.00	-	-

Tested By TO Date 5/16/00 Checked By LB Date 5-19-00

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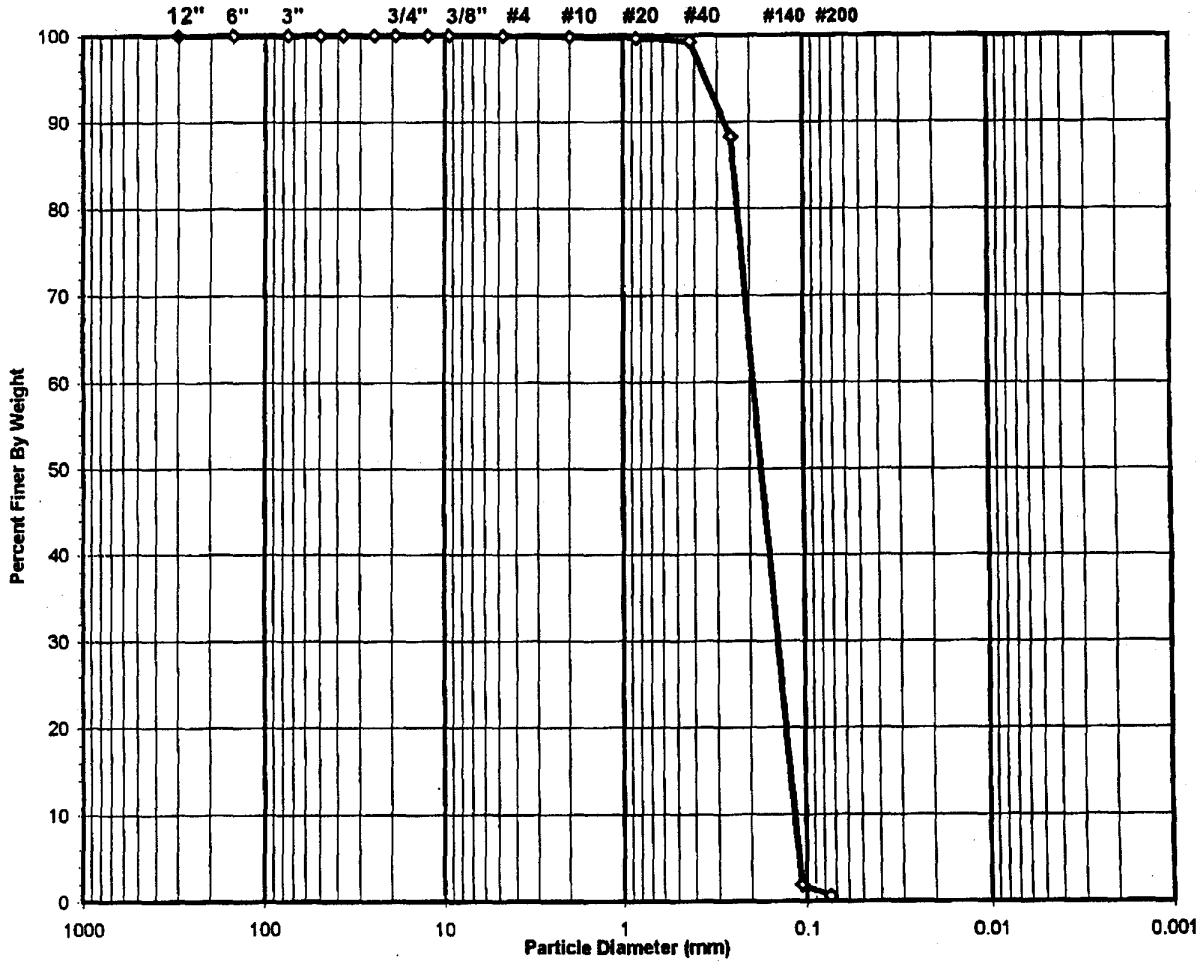
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	STL-NORTH CANTON	Boring No.	A0E050174-004
Client Reference	TETRA TECH	Depth (ft)	NA
Project No.	00125-02	Sample No.	DCZP-001+2
Lab ID	00125-02.001	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*
USCS	gravel	sand	silt and clay



USCS Symbol	*sp, ASSUMED*	D60 =	0.2	CC =	0.9
USCS Classification	*POORLY GRADED SAND*	D30 =	0.1	CU =	1.6
	UNABLE TO RUN HYDRO	D10 =	0.1		

Tested By TO Date 5/16/00 Checked By LB Date 5-19-00

page 1 of 2 DCN: CT-S3C DATE 6-25-98 REVISION: 2 C:\MY DOCUMENTS\PrintQ\[D58.xls]Sheet1

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	STL-NORTH CANTON	Boring No.	A0E050174-004
Client Reference	TETRA TECH	Depth (ft)	NA
Project No.	00125-02	Sample No.	DCZP-001+2
Lab ID	00125-02.001	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1655	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	1406.50	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	1233.90	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	96.10	Weight of Tare (gm)	NA
Weight of Water (gm)	172.60	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	1137.80	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**15.2**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	1137.80
Dry Weight - 3/4" Sample (gm)	1131.8	Weight of minus #200 material (gm)	6.05
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	1131.75
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	**100.00**
6"	150	0.00	0.00	0.00	100.00	**100.00**
3"	75	0.00	0.00	0.00	100.00	**100.00**
2"	50	0.00	0.00	0.00	100.00	**100.00**
1 1/2"	37.5	0.00	0.00	0.00	100.00	**100.00**
1"	25.0	0.00	0.00	0.00	100.00	**100.00**
3/4"	19.0	0.00	0.00	0.00	100.00	**100.00**
1/2"	12.50	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.63	0.06	0.06	99.94	**99.94**
#10	2.00	1.49	0.13	0.19	99.81	**99.81**
#20	0.850	1.91	0.17	0.35	99.65	**99.65**
#40	0.425	4.14	0.36	0.72	99.28	**99.28**
#60	0.250	125.64	11.04	11.76	88.24	**88.24**
#140	0.106	983.10	86.40	98.16	1.84	**1.84**
#200	0.075	14.84	1.30	99.47	0.53	**0.53**
Pan	-	6.05	0.53	100.00	-	-

Tested By TO Date 5/16/00 Checked By CB Date 5-19-00

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Tetra Tech NUS, Inc. **Internal Correspondence**

TO: **Mr. Rick Ofsanko** **DATE: July 26, 2000**

FROM: **William Howard Engle** **CC: File**

SUBJECT: **Inorganic Data Validation –TCLP Metals and TOC**
CTO123 – NS Mayport
SDG MP008

SAMPLES: **3/Leachates**

351-SS-SB02-05
425-SS-SB11-05
436-SS-SB01-05

1/Soil

351-SS-SB07-05

OVERVIEW

The sample set for CTO123, SDG MP008; Naval Station Mayport, Jacksonville, Florida consists of three (3) leachates and one (1) soil environmental samples. The leachates were analyzed for TCLP metals using SW-846 6010B. The soil sample was analyzed for FOC using ASTM D2974-84.

The samples were collected by Tetra Tech NUS on May 24, 2000 and analyzed by STL-No. Canton (formerly Quanterra) Laboratory. All analyses were performed in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria and analyzed according to SW-846 Method 6010B, 7470A, 1311, and ASTM D2974-84 analytical and reporting protocols. The data in this SDG was validated with regard to the following parameters:

* • Data Completeness
* • Holding Times
* • Initial/continuing calibrations
• Laboratory method/field quality control blank results

The symbol (*) indicates that all quality control criteria were met for this parameter. Supporting documentation is presented in Appendix C. Qualified analytical results are presented in Appendix A. The original laboratory data is contained in Appendix B.

TCLP Metals Fraction

Laboratory Blank Analysis

Affected leachates: all

Analyte	Maximum Concentration (ug/L)	Action Level (ug/L)
Barium	29.1 (1)	145.5
Chromium	3.8 (1)	19
Lead	3.9 (1)	19.5
Mercury	0.061 (1)	0.305

(1) Contamination in the preparation blank.

An action level of 5x the maximum concentration has been used to evaluate the sample for contamination in continuing calibration blank and preparation blank. Dilution factors and sample aliquots were taken into consideration when evaluating for blank contamination. Positive results < action level were qualified nondetected "U" due to contamination in the preparation blank.

All other quality control criteria were met.

Total Organic Carbon Fraction

All quality control criteria were met for this parameter.

Notes

The initial sampling effort had to be reconducted because the samples were received outside of the temperature control limits.

Executive Summary

Laboratory performance: Several analytes were detected in the laboratory blanks. Positive results < action levels were qualified "U" due to lab blank contamination

Other factors affecting data quality: None.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Inorganic Data Validation (February, 1994), and the NFESC guidelines "Navy IRCQM" (September, 1999). The text of the report has been formulated to address only those problems affecting data quality.

"I attest that the data referenced herein was validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

William Howard Engle

Project Chemist
Tetra Tech NUS, Inc.

Joseph A. Samchuck

Data Validation Quality Assurance Officer
Tetra Tech NUS, Inc.

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B – Results as reported by the laboratory
3. Appendix C – Supporting Documentation

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD 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 - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

APPENDIX A

Qualified Analytical Results

MP008

HOLDING TIME
07/07/00

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
UG/KG	351-SS-SB02-05	A0E260112001	NORMAL	MP008	OS	05/24/00	05/30/00	06/01/00	6	2	8
UG/KG	351-SS-SB05-05	A0E260112002	NORMAL	MP008	OS	05/24/00	05/30/00	06/01/00	6	2	8
UG/KG	351-SS-SB07-05RE	A0E260112003	NORMAL	MP008	OS	05/24/00	06/05/00	06/09/00	12	4	16
UG/KG	351-SS-SB02-05	A0E260112001	NORMAL	MP008	OV	05/24/00	06/06/00	06/06/00	13	0	13
UG/KG	351-SS-SB05-05	A0E260112002	NORMAL	MP008	OV	05/24/00	06/06/00	06/06/00	13	0	13
UG/KG	351-SS-SB07-05	A0E260112003	NORMAL	MP008	OV	05/24/00	06/06/00	06/06/00	13	0	13
UG/KG	351-SS-SB02-05	A0E260112001	NORMAL	MP008	PAH	05/24/00	06/03/00	06/08/00	10	5	15
UG/KG	351-SS-SB05-05	A0E260112002	NORMAL	MP008	PAH	05/24/00	06/03/00	06/12/00	10	9	19
UG/KG	351-SS-SB07-05	A0E260112003	NORMAL	MP008	PAH	05/24/00	06/03/00	06/08/00	10	5	15
UG/L	351-SS-SB02-05	A0E260112001	NORMAL	MP008	TCLPM	05/24/00	06/01/00	06/02/00	8	1	9
UG/L	425-1-SS-SB11-05	A0E260115001	NORMAL	MP008	TCLPM	05/24/00	06/01/00	06/02/00	8	1	9
UG/L	436-SS-SB01-05	A0E260115002	NORMAL	MP008	TCLPM	05/24/00	06/01/00	06/02/00	8	1	9
MG/L	425-1-SS-SB11-05	A0E260115001	NORMAL	MP008	TCLPS	05/24/00	06/01/00	06/02/00	8	1	9
MG/L	436-SS-SB01-05	A0E260115002	NORMAL	MP008	TCLPS	05/24/00	06/01/00	06/02/00	8	1	9
MG/L	351-SS-SB02-05	A0E260112001	NORMAL	MP008	TCLPT	05/24/00	06/08/00	06/12/00	15	4	19
MG/L	425-1-SS-SB11-05	A0E260115001	NORMAL	MP008	TCLPT	05/24/00	06/08/00	06/12/00	15	4	19
MG/L	436-SS-SB01-05	A0E260115002	NORMAL	MP008	TCLPT	05/24/00	06/08/00	06/12/00	15	4	19
MG/L	351-SS-SB02-05	A0E260112001	NORMAL	MP008	TCLPV	05/24/00	06/02/00	06/02/00	9	0	9
MG/L	425-1-SS-SB11-05	A0E260115001	NORMAL	MP008	TCLPV	05/24/00	06/02/00	06/02/00	9	0	9
MG/L	436-SS-SB01-05	A0E260115002	NORMAL	MP008	TCLPV	05/24/00	06/02/00	06/02/00	9	0	9
%	351-SS-SB07-05	A0E260112003	NORMAL	MP008	TOC	05/24/00	05/30/00	05/31/00	6	1	7
UG/L	351-SS-SB02-05	A0E260112001	NORMAL	MP008	TPAH	05/24/00	06/08/00	06/14/00	15	6	21
UG/L	425-1-SS-SB11-05	A0E260115001	NORMAL	MP008	TPAH	05/24/00	06/08/00	06/14/00	15	6	21
UG/L	436-SS-SB01-05	A0E260115002	NORMAL	MP008	TPAH	05/24/00	06/08/00	06/14/00	15	6	21
MG/KG	351-SS-SB02-05	A0E260112001	NORMAL	MP008	TPH	05/24/00	06/01/00	06/05/00	8	4	12

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
MG/KG	351-SS-SB05-05	A0E260112002	NORMAL	MP008	TPH	05/24/00	06/01/00	06/05/00	8	4	12
MG/KG	351-SS-SB07-05	A0E260112003	NORMAL	MP008	TPH	05/24/00	06/01/00	06/05/00	8	4	12

CTO123-NS MAYPORT
TCLP DATA
QUANTERRA
SDG: MP008

SAMPLE NUMBER:	351-SS-SB02-05	425-1-SS-SB11-05	436-SS-SB01-05	
SAMPLE DATE:	05/24/00	05/24/00	05/24/00	/ /
LABORATORY ID:	A0E260112001	A0E260115001	A0E260115002	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	0.0 %	0.0 %	0.0 %	100.0 %
UNITS:	UG/L	UG/L	UG/L	
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ARSENIC	2.9	U		2.9	U		2.9	U				
BARIUM	48.6	~~B~~ U	A	28.9	~~B~~ U	A	104	~~B~~ U	A			
CADMIUM	0.30	U		0.37	~~B~~		0.90	~~B~~				
CHROMIUM	2.5	~~B~~ U	A	2.3	~~B~~ U	A	9.7	~~B~~ U	A			
LEAD	1.3	U		1.3	U		1.9	~~B~~ U	A			
MERCURY	1.4	~~B~~		2.3			13.4					
SELENIUM	8.9	~~B~~		7.7	~~B~~		6.9	~~B~~				
SILVER	1.0	U		1.0	U		1.0	U				

CTO123-NS MAYPORT
SOIL DATA
QUANTERRA
SDG: MP008

SAMPLE NUMBER:	351-SS-SB07-05			
SAMPLE DATE:	05/24/00	/ /	/ /	/ /
LABORATORY ID:	A0E260112003			
QC_TYPE:	NORMAL			
% SOLIDS:	93.5 %	100.0 %	100.0 %	100.0 %
UNITS:	%			
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
TOTAL ORGANIC CARBON	5.4											

APPENDIX B

Results as Reported by the Laboratory

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DDR83 **Client ID:** 436-SS-SB01-05

Matrix: Water **Units:** ug/L **Prep Date:** 6/1/00 **Prep Batch:** 0153104

Weight: NA **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Arsenic	189.04	2.9	500	2.9	U	1	ICPST	6/2/00	20:36
Barium	493.41	0.3	10000	104	B	1	ICPST	6/2/00	20:36
Cadmium	226.50	0.3	100	0.9	B	1	ICPST	6/2/00	20:36
Chromium	267.72	0.8	500	9.7	B	1	ICPST	6/2/00	20:36
Lead	220.35	1.3	500	1.9	B	1	ICPST	6/2/00	20:36
Mercury	253.7	0.074	4	13.4		2	CVAA	6/5/00	12:52
Selenium	196.03	4.9	250	6.9	B	1	ICPST	6/2/00	20:36
Silver	328.07	1	500	1	U	1	ICPST	6/2/00	20:36

Comments: Lot #: A0E260115 Sample #: 2

Version 3.62.1

U Result is less than the IDL
B Result is between IDL and RL

Form 1 Equivalent

CASE NARRATIVE
METALS
MP008

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Samples which contain results between the Instrument Detection Limit (IDL) and the Reporting Limit (RL) are flagged with "B". There is the possibility of false positive results at these quantitation levels. The acceptance criteria for ICB, CCB, and Method Blank is ± the RL.

Holding Time Violation

All samples were prepared and analyzed within the method-specified holding time requirements.

Method Blank Contamination

All analytes in the method blank were less than the associated reporting limits.

MS/MSD/LCS/DCS Outside of QC Criteria

All spike recovery and RPD data met method-specific quality control criteria.

Calibrations

All calibrations and calibration verifications met method-specific quality control criteria.

STL North Canton

Metals Data Reporting Form

Instrument Runlog

Instrument: ICPST **Chart Number:** i50602a.arc

Sample Name	Date of Analysis	Time of Analysis
STD1-Blank	6/2/00	9:01 AM
CALSTD	6/2/00	9:06 AM
CAL 2	6/2/00	9:11 AM
ICV	6/2/00	9:15 AM
ICB	6/2/00	9:20 AM
CRI	6/2/00	9:25 AM
ZZZZZZ	6/2/00	9:30 AM
ZZZZZZ	6/2/00	9:35 AM
ICSA	6/2/00	9:40 AM
ICSAB	6/2/00	9:46 AM
CCV	6/2/00	9:51 AM
CCB	6/2/00	9:57 AM
ZZZZZZ	6/2/00	10:32 AM
ZZZZZZ	6/2/00	10:37 AM
ZZZZZZ	6/2/00	10:42 AM
ZZZZZZ	6/2/00	10:47 AM
ZZZZZZ	6/2/00	10:53 AM
ZZZZZZ	6/2/00	10:58 AM
ZZZZZZ	6/2/00	11:04 AM
ZZZZZZ	6/2/00	11:09 AM
ZZZZZZ	6/2/00	11:14 AM
ZZZZZZ	6/2/00	11:19 AM
CCV	6/2/00	11:26 AM
CCB	6/2/00	11:32 AM
ZZZZZZ	6/2/00	11:37 AM
ZZZZZZ	6/2/00	11:42 AM
ZZZZZZ	6/2/00	11:47 AM
ZZZZZZ	6/2/00	11:53 AM
ZZZZZZ	6/2/00	11:58 AM
ZZZZZZ	6/2/00	12:03 PM
ZZZZZZ	6/2/00	12:09 PM
ZZZZZZ	6/2/00	12:14 PM
ZZZZZZ	6/2/00	12:20 PM
ZZZZZZ	6/2/00	12:25 PM
CCV	6/2/00	12:32 PM
CCB	6/2/00	12:38 PM
ZZZZZZ	6/2/00	12:43 PM
ZZZZZZ	6/2/00	12:48 PM
ZZZZZZ	6/2/00	12:54 PM
ZZZZZZ	6/2/00	12:59 PM
ZZZZZZ	6/2/00	1:04 PM

Version 3.62.1

Form 14 Equivalent

STL North Canton

Metals Data Reporting Form

Instrument Runlog

Instrument: ICPST **Chart Number:** i50602a.arc

Sample Name	Date of Analysis	Time of Analysis
ZZZZZZ	6/2/00	1:10 PM
ZZZZZZ	6/2/00	1:15 PM
ZZZZZZ	6/2/00	1:20 PM
ZZZZZZ	6/2/00	1:25 PM
ZZZZZZ	6/2/00	1:30 PM
CCV	6/2/00	1:37 PM
CCB	6/2/00	1:43 PM
ZZZZZZ	6/2/00	1:48 PM
ZZZZZZ	6/2/00	1:53 PM
ZZZZZZ	6/2/00	1:58 PM
ZZZZZZ	6/2/00	2:03 PM
ZZZZZZ	6/2/00	2:08 PM
ZZZZZZ	6/2/00	2:13 PM
ZZZZZZ	6/2/00	2:18 PM
ZZZZZZ	6/2/00	2:23 PM
ZZZZZZ	6/2/00	2:28 PM
ZZZZZZ	6/2/00	2:33 PM
CCV	6/2/00	2:40 PM
CCB	6/2/00	2:46 PM
ZZZZZZ	6/2/00	3:03 PM
ZZZZZZ	6/2/00	3:08 PM
ZZZZZZ	6/2/00	3:13 PM
ZZZZZZ	6/2/00	3:22 PM
ZZZZZZ	6/2/00	3:27 PM
ZZZZZZ	6/2/00	3:32 PM
ZZZZZZ	6/2/00	3:38 PM
ZZZZZZ	6/2/00	3:43 PM
ZZZZZZ	6/2/00	3:49 PM
ZZZZZZ	6/2/00	3:54 PM
CCV	6/2/00	4:00 PM
CCB	6/2/00	4:06 PM
ZZZZZZ	6/2/00	4:11 PM
ZZZZZZ	6/2/00	4:16 PM
ZZZZZZ	6/2/00	4:23 PM
ZZZZZZ	6/2/00	4:28 PM
ZZZZZZ	6/2/00	4:33 PM
ZZZZZZ	6/2/00	4:38 PM
ZZZZZZ	6/2/00	4:43 PM
ZZZZZZ	6/2/00	4:48 PM
ZZZZZZ	6/2/00	4:54 PM
ZZZZZZ	6/2/00	5:00 PM

Version 3.62.1

Form 14 Equivalent

STL North Canton

Metals Data Reporting Form

Instrument Runlog

Instrument: ICPST **Chart Number:** i50602a.arc

Sample Name	Date of Analysis	Time of Analysis
CCV	6/2/00	5:05 PM
CCB	6/2/00	5:11 PM
ZZZZZZ	6/2/00	5:16 PM
ZZZZZZ	6/2/00	5:22 PM
ZZZZZZ	6/2/00	5:27 PM
ZZZZZZ	6/2/00	5:32 PM
ZZZZZZ	6/2/00	5:37 PM
ZZZZZZ	6/2/00	5:43 PM
ZZZZZZ	6/2/00	5:49 PM
ZZZZZZ	6/2/00	5:54 PM
ZZZZZZ	6/2/00	5:59 PM
ZZZZZZ	6/2/00	6:04 PM
CCV	6/2/00	6:10 PM
CCB	6/2/00	6:17 PM
ZZZZZZ	6/2/00	6:22 PM
ZZZZZZ	6/2/00	6:27 PM
ZZZZZZ	6/2/00	6:32 PM
ZZZZZZ	6/2/00	6:37 PM
ZZZZZZ	6/2/00	6:42 PM
ZZZZZZ	6/2/00	6:48 PM
ZZZZZZ	6/2/00	6:53 PM
ZZZZZZ	6/2/00	6:58 PM
ZZZZZZ	6/2/00	7:03 PM
ZZZZZZ	6/2/00	7:08 PM
CCV	6/2/00	7:14 PM
CCB	6/2/00	7:20 PM
ZZZZZZ	6/2/00	7:25 PM
ZZZZZZ	6/2/00	7:30 PM
ZZZZZZ	6/2/00	7:35 PM
DE0JJBT	6/2/00	7:42 PM
DE1F9B	6/2/00	7:47 PM
DE1F9C	6/2/00	7:52 PM
DDR70	6/2/00	7:58 PM
DDR70L	6/2/00	8:03 PM
DDR70S	6/2/00	8:08 PM
DDR70D	6/2/00	8:13 PM
CCV	6/2/00	8:19 PM
CCB	6/2/00	8:26 PM
DDR7X	6/2/00	8:31 PM
DDR83	6/2/00	8:36 PM
ZZZZZZ	6/2/00	8:41 PM

Version 3.62.1 *Form 14 Equivalent*

STL North Canton

Metals Data Reporting Form

Instrument Runlog

Instrument: ICPST **Chart Number:** i50602a.arc

Sample Name	Date of Analysis	Time of Analysis
CCV	6/2/00	8:47 PM
CCB	6/2/00	8:53 PM

STL North Canton

Metals Data Reporting Form

Instrument Runlog

Instrument: CVAA **Chart Number:** hg10605c.prn

Sample Name	Date of Analysis	Time of Analysis
Std1Rep1	6/5/00	11:05 AM
Std2Rep1	6/5/00	11:06 AM
Std3Rep1	6/5/00	11:07 AM
Std4Rep1	6/5/00	11:08 AM
Std5Rep1	6/5/00	11:10 AM
Std6Rep1	6/5/00	11:11 AM
Ck5ICV	6/5/00	11:12 AM
Ck4ICB	6/5/00	11:14 AM
Ck3CRA	6/5/00	11:15 AM
Ck2CCV	6/5/00	11:16 AM
Ck1CCB	6/5/00	11:18 AM
ZZZZZZ	6/5/00	11:19 AM
ZZZZZZ	6/5/00	11:20 AM
ZZZZZZ	6/5/00	11:21 AM
ZZZZZZ	6/5/00	11:22 AM
ZZZZZZ	6/5/00	11:24 AM
ZZZZZZ	6/5/00	11:25 AM
ZZZZZZ	6/5/00	11:26 AM
ZZZZZZ	6/5/00	11:28 AM
ZZZZZZ	6/5/00	11:30 AM
ZZZZZZ	6/5/00	11:31 AM
Ck2CCV	6/5/00	11:32 AM
Ck1CCB	6/5/00	11:34 AM
ZZZZZZ	6/5/00	11:35 AM
ZZZZZZ	6/5/00	11:36 AM
ZZZZZZ	6/5/00	11:37 AM
ZZZZZZ	6/5/00	11:39 AM
ZZZZZZ	6/5/00	11:40 AM
ZZZZZZ	6/5/00	11:41 AM
ZZZZZZ	6/5/00	11:42 AM
ZZZZZZ	6/5/00	11:44 AM
ZZZZZZ	6/5/00	11:45 AM
ZZZZZZ	6/5/00	11:46 AM
Ck2CCV	6/5/00	11:47 AM
Ck1CCB	6/5/00	11:49 AM
ZZZZZZ	6/5/00	11:50 AM
ZZZZZZ	6/5/00	11:51 AM
ZZZZZZ	6/5/00	11:52 AM
ZZZZZZ	6/5/00	11:54 AM
ZZZZZZ	6/5/00	11:55 AM
ZZZZZZ	6/5/00	11:56 AM

Version 3.62.1 *Form 14 Equivalent*

STL North Canton

Metals Data Reporting Form

Instrument Runlog

Instrument: CVAA **Chart Number:** hg10605c.prn

Sample Name	Date of Analysis	Time of Analysis
ZZZZZZ	6/5/00	11:58 AM
ZZZZZZ	6/5/00	11:59 AM
ZZZZZZ	6/5/00	12:01 PM
DE0JJB	6/5/00	12:02 PM
Ck2CCV	6/5/00	12:03 PM
Ck1CCB	6/5/00	12:04 PM
DE1F9B	6/5/00	12:05 PM
DE1F9C	6/5/00	12:06 PM
DDR70	6/5/00	12:08 PM
DDR70S	6/5/00	12:09 PM
DDR70D	6/5/00	12:10 PM
DDR7X	6/5/00	12:11 PM
ZZZZZZ	6/5/00	12:12 PM
ZZZZZZ	6/5/00	12:14 PM
Ck2CCV	6/5/00	12:15 PM
Ck1CCB	6/5/00	12:17 PM
Ck2CCV	6/5/00	12:50 PM
Ck1CCB	6/5/00	12:51 PM
DDR83	6/5/00	12:52 PM
Ck2CCV	6/5/00	12:54 PM
Ck1CCB	6/5/00	12:55 PM

STL North Canton

Metals Data Reporting Form

Initial Calibration Blank Results

Instrument: CVAA **Units:** ug/L

Chart Number: hg10605c.prn

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	Ck4ICB 6/5/00 11:14 AM									
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Mercury	253.7	2	-0.044	B								

Version 3.62.1

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Initial Calibration Blank Results

Instrument: ICPST **Units:** ug/L

Chart Number: i50602a.arc

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	ICB 6/2/00 9:20 AM Found	O	Found	O	Found	O	Found	O	Found	O
Arsenic	189.042	500	2.9	U								
Barium	493.409	10000	0.52	B								
Cadmium	226.502	100	0.3	U								
Chromium	267.716	500	0.8	U								
Lead	220.353	500	1.3	U								
Selenium	196.026	250	4.9	U								
Silver	328.068	500	1	U								

Version 3.62.1

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Continuing Calibration Blank Results

Instrument: CVAA **Units:** ug/L

Chart Number: hg10605c.prn

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	Ck1CCB 6/5/00 11:18 AM		Ck1CCB 6/5/00 11:34 AM		Ck1CCB 6/5/00 11:49 AM		Ck1CCB 6/5/00 12:04 PM		Ck1CCB 6/5/00 12:17 PM	
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Mercury	253.7	2	-0.049	B	-0.046	B	-0.051	B	-0.076	B	-0.058	B

Version 3.62.1

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Continuing Calibration Blank Results

Instrument: CVAA **Units:** ug/L

Chart Number: hg10605c.prn

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	Ck1CCB 6/5/00 12:51 PM		Ck1CCB 6/5/00 12:55 PM							
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Mercury	253.7	2	-0.089	B	0.037	U						

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Continuing Calibration Blank Results

Instrument: ICPST **Units:** ug/L

Chart Number: i50602a.arc

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	CCB 6/2/00 9:57 AM		CCB 6/2/00 11:32 AM		CCB 6/2/00 12:38 PM		CCB 6/2/00 1:43 PM		CCB 6/2/00 2:46 PM	
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Arsenic	189.042	500	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U
Barium	493.409	10000	0.44	B	0.65	B	0.41	B	0.51	B	0.4	B
Cadmium	226.502	100	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
Chromium	267.716	500	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U
Lead	220.353	500	1.3	U	-2.2	B	-2	B	1.3	U	-1.5	B
Selenium	196.026	250	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U
Silver	328.068	500	1	U	1	U	1	U	1	U	1	U

Version 3.62.1

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Continuing Calibration Blank Results

Instrument: ICPST **Units:** ug/L

Chart Number: i50602a.arc

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	CCB 6/2/00 4:06 PM		CCB 6/2/00 5:11 PM		CCB 6/2/00 6:17 PM		CCB 6/2/00 7:20 PM		CCB 6/2/00 8:26 PM	
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Arsenic	189.042	500	2.9	U	2.9	U	2.9	U	2.9	U	-3.2	B
Barium	493.409	10000	0.67	B	0.68	B	0.61	B	0.57	B	1.2	B
Cadmium	226.502	100	0.37	B	0.3	U	0.3	U	0.3	U	0.3	U
Chromium	267.716	500	1.1	B	0.8	U	0.8	U	0.8	U	0.8	U
Lead	220.353	500	1.3	U	-1.8	B	1.3	U	1.3	U	1.3	U
Selenium	196.026	250	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U
Silver	328.068	500	1	U	1	U	1	U	1	U	1	U

Version 3.62.1

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Continuing Calibration Blank Results

Instrument: ICPST **Units:** ug/L

Chart Number: i50602a.arc

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	CCB 6/2/00 8:53 PM Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Arsenic	189.042	500	2.9	U								
Barium	493.409	10000	0.54	B								
Cadmium	226.502	100	0.3	U								
Chromium	267.716	500	1.2	B								
Lead	220.353	500	1.3	U								
Selenium	196.026	250	4.9	U								
Silver	328.068	500	1	U								

Version 3.62.1

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Preparation Blank Results

Lab Sample ID: DE0JJB

Matrix: Water **Units:** ug/L **Prep Date:** 6/1/00 **Prep Batch:** 0153104

Weight: NA **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Arsenic	189.042	2.9	500	-3.2	B	1	ICPST	6/2/00	19:42
Barium	493.409	0.3	10000	29.1	B	1	ICPST	6/2/00	19:42
Cadmium	226.502	0.3	100	0.3	U	1	ICPST	6/2/00	19:42
Chromium	267.716	0.8	500	3.8	B	1	ICPST	6/2/00	19:42
Lead	220.353	1.3	500	3.9	B	1	ICPST	6/2/00	19:42
Mercury	253.7	0.037	2	0.061	B	1	CVAA	6/5/00	12:02
Selenium	196.026	4.9	250	4.9	U	1	ICPST	6/2/00	19:42
Silver	328.068	1	500	1	U	1	ICPST	6/2/00	19:42

Comments: Lot #: A0E260115

Version 3.62.1

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Preparation Blank Results

Lab Sample ID: DE1F9B

Matrix: Water **Units:** ug/L **Prep Date:** 6/1/00 **Prep Batch:** 0153104

Weight: NA **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Arsenic	189.042	2.9	500	2.9	U	1	ICPST	6/2/00	19:47
Barium	493.409	0.3	10000	0.3	U	1	ICPST	6/2/00	19:47
Cadmium	226.502	0.3	100	0.3	U	1	ICPST	6/2/00	19:47
Chromium	267.716	0.8	500	0.8	U	1	ICPST	6/2/00	19:47
Lead	220.353	1.3	500	1.3	U	1	ICPST	6/2/00	19:47
Mercury	253.7	0.037	2	0.037	U	1	CVAA	6/5/00	12:05
Selenium	196.026	4.9	250	4.9	U	1	ICPST	6/2/00	19:47
Silver	328.068	1	500	1	U	1	ICPST	6/2/00	19:47

Comments: Lot #: A0E260115

Version 3.62.1

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

CASE NARRATIVE
GENERAL CHEMISTRY
MP008

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Holding Time Violation

All samples were prepared and analyzed within the method-specified holding time requirements.

Method Blank Contamination

All analytes in the method blank were less than the associated reporting limits.

MS/MSD/LCS/DCS/Sample Duplicate Outside of QC Criteria

All spike recovery and RPD data met method-specific quality control criteria.

Calibrations

All calibrations and calibration verifications met method-specific quality control criteria.

Tetra Tech NUS, Inc.

Internal Correspondence

TO: Mr. Mark Peterson

Date: August 11, 2000

FROM: William Howard Engle

CC: File

SUBJECT: Organic Data Validation – VOA, SVOA, PAHs, and TRPHs,
CTO123 – NS Mayport
SDG MP008

SAMPLES: 3/Soil

351-SS-SB02-05
351-SS-SB05-05
351-SS-SB07-05

3/Leachates

351-SS-SB02-05
425-1-SS-SB11-05
436-SS-SB01-05

OVERVIEW

The sample set for CTO123, SDG MP008; Naval Station Mayport, Jacksonville, Florida consists of three (3) soil environmental samples and three (3) leachates. Samples 351-SS-SB02-05, 351-SS-SB05-05 were analyzed for volatile organics (VOAs), semi-volatile organics (SVOAs), polycyclic aromatic hydrocarbons (PAHs), and total recoverable petroleum hydrocarbons (TRPHs). Sample 351-SS-SB07-05 and the leachates were analyzed for all parameters, except FOC.

The samples were collected by Tetra Tech NUS on May 24, 2000 and analyzed by STL - North Canton (formerly Quanterra, Inc.). All analyses were performed in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/ Quality Control (QA/QC) criteria and analyzed according to SW-846 Method 8260B (VOAs), 8270C (SVOAs), and 8310 (PAHs), and FL-PRO (TRPHs) analytical and reporting protocols. The data in this SDG was validated with regard to the following parameters:

* • Data Completeness
* • Holding Times
* • Initial/ continuing calibrations
  • Laboratory method/ field quality control blank results
* • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Supporting documentation is presented in Appendix C. Qualified analytical results are presented in Appendix A. The original laboratory data is contained in Appendix B.

Volatile Fraction

Laboratory Blank Analyses

Affected samples: 351-SS-SB02-05
351-SS-SB05-05
351-SS-SB07-05

Compound	Maximum Concentration(ug/kg)	Action Level(ug/kg)
methylene chloride	0.74	7.4
2-butanone	1.2	6.0

An action level of 5X (10X for methylene chloride and acetone) the maximum concentration has been used to evaluate the sample for blank contamination. Dilution factors, percent solid, and sample aliquot were taken into consideration when evaluating for blank contamination. Positive results, < the action level for methylene chloride and 2-butanone, were qualified as nondetects (U) as a result of blank contamination.

All other quality control criteria was met for this fraction.

Semi-Volatile Fraction

Sample 351-SS-SB05-05 had one surrogate outside of the acceptance limits. No action was taken.

Laboratory Blank Analyses

Affected samples: All Soils

Compound	Maximum Concentration(ug/kg)	Action Level(ug/kg)
Bis (2-Ethylhexyl) phthalate	42	420

An action level of 10x the maximum concentration has been used to evaluate the sample for blank contamination. Dilution factors, percent solid, and sample aliquot were taken into consideration when evaluating for blank contamination. No action was taken.

Polynuclear Aromatic Hydrocarbons

Laboratory Blank Analyses

Affected samples: Leachates

Compound	Maximum Concentration(ug/L)	Action Level(ug/L)
Anthracene	7.5	37.5

An action level of 5x the maximum concentration has been used to evaluate the sample for blank contamination. Dilution factors and sample aliquots were taken into consideration when evaluating for blank contamination. Positive results, < the action level for anthracene, were qualified as nondetects (U) as a result of blank contamination.

Total Recoverable Petroleum Hydrocarbons

Laboratory Blank Analyses

Affected leachates: All

Compound	Maximum Concentration(mg/L)	Action Level(mg/L)
TRPH	1.3	6.5

An action level of 5X the maximum concentration has been used to evaluate the sample for blank contamination. Dilution factors and sample aliquots were taken into consideration when evaluating for blank contamination. Positive results, < the action level for TRPH, were qualified as nondetects (U) as a result of blank contamination.

Note

PAHs were reported in both the 8270C and 8310 analyses for the soil samples. Since the reprting limit are lower in the 8310 analysis these results should be used instead of the 8270C PAH results.

Executive Summary

Laboratory performance: Several blanks contained contamination. Positive results above the action levels were qualified "U".

Other factors affecting data quality: None.

The data for these analyzes were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (February 1994). The text of the report has been formulated to address only those problems affecting data quality.

"I attest that the data referenced herein was validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

William Howard Engle
Project Chemist
Tetra Tech NUS, Inc.

William Howard Engle for:
Joseph A. Samchuck
Data Validation Quality Assurance Officer
Tetra Tech NUS, Inc.

Attachments:
1. Appendix A – Qualified analytical results
2. Appendix B – Results as reported by the laboratory
3. Appendix C – Supporting documentation

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD 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 - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

APPENDIX A

Qualified Analytical Results

MP008

HOLDING TIME
07/07/00

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
UG/KG	351-SS-SB02-05	A0E260112001	NORMAL	MP008	OS	05/24/00	05/30/00	06/01/00	6	2	8
UG/KG	351-SS-SB05-05	A0E260112002	NORMAL	MP008	OS	05/24/00	05/30/00	06/01/00	6	2	8
UG/KG	351-SS-SB07-05RE	A0E260112003	NORMAL	MP008	OS	05/24/00	06/05/00	06/09/00	12	4	16
UG/KG	351-SS-SB02-05	A0E260112001	NORMAL	MP008	OV	05/24/00	06/06/00	06/06/00	13	0	13
UG/KG	351-SS-SB05-05	A0E260112002	NORMAL	MP008	OV	05/24/00	06/06/00	06/06/00	13	0	13
UG/KG	351-SS-SB07-05	A0E260112003	NORMAL	MP008	OV	05/24/00	06/06/00	06/06/00	13	0	13
UG/KG	351-SS-SB02-05	A0E260112001	NORMAL	MP008	PAH	05/24/00	06/03/00	06/08/00	10	5	15
UG/KG	351-SS-SB05-05	A0E260112002	NORMAL	MP008	PAH	05/24/00	06/03/00	06/12/00	10	9	19
UG/KG	351-SS-SB07-05	A0E260112003	NORMAL	MP008	PAH	05/24/00	06/03/00	06/08/00	10	5	15
UG/L	351-SS-SB02-05	A0E260112001	NORMAL	MP008	TCLPM	05/24/00	06/01/00	06/02/00	8	1	9
UG/L	425-1-SS-SB11-05	A0E260115001	NORMAL	MP008	TCLPM	05/24/00	06/01/00	06/02/00	8	1	9
UG/L	436-SS-SB01-05	A0E260115002	NORMAL	MP008	TCLPM	05/24/00	06/01/00	06/02/00	8	1	9
MG/L	425-1-SS-SB11-05	A0E260115001	NORMAL	MP008	TCLPS	05/24/00	06/01/00	06/02/00	8	1	9
MG/L	436-SS-SB01-05	A0E260115002	NORMAL	MP008	TCLPS	05/24/00	06/01/00	06/02/00	8	1	9
MG/L	351-SS-SB02-05	A0E260112001	NORMAL	MP008	TCLPT	05/24/00	06/08/00	06/12/00	15	4	19
MG/L	425-1-SS-SB11-05	A0E260115001	NORMAL	MP008	TCLPT	05/24/00	06/08/00	06/12/00	15	4	19
MG/L	436-SS-SB01-05	A0E260115002	NORMAL	MP008	TCLPT	05/24/00	06/08/00	06/12/00	15	4	19
MG/L	351-SS-SB02-05	A0E260112001	NORMAL	MP008	TCLPV	05/24/00	06/02/00	06/02/00	9	0	9
MG/L	425-1-SS-SB11-05	A0E260115001	NORMAL	MP008	TCLPV	05/24/00	06/02/00	06/02/00	9	0	9
MG/L	436-SS-SB01-05	A0E260115002	NORMAL	MP008	TCLPV	05/24/00	06/02/00	06/02/00	9	0	9
%	351-SS-SB07-05	A0E260112003	NORMAL	MP008	TOC	05/24/00	05/30/00	05/31/00	6	1	7
UG/L	351-SS-SB02-05	A0E260112001	NORMAL	MP008	TPAH	05/24/00	06/08/00	06/14/00	15	6	21
UG/L	425-1-SS-SB11-05	A0E260115001	NORMAL	MP008	TPAH	05/24/00	06/08/00	06/14/00	15	6	21
UG/L	436-SS-SB01-05	A0E260115002	NORMAL	MP008	TPAH	05/24/00	06/08/00	06/14/00	15	6	21
MG/KG	351-SS-SB02-05	A0E260112001	NORMAL	MP008	TPH	05/24/00	06/01/00	06/05/00	8	4	12

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
MG/KG	351-SS-SB05-05	A0E260112002	NORMAL	MP008	TPH	05/24/00	06/01/00	06/05/00	8	4	12
MG/KG	351-SS-SB07-05	A0E260112003	NORMAL	MP008	TPH	05/24/00	06/01/00	06/05/00	8	4	12

CTO123-MS MAYPORT
TCLP DATA
QUANTERRA
SDG: MP008

SAMPLE NUMBER:	351-SS-SB02-05	425-1-SS-SB11-05	436-SS-SB01-05	
SAMPLE DATE:	05/24/00	05/24/00	05/24/00	/ /
LABORATORY ID:	A0E260112001	A0E260115001	A0E260115002	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	0.0 %	0.0 %	0.0 %	100.0 %
UNITS:	MG/L	MG/L	MG/L	
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1-DICHLOROETHENE	0.07	U		0.07	U		0.07	U				
1,2-DICHLOROETHANE	0.025	U		0.025	U		0.025	U				
BENZENE	0.025	U		0.025	U		0.025	U				
CARBON TETRACHLORIDE	0.025	U		0.025	U		0.025	U				
CHLOROBENZENE	0.025	U		0.025	U		0.025	U				
CHLOROFORM	0.025	U		0.025	U		0.025	U				
METHYL ETHYL KETONE	20	U		20	U		20	U				
TETRACHLOROETHENE	0.07	U		0.07	U		0.07	U				
TRICHLOROETHENE	0.05	U		0.05	U		0.05	U				
VINYL CHLORIDE	0.05	U		0.05	U		0.05	U				

CTO123-MS MAYPORT
TCLP DATA
QUANTERRA
SDG: MP008

SAMPLE NUMBER:	351-SS-SB02-05	425-1-SS-SB11-05	436-SS-SB01-05	
SAMPLE DATE:	05/24/00	05/24/00	05/24/00	/ /
LABORATORY ID:	A0E260112001	A0E260115001	A0E260115002	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	0.0 %	0.0 %	0.0 %	100.0 %
UNITS:	MG/L	MG/L	MG/L	
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,2-DICHLOROETHANE	0.025	U		0.025	U		0.025	U				
BENZENE	0.025	U		0.025	U		0.025	U				
CARBON TETRACHLORIDE	0.025	U		0.025	U		0.025	U				
CHLOROBENZENE	0.025	U		0.025	U		0.025	U				
CHLOROFORM	0.025	U		0.025	U		0.025	U				
METHYL ETHYL KETONE	20	U		20	U		20	U				
VINYL CHLORIDE	0.05	U		0.05	U		0.05	U				

CTO123-NS MAYPORT
TCLP DATA
QUANTERRA
SDG: MP008

SAMPLE NUMBER:	425-1-SS-SB11-05	436-SS-SB01-05		
SAMPLE DATE:	05/24/00	05/24/00	/ /	/ /
LABORATORY ID:	A0E260115001	A0E260115002		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	MG/L	MG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,4-DICHLOROBENZENE	0.05	U		0.05	U							
2,4,5-TRICHLOROPHENOL	0.05	U		0.05	U							
2,4,6-TRICHLOROPHENOL	0.05	U		0.05	U							
2,4-DINITROTOLUENE	0.05	U		0.05	U							
HEXACHLOROBENZENE	0.05	U		0.05	U							
HEXACHLOROBUTADIENE	0.05	U		0.05	U							
HEXACHLOROETHANE	0.05	U		0.05	U							
M & P-CRESOL	0.1	U		0.1	U							
NITROBENZENE	0.05	U		0.05	U							
O-CRESOL				0.05	U							
PENTACHLOROPHENOL	0.1	U		0.1	U							
PYRIDINE	0.1	U		0.1	U							

CTO123-NS MAYPORT
TCLP DATA
QUANTERRA
SDG: MP008

SAMPLE NUMBER:	351-SS-SB02-05	425-1-SS-SB11-05	436-SS-SB01-05	
SAMPLE DATE:	05/24/00	05/24/00	05/24/00	/ /
LABORATORY ID:	A0E260112001	A0E260115001	A0E260115002	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	0.0 %	0.0 %	0.0 %	100.0 %
UNITS:	UG/L	UG/L	UG/L	
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	20	U		20	U		20	U				
2-METHYLNAPHTHALENE	20	U		20	U		20	U				
ACENAPHTHENE	10	U		10	U		10	U				
ACENAPHTHYLENE	10	U		10	U		10	U				
ANTHRACENE	~~7.8~~ 10	J UA	A	10	U		~~7.7~~ 10	J UA	A			
BENZO(A)ANTHRACENE	1	U		1	U		1	U				
BENZO(A)PYRENE	1	U		1	U		1	U				
BENZO(B)FLUORANTHENE	1	U		1	U		1	U				
BENZO(G,H,I)PERYLENE	1	U		1	U		1	U				
BENZO(K)FLUORANTHENE	3	U		3	U		3	U				
CHRYSENE	1	U		1	U		1	U				
DIBENZO(A,H)ANTHRACENE	1	U		1	U		1	U				
FLUORANTHENE	2	U		2	U		2	U				
FLUORENE	20	U		20	U		20	U				
INDENO(1,2,3-CD)PYRENE	1	U		1	U		1	U				
NAPHTHALENE	20	U		20	U		20	U				
PHENANTHRENE	10	U		10	U		10	U				
PYRENE	1	U		1	U		1	U				

CTO123-NS MAYPORT
TCLP DATA
QUANTERRA
SDG: MP008

SAMPLE NUMBER:	351-SS-SB02-05			425-1-SS-SB11-05			436-SS-SB01-05					
SAMPLE DATE:	05/24/00			05/24/00			05/24/00			/ /		
LABORATORY ID:	A0E260112001			A0E260115001			A0E260115002					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	MG/L			MG/L			MG/L					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PETROLEUM HYDROCARBONS												
TPH (C8-C40)	1.4 S	J	A	1.1 S	J	A	1.4 S	J	A			

APPENDIX B

Results as Reported by the Laboratory

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP008

Matrix: (soil/water) SO Lab Sample ID:A0E260115 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 1 / mL Date Received: 05/25/00
Work Order: DDR83101 Date Extracted:06/02/00
Dilution factor: 1 Date Analyzed: 06/02/00
Moisture %:

QC Batch: 0157473

Client Sample Id: 436-SS-SB01-05

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) mg/L	Q
71-43-2	Benzene	0.025	U
56-23-5	Carbon tetrachloride	0.025	U
108-90-7	Chlorobenzene	0.025	U
67-66-3	Chloroform	0.025	U
107-06-2	1,2-Dichloroethane	0.025	U
75-35-4	1,1-Dichloroethylene	0.070	U
78-93-3	Methyl ethyl ketone	20	U
127-18-4	Tetrachloroethylene	0.070	U
79-01-6	Trichloroethylene	0.050	U
75-01-4	Vinyl chloride	0.050	U

FORM I

Cooler Receipt Form

STL Pittsburgh

P: Preserved

UP: Unpreserved

Sample ID	TMET PH<2	DMET PH<2	HG PH<2	NUT(1) PH<2	CN PH ≥12	OG TPHC PH<2	PHEN PH<2	SULF PH ≥12	TOC PH<2	TOX PH<2	VOA P/UP	hrdnss PH<2			

(1) "NUT" could include sample bottles for ammonia, chemical oxygen demand, nitrate/nitrite, TKN, or total phosphorus

Comments: _____

Cooler Number	Temperature
	20°

Bottle Type	Lot Number*

* Please use an asterisk if bottle lot number was covered by the label.

[redacted]

Chain of Custody Record

Quanterra

QUX-4134

Client: TETRA TECH NUS	Project Manager: RICK OPSANKO	Date: 5/24/00	Chain Of Custody Number: 14155
Address: 794 S. MILITARY TRAIL	Telephone Number (Area Code)/Fax Number: (954) 570-5885 / 570-5974	Lab Number:	Page ____ of ____
City: DEERFIELD BEACH; State: FL; Zip Code: 33442	Site Contact: GARY BRAGANZA		
Project Name: NS MAYPORT, CTO-122 + 123	Carrier/Waybill Number: FED-EX / 811289329463		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	VOC	SVOC	TRPH	PAH	FOC	LEACHABILITY
351-SB-SB02-05	5/24/00	12:00	SOIL				NONE		✓	✓	✓	✓		✓
351-SS-SB05-05	↓	15:00	↓				↓		✓	✓	✓	✓		
351-SS-SB07-05		16:00							✓	✓	✓	✓	✓	
425-1-SS-SB11-05		14:00												✓
436-SS-SB01-05	↓	13:00	↓				↓							✓

Special Instructions: temp = 5.1°C

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☑ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Turn Around Time Required: ☑ Normal ☐ Rush

QC Level: ☑ I. ☐ II. ☐ III.

Project Specific (Specify):

	Date	Time		Date	Time
1. Relinquished By: Gary Braganza	5/24/00	17:30	1. Received By: Jerry Miller	5-25-00	10:15A
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

STL North Canton

North Canton Facility

AOE 260112

Client: TetraTech Project: NS Mayport Quote#: 33626
Cooler Received on: 5-25-00 Opened on: 5-25-00 by Jenny Miller (Signature)

Fedx [X] Client Drop Off [ ] UPS [ ] Airborne [ ]
Other:_____

Cooler [X] Safe [ ] Foam Box [ ] Client Cooler [ ] Other:_____
Quanterra Shipper No#: 5584

1. Were custody seals on the outside of the cooler and intact? Yes [ ] No [X]
   If YES, Quantity_____ Location_____
   Were the custody seals signed and dated? Yes [ ] No [ ] NA [X]
2. Shipper's packing slip attached to this form? Yes [X] No [ ]
3. Were custody papers included inside the cooler and relinquished? Yes [X] No [ ]
4. Did you sign the custody papers in the appropriate place? Yes [X] No [ ]
5. Packing material used:
Peanuts [ ] Bubble Wrap [X] Vermiculite [ ] Foam [ ] None [ ] Other :_____
6. Cooler temperature upon receipt 5.1 °C (see back of form for multiple coolers/temp)
METHOD: Temperature Vial [X] Coolant [ ] Against Bottles [ ]
COOLANT: Wet Ice [X] Blue Ice [ ] Dry Ice [ ] None [ ]
7. Were all the bottles sealed in separate plastic bags? Yes [ ] No [X]
8. Did all bottles arrive in good condition (Unbroken)? Yes [X] No [ ]
9. Did all bottle labels and tags agree with the custody papers? Yes [X] No [ ]
10. Were samples at the correct pH? Yes [ ] No [ ] NA [X]
11. Were correct bottles used for the tests indicated? Yes [X] No [ ]
12. Were air bubbles >6 mm in any VOA vials? Yes [ ] No [ ] NA [X]
13. Was a sufficient amount of sample sent in each bottle? Yes [X] No [ ]
Contacted PM _____ Date:_____ by:_____ via Voice Mail [ ] Verbal [ ] Other [ ]
Concerning:_____

Check √	MACRO	MACRO
1. CHAIN OF CUSTODY		
√	SR1A	Samples were received under proper custody procedures and without discrepancies.
	SR1B	The chain of custody and sample bottles did not agree. The following discrepancies occurred_____
2. SAMPLE CONDITION		
	SR2A	Sample(s)_____ were received or requested after the recommended holding time had expired.
	SR2B	Sample(s) _____ were received with insufficient volume
	SR2C	Sample(s)_____ were received in a broken container.
3. SAMPLE PRESERVATION		
√	SR3A	The temperature of the cooler was _____ ° C
	SR3C	Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving.
	SR3D	Sample(s) _____ were received incorrectly preserved and split off in sample receiving.
	SR3E	Samples (s)_____ were received incorrectly preserved and were unable to be analyzed.
	SR3F	Sample(s)_____ were received with bubble > 6 mm in diameter (cc: PM)
	N/A	See back for other anomalies

Quanterra ® Cooler Receipt Form/Narrative
North Canton Facility

Client ID	pH	Date	Initials

Cooler	Temp	Method	Comments

Discrepancies Cont.

Macro Name:

Macro Name:

Macro Name:

Other Anomalies:

Revision #13. Date: 09/04/98
SOP: NC-SC-00005, Sample Receiving
n:\qaqc\narrativ\cooler.doc

Chain of Custody Record

Quanterra

QUA-4124

Client: TETRA TECH NUS	Project Manager: RICK OPSANKO	Date: 5/24/00	Chain Of Custody Number: 14155
Address: 794 S. MILITARY TRAIL	Telephone Number (Area Code)/Fax Number: (954)570-5885 / 570-5974	Lab Number:	Page ____ of ____
City: DEERFIELD BEACH; State: FL; Zip Code: 33442	Site Contact: GARY BRAGANZA		
Project Name: NS MAYPORT, CTO-122 + 123	Carrier/Waybill Number: FED-EX / 811289329463		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	VOC	SVOC	TRPH	PAH	FOC	LEACHABILITY
351-SB-SB02-05	5/24/00	12:00	SOIL				NONE		✓	✓	✓	✓		✓
351-SS-SB05-05	↓	15:00	↓				↓		✓	✓	✓	✓		
351-SS-SB07-05		16:00							✓	✓	✓	✓	✓	
425-1-SS-SB11-05		14:00												✓
436-SS-SB01-05	↓	13:00	↓				↓							✓

Special Instructions: temp 5.1°C

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Turn Around Time Required: ☒ Normal ☐ Rush

QC Level: ☐ I. ☐ II. ☐ III.

Project Specific (Specify):

	Date	Time		Date	Time
1. Relinquished By: Gary Braganza	5/24/00	17:30	1. Received By: Jerry Miller	5-25-00	10:15A
2. Relinquished By:			2. Received By:		
3. Relinquished By:			3. Received By:		

Comments:

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

STL North Canton

21

North Canton Facility

ADE 260115

Client: TetraTech Project: NS Mayport Quote#: 33026
Cooler Received on: 5-25-00 Opened on: 5-25-00 by: Jennifer Miller (Signature)

Fedx [X] Client Drop Off [ ] UPS [ ] Airborne [ ]
Other:_____

Cooler [X] Safe [ ] Foam Box [ ] Client Cooler [ ] Other:_____
Quanterra Shipper No#: 5584

1. Were custody seals on the outside of the cooler and intact? Yes [ ] No [X]
   If YES, Quantity_____ Location_____
   Were the custody seals signed and dated? Yes [ ] No [ ] NA [X]
2. Shipper's packing slip attached to this form? Yes [X] No [ ]
3. Were custody papers included inside the cooler and relinquished? Yes [X] No [ ]
4. Did you sign the custody papers in the appropriate place? Yes [X] No [ ]
5. Packing material used:
Peanuts [ ] Bubble Wrap [X] Vermiculite [ ] Foam [ ] None [ ] Other :_____
6. Cooler temperature upon receipt 5.1 °C (see back of form for multiple coolers/temp)
METHOD: Temperature Vial [X] Coolant [ ] Against Bottles [ ]
COOLANT: Wet Ice [X] Blue Ice [ ] Dry Ice [ ] None [ ]
7. Were all the bottles sealed in separate plastic bags? Yes [ ] No [X]
8. Did all bottles arrive in good condition (Unbroken)? Yes [X] No [ ]
9. Did all bottle labels and tags agree with the custody papers? Yes [X] No [ ]
10. Were samples at the correct pH? Yes [ ] No [ ] NA [X]
11. Were correct bottles used for the tests indicated? Yes [X] No [ ]
12. Were air bubbles >6 mm in any VOA vials? Yes [ ] No [ ] NA [X]
13. Was a sufficient amount of sample sent in each bottle? Yes [X] No [ ]
Contacted PM _____ Date:_____ by:_____ via Voice Mail [ ] Verbal [ ] Other [ ]
Concerning:_____

Check √	MACRO	MACRO
1. CHAIN OF CUSTODY		
√	SR1A	Samples were received under proper custody procedures and without discrepancies.
	SR1B	The chain of custody and sample bottles did not agree. The following discrepancies occurred_____
2. SAMPLE CONDITION		
	SR2A	Sample(s)_____ were received or requested after the recommended holding time had expired.
	SR2B	Sample(s) _____ were received with insufficient volume
	SR2C	Sample(s)_____ were received in a broken container.
3. SAMPLE PRESERVATION		
√	SR3A	The temperature of the cooler was _____ °C
	SR3C	Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving.
	SR3D	Sample(s) _____ were received incorrectly preserved and split off in sample receiving.
	SR3E	Samples (s)_____ were received incorrectly preserved and were unable to be analyzed.
	SR3F	Sample(s)_____ were received with bubble > 6 mm in diameter (cc: PM)
	N/A	See back for other anomalies

Quanterra ® Cooler Receipt Form/Narrative
North Canton Facility

Client ID	pH	Date	Initials

Cooler	Temp	Method	Comments

Discrepancies Cont.

Macro Name:

Macro Name:

Macro Name:

Other Anomalies:

CASE NARRATIVE
GC/MS VOLATILES
MP008

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Samples in this lot were preserved by freezing in water due to samples effervescing when preserved with sodium bisulfate.

Sample(s) which contain results between the MDL and the RL are flagged with "J". There is the possibility of false positive or misidentification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation will be performed only down to the standard reporting limit (SRL). The acceptance criteria for quality control criteria may not be met at these quantitation levels.

Holding Time Violation

All samples were prepared and analyzed within the method-specified holding time requirements.

Method Blank Contamination

Sample(s) which contain concentrations of target analyte(s) at a reportable level in the associated method blank(s) have been flagged with B. All target analytes in the method blank must be below the reporting limits (RL) or the associated sample(s) must be ND with the exception of Methylene chloride, Acetone, and 2-Butanone. These are common laboratory contaminants and may be present in concentrations up to five times the reporting limits.

MS/MSD/LCS/DCS and Surrogates Outside of QC Criteria

All spike recovery and RPD data met method-specific quality control criteria.

Calibrations

All calibrations and calibration verifications met method-specific quality control criteria.

METHOD BLANK REPORT

HPLC

Client Lot #...: A0E260112
MB Lot-Sample #: B0F030000-153
Analysis Date..: 06/07/00
Dilution Factor: 1

Work Order #...: DE5TX101
Prep Date.....: 06/03/00
Prep Batch #...: 0155153
Initial Wgt/Vol: 30 g

Matrix.....: SOLID
Final Wgt/Vol..: 1 mL

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
2-Methylnaphthalene	ND	50	ug/kg	SW846 8310
1-Methylnaphthalene	ND	50	ug/kg	SW846 8310
Acenaphthene	ND	50	ug/kg	SW846 8310
Acenaphthylene	ND	50	ug/kg	SW846 8310
Anthracene	ND	50	ug/kg	SW846 8310
Benzo(a)anthracene	ND	5.0	ug/kg	SW846 8310
Benzo(a)pyrene	ND	5.0	ug/kg	SW846 8310
Benzo(b)fluoranthene	ND	5.0	ug/kg	SW846 8310
Benzo(ghi)perylene	ND	5.0	ug/kg	SW846 8310
Benzo(k)fluoranthene	ND	5.0	ug/kg	SW846 8310
Chrysene	ND	5.0	ug/kg	SW846 8310
Dibenz(a,h)anthracene	ND	5.0	ug/kg	SW846 8310
Fluoranthene	ND	5.0	ug/kg	SW846 8310
Fluorene	ND	50	ug/kg	SW846 8310
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/kg	SW846 8310
Naphthalene	ND	50	ug/kg	SW846 8310
Phenanthrene	ND	50	ug/kg	SW846 8310
Pyrene	ND	5.0	ug/kg	SW846 8310

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Carbazole	72	(17 - 115)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

HPLC

Client Lot #...: A0E260112 Work Order #...: DEDET101 Matrix.....: SOLID
MB Lot-Sample #: B0F080000-329

Prep Date.....: 06/08/00
Analysis Date..: 06/14/00 Prep Batch #...: 0160329
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Acenaphthene	ND	10	ug/L	SW846 8310
Acenaphthylene	ND	10	ug/L	SW846 8310
Anthracene	7.5 J	10	ug/L	SW846 8310
Benzo(a)anthracene	ND	1.0	ug/L	SW846 8310
Benzo(a)pyrene	ND	1.0	ug/L	SW846 8310
Benzo(b)fluoranthene	ND	1.0	ug/L	SW846 8310
Benzo(ghi)perylene	ND	1.0	ug/L	SW846 8310
Benzo(k)fluoranthene	ND	3.0	ug/L	SW846 8310
Chrysene	ND	1.0	ug/L	SW846 8310
Dibenz(a,h)anthracene	ND	1.0	ug/L	SW846 8310
Fluoranthene	ND	2.0	ug/L	SW846 8310
Fluorene	ND	20	ug/L	SW846 8310
Indeno(1,2,3-cd)pyrene	ND	1.0	ug/L	SW846 8310
1-Methylnaphthalene	ND	20	ug/L	SW846 8310
2-Methylnaphthalene	ND	20	ug/L	SW846 8310
Naphthalene	ND	20	ug/L	SW846 8310
Phenanthrene	ND	10	ug/L	SW846 8310
Pyrene	ND	1.0	ug/L	SW846 8310

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Carbazole	79	(10 - 127)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

J Estimated result. Result is less than RL.

RQC058

Severn Trent Laboratories, Inc.
EXTRACTION BENCH WORKSHEET

Run Date: 6/05/00
Time: 11:38:36

LEV 1	LEV 2		LEV 1	LEV 2	
Y	Y	Blank	Y	Y	Weights/Volumes
Y	Y	Check	Y	Y	Spike & Surrogate Worksheet
Y	Y	MS/MSD	Y	Y	Vial contains correct volume
			Y	Y	Labels, greenbars, worksheets computer batch: correct & all match
			_	_	Anomalies to Extraction Method

_ Expanded Deliverable
_ COC Completed
_ Bench Sheet Copied
_ Package Submitted to AnalyticalGroup
_ Bench Sheet Copied per COC

Extractionist: 003000 Randy Myers

Concentrationist: 008029 Desmond Jackson

QC BATCH: 0155153

PREP DATE: 6/03/00
COMP DATE: 6/04/00

Reviewer/Date: JACKSOND / 6/05/00 ab/5/00

Hydrocarbons, Polynuclear Aromatic (HPLC - 8310)
SOXHLET (NONE,Na2SO4)

EXTR EXPR	ANL DUE	LOT#,MSRUN#/ WORK ORDER	TEST FLGS	EXT	MTH	MATRIX	INIT/FIN WT/VOL	PH'S INIT	PH'S ADJ1	PH'S ADJ2	SOLVENTS EXTRACTION	VOL	EXCHANGE	VOL	SPIKE STANDARD/ SURROGATE ID
6/07/00 COMMENTS:	6/14/00	A0E260112-002 DDR7G-1-05	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606
6/07/00 COMMENTS:	6/14/00	A0E260112-003 DDR7M-1-06	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606
6/07/00 COMMENTS:	6/14/00	A0E260112-001 DDR70-1-05	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606
6/09/00 COMMENTS:	6/09/00	B0E270139-001 DDVPN-1-01	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606
6/09/00 COMMENTS:	6/09/00	B0E270139-001 DDVPN-1-08S	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0605 1.0 ML 00-SV-0606
6/09/00 COMMENTS:	6/09/00	B0E270139-001 DDVPN-1-09D	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0605 1.0 ML 00-SV-0606
6/09/00 COMMENTS:	6/09/00	B0E270139-002 DDVPQ-1-01	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606

ANALYTEKA INC.
TAMPA, FL
SOP QC/REV. 3.2

RQC058

Severn Trent Laboratories, Inc.
EXTRACTION BENCH WORKSHEET

Run Date: 6/05/00
Time: 11:38:36

QC BATCH: 0155153

PREP DATE: 6/03/00
COMP DATE: 6/04/00

EXTR EXPR	ANL DUE	LOT#,MSRUN#/ WORK ORDER	TEST FLGS	EXT	MTH	MATRIX	INIT/FIN WT/VOL	INIT	PH*S ADJ1	ADJ2	SOLVENTS EXTRACTION	VOL	EXCHANGE	VOL	SPIKE STANDARD/ SURROGATE ID
6/09/00 COMMENTS:	6/09/00	B0E270139-003 DDVPV-1-01	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606
6/08/00 COMMENTS:	6/09/00	B0E270142-001 DDVQR-1-01	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606
6/08/00 COMMENTS:	6/09/00	B0E270142-009 DDVRA-1-01	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606
6/08/00 COMMENTS:	6/09/00	B0E270142-002 DDVR0-1-01	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606
6/08/00 COMMENTS:	6/09/00	B0E270142-003 DDVR1-1-01	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606
6/08/00 COMMENTS:	6/09/00	B0E270142-004 DDVR3-1-01	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606
6/08/00 COMMENTS:	6/09/00	B0E270142-005 DDVR4-1-01	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606
6/08/00 COMMENTS:	6/09/00	B0E270142-006 DDVR6-1-01	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606
6/08/00 COMMENTS:	6/09/00	B0E270142-006 DDVR6-1-08S	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0605 1.0 ML 00-SV-0606
6/08/00 COMMENTS:	6/09/00	B0E270142-006 DDVR6-1-09D	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0605 1.0 ML 00-SV-0606

RQC058

Severn Trent Laboratories, Inc.
EXTRACTION BENCH WORKSHEET

Run Date: 6/05/00
Time: 11:38:36

****
* QC BATCH: 0155153 *
****

PREP DATE: 6/03/00
COMP DATE: 6/04/00

EXTR EXPR	ANL DUE	LOT#.MSRUN#/ WORK ORDER	TEST FLGS	EXT	MTH	MATRIX	INIT/FIN WT/VOL	INIT	PH*S ADJ1	ADJ2	EXTRACTION	SOLVENTS VOL	EXCHANGE	VOL	SPIKE STANDARD/ SURROGATE ID
6/08/00	6/09/00	B0E270142-007 DDVR8-1-01	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606
COMMENTS:															
6/08/00	6/09/00	B0E270142-008 DDVR9-1-01	D	11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606
COMMENTS:															
6/09/00	0/00/00	B0F030000-153 DESTX-1-01B		11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0606
COMMENTS:															
6/09/00	0/00/00	B0F030000-153 DESTX-1-02C		11	SG	SOLID	30g 1.00mL	NA	NA	NA	DCM/ACET	200.0	ACN	5.0	1.0 ML 00-SV-0605 1.0 ML 00-SV-0606
COMMENTS:															

R = RUSH C = CLP
E = EPA 600 D = EXP.DEL)
M = CLIENT REQ MS/MSD
$

NUMBER OF WORK ORDERS IN BATCH: 21

RQC058

Severn Trent Laboratories, Inc.
EXTRACTION BENCH WORKSHEET

Run Date: 6/14/00
Time: 7:38:33

LEV 1	LEV 4		LEV 1	LEV 4	
Y	Y	Blank	Y	Y	Weights/Volumes
Y	Y	Check	Y	Y	Spike & Surrogate Worksheet
_	_	MS/MSD	Y	Y	Vial contains correct volume
			Y	Y	Labels, greenbars, worksheets computer batch: correct & all match
			_	_	Anomalies to Extraction Method

_ Expanded Deliverable
_ COC Completed
_ Bench Sheet Copied
_ Package Submitted to AnalyticalGroup
_ Bench Sheet Copied per COC

Extractionist: 090002 Justin Ooms

Concentrationist: 008029 Desmond Jackson

Reviewer/Date: JACKSOND / 6/09/00 6/14/00

****
* QC BATCH: 0160329 *
****

PREP DATE: 6/08/00
COMP DATE: 6/08/00

Hydrocarbons, Polynuclear Aromatic (HPLC - 8310)
TCLP(1311) -> LIQ/LIQ, CONT - Nominal

EXTR EXPR	ANL DUE	LOT#,MSRUN#/ WORK ORDER	TEST FLGS	EXT	MTH	MATRIX	INIT/FIN WT/VOL	PH'S INIT	PH'S ADJ1	PH'S ADJ2	SOLVENTS EXTRACTION	SOLVENTS VOL	SOLVENTS EXCHANGE	VOL	SPIKE STANDARD/ SURROGATE ID
6/07/00 COMMENTS:	6/14/00	A0E260115-001 DDR7X-1-03	D	48	SG	SOLID	100mL 1.00mL	NA	NA	NA	DCM	400.0	ACN	5.0	00-SV-0640 1.0 ML
6/07/00 COMMENTS:	6/14/00	A0E260112-001 DDR70-1-07	D	48	SG	SOLID	100mL 1.00mL	NA	NA	NA	DCM	400.0	ACN	5.0	00-SV-0640 1.0 ML
6/07/00 COMMENTS:	6/14/00	A0E260115-002 DDR83-1-03	D	48	SG	SOLID	100mL 1.00mL	NA	NA	NA	DCM	400.0	ACN	5.0	00-SV-0640 1.0 ML
6/07/00 COMMENTS:	0/00/00	B0F080000-329 DEDET-1-01B		48	SG	SOLID	100mL 1.00mL	NA	NA	NA	DCM	400.0	ACN	5.0	00-SV-0640 1.0 ML
6/07/00 COMMENTS:	0/00/00	B0F080000-329 DEDET-1-02C		48	SG	SOLID	100mL 1.00mL	NA	NA	NA	DCM	400.0	ACN	5.0	00-SV-0605 1.0 ML 00-SV-0640 1.0 ML
6/07/00 COMMENTS:	0/00/00	B0F080000-329 DEDET-1-03L	R	48	SG	SOLID	100mL 1.00mL	NA	NA	NA	DCM	400.0	ACN	5.0	00-SV-0605 1.0 ML 00-SV-0640 1.0 ML

R = RUSH C = CLP
E = EPA 600 D = EXP.DEL)
M = CLIENT REQ MS/MSD
$

NUMBER OF WORK ORDERS IN BATCH: 6

QUANTERRA INC.
TAMPA, FL
CO-OP-0001REV.3.2

RQC058

Severn Trent Laboratories, Inc.
EXTRACTION BENCH WORKSHEET

Run Date: 6/09/00
Time: 12:52:31

LEV 1	LEV 2		LEV 1	LEV 2	
Y	Y	Blank	Y	Y	Weights/Volumes
Y	Y	Check	Y	Y	Spike & Surrogate Worksheet
_	_	MS/MSD	Y	Y	Vial contains correct volume
			Y	Y	Labels, greenbars, worksheets
					computer batch: correct & all match
			_	_	Anomalies to Extraction Method

_ Expanded Deliverable
_ COC Completed
_ Bench Sheet Copied
_ Package Submitted to AnalyticalGroup
_ Bench Sheet Copied per COC

Extractionist: 090002 Justin Ooms

Concentrationist: 008029 Desmond Jackson

Reviewer/Date: JACKSOND / 6/09/00 ab/9/00

****
* QC BATCH: 0160329 *
****

PREP DATE: 6/08/00
COMP DATE: 6/08/00

Hydrocarbons, Polynuclear Aromatic (HPLC - 8310)
TCLP(1311) -> LIQ/LIQ, CONT - Nominal

EXTR EXPR	ANL DUE	LOT#,MSRUN#/ WORK ORDER	TEST FLGS	EXT	MTH	MATRIX	INIT/FIN WT/VOL	INIT	PH"S ADJT	ADJ2	SOLVENTS EXTRACTION	VOL	EXCHANGE	VOL	SPIKE STANDARD/ SURROGATE ID
6/07/00 COMMENTS:	6/14/00	A0E260115-001 DER7X-1-03	D	48	SG	SOLID	980.0mL 1.00mL	NA	NA	NA	DCM	400.0	ACN	5.0	00-SV-0640 1.0 ML
6/07/00 COMMENTS:	6/14/00	A0E260112-001 DER70-1-07	D	48	SG	SOLID	980.0mL 1.00mL	NA	NA	NA	DCM	400.0	ACN	5.0	00-SV-0640 1.0 ML
6/07/00 COMMENTS:	6/14/00	A0E260115-002 DER83-1-03	D	48	SG	SOLID	980.0mL 1.00mL	NA	NA	NA	DCM	400.0	ACN	5.0	00-SV-0640 1.0 ML
6/07/00 COMMENTS:	0/00/00	B0F080000-329 DEDET-1-01B		48	SG	SOLID	1000mL 1.00mL	NA	NA	NA	DCM	400.0	ACN	5.0	00-SV-0640 1.0 ML
6/07/00 COMMENTS:	0/00/00	B0F080000-329 DEDET-1-02C		48	SG	SOLID	1000mL 1.00mL	NA	NA	NA	DCM	400.0	ACN	5.0	00-SV-0605 1.0 ML 00-SV-0640 1.0 ML
6/07/00 COMMENTS:	0/00/00	B0F080000-329 DEDET-1-03L	R	48	SG	SOLID	1000mL 1.00mL	NA	NA	NA	DCM	400.0	ACN	5.0	00-SV-0605 1.0 ML 00-SV-0640 1.0 ML

R = RUSH C = CLP
E = EPA 600 D = EXP.DEL)
M = CLIENT REQ MS/MSD
*

NUMBER OF WORK ORDERS IN BATCH: 6

LANTERRA INC.
TAMPA, FL
TN-OP-0001 REV. 3.2

STL North Canton

Operator: 2899

Data Subdirectory: 90921
Part of Methods to run: Acquisition only

Wait Time after loading Method: 0.000 min

Barcode Reader: not available

Sequence Timeout: 60.000 min
Shutdown Cmd/Macro: SHUTDOWN.MAC

Sequence Comment:
Quanterra - Tampa SOP#: HP1001 (8310/610)

Solvent Lot# ACN: M15A20 Water: M34287

IS#: 8M273 Level #6: 99-SV-0233 Level #3: 99-SV-0234

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
1	1	IB	20	1	5		PAH	1
2	3	L6 100/80/40/20	20	1	5		PAH	1
3	3	L6 100/80/40/20	20	1	5		PAH1620	1
4	3	L6 100/80/40/20	20	1	5		PAH0820	1
5	3	L6 100/80/40/20	20	1	5		PAH0420	1
6	4	L3 100/75/50/25	20	1	5		PAH	1
7	4	L3 100/75/50/25	20	1	5		PAH1520	1
8	4	L3 100/75/50/25	20	1	5		PAH1020	1
9	4	L3 100/75/50/25	20	1	5		PAH0520	1
10	5	ICV	20	1	5		PAH	1
ICV 0303								
11	6	D2JFV101	20	1	5		PAH	1
9259318-B								
11	7	D2JFV102	20	1	5		PAH	1
9259318-C								

371

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
11	8	D2A1L20W	20	1	5		PAH	1
		B9I100139-5						
11	9	D2KMG101	20	1	5		PAH	1
		9260244-B						
11	10	D2KMG102	20	1	5		PAH	1
		9260244-C						
11	11	D28H0101	20	1	5		PAH	1
		B9I090157-1						
11	12	D28H7101,50	20	1	5		PAH	1
		B9I090157-2X50 DLN						
11	13	D28H9101	20	1	5		PAH	1
		B9I090157-3						
11	14	D28HC101,50	20	1	5		PAH	1
		B9I090157-4X50 DLN						
12	3	L6 100/80/40/20	20	1	5		PAHCCV	1
13	15	D28HC102,50	20	1	5		PAH	1
		B9I090157-4SX50 DLN						
13	16	D28HC103,50	20	1	5		PAH	1
		B9I090157-4DX50 DLN						
13	17	D28HD101	20	1	5		PAH	1
		B9I090157-5						

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
13	18	D28HG101,50	20	1	5		PAH	1
		B9I090157-6X50 DLN						
13	19	D28HH101,50	20	1	5		PAH	1
		B9I090157-7X50 DLN						
13	20	D2CA412R	20	1	5		PAH	1
		B9I110111-1D						
13	21	D2CAD10W	20	1	5		PAH	1
		B9I110111-3						
13	22	D2CAG10W	20	1	5		PAH	1
		B9I110111-4						
13	23	D2CAJ10W	20	1	5		PAH	1
		B9I110111-6						
13	24	D2CAN10W	20	1	5		PAH	1
		B9I110111-7						
14	3	L6 100/80/40/20	20	1	5		PAHCCV	1
15	25	D2CAP110	20	1	5		PAH	1
		B9I110111-8						
15	26	D2CAQ110	20	1	5		PAH	1
		B9I110111-9						
15	27	D28H0101,2	20	1	5		PAH	1
		B9I090157-1X2 DLN						

373

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
15	28	D28H7101,10	20	1	5		PAH	1
		B9I090157-2X10 DLN						
15	29	D28H9101,2	20	1	5		PAH	1
		B9I090157-3X2 DLN						
15	30	D2AN6101,100	20	100	5		PAH	1
		B9I100218-1 X 100 DLN						
15	31	D2AP0101,100	20	100	5		PAH	1
		B9I100218-2 X 100 DLN						
15	32	D2CE7101	20	1	5		PAH	1
		B9I110121-2						
15	33	D2CEE101	20	1	5		PAH	1
		B9I110121-3						
15	34	D2AN6101,1000	20	100	5		PAH	1
		B9I100218-1 X 1000 DLN						
16	3	L6 100/80/40/20	20	1	5		PAHCCV	1

equence: C:\HPCHEM\1\SEQUENCE\

Operator: 2899

Data Subdirectory: 00606

Part of Methods to run: Acquisition only

Wait Time after loading Method: 0.000 min

Barcode Reader: not available

Sequence Timeout: 60.000 min

Shutdown Cmd/Macro: SHUTDOWN.MAC

Sequence Comment:
STL - Tampa SOP#: HP1001 (8310/610)

Solvent Lot# ACN: N37437 Water: N31276

IS#: 8M273 Level #6: 00-SV-0608 Level #3: 00-SV-0415

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
1	1	IB	20	1		5	PAH	1
2	3	CCV	20	1		5	PAHCCV	1
3	4	RL	20	1		5	PAH0520	1
4	5	DDVX8101,10	20	1		5	PAH	1
		B0E270151-12 x 10 dln						
4	6	DDVQ2101,10	20	1		5	PAH	1
		B0E270140-1 X 10 DLN						
4	7	DDVQ5101,2	20	1		5	PAH	1
		B0E270140-2 X 2 DLN						
4	8	DDVQ6101	20	1		5	PAH	1
		B0E270140-3						
4	9	DDVQ7101,10	20	1		5	PAH	1
		B0E270140-4 X 10 DLN						

STL North Canton
HP LC System Wednesday, June 07, 1900 08:30:04 by 2899

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
4	10	DDRWA101	20	1	5		PAH	1
		B0E260167-1						
4	11	DDTEK101,10	20	1	5		PAH	1
		B0E260226-1 X 10 DLN						
4	12	DDTF1101,2	20	1	5		PAH	1
		B0E260226-6 X 2 DLN						
4	13	DDTF2101,2	20	1	5		PAH	1
		B0E260226-7 X 2 DLN						
4	14	DE27T101	20	1	5		PAH	1
		0153260/61-B						
5	1	IB	20	1	5		PAH	1
6	3	CCV	20	1	5		PAHCCV	1
7	15	DE27T102	20	1	5		PAH	1
		0153260/61-C						
7	16	DE27T103	20	1	5		PAH	1
		0153260/61-L						
7	17	DDXTQ101	20	1	5		PAH	1
		B0E310110-1						
7	18	DDXTV101	20	1	5		PAH	1
		B0E310110-2						
7	19	DDXTW101	20	1	5		PAH	1
		B0E310110-3						

Sequence: C:\HPCHEM\1\SEQUENCE\[illegible]

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
7	20	DDXTX101	20	1	5		PAH	1
		B0E310110-4						
7	21	DE5TX101	20	1	5		PAH	1
		0155153-B						
7	22	DE5TX102	20	1	5		PAH	1
		0155153-C						
7	23	DDVPN101	20	1	5		PAH	1
		B0E270139-1						
7	24	DDVPN108	20	1	5		PAH	1
		B0E270139-1S						
8	1	IB	20	1	5		PAH	1
9	3	CCV	20	1	5		PAHCCV	1
10	25	DDVPN109	20	1	5		PAH	1
		B0E270139-1D						
10	26	DDVPQ101	20	1	5		PAH	1
		B0E270139-2						
10	27	DDVPV101	20	1	5		PAH	1
		B0E270139-3						
10	28	DDVQR101,10	20	1	5		PAH	1
		B0E270142-1 X 10 DLN						
10	29	DDVR0101	20	1	5		PAH	1
		B0E270142-2						

Dil 1/5

Dil 1/10

1/500

1/50

Sequence: C:\HPCHEM\1\SEQUENCE\

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
10	30	DDVR1101,5	20	1	5		PAH	1
		B0E270142-3 X 5 DLN						
10	31	DDVR3101	20	1	5		PAH	1
		B0E270142-4						
10	32	DDVR4101	20	1	5		PAH	1
		B0E270142-5						
10	33	DDVR6101	20	1	5		PAH	1
		B0E270142-6						
10	34	DDVR8101	20	1	5		PAH	1
		B0E270142-7						
11	1	IB	20	1	5		PAH	1
12	3	CCV	20	1	5		PAHCCV	1

1/50

1/10

1/20

1/10

1/50

Sequence: C:\HPCHEM\1\SEQUENCE\

Operator: 2899

Data Subdirectory: 00608
Part of Methods to run: Acquisition only

Wait Time after loading Method: 0.000 min

Barcode Reader: not available

Sequence Timeout: 60.000 min
Shutdown Cmd/Macro: SHUTDOWN.MAC

Sequence Comment:
STL - Tampa SOP#: HP1001 (8310/610)

Solvent Lot# ACN: N37437 Water: N31276

IS#: 8M273 Level #6: 00-SV-0608 Level #3: 00-SV-0415

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
1	1	IB see previous cal for opening 6/12/2000	20	1		5	PAH	1
2	4	RL	20	1		5	PAH0520	1
3	5	DDV7L103,100	20	1		5	PAH	1
		H0E260287-7 DLN 100						
3	6	~~DEC39102~~ DE3C9102,5 mb 6/9/00	20	1		5	PAH	1
		B0F020109-1 X DLN 5						
3	7	DDXTE102	20	1		5	PAH	1
		B0E310109-1						
3	8	DDXTJ102	20	1		5	PAH	1
		B0E310109-2						
3	9	DDXV4101	20	1		5	PAH	1
		B0E310111-1						

163

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
3	10	DDR70105	20	1	5		PAH	1
A0E260112-1								
3	11	DDR7G105,5	20	1	5		PAH	1
A0E260112-2 X DLN 5 needs 1:1								
3	12	DDR7M106	20	1	5		PAH	1
A0E260112-3								
3	13	DDVR6108	20	1	5		PAH	1
B0E270142-6S X DLN 10								
3	14	DDVR6109	20	1	5		PAH	1
B0E270142-6D X DLN 10								
4	1	IB	20	1	5		PAH	1
5	3	CCV	20	1	5		PAHCCV	1
6	15	DDVR9101	20	1	5		PAH	1
B0E270142-8 needs 1:5								
6	16	DDVRA101,100	20	1	5		PAH	1
B0E270142-9 X DLN 100 needs 1:50								
6	17	DE84T101	20	1	5		PAH	1
0158237-BK								
6	18	DE84T102	20	1	5		PAH	1
0158237-C								
6	19	DDV5V103,5	20	1	5		PAH	1
H0E260286-1 X DLN 5								

164

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
6	20	DDV5V106,5	20	1	5		PAH	1
H0E260286-1S X DLN 5								
6	21	DDV5V107,5	20	1	5		PAH	1
H0E260286-1D X DLN 5								
6	22	DDV60103	20	1	5		PAH	1
H0E260286-2								
6	23	DDV62103	20	1	5		PAH	1
H0E260286-3								
6	24	DDV63103	20	1	5		PAH	1
H0E260286-4								
7	1	IB	20	1	5		PAH	1
8	3	CCV	20	1	5		PAHCCV	1
9	25	DDV65103	20	1	5		PAH	1
H0E260286-5								
9	26	DDV67103	20	1	5		PAH	1
H0E260286-6								
9	27	DDV68103	20	1	5		PAH	1
H0E260286-7								
9	28	DDV69103	20	1	5		PAH	1
H0E260286-8								
9	29	DDV6C103	20	1	5		PAH	1
H0E260286-9								

165

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
9	30	DDV6D103	20	1	5		PAH	1
H0E260286-10								
9	31	DDV6E103	20	1	5		PAH	1
H0E260286-11								
9	32	DDV6G103	20	1	5		PAH	1
H0E260286-12								
9	33	DDVR9101,5	20	1	5		PAH	1
B0E270142-8 X 5 DLN								
9	34	DDVRA101,500	20	1	5		PAH	1
B0E270142-9 X DLN 500								
10	3	CCV	20	1	5		PAHCCV	1

146

:quence: C:\HPCHEM\1\SEQUENCE\00612.S

Operator: 2899

Data Subdirectory: 00612
Part of Methods to run: Acquisition only

Wait Time after loading Method: 0.000 min

Barcode Reader: not available

Sequence Timeout: 60.000 min
Shutdown Cmd/Macro: SHUTDOWN.MAC

Sequence Comment:
STL - Tampa SOP#: HP1001 (8310/610)

Solvent Lot# ACN: N37437 Water: N31276

IS#: 8M273 Level #6: 00-SV-0608 Level #3: 00-SV-0415

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
1	1	IB	20	1	5		PAH	1
2	3	CCV	20	1	5		PAHCCV	1
3	4	RL	20	1	5		PAH0520	1
4	5	DDV6H103	20	1	5		PAH	1
H0E260287-13								
4	6	DDV6J103	20	1	5		PAH	1
H0E260287-14								
4	7	DDV6K103	20	1	5		PAH	1
H0E260287-15								
4	8	DDV6M103	20	1	5		PAH	1
H0E260287-16								
4	9	DDE3C5101	20	1	5		PAH	1
B0F020108-1								

167

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
4	10	DDE3C8101	20	1	5		PAH	1
		B0F020108-3						
4	11	DDR7G105	20	1	5		PAH	1
		A0E260112-2						
4	12	DE9XP101	20	1	5		PAH	1
		0159277/278-BK						
4	13	DE9XP102	20	1	5		PAH	1
		0159277/278-C						
4	14	DE9XP103	20	1	5		PAH	1
		0159277/278-L						
5	1	IB	20	1	5		PAH	1
6	3	CCV	20	1	5		PAHCCV	1
7	15	DE81F101	20	1	5		PAH	1
		B0F060156-1						
7	16	DE7PK101	20	1	5		PAH	1
		B0F060127-1						
7	17	DE7PQ101	20	1	5		PAH	1
		B0F060127-2						
7	18	DE7PV101	20	1	5		PAH	1
		B0F060127-3						
7	19	DE7PX101	20	1	5		PAH	1
		B0F060127-4						

168

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
7	20	DEDG8101	20	1	5		PAH	1
		0160332-BK						
7	21	DEDG8101	20	1	5		PAH	1
		0160332-BK						
7	22	DEDG8102	20	1	5		PAH	1
		0160332-C						
7	23	DE3HK101	20	1	5		PAH	1
		B0F020124-2						
7	24	DE3HN101	20	1	5		PAH	1
		B0F020124-3						
8	1	IB	20	1	5		PAH	1
9	3	CCV	20	1	5		PAHCCV	1
10	25	DE3HR101	20	1	5		PAH	1
		B0F020124-4						
10	26	DE3HW101	20	1	5		PAH	1
		B0F020124-5						
10	27	DE3HW105	20	1	5		PAH	1
		B0F020124-5MS						
10	28	DE3HW106	20	1	5		PAH	1
		B0F020124-5MSD						
10	29	DE3J5101	20	1	5		PAH	1
		B0F020124-8						

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
10	30	DEDET101	20	1	5		PAH	1
		0160329-BK						
10	31	DEDET102	20	1	5		PAH	1
		0160329-C						
10	32	DEDET103	20	1	5		PAH	1
		0160329-L						
10	33	DDR7X103	20	1	5		PAH	1
		A0E260115-1						
10	34	DDR83103	20	1	5		PAH	1
		A0E260115-2						
11	3	CCV	20	1	5		PAHCCV	1
12	1	IB	20	1	5		PAH	1

17d

Operator: 2899

Data Subdirectory: 00613
Part of Methods to run: Acquisition only

Wait Time after loading Method: 0.000 min

Barcode Reader: not available

Sequence Timeout: 60.000 min
Shutdown Cmd/Macro: SHUTDOWN.MAC

Sequence Comment:
STL - Tampa SOP#: HP1001 (8310/610)

Solvent Lot# ACN: N37437 Water: N31276

IS#: 8M273 Level #6: 00-SV-0608 Level #3: 00-SV-0415

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
1	1	IB	20	1	5		PAH	1
2	3	CCV	20	1	5		PAHCCV	1
3	4	RL	20	1	5		PAH0520	1
4	5	DE3C5101,100	20	1	5		PAH	1
B0F020108-1 X DLN 100								
4	6	DE3C8101,50	20	1	5		PAH	1
B0F020108-3 X DLN 50								
4	7	DE3HF101	20	1	5		PAH	1
B0F020124-1								
4	8	DE3HR101	20	1	5		PAH	1
B0F020124-4								
4	9	DE3HW101	20	1	5		PAH	1
B0F020124-5								

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
4	10	DE3HW105	20	1	5		PAH	1
		B0F020124-5MS						
4	11	DE3HW106	20	1	5		PAH	1
		B0F020124-5MSD						
4	12	DE3J5101	20	1	5		PAH	1
		B0F020124-8						
4	13	DEDET101	20	1	5		PAH	1
		0160329-BK						
4	14	DEDET102	20	1	5		PAH	1
		0160329-C						
5	1	IB	20	1	5		PAH	1
6	3	CCV	20	1	5		PAHCCV	1
7	15	DEDET103	20	1	5		PAH	1
		0160329-L						
7	16	DDR7X103	20	1	5		PAH	1
		A0E260115-1						
7	17	DDR83103	20	1	5		PAH	1
		A0E260115-2						
7	18	DDR70107	20	1	5		PAH	1
		A0E260112-1						
7	19	DEFK8101	20	1	5		PAH	1
		0161288-BK						

172

Sample Log Table

Seq. Line	Vial Num.	Sample Name	Sample Amount	Multiplier	ISTD Amount	Cal. Line	Method Name	Inj/ Vial
7	20	DEFK8102	20	1	5		PAH	1
		0161288-C						
7	21	DEDC5101	20	1	5		PAH	1
		B0F080206-1						
7	22	DEDD0101	20	1	5		PAH	1
		B0F080206-2						
7	23	DEDD9101	20	1	5		PAH	1
		B0F080206-3						
7	24	DEDDM101	20	1	5		PAH	1
		B0F080206-5						
8	1	IB	20	1	5		PAH	1
9	3	CCV	20	1	5		PAHCCV	1
10	25	DEDD9107	20	1	5		PAH	1
		B0F080206-3S						
10	26	DEDD9108	20	1	5		PAH	1
		B0F080206-3D						
10	27	TEST	20	1	5		PAH	1
		RESTEK CARBAZOLE 100 PPM						
10	28	TEST	20	1	5		PAH	1
		CHEMSERV CARBAZOLE 100 PPM						
11	3	CCV	20	1	5		PAHCCV	1

173

APPENDIX G

MOBILE LABORATORY ANALYTICAL REPORTS FOR GROUNDWATER

TetraTech NUS

Analytical Data
Mayport NAS, Bldg 436
Jacksonville, FL
5/1/00 - 5/5/00

Method 8260 (ug/L)	436-gw-tw01-01	436-gw-tw02-01	436-gw-tw03-01	436-gw-tw05-01	436-gw-tw06-01	436-gw-tw09-01	436-gw-tw04-01	436-gw-tw07-01
MTBE	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	1.2	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND
m&p-Xylene	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND
dilution factor	1x	1x	1x	1x	1x	1x	1x	1x

Method 8260 (ug/L)	436-gw-tw08-01	436-gw-tw10-01	436-gw-fd01-01					
MTBE	ND	ND	ND					
Benzene	ND	ND	ND					
Toluene	ND	ND	ND					
Ethylbenzene	ND	ND	ND					
m&p-Xylene	ND	ND	ND					
o-Xylene	ND	ND	ND					
Naphthalene	ND	ND	ND					
dilution factor	1x	1x	1x					

Source: KB Labs, Inc.
May 2000

APPENDIX H

LABORATORY ANALYTICAL REPORTS FOR GROUNDWATER

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**Mr. Mark Peterson**	**DATE:**	**January 15, 2001**
FROM:	**Elena Rodriguez**	**COPIES:**	**DV FILE**

SUBJECT: **DATA VALIDATION – VOLATILE ORGANICS**
CTO 0123, NS Mayport
SDG MP035

SAMPLES: 3/Aqueous/

351-GW-MW05-001
436-GW-MW05-001
TRIP BLANK

OVERVIEW

The sample set for CTO 0123, NS Mayport, SDG MP035 consists of 2 aqueous environmental samples and one (1) aqueous field quality control sample. All samples were analyzed for select volatile organic compounds.

The samples were collected by TetraTech NUS on January 4, 2001 and analyzed by Severn Trent Laboratories (STL). All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using SW-846 Method 8260B. The data contained in this SDG were validated with regard to the following parameters:

* • Data completeness
* • Holding times
* • Initial/continuing calibrations
* • Laboratory method and field quality control blank results
* • 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.

Volatile Organics

Samples were analyzed for BTEX (benzene, toluene, ethylbenzene, and total xylenes) and MTBE (methyl tert-butyl ether). All quality control data reported for this fraction were found to be acceptable.

Additional Comments

Positive results below 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: None.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (10/99), and the Navy IRCDQM (9/99) NFESC guidelines. The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."

Elena Rodriguez
Tetra Tech NUS

Elena Rodriguez
Chemist/Data Validator

Mark Petrusa
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

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank contamination
C = Calibration (i.e. %RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS – GFAA MSAs r<0.995
K = ICP Interference – Include ICSAB %Rs
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (I.E. base-time drifting)
P = Uncertainty near detection limit (<2 x IDL for Inorganics and < CRQL for Organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-Linear calibrations, tuning r< 0.995 (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO123-NS MAYPORT
WATER DATA
QUANTERRA
SDG: MP035

SAMPLE NUMBER:	351-GW-MW05-001			436-GW-MW05-001			TRIP BLANK					
SAMPLE DATE:	01/04/01			01/04/01			01/04/01			/ /		
LABORATORY ID:	A1A050149002			A1A050149001			A1A050149003					
QC_TYPE:	NORMAL			NORMAL			TRIP BLANK					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
BENZENE	3.7	J	P	1	U							
ETHYLBENZENE	87			1	U							
METHYL TERT-BUTYL ETHER	50	U		5	U							
TOLUENE	20			1	U							
XYLENES, TOTAL	500			1	U							

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP035

Matrix: (soil/water) WG Lab Sample ID:A1A050149 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 01/05/01
Work Order: DR9Q61AA Date Extracted:01/08/01
Dilution factor: 1 Date Analyzed: 01/08/01
Moisture %:

QC Batch: 1009151

Client Sample Id: 436-GW-MW05-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-43-2	Benzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
108-88-3	Toluene	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP035

Matrix: (soil/water) WG Lab Sample ID:A1A050149 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 01/05/01
Work Order: DR9Q91AA Date Extracted:01/08/01
Dilution factor: 10 Date Analyzed: 01/08/01
Moisture %:

QC Batch: 1009151

Client Sample Id: 351-GW-MW05-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-43-2	Benzene	3.7	J
100-41-4	Ethylbenzene	87	
108-88-3	Toluene	20	
1330-20-7	Xylenes (total)	500	
1634-04-4	Methyl tert-butyl ether	50	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP035

Matrix: (soil/water) WQ Lab Sample ID:A1A050149 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 01/05/01
Work Order: DR9RA1AA Date Extracted:01/08/01
Dilution factor: 1 Date Analyzed: 01/08/01
Moisture %:

QC Batch: 1009151

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-43-2	Benzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
108-88-3	Toluene	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U

FORM I

APPENDIX C

SUPPORT DOCUMENTATION

MP035

HOLDING TIME

01/11/01

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
UG/L	351-GW-MW05-001	A1A050149002	NORMAL	MP035	BTEX	01/04/01	01/08/01	01/08/01	4	0	4
UG/L	436-GW-MW05-001	A1A050149001	NORMAL	MP035	BTEX	01/04/01	01/08/01	01/08/01	4	0	4
UG/L	TRIP BLANK	A1A050149003	TRIP BLANK	MP035	BTEX	01/04/01	01/08/01	01/08/01	4	0	4

SDG NARRATIVE
MP035

The following report contains the analytical results for two water samples and one quality control sample submitted to STL North Canton by Tetra Tech NUS, Inc. from the NS Mayport Bldg 436 site. The samples were received January 5, 2000, according to documented sample acceptance procedures.

This SDG consists of one (1) laboratory IDs: A1A050149.

STL North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated.

Please refer to individual analytical sections for laboratory specific narratives.

SAMPLE RECEIVING

The temperature of the cooler upon sample receipt was 0.7° C. The samples were received in wet ice.

SDG NARRATIVE
MP035

GC/MS VOLATILES

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Sample(s) that contain results between the MDL and the RL were flagged with "J". There is the possibility of false positive or mis-identification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation was performed only down to the standard reporting limit (SRL). The acceptance criteria for QC samples may not be met at these quantitation levels.

Holding Time Violations

All samples were prepared and analyzed within the method-specified holding time requirements.

Method Blank Contamination

All analytes in the method blank were less than the associated reporting limits.

MS/MSD/LCS/DCS and Surrogates Outside of QC Criteria

All spike recovery and RPD data met method-specific quality control criteria.

Calibrations

All calibrations and calibration verifications met method-specific quality control criteria.

Chain of Custody Record

Quanterra

QUA-4124 0797

Client	Project Manager	Date	Chain of Custody Number
TTNUS	Mark Peterson	1-4-00	45804
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 1 of 1**
7018 AC Skinner Pkwy, Ste 250	904/281-0400 904/281-0070		

City	State	Zip Code	Site Contact	Lab Contact
Jacksonville	FL	32256		Denise Pohl

Project Name	Carrier/Waybill Number
NS Mayport Bldg 436	FedEx

Contract/Purchase Order/Quote No.

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Aqueous	Sed.	Soil		Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH		Analysis (Attach list if more space is needed): BTEX + MTBE Method 602										Special Instructions/ Conditions of Receipt
436-GW-MW05-001	1-4-00		X							X				X										Cool to 4°C
351-GW-MW05-001	1-4-00		X							X				X										
TRIP BLANK	1-4-00	–	X							X														*Results to be delivered by 1/12/01 per Denise Pohl.

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other By Jan 12*

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By	1-4-01	1700	1. Received By	1/5/01	950
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

STL North Canton

11

TETRA TECH NUS, INC.
METHOD BLANK COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP035

Matrix: (soil/water) WATER Lab Sample ID:A1A090000 151
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 01/05/01
Work Order: DTD2G1AA Date Extracted:01/08/01
Dilution factor: 1 Date Analyzed: 01/08/01
Moisture %:NA

QC Batch: 1009151

Client Sample Id: INTRA-LAB BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-43-2	Benzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
108-88-3	Toluene	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U

FORM I

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**Mr. Mark Peterson**	**DATE:**	**December 22, 2000**
FROM:	**Elena Rodriguez**	**COPIES:**	**DV FILE**
SUBJECT:	**INORGANIC DATA VALIDATION - METALS** **CTO 123, NS Mayport** **SDG MP027**		
SAMPLES:	1/Aqueous/ 436-GW-MW04-001		

OVERVIEW

The sample set for CTO 123, NS Mayport, SDG MP027 consists of 1 aqueous environmental sample. The sample was analyzed for lead.

The sample was collected by TetraTech NUS on November 2, 2000 and analyzed by Accutest Laboratories. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using the following analytical and reporting protocols: SW-846 Method 6010B. The data contained in this SDG were validated with regard to the following parameters:

* • Data completeness
* • Holding times
* • Initial/continuing calibrations
* • Laboratory method and field quality control blank results
* • 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.

Metals
All quality control data reported for this fraction were found to be acceptable.

EXECUTIVE SUMMARY

Laboratory Performance Issues: None.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1994, and the NFESC document entitles "Navy IRCDQM", September 1999. The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."

Elena Rodriguez

Tetra Tech NUS, Inc.

Elena Rodriguez

Tetra Tech NUS, Inc.

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

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank contamination
C = Calibration (i.e. %RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS – GFAA MSAs r<0.995
K = ICP Interference – Include ICSAB %Rs
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (I.E. base-time drifting)
P = Uncertainty near detection limit (<2 x IDL for Inorganics and < CRQL for Organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-Linear calibrations, tuning r< 0.995 (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO123 - NS MAYPORT
WATER DATA
QUANTERRA
SDG: MP027

SAMPLE NUMBER:	436-GW-MW04-001			
SAMPLE DATE:	11/02/00	/ /	/ /	/ /
LABORATORY ID:	A0K030230001			
QC_TYPE:	NORMAL			
% SOLIDS:	0.0 %	100.0 %	100.0 %	100.0 %
UNITS:	UG/L			
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
LEAD	1.3	U										

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DPA3F **Client ID:** 436-GW-MW04-001

Matrix: Water **Units:** ug/L **Prep Date:** 11/15/00 **Prep Batch:** 0319285

Weight: NA **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Lead	220.35	1.3	3.0	1.3	U	1	ICPST	11/15/00	23:58

Comments: Lot #: A0K030230 Sample #: 1

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 1 Equivalent

APPENDIX C

SUPPORT DOCUMENTATION

MP027

HOLDING TIME
12/12/00

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
UG/L	436-GW-MW04-001	A0K030230001	NORMAL	MP027	M	11/02/00	11/15/00	11/15/00	13	0	13
UG/L	436-GW-MW04-001	A0K030230001	NORMAL	MP027	OV	11/02/00	11/14/00	11/15/00	12	1	13
UG/L	TRIP BLANK	A0K030230002	NORMAL	MP027	OV	11/02/00	11/14/00	11/14/00	12	0	12
UG/L	436-GW-MW04-001	A0K030230001	NORMAL	MP027	PAH	11/02/00	11/06/00	11/09/00	4	3	7
MG/L	436-GW-MW04-001	A0K030230001	NORMAL	MP027	TPH	11/02/00	11/08/00	11/27/00	6	19	25

Chain of Custody Record

Quanterra

QUA-4124 0797

2.0°C

Client: TETRA TECH NUS	Project Manager: MARK PETERSON	Date: 11-2-00	Chain of Custody Number: 45607
Address: 7018 A C SKINNER PKWY SUITE 250	Telephone Number (Area Code)/Fax Number: 904-281-0400	Lab Number:	Page 1 of 1
City: JACKSONVILLE; State: FL; Zip Code: 32256	Site Contact:	Lab Contact: DENISE POLE	
Project Name: NS MAYPORT Bldg. 436	Carrier/Waybill Number: FedEx 7923 8013 4187		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Aqueous	Sed.	Soil		Containers & Preservatives: Unpres.	H_2SO_4	HNO_3	HCl	NaOH	Zn-Ac/NaOH		Analysis (Attach list if more space is needed): 601, 602	8310	FL PRO	504	LEAD								Special Instructions/ Conditions of Receipt
436-GW-MW04-001	11/2/00	1142	X				2		1	8				X	X	X	X	X								Cool to 4°C
TRIP BLANK	11/2/00	—	X											X												

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☒ 14 Days ☐ 21 Days ☐ Other ____

QC Requirements (Specify):

	Date	Time		Date	Time
1. Relinquished By	11-2-00	1700	1. Received By	11/3/00	905
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments: Temp 2.0°C

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

STL North Canton

SDG NARRATIVE
MP027

The following report contains the analytical results for one water sample and one quality control sample submitted to STL North Canton by Tetra Tech NUS, Inc. from the NS Mayport BLDG. 436 site. The samples were received November 3, 2000, according to documented sample acceptance procedures.

This SDG consists of one (1) laboratory ID: A0K030230.

Samples submitted for Volatile Organics 504.1, TPH FL-PRO and PAH were analyzed at the STL Tampa facility.

STL North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. Preliminary results were provided to Alan Pate on November 27, 2000.

Please refer to individual analytical sections for laboratory specific narratives.

SAMPLE RECEIVING

The temperature of the cooler upon sample receipt was 2.0° C.

SDG NARRATIVE
MP027

METALS

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Holding Time Violations

All samples were prepared and analyzed within the method-specified holding time requirements.

Method Blank Contamination

All analytes in the method blank were less than the associated reporting limits.

MS/MSD/LCS/DCS and Surrogates Outside of QC Criteria

All spike recovery and RPD data met method-specific quality control criteria.

Calibrations

All calibrations and calibration verifications met method-specific quality control criteria.

STL North Canton

Metals Data Reporting Form

Initial Calibration Blank Results

Instrument: ICPST **Units:** ug/L

Chart Number: i61115a.arc

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	ICB 11/15/00 9:23 AM									
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Lead	220.353	3	1.3	U								

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Continuing Calibration Blank Results

Instrument: ICPST **Units:** ug/L

Chart Number: i61115a.arc

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	CCB 11/15/00 9:52 AM		CCB 11/15/00 11:50 AM		CCB 11/15/00 12:52 PM		CCB 11/15/00 1:56 PM		CCB 11/15/00 2:59 PM	
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Lead	220.353	3	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Continuing Calibration Blank Results

Instrument: ICPST **Units:** ug/L

Chart Number: i61115a.arc

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	CCB 11/15/00 4:04 PM		CCB 11/15/00 5:07 PM		CCB 11/15/00 6:09 PM		CCB 11/15/00 6:28 PM		CCB 11/15/00 8:39 PM	
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Lead	220.353	3	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Continuing Calibration Blank Results

Instrument: ICPST **Units:** ug/L

Chart Number: i61115a.arc

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	CCB 11/15/00 9:44 PM		CCB 11/15/00 10:49 PM		CCB 11/15/00 11:52 PM		CCB 11/16/00 12:59 AM			
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Lead	220.353	3	1.3	U	1.3	U	1.3	U	1.3	U		

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Preparation Blank Results

Lab Sample ID: DPTGQB

Matrix: Water **Units:** ug/L **Prep Date:** 11/15/00 **Prep Batch:** 0319285

Weight: NA **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Lead	220.353	1.3	3.0	1.3	U	1	ICPST	11/15/00	23:34

Comments: Lot #: A0K030230

Version 4.10.5

U Result is less than the IDL

B Result is between IDL and RL

Form 3 Equivalent

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**Mr. Mark Peterson**	**DATE:**	**January 12, 2001**
FROM:	**Elena Rodriguez**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION - METALS**
CTO 123, NS Mayport
SDG MP030

SAMPLES:

2/Aqueous/	4/Soil/
436-GW-MW05-001	MPT-436-SS11-02'
351-GW-MW05-001	MPT-436-SS11-06'
	MPT-436-SS12-02'
	MPT-436-SS13-06'

OVERVIEW

The sample set for CTO 123, NS Mayport, SDG MP030 consists of 2 aqueous environmental samples and 4 soil environmental samples. All samples were analyzed lead.

The sample was collected by TetraTech NUS on November 29-30, 2000 and analyzed by Accutest Laboratories. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using the following analytical and reporting protocols: SW-846 Method 6010B. The data contained in this SDG were validated with regard to the following parameters:

* • Data completeness
* • Holding times
* • Initial/continuing calibrations
* • Laboratory method and quality control blank results
* • 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.

Metals
All quality control data reported for this fraction were found to be acceptable.

EXECUTIVE SUMMARY

Laboratory Performance Issues: None.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1994, and the NFESC document entitles "Navy IRCDQM", September 1999. The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."

Elena Rodriguez
Tetra Tech NUS, Inc.

Elena Rodriguez

Tetra Tech NUS, Inc.

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

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank contamination
C = Calibration (i.e. %RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS – GFAA MSAs r<0.995
K = ICP Interference – Include ICSAB %Rs
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (I.E. base-time drifting)
P = Uncertainty near detection limit (<2 x IDL for Inorganics and < CRQL for Organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-Linear calibrations, tuning r< 0.995 (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO123-NS MAYPORT
WATER DATA
QUANTERRA
SDG: MP030

SAMPLE NUMBER:	351-GW-MW05-001			436-GW-MW05-001								
SAMPLE DATE:	11/30/00			11/30/00			/ /			/ /		
LABORATORY ID:	A0L010208002			A0L010208001								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	0.0 %			0.0 %			100.0 %			100.0 %		
UNITS:	UG/L			UG/L								
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
LEAD	1.9	U		1.9	U							

CTO123-NS MAYPORT
SOIL DATA
QUANTERRA
SDG: MP030

SAMPLE NUMBER:	MPT-436-SS11-02'	MPT-436-SS11-06'	MPT-436-SS12-02'	MPT-436-SS13-06'
SAMPLE DATE:	11/29/00	11/29/00	11/29/00	11/29/00
LABORATORY ID:	A0K300158001	A0K300158002	A0K300158003	A0K300158004
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	90.5 %	88.0 %	94.7 %	84.0 %
UNITS:	MG/KG	MG/KG	MG/KG	MG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
LEAD	5.9			4.0			7.3			0.67		

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DQNNE **Client ID:** 351-GW-MW05-001

Matrix: Water **Units:** ug/L **Prep Date:** 12/11/00 **Prep Batch:** 0343200

Weight: NA **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Lead	220.35	1.9	3.0	1.9	U	1	ICPST	12/11/00	23:03

Comments:

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 1 Equivalent

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DQNNA **Client ID:** 436-GW-MW05-001

Matrix: Water **Units:** ug/L **Prep Date:** 12/11/00 **Prep Batch:** 0343200

Weight: NA **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Lead	220.35	1.9	3.0	1.9	U	1	ICPST	12/11/00	22:48

Comments:

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 1 Equivalent

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DQKF4 **Client ID:** MPT-436-SS11-02'

Matrix: Soil **Units:** mg/kg **Prep Date:** 12/11/00 **Prep Batch:** 0343203

Weight: 1.00 **Volume:** 100 **Percent Moisture:** 9.5

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Lead	220.35	0.21	0.33	5.9		1	ICPST	12/11/00	21:49

Comments: Lot #: A0K300158 Sample #: 1

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 1 Equivalent

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DQKF7 **Client ID:** MPT-436-SS11-06'

Matrix: Soil **Units:** mg/kg **Prep Date:** 12/11/00 **Prep Batch:** 0343203

Weight: 1.00 **Volume:** 100 **Percent Moisture:** 12.1

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Lead	220.35	0.22	0.34	4.0		1	ICPST	12/11/00	22:05

Comments: Lot #: A0K300158 Sample #: 2

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 1 Equivalent

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DQKF8 **Client ID:** MPT-436-SS12-02'

Matrix: Soil **Units:** mg/kg **Prep Date:** 12/11/00 **Prep Batch:** 0343203

Weight: 1.00 **Volume:** 100 **Percent Moisture:** 5.3

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Lead	220.35	0.20	0.32	7.3		1	ICPST	12/11/00	22:14

Comments: Lot #: A0K300158 Sample #: 3

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 1 Equivalent

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DQKF9 **Client ID:** MPT-436-SS13-06'

Matrix: Soil **Units:** mg/kg **Prep Date:** 12/11/00 **Prep Batch:** 0343203

Weight: 1.00 **Volume:** 100 **Percent Moisture:** 16.4

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Lead	220.35	0.23	0.36	0.67		1	ICPST	12/11/00	22:19

Comments: Lot #: A0K300158 Sample #: 4

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 1 Equivalent

APPENDIX C

SUPPORT DOCUMENTATION

SDG NARRATIVE
MP030

The following report contains the analytical results for two water samples, four solid samples, and two quality control samples submitted to STL North Canton by Tetra Tech NUS, Inc. from the NS Mayport-Bldg. 436 Site. The samples were received November 30 and December 1 2000, according to documented sample acceptance procedures.

FL-PRO and 8310 analyses were performed at STL's Tampa, Florida facility.

STL North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. Preliminary results were provided by electronic mail to Alan Pate on December 11, 2000.

Please refer to individual analytical sections for laboratory specific narratives.

SAMPLE RECEIVING

The cooler was received at the laboratory at a temperature of 3.2° C.

Samples 436-GW-MW05-001, 351-GW-MW05-001, and TRIP BLANK for Volatile analyses were mistakenly stored in the GCS cooler. Samples were given to MS immediately upon discovery.

MP030

HOLDING TIME
01/04/01

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
UG/L	351-GW-MW05-001	A0L010208002	NORMAL	MP030	BTEX	11/30/00	12/20/00	12/20/00	20	0	20
UG/L	436-GW-MW05-001	A0L010208001	NORMAL	MP030	BTEX	11/30/00	12/20/00	12/20/00	20	0	20
UG/KG	MPT-436-SS11-02'	A0K300158001	NORMAL	MP030	BTEX	11/29/00	12/05/00	12/05/00	6	0	6
UG/KG	MPT-436-SS11-06'	A0K300158002	NORMAL	MP030	BTEX	11/29/00	12/05/00	12/05/00	6	0	6
UG/KG	MPT-436-SS12-02'	A0K300158003	NORMAL	MP030	BTEX	11/29/00	12/06/00	12/06/00	7	0	7
UG/KG	MPT-436-SS13-06'	A0K300158004	NORMAL	MP030	BTEX	11/29/00	12/05/00	12/05/00	6	0	6
UG/L	TRIP BLANK	A0L010208003	TRIP BLANK	MP030	BTEX	11/30/00	12/20/00	12/20/00	20	0	20
UG/L	TRIP BLANK1	A0K300158005	TRIP BLANK	MP030	BTEX	11/29/00	12/01/00	12/01/00	2	0	2
UG/L	351-GW-MW05-001	A0L010208002	NORMAL	MP030	M	11/30/00	12/11/00	12/11/00	11	0	11
UG/L	436-GW-MW05-001	A0L010208001	NORMAL	MP030	M	11/30/00	12/11/00	12/11/00	11	0	11
MG/KG	MPT-436-SS11-02'	A0K300158001	NORMAL	MP030	M	11/29/00	12/11/00	12/11/00	12	0	12
MG/KG	MPT-436-SS11-06'	A0K300158002	NORMAL	MP030	M	11/29/00	12/11/00	12/11/00	12	0	12
MG/KG	MPT-436-SS12-02'	A0K300158003	NORMAL	MP030	M	11/29/00	12/11/00	12/11/00	12	0	12
MG/KG	MPT-436-SS13-06'	A0K300158004	NORMAL	MP030	M	11/29/00	12/11/00	12/11/00	12	0	12
UG/L	351-GW-MW05-001	A0L010208002	NORMAL	MP030	OV	11/30/00	12/14/00	12/15/00	14	1	15
UG/L	436-GW-MW05-001	A0L010208001	NORMAL	MP030	OV	11/30/00	12/14/00	12/15/00	14	1	15
UG/L	351-GW-MW05-001	A0L010208002	NORMAL	MP030	PAH	11/30/00	12/04/00	12/07/00	4	3	7
UG/L	436-GW-MW05-001	A0L010208001	NORMAL	MP030	PAH	11/30/00	12/04/00	12/06/00	4	2	6
UG/KG	MPT-436-SS11-02'	A0K300158001	NORMAL	MP030	PAH	11/29/00	12/13/00	12/15/00	14	2	16
UG/KG	MPT-436-SS11-06'	A0K300158002	NORMAL	MP030	PAH	11/29/00	12/13/00	12/18/00	14	5	19
UG/KG	MPT-436-SS12-02'	A0K300158003	NORMAL	MP030	PAH	11/29/00	12/13/00	12/15/00	14	2	16
UG/KG	MPT-436-SS13-06'	A0K300158004	NORMAL	MP030	PAH	11/29/00	12/13/00	12/15/00	14	2	16
MG/L	351-GW-MW05-001	A0L010208002	NORMAL	MP030	TPH	11/30/00	12/04/00	12/06/00	4	2	6
MG/L	436-GW-MW05-001	A0L010208001	NORMAL	MP030	TPH	11/30/00	12/04/00	12/06/00	4	2	6

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
MG/KG	MPT-436-SS11-02'	A0K300158001	NORMAL	MP030	TPH	11/29/00	12/11/00	12/16/00	12	5	17
MG/KG	MPT-436-SS11-06'	A0K300158002	NORMAL	MP030	TPH	11/29/00	12/11/00	12/16/00	12	5	17
MG/KG	MPT-436-SS12-02'	A0K300158003	NORMAL	MP030	TPH	11/29/00	12/11/00	12/16/00	12	5	17
MG/KG	MPT-436-SS13-06'	A0K300158004	NORMAL	MP030	TPH	11/29/00	12/11/00	12/16/00	12	5	17

SDG NARRATIVE
MP030

METALS

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Holding Time Violation

All samples were prepared and analyzed within the method-specified holding time requirements.

Method Blank Contamination

All analytes in the method blank were less than the associated reporting limits.

MS/MSD/LCS/DCS Outside of QC Criteria

All spike recovery and RPD data met method-specific quality control criteria.

Calibrations

All calibrations and calibration verifications met method-specific quality control criteria.

Chain of Custody Record

SEVERN TRENT SERVICES

Severn Trent Laboratories, Inc.

STL-4124 (0700)

Client: TETRA TECH NUS	Project Manager: MARK PETERSON	Date: 11/30/00	Chain of Custody Number: 030548
Address: 7018 AC SKINNER PKWY SUITE 250	Telephone Number (Area Code)/Fax Number: 904-281-0400 / 904-281-0070	Lab Number:	Page 1 of 1
City: JACKSONVILLE; State: FL; Zip Code: 32256	Site Contact:	Lab Contact: DENISE POHL	
Project Name and Location (State): NS MAYPORT Bldg. 436	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.:			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	601, 602	8310	FLOTRO	504	LEAD	Special Instructions/ Conditions of Receipt
436-GW-MW05-001	11/30/00	0708		X			7		1	3			X	X	X	X	X	COOL TO 4°C
351-GW-MW05-001	11/30/00	0820		X			7		1	3			X	X	X	X	X	
TRIP BLANK	11/30/00	-		X									X					REFER TO ATTACHED TABLE A & B FOR PARAMETER INFO

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☒ 14 Days ☐ 21 Days ☐ Other_____

QC Requirements (Specify):

	Date	Time		Date	Time
1. Relinquished By: Alan Pate	11/30/00	1600	1. Received By: Anne Sanders	12-1-00	910 AM
2. Relinquished By:			2. Received By:		
3. Relinquished By:			3. Received By:		

Comments: 3.0°C

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

STL North Cam 13

Chain of Custody Record

SEVERN TRENT SERVICES

Severn Trent Laboratories, Inc.

STL-4124 (0700)

Client: TETRA TECH NUS	Project Manager: MARK PETERSON	Date: 11/29/00	Chain of Custody Number: 030549
Address: 7018 AC SKINNER PKWY SUITE 250	Telephone Number (Area Code)/Fax Number: 904-281-0400 / 904-281-0070	Lab Number:	Page 1 of 1
City: JACKSONVILLE; State: FL; Zip Code: 32256	Site Contact:	Lab Contact: DENISE POHL	
Project Name and Location (State): NS MAYPORT - Bldg. 436	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.:			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil		Containers & Preservatives: Unpres.	H2SO4	HNOS	HCl	NaOH	ZnAc/NaOH	Analysis (Attach list if more space is needed): VOCs 8260*	PAH 8310**	METALS (LEAD)	FLO PRO	Special Instructions/ Conditions of Receipt
MPT-436-SS11-02'	11/29/00	1015				X		5						X	X	X	X	COOL TO 4° C
MPT-436-SS11-06'	11/29/00	1030				X		5						X	X	X	X	
MPT-436-SS12-02'	11/29/00	1050				X		5						X	X	X	X	*8260-ONLY
MPT-436-SS13-06'	11/29/00	1110				X		5						X	X	X	X	BTEX AND MTBE
TRIP BLANK	11/29/00	—												X				**SEE ATTACHED
																		TABLE A FOR PAH
																		REQUIREMENTS

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☒ 14 Days ☐ 21 Days ☐ Other_____

QC Requirements (Specify):

1. Relinquished By: Alan L Pate	Date: 11/29/00	Time: 1600	1. Received By:	Date:	Time:
2. Relinquished By:	Date:	Time:	2. Received By: Anthony R. Reed	Date: 11-30-00	Time: 9:10 AM
3. Relinquished By:	Date:	Time:	3. Received By:	Date:	Time:

Comments: 0.8°C

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

STL North Canton

STL North Canton

Metals Data Reporting Form

Initial Calibration Blank Results

Instrument: ICPST **Units:** ug/L

Chart Number: i51211a.arc

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	ICB 12/11/00 10:28 AM									
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Lead	220.353	3	1.9	U								

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Continuing Calibration Blank Results

Instrument: ICPST **Units:** ug/L

Chart Number: i51211a.arc

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	CCB 12/11/00 10:56 AM		CCB 12/11/00 11:44 AM		CCB 12/11/00 12:47 PM		CCB 12/11/00 1:48 PM		CCB 12/11/00 2:51 PM	
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Lead	220.353	3	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Continuing Calibration Blank Results

Instrument: ICPST **Units:** ug/L

Chart Number: i51211a.arc

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	CCB 12/11/00 3:54 PM		CCB 12/11/00 4:56 PM		CCB 12/11/00 5:59 PM		CCB 12/11/00 7:08 PM		CCB 12/11/00 8:37 PM	
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Lead	220.353	3	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Continuing Calibration Blank Results

Instrument: ICPST **Units:** ug/L

Chart Number: i51211a.arc

Standard Source: _____ **Standard ID:** _____

Element	WL/ Mass	Report Limit	CCB 12/11/00 9:39 PM		CCB 12/11/00 10:43 PM		CCB 12/11/00 11:47 PM					
			Found	Q	Found	Q	Found	Q	Found	Q	Found	Q
Lead	220.353	3	1.9	U	1.9	U	1.9	U				

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Preparation Blank Results

Lab Sample ID: DQ3VTB

Matrix: Water **Units:** ug/L **Prep Date:** 12/11/00 **Prep Batch:** 0343200

Weight: NA **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Lead	220.353	1.9	3.0	1.9	U	1	ICPST	12/11/00	22:26

Comments:

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

STL North Canton

Metals Data Reporting Form

Preparation Blank Results

Lab Sample ID: DQ3V1B

Matrix: Soil **Units:** mg/kg **Prep Date:** 12/11/00 **Prep Batch:** 0343203

Weight: 1.00 **Volume:** 100 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Lead	220.353	0.19	0.30	0.19	U	1	ICPST	12/11/00	21:28

Comments:

Version 4.10.5

U Result is less than the IDL
B Result is between IDL and RL

Form 3 Equivalent

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO: **Mr. Mark Peterson** **DATE:** **December 22, 2000**

FROM: **Elena Rodriguez** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION**
CTO 0123, NS Mayport
SDG MP027

SAMPLES: 1/Aqueous/

436-GW-MW04-001
TRIP BLANK

OVERVIEW

The sample set for CTO 0123, NS Mayport, SDG MP027 consists of 1 aqueous environmental sample and 1 aqueous field quality control sample. The environmental sample was analyzed for volatile organic compounds, ethylene dibromide, polynuclear aromatic hydrocarbons, and total recoverable petroleum hydrocarbons.

The sample was collected by TetraTech NUS on November 2, 2000 and analyzed by Severn Trent Laboratories (STL). All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using the following analytical and reporting protocols: SW-846 Methods 8260B, 504.1, 8310, and FL DEP PRO. The data contained in this SDG were validated with regard to the following parameters:

* • Data completeness
* • Holding times
* • Initial/continuing calibrations
• Laboratory method and field quality control blank results
* • 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.

Volatile Organics

Two analytical methods were performed: GC/MS by EPA 8260B and GC by EPA 504.1.

In the 8260B analysis, the following compound was detected in the field quality control blank (trip blank):

Compound	Maximum Concentration	Blank Action Level
Methylene Chloride	1.2 ug/L	6.0 ug/L

Sample aliquot and dilution factors were taken into consideration when applying the blank action level.

Positive results for Methylene Chloride below the blank action level were qualified as nondetected, U.

All quality control data reported by 504.1 for Ethylene Dibromide (EDB) were found to be acceptable.

Polynuclear Aromatic Hydrocarbons

All quality control data reported for this fraction were found to be acceptable.

Petroleum Hydrocarbons

All quality control data reported for this fraction were found to be acceptable.

Additional Comments

Positive results below the reporting limit (RL) were qualified as estimated, J, due to uncertainty near the detection limit.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Several compounds were detected in the laboratory and field blanks.

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 Navy IRCDQM (9/99) NFESC guidelines. The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."

Elena Rodriguez
Tetra Tech NUS, Inc.

Elena Rodriguez

Tetra Tech NUS, Inc.

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

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank contamination
C = Calibration (i.e. %RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS – GFAA MSAs r<0.995
K = ICP Interference – Include ICSAB %Rs
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (I.E. base-time drifting)
P = Uncertainty near detection limit (<2 x IDL for Inorganics and < CRQL for Organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-Linear calibrations, tuning r< 0.995 (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO123 - NS MAYPORT
WATER DATA
QUANTERRA
SDG: MP027

SAMPLE NUMBER:	436-GW-MW04-001	TB110200		
SAMPLE DATE:	11/02/00	11/02/00	/ /	/ /
LABORATORY ID:	A0K030230001	A0K030230002		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U							
1,1,2,2-TETRACHLOROETHANE	1	U		1	U							
1,1,2-TRICHLOROETHANE	1	U		1	U							
1,1-DICHLOROETHANE	1	U		1	U							
1,1-DICHLOROETHENE	1	U		1	U							
1,2-DIBROMOETHANE	0.02	U		1	U							
1,2-DICHLOROETHANE	1	U		1	U							
1,2-DICHLOROETHENE (TOTAL)	1	U		1	U							
1,2-DICHLOROPROPANE	1	U		1	U							
ACROLEIN	20	U		20	U							
ACRYLONITRILE	20	U		20	U							
BENZENE	1	U		1	U							
BROMODICHLOROMETHANE	1	U		1	U							
BROMOFORM	1	U		1	U							
BROMOMETHANE	2	U		2	U							
CARBON TETRACHLORIDE	1	U		1	U							
CHLOROBENZENE	1	U		1	U							
CHLOROETHANE	2	U		2	U							
CHLOROFORM	1	U		1	U							
CHLOROMETHANE	2	U		2	U							
CIS-1,3-DICHLOROPROPENE	1	U		1	U							
DIBROMOCHLOROMETHANE	1	U		1	U							
ETHYLBENZENE	1	U		1	U							
METHYL TERT-BUTYL ETHER	5	U		5	U							
METHYLENE CHLORIDE	1	U	A	1.2								
TETRACHLOROETHENE	1	U		1	U							
TOLUENE	0.32	J	P	1	U							
TRANS-1,2-DICHLOROETHENE	0.5	U		0.5	U							
TRANS-1,3-DICHLOROPROPENE	1	U		1	U							
TRICHLOROETHENE	1	U		1	U							
VINYL CHLORIDE	1	U		1	U							
XYLENES, TOTAL	1	U		1	U							

CTO123 - NS MAYPORT
WATER DATA
QUANTERRA
SDG: MP027

SAMPLE NUMBER:	436-GW-MW04-001			
SAMPLE DATE:	11/02/00	/ /	/ /	/ /
LABORATORY ID:	A0K030230001			
QC_TYPE:	NORMAL			
% SOLIDS:	0.0 %	100.0 %	100.0 %	100.0 %
UNITS:	UG/L			
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	2	U										
2-METHYLNAPHTHALENE	2	U										
ACENAPHTHENE	1	U										
ACENAPHTHYLENE	1	U										
ANTHRACENE	1	U										
BENZO(A)ANTHRACENE	0.1	U										
BENZO(A)PYRENE	0.1	U										
BENZO(B)FLUORANTHENE	0.1	U										
BENZO(G,H,I)PERYLENE	0.1	U										
BENZO(K)FLUORANTHENE	0.3	U										
CHRYSENE	0.1	U										
DIBENZO(A,H)ANTHRACENE	0.1	U										
FLUORANTHENE	0.2	U										
FLUORENE	2	U										
INDENO(1,2,3-CD)PYRENE	0.1	U										
NAPHTHALENE	2	U										
PHENANTHRENE	1	U										
PYRENE	0.1	U										

CTO123 - NS MAYPORT
WATER DATA
QUANTERRA
SDG: MP027

SAMPLE NUMBER:	436-GW-MW04-001			
SAMPLE DATE:	11/02/00	/ /	/ /	/ /
LABORATORY ID:	A0K030230001			
QC_TYPE:	NORMAL			
% SOLIDS:	0.0 %	100.0 %	100.0 %	100.0 %
UNITS:	MG/L			
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PETROLEUM HYDROCARBONS												
TOTAL PETROLEUM HYDROCARBONS	0.29	J	P									

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP027

Matrix: (soil/water) WG Lab Sample ID:A0K030230 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 11/03/00
Work Order: DPA3F1AE Date Extracted:11/14/00
Dilution factor: 1 Date Analyzed: 11/14/00
Moisture %:

QC Batch: 0320164

Client Sample Id: 436-GW-MW04-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
107-02-8	Acrolein	20	U
107-13-1	Acrylonitrile	20	U
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	2.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
75-00-3	Chloroethane	2.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	2.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
540-59-0	1,2-Dichloroethene (total)	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U
75-09-2	Methylene chloride	0.27	J
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	0.32	J
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP027

Matrix: (soil/water) WG Lab Sample ID:A0K030230 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 11/03/00
Work Order: DPA3F1AE Date Extracted:11/14/00
Dilution factor: 1 Date Analyzed: 11/14/00
Moisture %:

QC Batch: 0320164

Client Sample Id: 436-GW-MW04-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U
106-93-4	1,2-Dibromoethane (EDB)	1.0	U
67-64-1	Acetone	1.5	J
75-15-0	Carbon disulfide	1.0	U
78-93-3	2-Butanone	10	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
100-42-5	Styrene	1.0	U
156-59-2	cis-1,2-Dichloroethene	0.50	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP027

Matrix: (soil/water) WG Lab Sample ID:A0K030230 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 11/03/00
Work Order: DPA3P1AA Date Extracted:11/14/00
Dilution factor: 1 Date Analyzed: 11/14/00
Moisture %:

QC Batch: 0320164

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
107-02-8	Acrolein	20	U
107-13-1	Acrylonitrile	20	U
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	2.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
75-00-3	Chloroethane	2.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	2.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
540-59-0	1,2-Dichloroethene (total)	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U
75-09-2	Methylene chloride	1.2	
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP027

Matrix: (soil/water) WG Lab Sample ID:A0K030230 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 11/03/00
Work Order: DPA3P1AA Date Extracted:11/14/00
Dilution factor: 1 Date Analyzed: 11/14/00
Moisture %:

QC Batch: 0320164

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U
106-93-4	1,2-Dibromoethane (EDB)	1.0	U

FORM I

TETRA TECH NUS, INC.

Client Sample ID: 436-GW-MW04-001

GC Semivolatiles

Lot-Sample #...: A0K030230-001 Work Order #...: DPA3F1AF Matrix.....: WG
Date Sampled...: 11/02/00 11:42 Date Received..: 11/03/00
Prep Date.....: 11/14/00 Analysis Date..: 11/15/00
Prep Batch #...: 0319256
Dilution Factor: 1 Method.....: EPA-DW 504.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
1,2-Dibromoethane (EDB)	ND	0.020	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,1,1,2-Tetrachloroethane	93	(67 - 137)

TETRA TECH NUS, INC.

Client Sample ID: 436-GW-MW04-001

GC Semivolatiles

Lot-Sample #...:	A0K030230-001	Work Order #...:	DPA3F1AD	Matrix.....:	WG
Date Sampled...:	11/02/00 11:42	Date Received..:	11/03/00 09:05		
Prep Date.....:	11/08/00	Analysis Date..:	11/27/00		
Prep Batch #...:	0313263	Analysis Time..:	08:36		
Dilution Factor:	1	Initial Wgt/Vol:	1000 mL	Final Wgt/Vol..:	2 mL
Analyst ID.....:	400088	Instrument ID..:	HPK		
		Method.....:	FL-DEP FL-PRO		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Petroleum Range Organics (C8 - C40)	0.29 J	0.50	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nonatriacontane	57	(12 - 149)
o-Terphenyl	89	(51 - 135)

NOTE(S):

J Estimated result. Result is less than RL.

TETRA TECH NUS, INC.

Client Sample ID: 436-GW-MW04-001

HPLC

Lot-Sample #...:	A0K030230-001	Work Order #...:	DPA3F1AC	Matrix.....:	WG
Date Sampled...:	11/02/00 11:42	Date Received..:	11/03/00 09:05		
Prep Date.....:	11/07/00	Analysis Date..:	11/09/00		
Prep Batch #...:	0311609	Analysis Time..:	03:58		
Dilution Factor:	1	Initial Wgt/Vol:	1000 mL	Final Wgt/Vol..:	1 mL
Analyst ID.....:	400112	Instrument ID..:	LC		
		Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	1.0	ug/L
Acenaphthylene	ND	1.0	ug/L
Anthracene	ND	1.0	ug/L
Benzo(a)anthracene	ND	0.10	ug/L
Benzo(a)pyrene	ND	0.10	ug/L
Benzo(b)fluoranthene	ND	0.10	ug/L
Benzo(ghi)perylene	ND	0.10	ug/L
Benzo(k)fluoranthene	ND	0.30	ug/L
Chrysene	ND	0.10	ug/L
Dibenz(a,h)anthracene	ND	0.10	ug/L
Fluoranthene	ND	0.20	ug/L
Fluorene	ND	2.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	0.10	ug/L
1-Methylnaphthalene	ND	2.0	ug/L
2-Methylnaphthalene	ND	2.0	ug/L
Naphthalene	ND	2.0	ug/L
Phenanthrene	ND	1.0	ug/L
Pyrene	ND	0.10	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Carbazole	54	(10 - 127)

APPENDIX C

SUPPORT DOCUMENTATION

MP027

HOLDING TIME
12/12/00

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
UG/L	436-GW-MW04-001	A0K030230001	NORMAL	MP027	M	11/02/00	11/15/00	11/15/00	13	0	13
UG/L	436-GW-MW04-001	A0K030230001	NORMAL	MP027	OV	11/02/00	11/14/00	11/15/00	12	1	13
UG/L	TRIP BLANK	A0K030230002	NORMAL	MP027	OV	11/02/00	11/14/00	11/14/00	12	0	12
UG/L	436-GW-MW04-001	A0K030230001	NORMAL	MP027	PAH	11/02/00	11/06/00	11/09/00	4	3	7
MG/L	436-GW-MW04-001	A0K030230001	NORMAL	MP027	TPH	11/02/00	11/08/00	11/27/00	6	19	25

Chain of Custody Record

Quanterra

QUA-4124 0797

2.0°C

Client	Project Manager	Date	Chain of Custody Number
TETRA TECH NUS	MARK PETERSON	11-2-00	45607
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 1 of 1**
7018 A C SKINNER PKWY SUITE 250	904-281-0400		

City	State	Zip Code	Site Contact	Lab Contact
JACKSONVILLE	FL	32256		DENISE POLE

Project Name	Carrier/Waybill Number
NS MAYPORT Bldg. 436	FedEx 7923 8013 4187

Contract/Purchase Order/Quote No.

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: 601, 602	8310	FL PRO	504	LEAD	Special Instructions/ Conditions of Receipt
436-GW-MW04-001	11/2/00	1142	X			2		1	8			X	X	X	X	X	Cool to 4°C
TRIP BLANK	11/2/00	—	X									X					

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☒ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By	11-2-00	1700	1. Received By	11/3/00	905
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments: Temp 2.0°C

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

STL North Canton

SDG NARRATIVE
MP027

The following report contains the analytical results for one water sample and one quality control sample submitted to STL North Canton by Tetra Tech NUS, Inc. from the NS Mayport BLDG. 436 site. The samples were received November 3, 2000, according to documented sample acceptance procedures.

This SDG consists of one (1) laboratory ID: A0K030230.

Samples submitted for Volatile Organics 504.1, TPH FL-PRO and PAH were analyzed at the STL Tampa facility.

STL North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. Preliminary results were provided to Alan Pate on November 27, 2000.

Please refer to individual analytical sections for laboratory specific narratives.

SAMPLE RECEIVING

The temperature of the cooler upon sample receipt was 2.0° C.

SDG NARRATIVE
MP027

GC/MS VOLATILES

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Sample(s) that contain results between the MDL and the RL were flagged with "J". There is the possibility of false positive or mis-identification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation was performed only down to the standard reporting limit (SRL). The acceptance criteria for QC samples may not be met at these quantitation levels.

Holding Time Violations

All samples were prepared and analyzed within the method-specified holding time requirements.

Method Blank Contamination

All analytes in the method blank were less than the associated reporting limits.

MS/MSD/LCS/DCS and Surrogates Outside of QC Criteria

All spike recovery and RPD data met method-specific quality control criteria.

Calibrations

All calibrations and calibration verifications met method-specific quality control criteria.

SDG NARRATIVE
MP027

STL TAMPA – 504.1

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Holding Time Violations

All samples were prepared and analyzed within the method-specified holding time requirements.

Method Blank Contamination

All analytes in the method blank were less than the associated reporting limits.

MS/MSD/LCS/DCS and Surrogates Outside of QC Criteria

All spike recovery and RPD data met method-specific quality control criteria.

Calibrations

All calibrations and calibration verifications met method-specific quality control criteria.

SDG NARRATIVE
MP027

STL TAMPA – FLO-PRO

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Holding Time Violations

All samples were prepared and analyzed within the method-specified holding time requirements.

Method Blank Contamination

All analytes in the method blank were less than the associated reporting limits.

MS/MSD/LCS/DCS and Surrogates Outside of QC Criteria

All spike recovery and RPD data met method-specific quality control criteria.

Calibrations

All calibrations and calibration verifications met method-specific quality control criteria.

SDG NARRATIVE
MP027

STL TAMPA – PAH -8310

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Holding Time Violations

All samples were prepared and analyzed within the method-specified holding time requirements.

Method Blank Contamination

All analytes in the method blank were less than the associated reporting limits.

MS/MSD/LCS/DCS and Surrogates Outside of QC Criteria

The LCS associated with batch 0311609 had outside acceptance criteria. The associated sample result is ND; therefore, no corrective action was initiated.

Calibrations

All calibrations and calibration verifications met method-specific quality control criteria.

SW846 8260B SURROGATE RECOVERY

Lab Name: Severn Trent Laboratories, Inc. Client: TETRA TECH NUS, INC.

Lab Code: QESCAN QESSDG: MP027

Lot #: A0K030230

	CLIENT ID.	SRG01	SRG02	SRG03	SRG04	TOT OUT
01	436-GW-MW04-001	93	97	81	82	00
02	TRIP BLANK	95	98	81	81	00
03	METHOD BLK. DPVWK1AA	94	100	82	84	00
04	LCS DPVWK1AC	94	96	82	82	00
05	436-GW-MW04-001 D	97	97	82	80	00
06	436-GW-MW04-001 S	93	96	81	81	00

SURROGATES		QC LIMITS
SRG01	= Dibromofluoromethane	(73-122)
SRG02	= 1,2-Dichloroethane-d4	(61-128)
SRG03	= Toluene-d8	(76-110)
SRG04	= 4-Bromofluorobenzene	(74-116)

\# Column to be used to flag recovery values
* Values outside of required QC Limits
D System monitoring Compound diluted out

FORM II

TETRA TECH NUS, INC.
METHOD BLANK COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP027

Matrix: (soil/water) WATER Lab Sample ID:A0K150000 164
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 11/03/00
Work Order: DPVWK1AA Date Extracted:11/14/00
Dilution factor: 1 Date Analyzed: 11/14/00
Moisture %:NA

QC Batch: 0320164

Client Sample Id: INTRA-LAB BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
107-02-8	Acrolein	20	U
107-13-1	Acrylonitrile	20	U
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	2.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
75-00-3	Chloroethane	2.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	2.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
540-59-0	1,2-Dichloroethene (total)	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U
75-09-2	Methylene chloride	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U

FORM I

TETRA TECH NUS, INC.
METHOD BLANK COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP027

Matrix: (soil/water) WATER Lab Sample ID:A0K150000 164
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 11/03/00
Work Order: DPVWK1AA Date Extracted:11/14/00
Dilution factor: 1 Date Analyzed: 11/14/00
Moisture %:NA

QC Batch: 0320164

Client Sample Id: INTRA-LAB BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U
106-93-4	1,2-Dibromoethane (EDB)	1.0	U

FORM I

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A0K030230
MB Lot-Sample #: B0K140000-256

Work Order #...: DPR9T1AA

Matrix.....: WATER

Prep Date.....: 11/14/00
Prep Batch #...: 0319256

Analysis Date..: 11/14/00
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
1,2-Dibromoethane (EDB)	ND	0.020	ug/L	EPA-DW 504.1

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,1,1,2-Tetrachloroethane	93	(67 - 137)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

STL Tampa East

Data file : \\qtamfl02\d\Chem\gcs\hpa.i\01114-1.b\A-A7563.d
Lab Smp Id: IB
Inj Date : 14-NOV-2000 15:58
Operator : 6423 Inst ID: hpa.i
Smp Info : 01114.b,1,IB,IB
Misc Info : IB
Comment :
Method : \\qtamfl02\d\Chem\gcs\hpa.i\01114-1.b\504hpaa.m
Meth Date : 15-Nov-2000 11:06 oomsj Quant Type: ESTD
Cal Date : 14-NOV-2000 18:09 Cal File: A-A7570.d
Als bottle: 1 QC Sample: INSTBLANK
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: 1-all.sub
Target Version: 4.10
Processing Host: TPAP1199

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/L)

STL Tampa East

Data file : \\qtamfl02\d\Chem\gcs\hpa.i\01114-2.b\A-B7563.d
Lab Smp Id: IB
Inj Date : 14-NOV-2000 15:58
Operator : 6423 Inst ID: hpa.i
Smp Info : 01114.b,1,IB,IB
Misc Info : IB
Comment :
Method : \\qtamfl02\d\Chem\gcs\hpa.i\01114-2.b\504hpab.m
Meth Date : 15-Nov-2000 11:08 oomsj Quant Type: ESTD
Cal Date : 14-NOV-2000 18:09 Cal File: A-B7570.d
Als bottle: 1 QC Sample: INSTBLANK
Dil Factor: 1.00000
Integrator: Falcon Compound Sublist: 1-all.sub
Target Version: 4.10
Processing Host: TPAP1199

Concentration Formula: Amt * DF * CpndVariable
Cpnd Variable Local Compound Variable

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A0K030230	Work Order #...: DPHQ61AA	Matrix.....: WATER
MB Lot-Sample #: B0K080000-263		
	Prep Date.....: 11/08/00	Analysis Time..: 06:37
Analysis Date..: 11/27/00	Prep Batch #...: 0313263	Final Wgt/Vol..: 2 mL
Dilution Factor: 1	Initial Wgt/Vol: 1000 mL	Instrument ID..: HPK
	Analyst ID.....: 400088	

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Petroleum Range Organics (C8 - C40)	ND	0.50	mg/L	FL-DEP FL-PRO

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nonatriacontane	41	(12 - 149)
o-Terphenyl	82	(51 - 135)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

STL Tampa East

Data file : \\Qtamfl02\D\Chem\gcs\hpk.i\112700A-2.B\HPKB6566.D
Lab Smp Id: IB
Inj Date : 27-NOV-2000 01:19
Operator : 400088 Inst ID: hpk.i
Smp Info : IB
Misc Info : IB
Comment :
Method : \\Qtamfl02\D\Chem\gcs\hpk.i\112700A-2.b\FLAPRO.m
Meth Date : 28-Nov-2000 14:47 ortizr Quant Type: ESTD
Cal Date : 27-NOV-2000 05:18 Cal File: HPKB6572.D
Als bottle: 1 QC Sample: INSTBLANK
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: 1-all.sub
Target Version: 4.10
Processing Host: TPAP1195

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng)	CONCENTRATIONS FINAL (ng)

STL Tampa East

Data file : \\Qtamfl02\D\Chem\gcs\hpk.i\112700A-2.B\HPKB6584.D
Lab Smp Id: IB
Inj Date : 27-NOV-2000 13:16
Operator : 400088 Inst ID: hpk.i
Smp Info : IB
Misc Info : IB
Comment :
Method : \\Qtamfl02\D\Chem\gcs\hpk.i\112700A-2.b\FLAPRO.m
Meth Date : 28-Nov-2000 14:47 ortizr Quant Type: ESTD
Cal Date : 27-NOV-2000 05:18 Cal File: HPKB6572.D
Als bottle: 1 QC Sample: INSTBLANK
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: 1-all.sub
Target Version: 4.10
Processing Host: TPAP1195

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng)	FINAL (ng)

METHOD BLANK REPORT

HPLC

Client Lot #...: A0K030230
MB Lot-Sample #: B0K060000-609

Work Order #...: DPFF71AA

Matrix.....: WATER

Prep Date.....: 11/07/00

Analysis Time..: 23:24

Analysis Date..: 11/08/00

Prep Batch #...: 0311609

Final Wgt/Vol..: 1 mL

Dilution Factor: 1

Initial Wgt/Vol: 1000 mL

Instrument ID..: LC

Analyst ID.....: 400112

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Acenaphthene	ND	1.0	ug/L	SW846 8310
Acenaphthylene	ND	1.0	ug/L	SW846 8310
Anthracene	ND	1.0	ug/L	SW846 8310
Benzo(a)anthracene	ND	0.10	ug/L	SW846 8310
Benzo(a)pyrene	ND	0.10	ug/L	SW846 8310
Benzo(b)fluoranthene	ND	0.10	ug/L	SW846 8310
Benzo(ghi)perylene	ND	0.10	ug/L	SW846 8310
Benzo(k)fluoranthene	ND	0.30	ug/L	SW846 8310
Chrysene	ND	0.10	ug/L	SW846 8310
Dibenz(a,h)anthracene	ND	0.10	ug/L	SW846 8310
Fluoranthene	ND	0.20	ug/L	SW846 8310
Fluorene	ND	2.0	ug/L	SW846 8310
Indeno(1,2,3-cd)pyrene	ND	0.10	ug/L	SW846 8310
1-Methylnaphthalene	ND	2.0	ug/L	SW846 8310
2-Methylnaphthalene	ND	2.0	ug/L	SW846 8310
Naphthalene	ND	2.0	ug/L	SW846 8310
Phenanthrene	ND	1.0	ug/L	SW846 8310
Pyrene	ND	0.10	ug/L	SW846 8310

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Carbazole	59	(10 - 127)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**Mr. Mark Peterson**	**DATE:**	**January 16, 2001**
FROM:	**Elena Rodriguez**	**COPIES:**	**DV FILE**
SUBJECT:	**ORGANIC DATA VALIDATION** **CTO 0123, NS Mayport** **SDG MP030**		

SAMPLES:

4/Aqueous/	~~4/Soil/~~
351-GW-MW05-001	MPT-436-SS11-02'
436-GW-MW05-001	MPT-436-SS11-06'
TB112900	MPT-436-SS12-02'
TB113000	MPT-436-SS13-06'

OVERVIEW

The sample set for CTO 0123, NS Mayport, SDG MP027 consists of 2 aqueous environmental samples, and 4 soil environmental samples, and 2 aqueous field quality control samples. The environmental samples were analyzed for volatile organic compounds, ethylene dibromide (EDB), polynuclear aromatic hydrocarbons, and total recoverable petroleum hydrocarbons. Only aqueous samples were analyzed for EDB. The field quality control samples, trip blanks, were provided by the lab, transported with each cooler of samples, and analyzed for volatile organic compounds only.

The sample was collected by TetraTech NUS on November 29-30, 2000 and analyzed by Severn Trent Laboratories (STL). All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using the following analytical and reporting protocols: SW-846 Methods 8260B, 8310, EPA 504.1, and FL DEP PRO. The data contained in this SDG were validated with regard to the following parameters:

*	•	Data completeness
	•	Holding times
*	•	Initial/continuing calibrations
*	•	Laboratory method and field quality control blank results
	•	Surrogate spike recoveries
*	•	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.

Volatile Organics

Aqueous samples were analyzed by two methods: GC/MS by SW846-8260B for BTEX (benzene, toluene, ethylbenzene, and total xylenes) and MTBE (methyl tert-butyl ether) and GC by EPA 504.1 for EDB (1,2-dibromoethane). Soil samples were analyzed by GC/MS by SW846-8260B only. Aqueous samples,

351-GW-MW05-001, 436-GW-MW05-001 and TRIP BLANK, were analyzed on December 20th exceeding the 14 day holding time. All results for BTEX and MTBE were qualified as "H". STL notified TetraTech NUS of the variance and replacement samples were collected on January 2, 2001.

All quality control data reported by SW846-8260B for the soil samples were found to be acceptable.

All quality control data reported by EPA 504.1 for EDB were found to be acceptable.

Polynuclear Aromatic Hydrocarbons

All quality control data reported for this fraction were found to be acceptable.

Petroleum Hydrocarbons

Surrogate recoveries for MPT-436-SS11-02' and MPT-436-SS12-02' exceeded QC limits. Positive results for MPT-436-SS12-02' were qualified as estimated, J.

The recovery for one of the surrogates for the closing CCV (continuing calibration verification) was below QC limits affecting samples 351-GW-MW05-001 and 436-GW-MW05-001. However, surrogate recoveries for both samples were acceptable. No action was taken

Additional Comments

Positive results below the reporting limit (RL) were qualified as estimated, J, due to uncertainty near the detection limit.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Petroleum hydrocarbons surrogate recoveries were outside the QC limits.

Other Factors Affecting Data Quality: The holding time was exceeded for BTEX and MTBE for the aqueous samples.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (10/99), and the Navy IRCDQM (9/99) NFESC guidelines. The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."

Elena Rodriguez
Tetra Tech NUS, Inc.

Elena Rodriguez

Elena Rodriguez for
Tetra Tech NUS, Inc.

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

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank contamination
C = Calibration (i.e. %RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS – GFAA MSAs r<0.995
K = ICP Interference – Include ICSAB %Rs
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (I.E. base-time drifting)
P = Uncertainty near detection limit (<2 x IDL for Inorganics and < CRQL for Organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-Linear calibrations, tuning r< 0.995 (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO123-NS MAYPORT
WATER DATA
QUANTERRA
SDG: MP030

SAMPLE NUMBER:	351-GW-MW05-001			436-GW-MW05-001			TB112900			TB113000		
SAMPLE DATE:	11/30/00			11/30/00			11/29/00			11/30/00		
LABORATORY ID:	A0L010208002			A0L010208001			A0K300158005			A0L010208003		
QC_TYPE:	NORMAL			NORMAL			TRIP BLANK			TRIP BLANK		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,2-DIBROMOETHANE	0.02	U		0.02	U							
BENZENE	4	J	H	1	UJ	H	1	U		1	UJ	H
ETHYLBENZENE	32	J	H	1	UJ	H	1	U		1	UJ	H
METHYL TERT-BUTYL ETHER	29	UJ	H	5	UJ	H	5	U		5	UJ	H
TOLUENE	20	J	H	1	UJ	H	1	U		1	UJ	H
XYLENES, TOTAL	180	J	H	1	UJ	H	1	U		1	UJ	H

CTO123-NS MAYPORT
WATER DATA
QUANTERRA
SDG: MP030

SAMPLE NUMBER:	351-GW-MW05-001	436-GW-MW05-001		
SAMPLE DATE:	11/30/00	11/30/00	/ /	/ /
LABORATORY ID:	A0L010208002	A0L010208001		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	93			2	U							
2-METHYLNAPHTHALENE	110			2	U							
ACENAPHTHENE	4	U		1	U							
ACENAPHTHYLENE	4	U		1	U							
ANTHRACENE	4	U		1	U							
BENZO(A)ANTHRACENE	0.4	U		0.1	U							
BENZO(A)PYRENE	0.4	U		0.1	U							
BENZO(B)FLUORANTHENE	0.4	U		0.1	U							
BENZO(G,H,I)PERYLENE	0.4	U		0.1	U							
BENZO(K)FLUORANTHENE	1.2	U		0.3	U							
CHRYSENE	0.4	U		0.1	U							
DIBENZO(A,H)ANTHRACENE	0.4	U		0.1	U							
FLUORANTHENE	0.8	U		0.2	U							
FLUORENE	6.7	J	P	2	U							
INDENO(1,2,3-CD)PYRENE	0.4	U		0.1	U							
NAPHTHALENE	41			2	U							
PHENANTHRENE	4	U		1	U							
PYRENE	0.4	U		0.1	U							

CTO123-NS MAYPORT
WATER DATA
QUANTERRA
SDG: MP030

SAMPLE NUMBER:	351-GW-MW05-001	436-GW-MW05-001		
SAMPLE DATE:	11/30/00	11/30/00	/ /	/ /
LABORATORY ID:	A0L010208002	A0L010208001		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	MG/L	MG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PETROLEUM HYDROCARBONS												
TPH (C8-C40)	5.5			0.5	U							

TETRA TECH NUS, INC.

Lab Name: Severn Trent Laboratories, Inc. SDG Number: MP030

Matrix: (soil/water) WG Lab Sample ID: A0L010208 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 12/01/00
Work Order: DQNNA1AF Date Extracted: 12/20/00
Dilution factor: 1 Date Analyzed: 12/20/00
Moisture %:

QC Batch: 0356132

Client Sample Id: 436-GW-MW05-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-43-2	Benzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
108-88-3	Toluene	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U

FORM I

TETRA TECH NUS, INC.

Lab Name: Severn Trent Laboratories, Inc. SDG Number: MP030

Matrix: (soil/water) WG Lab Sample ID: A0L010208 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 12/01/00
Work Order: DQNNE1AF Date Extracted: 12/20/00
Dilution factor: 5.88 Date Analyzed: 12/20/00
Moisture %:

QC Batch: 0356132

Client Sample Id: 351-GW-MW05-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-43-2	Benzene	4.0	J
100-41-4	Ethylbenzene	32	
108-88-3	Toluene	20	
1330-20-7	Xylenes (total)	180	
1634-04-4	Methyl tert-butyl ether	29	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP030

Matrix: (soil/water) WQ Lab Sample ID:A0K300158 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 11/30/00
Work Order: DQKGE1AA Date Extracted:12/01/00
Dilution factor: 1 Date Analyzed: 12/01/00
Moisture %:

QC Batch: 0339124

Client Sample Id: TRIP BLANK

TB112900

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-43-2	Benzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
108-88-3	Toluene	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U

1-18-01
JAJ

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP030

Matrix: (soil/water) WQ Lab Sample ID:A0L010208 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 12/01/00
Work Order: DQNNF1AA Date Extracted:12/20/00
Dilution factor: 1 Date Analyzed: 12/20/00
Moisture %:

QC Batch: 0356132

Client Sample Id: TRIP BLANK
761130 20

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-43-2	Benzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
108-88-3	Toluene	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U

1-18-01
JAI

FORM I

TETRA TECH NUS, INC.

Client Sample ID: 351-GW-MW05-001

GC Semivolatiles

Lot-Sample #...: A0L010208-002 Work Order #...: DQNNE1AD Matrix.....: WG
Date Sampled...: 11/30/00 08:20 Date Received..: 12/01/00
Prep Date.....: 12/14/00 Analysis Date..: 12/15/00
Prep Batch #...: 0349391
Dilution Factor: 1 Method.....: EPA-DW 504.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
1,2-Dibromoethane (EDB)	ND	0.020	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,1,1,2-Tetrachloroethane	105	(67 - 137)

TETRA TECH NUS, INC.

Client Sample ID: 436-GW-MW05-001

GC Semivolatiles

Lot-Sample #...: A0L010208-001 Work Order #...: DQNNA1AD Matrix.....: WG
Date Sampled...: 11/30/00 07:08 Date Received..: 12/01/00
Prep Date.....: 12/14/00 Analysis Date..: 12/15/00
Prep Batch #...: 0349391
Dilution Factor: 1 Method.....: EPA-DW 504.1

PARAMETER	RESULT	REPORTING LIMIT	UNITS
1,2-Dibromoethane (EDB)	ND	0.020	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,1,1,2-Tetrachloroethane	107	(67 - 137)

TETRA TECH NUS, INC.

Client Sample ID: 351-GW-MW05-001

HPLC

Lot-Sample #...:	A0L010208-002	Work Order #...:	DQNNE1AA	Matrix.....:	WG
Date Sampled...:	11/30/00 08:20	Date Received..:	12/01/00 09:10		
Prep Date.....:	12/04/00	Analysis Date..:	12/07/00		
Prep Batch #...:	0339469	Analysis Time..:	10:52		
Dilution Factor:	4	Initial Wgt/Vol:	970 mL	Final Wgt/Vol..:	1 mL
Analyst ID.....:	400112	Instrument ID..:	LC		
		Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	4.0	ug/L
Acenaphthylene	ND	4.0	ug/L
Anthracene	ND	4.0	ug/L
Benzo(a)anthracene	ND	0.40	ug/L
Benzo(a)pyrene	ND	0.40	ug/L
Benzo(b)fluoranthene	ND	0.40	ug/L
Benzo(ghi)perylene	ND	0.40	ug/L
Benzo(k)fluoranthene	ND	1.2	ug/L
Chrysene	ND	0.40	ug/L
Dibenz(a,h)anthracene	ND	0.40	ug/L
Fluoranthene	ND	0.80	ug/L
Fluorene	6.7 J	8.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	0.40	ug/L
1-Methylnaphthalene	93	8.0	ug/L
2-Methylnaphthalene	110	8.0	ug/L
Naphthalene	41	8.0	ug/L
Phenanthrene	ND	4.0	ug/L
Pyrene	ND	0.40	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Carbazole	110	(10 - 127)

NOTE(S):

J Estimated result. Result is less than RL.

TETRA TECH NUS, INC.

Client Sample ID: 351-GW-MW05-001

GC Semivolatiles

Lot-Sample #...:	A0L010208-002	Work Order #...:	DQNNE1AC	Matrix.....:	WG
Date Sampled...:	11/30/00 08:20	Date Received..:	12/01/00 09:10		
Prep Date.....:	12/04/00	Analysis Date..:	12/06/00		
Prep Batch #...:	0339466	Analysis Time..:	21:34		
Dilution Factor:	1	Initial Wgt/Vol:	1010 mL	Final Wgt/Vol..:	2 mL
Analyst ID.....:	400088	Instrument ID..:	HPK		
		Method.....:	FL-DEP FL-PRO		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Petroleum Range Organics (C8 - C40)	5.5	0.50	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nonatriacontane	31	(12 - 149)
o-Terphenyl	70	(51 - 135)

TETRA TECH NUS, INC.

Client Sample ID: 436-GW-MW05-001

GC Semivolatiles

Lot-Sample #...:	A0L010208-001	Work Order #...:	DQNNA1AC	Matrix.....:	WG
Date Sampled...:	11/30/00 07:08	Date Received..:	12/01/00 09:10		
Prep Date.....:	12/04/00	Analysis Date..:	12/06/00		
Prep Batch #...:	0339466	Analysis Time..:	20:54		
Dilution Factor:	1	Initial Wgt/Vol:	980 mL	Final Wgt/Vol..:	2 mL
Analyst ID.....:	400088	Instrument ID..:	HPK		
		Method.....:	FL-DEP FL-PRO		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Petroleum Range Organics (C8 - C40)	ND	0.50	mg/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nonatriacontane	30	(12 - 149)
o-Terphenyl	84	(51 - 135)

SDG NARRATIVE
MP030

FL-PRO (continued)

The closing CCV (HPKB 6979) associated with samples 436-GW-MW05-001 and 351-GW-MW05-001' was low outside QC limits for C-39 (secondary) surrogate @ 73% (limits = 75-125%). The OTP (primary) surrogate was in control @ 109%. The associated samples were in control for both OTP and C-39 surrogates and were not effected by the low bias of the C-39 of the closing CCV. Results have been reported as is.

Chain of Custody Record

SEVERN TRENT SERVICES — Severn Trent Laboratories, Inc.

STL-4124 (0700)

Client: TETRA TECH NUS	Project Manager: MARK PETERSON	Date: 11/30/00	Chain of Custody Number: 030548
Address: 7018 AC SKINNER PKWY SUITE 250	Telephone Number (Area Code)/Fax Number: 904-281-0400 / 904-281-0070	Lab Number:	Page 1 of 1
City: JACKSONVILLE; State: FL; Zip Code: 32256	Site Contact:	Lab Contact: DENISE POHL	
Project Name and Location (State): NS MAYPORT Bldg. 436	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.:			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Air	Aqueous	Sed.	Soil		Unpres.	H2SO4	HNOS	HCl	NaOH	ZnAc/NaOH		601,602	B310	FLOPRO	504	LEAD								Special Instructions/ Conditions of Receipt
436-GW-MW05-001	11/30/00	0708		X				7		1	3				X	X	X	X	X								COOL TO 4°C
351-GW-MW05-001	11/30/00	0820		X				7		1	3				X	X	X	X	X								
TRIP BLANK	11/30/00	-		X											X												REFER TO ATTACHED
																											TABLE A & B FOR
																											PARAMETER INFO

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☒ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify):

	Date	Time		Date	Time
1. Relinquished By: Alan Pate	11/30/00	1600	1. Received By: Anne Sanders	12-1-00	910AM
2. Relinquished By:			2. Received By:		
3. Relinquished By:			3. Received By:		

Comments: 3.0°C

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

TETRA TECH NUS, INC.
METHOD BLANK COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP030

Matrix: (soil/water) SOLID Lab Sample ID:A0L060000 124
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / g Date Received: 11/30/00
Work Order: DQWCV1AA Date Extracted:12/05/00
Dilution factor: 1 Date Analyzed: 12/05/00
Moisture %:NA

QC Batch: 0341124

Client Sample Id: INTRA-LAB BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
71-43-2	Benzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
108-88-3	Toluene	5.0	U
1330-20-7	Xylenes (total)	10	U
1634-04-4	Methyl tert-butyl ether	20	U

FORM I

TETRA TECH NUS, INC.
METHOD BLANK COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP030

Matrix: (soil/water) SOLID Lab Sample ID:A0L080000 124
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / g Date Received: 11/30/00
Work Order: DQ3G51AA Date Extracted:12/06/00
Dilution factor: 1 Date Analyzed: 12/06/00
Moisture %:NA

QC Batch: 0343124

Client Sample Id: INTRA-LAB BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
71-43-2	Benzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
108-88-3	Toluene	5.0	U
1330-20-7	Xylenes (total)	10	U
1634-04-4	Methyl tert-butyl ether	20	U

FORM I

TETRA TECH NUS, INC.
METHOD BLANK COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP030

Matrix: (soil/water) WATER Lab Sample ID:A0L040000 124
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 11/22/00
Work Order: DQQV41AA Date Extracted:12/01/00
Dilution factor: 1 Date Analyzed: 12/01/00
Moisture %:NA

QC Batch: 0339124

Client Sample Id: INTRA-LAB BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-43-2	Benzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
108-88-3	Toluene	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U

FORM I

TETRA TECH NUS, INC.
METHOD BLANK COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP030

Matrix: (soil/water) WATER Lab Sample ID:A0L210000 132
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 12/16/00
Work Order: DRTD71AA Date Extracted:12/20/00
Dilution factor: 1 Date Analyzed: 12/20/00
Moisture %:NA

QC Batch: 0356132

Client Sample Id: INTRA-LAB BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
71-43-2	Benzene	1.0	U
100-41-4	Ethylbenzene	1.0	U
108-88-3	Toluene	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U

FORM I

METHOD BLANK REPORT

HPLC

Client Lot #...: A0L010208	Work Order #...: DQRV81AA	Matrix.....: WATER
MB Lot-Sample #: B0L040000-469		
	Prep Date.....: 12/04/00	Analysis Time..: 16:33
Analysis Date..: 12/06/00	Prep Batch #...: 0339469	Final Wgt/Vol..: 1 mL
Dilution Factor: 1	Initial Wgt/Vol: 1000 mL	Instrument ID..: LC
	Analyst ID.....: 400112	

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Acenaphthene	ND	1.0	ug/L	SW846 8310
Acenaphthylene	ND	1.0	ug/L	SW846 8310
Anthracene	ND	1.0	ug/L	SW846 8310
Benzo(a)anthracene	ND	0.10	ug/L	SW846 8310
Benzo(a)pyrene	ND	0.10	ug/L	SW846 8310
Benzo(b)fluoranthene	ND	0.10	ug/L	SW846 8310
Benzo(ghi)perylene	ND	0.10	ug/L	SW846 8310
Benzo(k)fluoranthene	ND	0.30	ug/L	SW846 8310
Chrysene	ND	0.10	ug/L	SW846 8310
Dibenz(a,h)anthracene	ND	0.10	ug/L	SW846 8310
Fluoranthene	ND	0.20	ug/L	SW846 8310
Fluorene	ND	2.0	ug/L	SW846 8310
Indeno(1,2,3-cd)pyrene	ND	0.10	ug/L	SW846 8310
1-Methylnaphthalene	ND	2.0	ug/L	SW846 8310
2-Methylnaphthalene	ND	2.0	ug/L	SW846 8310
Naphthalene	ND	2.0	ug/L	SW846 8310
Phenanthrene	ND	1.0	ug/L	SW846 8310
Pyrene	ND	0.10	ug/L	SW846 8310

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Carbazole	92	(10 - 127)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

HPLC

Client Lot #...: A0K300158	Work Order #...: DRCXT1AA	Matrix.....: SOLID
MB Lot-Sample #: B0L130000-362		
	Prep Date.....: 12/13/00	Analysis Time..: 22:52
Analysis Date..: 12/14/00	Prep Batch #...: 0348362	Final Wgt/Vol..: 1 mL
Dilution Factor: 1	Initial Wgt/Vol: 30 g	Instrument ID..: LC
	Analyst ID.....: 400112	

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
2-Methylnaphthalene	ND	50	ug/kg	SW846 8310
1-Methylnaphthalene	ND	50	ug/kg	SW846 8310
Acenaphthene	ND	50	ug/kg	SW846 8310
Acenaphthylene	ND	50	ug/kg	SW846 8310
Anthracene	ND	50	ug/kg	SW846 8310
Benzo(a)anthracene	ND	5.0	ug/kg	SW846 8310
Benzo(a)pyrene	ND	5.0	ug/kg	SW846 8310
Benzo(b)fluoranthene	ND	5.0	ug/kg	SW846 8310
Benzo(ghi)perylene	ND	5.0	ug/kg	SW846 8310
Benzo(k)fluoranthene	ND	5.0	ug/kg	SW846 8310
Chrysene	ND	5.0	ug/kg	SW846 8310
Dibenz(a,h)anthracene	ND	5.0	ug/kg	SW846 8310
Fluoranthene	ND	5.0	ug/kg	SW846 8310
Fluorene	ND	50	ug/kg	SW846 8310
Indeno(1,2,3-cd)pyrene	ND	5.0	ug/kg	SW846 8310
Naphthalene	ND	50	ug/kg	SW846 8310
Phenanthrene	ND	50	ug/kg	SW846 8310
Pyrene	ND	5.0	ug/kg	SW846 8310

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Carbazole	80	(17 - 113)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A0K300158	Work Order #...: DQ75N1AA	Matrix.....: SOLID
MB Lot-Sample #: B0L110000-400		
	Prep Date.....: 12/11/00	Analysis Time..: 02:10
Analysis Date..: 12/16/00	Prep Batch #...: 0346400	Final Wgt/Vol..: 2 mL
Dilution Factor: 1	Initial Wgt/Vol: 30 g	Instrument ID..: HPK
	Analyst ID.....: 400088	

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Petroleum Range Organics (C8 - C40)	ND	10	mg/kg	FL-DEP FL-PRO

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nonatriacontane	42	(22 - 152)
o-Terphenyl	117	(45 - 143)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #...:	A0K300158	Work Order #...:	DQKF81AG-MS	Matrix.....:	SO
MS Lot-Sample #:	A0K300158-003		DQKF81AH-MSD		
Date Sampled...:	11/29/00 10:50	Date Received..:	11/30/00 09:10		
Prep Date.....:	12/11/00	Analysis Date..:	12/16/00		
Prep Batch #...:	0346400	Analysis Time..:	09:49		
Dilution Factor:	1	Initial Wgt/Vol:	30.35 g	Final Wgt/Vol..:	2 mL
Analyst ID.....:	400088	Instrument ID..:	HPK		

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Petroleum Range Organics (C8 - C40)	**96**	**(46 - 115)**			**FL-DEP FL-PRO**
	126 a	**(46 - 115)**	**19**	**(0-45)**	**FL-DEP FL-PRO**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nonatriacontane	67	(22 - 152)
	48	(22 - 152)
o-Terphenyl	103	(45 - 143)
	109	(45 - 143)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

a Spiked analyte recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

MATRIX SPIKE SAMPLE DATA REPORT

GC Semivolatiles

Client Lot #...:	A0K300158	Work Order #...:	DQKF81AG-MS	Matrix.....:	SO
MS Lot-Sample #:	A0K300158-003		DQKF81AH-MSD		
Date Sampled...:	11/29/00 10:50	Date Received..:	11/30/00 09:10		
Prep Date.....:	12/11/00	Analysis Date..:	12/16/00		
Prep Batch #...:	0346400	Analysis Time..:	09:49		
Dilution Factor:	1	Initial Wgt/Vol:	30.35 g	Final Wgt/Vol..:	2 mL
Analyst ID.....:	400088	Instrument ID..:	HPK		

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCENT RECOVERY	RPD	METHOD
Petroleum Range Organics (C8 - C40)	26	59	83	mg/kg	96		FL-DEP FL-PRO
	26	60	100	mg/kg	126 a	19	FL-DEP FL-PRO

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nonatriacontane	67	(22 - 152)
	48	(22 - 152)
o-Terphenyl	103	(45 - 143)
	109	(45 - 143)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

a Spiked analyte recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

STL Tampa East

Data file : \\Qtamfl02\D\Chem\gcs\hpk.i\121500-2.b\HPKB7298.D
Lab Smp Id: IB
Inj Date : 15-DEC-2000 23:21
Operator : 400088 Inst ID: hpk.i
Smp Info : IB
Misc Info : IB
Comment :
Method : \\Qtamfl02\D\Chem\gcs\hpk.i\121500-2.b\FLAPRO.m
Meth Date : 16-Dec-2000 14:54 mccombsr Quant Type: ESTD
Cal Date : 15-DEC-2000 13:55 Cal File: HPKB7285.D
Als bottle: 1 QC Sample: INSTBLANK
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: 1-all.sub
Target Version: 4.10
Processing Host: TPAP1149

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng)	FINAL (ng)

REPORT

TETRA TECH NUS, INC.

Client Sample ID: MPT-436-SS11-02'

GC Semivolatiles

Lot-Sample #...:	A0K300158-001	Work Order #...:	DQKF41AC	Matrix.....:	SO
Date Sampled...:	11/29/00 10:15	Date Received..:	11/30/00 09:10		
Prep Date.....:	12/11/00	Analysis Date..:	12/16/00		
Prep Batch #...:	0346400	Analysis Time..:	07:44		
Dilution Factor:	1	Initial Wgt/Vol:	30.5 g	Final Wgt/Vol..:	2 mL
% Moisture.....:	9.5	Analyst ID.....:	400088	Instrument ID..:	HPK
		Method.....:	FL-DEP FL-PRO		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Petroleum Range Organics (C8 - C40)	ND	11	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nonatriacontane	160 *	(22 - 152)
o-Terphenyl	149 *	(45 - 143)

NOTE(S):

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

TETRA TECH NUS, INC.

Client Sample ID: MPT-436-SS11-06'

GC Semivolatiles

Lot-Sample #...:	A0K300158-002	Work Order #...:	DQKF71AC	Matrix.....:	SO
Date Sampled...:	11/29/00 10:30	Date Received..:	11/30/00 09:10		
Prep Date.....:	12/11/00	Analysis Date..:	12/16/00		
Prep Batch #...:	0346400	Analysis Time..:	08:26		
Dilution Factor:	1	Initial Wgt/Vol:	30.5 g	Final Wgt/Vol..:	2 mL
% Moisture.....:	12	Analyst ID.....:	400088	Instrument ID..:	HPK
		Method.....:	FL-DEP FL-PRO		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Petroleum Range Organics (C8 - C40)	ND	11	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nonatriacontane	120	(22 - 152)
o-Terphenyl	114	(45 - 143)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

TETRA TECH NUS, INC.

Client Sample ID: MPT-436-SS12-02'

GC Semivolatiles

Lot-Sample #...:	A0K300158-003	Work Order #...:	DQKF81AC	Matrix.....:	SO
Date Sampled...:	11/29/00 10:50	Date Received..:	11/30/00 09:10		
Prep Date.....:	12/11/00	Analysis Date..:	12/16/00		
Prep Batch #...:	0346400	Analysis Time..:	09:08		
Dilution Factor:	1	Initial Wgt/Vol:	30 g	Final Wgt/Vol..:	2 mL
% Moisture.....:	5.3	Analyst ID.....:	400088	Instrument ID..:	HPK
		Method.....:	FL-DEP FL-PRO		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Petroleum Range Organics (C8 - C40)	26	11	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nonatriacontane	158 *	(22 - 152)
o-Terphenyl	101	(45 - 143)

NOTE(S):

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

TETRA TECH NUS, INC.

Client Sample ID: MPT-436-SS13-06'

GC Semivolatiles

Lot-Sample #...:	A0K300158-004	Work Order #...:	DQKF91AC	Matrix.....:	SO
Date Sampled...:	11/29/00 11:10	Date Received..:	11/30/00 09:10		
Prep Date.....:	12/11/00	Analysis Date..:	12/16/00		
Prep Batch #...:	0346400	Analysis Time..:	11:13		
Dilution Factor:	1	Initial Wgt/Vol:	30.35 g	Final Wgt/Vol..:	2 mL
% Moisture.....:	16	Analyst ID.....:	400088	Instrument ID..:	HPK
		Method.....:	FL-DEP FL-PRO		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Petroleum Range Organics (C8 - C40)	ND	12	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nonatriacontane	37	(22 - 152)
o-Terphenyl	107	(45 - 143)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

TETRA TECH NUS, INC.

Client Sample ID: 436-GW-MW05-001

HPLC

Lot-Sample #...:	A0L010208-001	Work Order #...:	DQNNA1AA	Matrix.....:	WG
Date Sampled...:	11/30/00 07:08	Date Received..:	12/01/00 09:10		
Prep Date.....:	12/04/00	Analysis Date..:	12/06/00		
Prep Batch #...:	0339469	Analysis Time..:	18:15		
Dilution Factor:	1	Initial Wgt/Vol:	980 mL	Final Wgt/Vol..:	1 mL
Analyst ID.....:	400112	Instrument ID..:	LC		
		Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	1.0	ug/L
Acenaphthylene	ND	1.0	ug/L
Anthracene	ND	1.0	ug/L
Benzo(a)anthracene	ND	0.10	ug/L
Benzo(a)pyrene	ND	0.10	ug/L
Benzo(b)fluoranthene	ND	0.10	ug/L
Benzo(ghi)perylene	ND	0.10	ug/L
Benzo(k)fluoranthene	ND	0.30	ug/L
Chrysene	ND	0.10	ug/L
Dibenz(a,h)anthracene	ND	0.10	ug/L
Fluoranthene	ND	0.20	ug/L
Fluorene	ND	2.0	ug/L
Indeno(1,2,3-cd)pyrene	ND	0.10	ug/L
1-Methylnaphthalene	ND	2.0	ug/L
2-Methylnaphthalene	ND	2.0	ug/L
Naphthalene	ND	2.0	ug/L
Phenanthrene	ND	1.0	ug/L
Pyrene	ND	0.10	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Carbazole	72	(10 - 127)

TETRA TECH NUS, INC.

Client Sample ID: MPT-436-SS11-02'

HPLC

Lot-Sample #...:	A0K300158-001	Work Order #...:	DQKF41AD	Matrix.....:	SO
Date Sampled...:	11/29/00 10:15	Date Received..:	11/30/00 09:10		
Prep Date.....:	12/13/00	Analysis Date..:	12/15/00		
Prep Batch #...:	0348362	Analysis Time..:	17:09		
Dilution Factor:	1	Initial Wgt/Vol:	30.15 g	Final Wgt/Vol..:	1 mL
% Moisture.....:	9.5	Analyst ID.....:	400112	Instrument ID..:	LC
		Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2-Methylnaphthalene	ND	55	ug/kg
1-Methylnaphthalene	ND	55	ug/kg
Acenaphthene	21 J	55	ug/kg
Acenaphthylene	ND	55	ug/kg
Anthracene	28 J	55	ug/kg
Benzo(a)anthracene	55	5.5	ug/kg
Benzo(a)pyrene	52	5.5	ug/kg
Benzo(b)fluoranthene	48	5.5	ug/kg
Benzo(ghi)perylene	38	5.5	ug/kg
Benzo(k)fluoranthene	35	5.5	ug/kg
Chrysene	63	5.5	ug/kg
Dibenz(a,h)anthracene	15	5.5	ug/kg
Fluoranthene	170	5.5	ug/kg
Fluorene	ND	55	ug/kg
Indeno(1,2,3-cd)pyrene	44	5.5	ug/kg
Naphthalene	ND	55	ug/kg
Phenanthrene	87	55	ug/kg
Pyrene	100	5.5	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Carbazole	69	(17 - 115)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

TETRA TECH NUS, INC.

Client Sample ID: MPT-436-SS11-06'

HPLC

Lot-Sample #...:	A0K300158-002	Work Order #...:	DQKF71AD	Matrix.....:	SO
Date Sampled...:	11/29/00 10:30	Date Received..:	11/30/00 09:10		
Prep Date.....:	12/13/00	Analysis Date..:	12/18/00		
Prep Batch #...:	0348362	Analysis Time..:	13:31		
Dilution Factor:	2	Initial Wgt/Vol:	30.25 g	Final Wgt/Vol..:	1 mL
% Moisture.....:	12	Analyst ID.....:	400112	Instrument ID..:	LC
		Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2-Methylnaphthalene	ND	110	ug/kg
1-Methylnaphthalene	ND	110	ug/kg
Acenaphthene	18 J	110	ug/kg
Acenaphthylene	ND	110	ug/kg
Anthracene	31 J	110	ug/kg
Benzo(a)anthracene	70	11	ug/kg
Benzo(a)pyrene	54	11	ug/kg
Benzo(b)fluoranthene	63	11	ug/kg
Benzo(ghi)perylene	48	11	ug/kg
Benzo(k)fluoranthene	43	11	ug/kg
Chrysene	100	11	ug/kg
Dibenz(a,h)anthracene	19	11	ug/kg
Fluoranthene	250	11	ug/kg
Fluorene	ND	110	ug/kg
Indeno(1,2,3-cd)pyrene	54	11	ug/kg
Naphthalene	ND	110	ug/kg
Phenanthrene	74 J	110	ug/kg
Pyrene	150	11	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Carbazole	73	(17 - 115)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

TETRA TECH NUS, INC.

Client Sample ID: MPT-436-SS12-02'

HPLC

Lot-Sample #...:	A0K300158-003	Work Order #...:	DQKF81AD	Matrix.....:	SO
Date Sampled...:	11/29/00 10:50	Date Received..:	11/30/00 09:10		
Prep Date.....:	12/13/00	Analysis Date..:	12/15/00		
Prep Batch #...:	0348362	Analysis Time..:	18:17		
Dilution Factor:	1	Initial Wgt/Vol:	30.2 g	Final Wgt/Vol..:	1 mL
% Moisture.....:	5.3	Analyst ID.....:	400112	Instrument ID..:	LC
		Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2-Methylnaphthalene	ND	53	ug/kg
1-Methylnaphthalene	ND	53	ug/kg
Acenaphthene	ND	53	ug/kg
Acenaphthylene	ND	53	ug/kg
Anthracene	ND	53	ug/kg
Benzo(a)anthracene	42	5.3	ug/kg
Benzo(a)pyrene	48	5.3	ug/kg
Benzo(b)fluoranthene	47	5.3	ug/kg
Benzo(ghi)perylene	45	5.3	ug/kg
Benzo(k)fluoranthene	24	5.3	ug/kg
Chrysene	52	5.3	ug/kg
Dibenz(a,h)anthracene	16	5.3	ug/kg
Fluoranthene	110	5.3	ug/kg
Fluorene	ND	53	ug/kg
Indeno(1,2,3-cd)pyrene	49	5.3	ug/kg
Naphthalene	ND	53	ug/kg
Phenanthrene	52 J	53	ug/kg
Pyrene	73	5.3	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Carbazole	75	(17 - 115)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

TETRA TECH NUS, INC.

Client Sample ID: MPT-436-SS13-06'

HPLC

Lot-Sample #...:	A0K300158-004	Work Order #...:	DQKF91AD	Matrix.....:	SO
Date Sampled...:	11/29/00 11:10	Date Received..:	11/30/00 09:10		
Prep Date.....:	12/13/00	Analysis Date..:	12/15/00		
Prep Batch #...:	0348362	Analysis Time..:	18:51		
Dilution Factor:	1	Initial Wgt/Vol:	30.15 g	Final Wgt/Vol..:	1 mL
% Moisture.....:	16	Analyst ID.....:	400112	Instrument ID..:	LC
		Method.....:	SW846 8310		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2-Methylnaphthalene	ND	60	ug/kg
1-Methylnaphthalene	ND	60	ug/kg
Acenaphthene	ND	60	ug/kg
Acenaphthylene	ND	60	ug/kg
Anthracene	ND	60	ug/kg
Benzo(a)anthracene	5.6 J	6.0	ug/kg
Benzo(a)pyrene	6.1	6.0	ug/kg
Benzo(b)fluoranthene	3.4 J	6.0	ug/kg
Benzo(ghi)perylene	3.0 J	6.0	ug/kg
Benzo(k)fluoranthene	2.2 J	6.0	ug/kg
Chrysene	7.2	6.0	ug/kg
Dibenz(a,h)anthracene	ND	6.0	ug/kg
Fluoranthene	13	6.0	ug/kg
Fluorene	ND	60	ug/kg
Indeno(1,2,3-cd)pyrene	ND	6.0	ug/kg
Naphthalene	ND	60	ug/kg
Phenanthrene	ND	60	ug/kg
Pyrene	8.4	6.0	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Carbazole	74	(17 - 115)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

STL Tampa East

Data file : \\Qtamfl02\D\Chem\gcs\hpk.i\121500-2.b\HPKB7307.D
Lab Smp Id: IB
Inj Date : 16-DEC-2000 05:38
Operator : 400088 Inst ID: hpk.i
Smp Info : IB
Misc Info : IB
Comment :
Method : \\Qtamfl02\D\Chem\gcs\hpk.i\121500-2.b\FLAPRO.m
Meth Date : 16-Dec-2000 14:54 mccombsr Quant Type: ESTD
Cal Date : 15-DEC-2000 13:55 Cal File: HPKB7285.D
Als bottle: 1 QC Sample: INSTBLANK
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: 1-all.sub
Target Version: 4.10
Processing Host: TPAP1149

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng)	FINAL (ng)

REPORT

STL Tampa East

Data file : \\Qtamfl02\D\Chem\gcs\hpk.i\121500-2.b\HPKB7318.D
Lab Smp Id: IB
Inj Date : 16-DEC-2000 13:17
Operator : 400088 Inst ID: hpk.i
Smp Info : IB
Misc Info : IB
Comment :
Method : \\Qtamfl02\D\Chem\gcs\hpk.i\121500-2.b\FLAPRO.m
Meth Date : 16-Dec-2000 14:54 mccombsr Quant Type: ESTD
Cal Date : 15-DEC-2000 13:55 Cal File: HPKB7285.D
Als bottle: 1 QC Sample: INSTBLANK
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: 1-all.sub
Target Version: 4.10
Processing Host: TPAP1149

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng)	FINAL (ng)

REPORT

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A0L010208	Work Order #...: DQRWA1AA	Matrix.....: WATER
MB Lot-Sample #: B0L040000-466		
	Prep Date.....: 12/04/00	Analysis Time..: 01:44
Analysis Date..: 12/06/00	Prep Batch #...: 0339466	Final Wgt/Vol..: 2 mL
Dilution Factor: 1	Initial Wgt/Vol: 1000 mL	Instrument ID..: HPK
	Analyst ID.....: 400088	

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Petroleum Range Organics (C8 - C40)	ND	0.50	mg/L	FL-DEP FL-PRO

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Nonatriacontane	25	(12 - 149)
o-Terphenyl	79	(51 - 135)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

STL Tampa East

Data file : \\Qtamfl02\D\Chem\gcs\hpk.i\120500-2.b\HPKB6937.D
Lab Smp Id: IB
Inj Date : 05-DEC-2000 20:30
Operator : 400088 Inst ID: hpk.i
Smp Info : IB
Misc Info : IB
Comment :
Method : \\Qtamfl02\D\Chem\gcs\hpk.i\120500-2.b\FLAPRO.m
Meth Date : 06-Dec-2000 08:33 mccombsr Quant Type: ESTD
Cal Date : Cal File:
Als bottle: 1 QC Sample: INSTBLANK
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: 1-all.sub
Target Version: 4.10
Processing Host: TPAP1149

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng)	CONCENTRATIONS FINAL (ng)
S 3 Fla-PRO	0.950	-26.500		682214		

REPORT

STL Tampa East

Data file : \\Qtamfl02\D\Chem\gcs\hpk.i\120500-2.b\HPKB6953.D
Lab Smp Id: IB
Inj Date : 06-DEC-2000 06:56
Operator : 400088 Inst ID: hpk.i
Smp Info : IB
Misc Info : IB
Comment :
Method : \\Qtamfl02\D\Chem\gcs\hpk.i\120500-2.b\FLAPRO.m
Meth Date : 06-Dec-2000 08:33 mccombsr Quant Type: ESTD
Cal Date : 06-DEC-2000 00:25 Cal File: HPKB6943.D
Als bottle: 1 QC Sample: INSTBLANK
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: 1-all.sub
Target Version: 4.10
Processing Host: TPAP1149

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng)	FINAL (ng)
S 3 Fla-PRO	0.950	-26.500		282680	2.39800	2.3979952

REPORT

STL Tampa East

Data file : \\Qtamfl02\D\Chem\gcs\hpk.i\120500-2.b\HPKB6978.D
Lab Smp Id: IB
Inj Date : 06-DEC-2000 23:33
Operator : 400088 Inst ID: hpk.i
Smp Info : IB
Misc Info : IB
Comment :
Method : \\Qtamfl02\D\Chem\gcs\hpk.i\120500-2.b\FLAPRO.m
Meth Date : 07-Dec-2000 07:37 mccombsr Quant Type: ESTD
Cal Date : 06-DEC-2000 00:25 Cal File: HPKB6943.D
Als bottle: 1 QC Sample: INSTBLANK
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: 1-all.sub
Target Version: 4.10
Processing Host: TPAP1149

Compounds	RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ng)	CONCENTRATIONS FINAL (ng)
S 3 Fla-PRO	0.950	-26.500		1192023	10.1120	10.1120187

REPORT

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A0L010208 Work Order #...: DRE1E1AA Matrix.....: WATER
MB Lot-Sample #: B0L140000-391

Prep Date.....: 12/14/00
Analysis Date..: 12/15/00 Prep Batch #...: 0349391
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
1,2-Dibromoethane (EDB)	ND	0.020	ug/L	EPA-DW 504.1

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,1,1,2-Tetrachloroethane	104	(67 - 137)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 06/16/00
Work Order: DET7W102 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0173099

Client Sample Id: 436-GW-MW01-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	2.1	J
75-05-8	Acetonitrile	20	U
107-02-8	Acrolein	10	U
107-13-1	Acrylonitrile	10	U
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	2.0	U
75-15-0	Carbon disulfide	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
126-99-8	Chloroprene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
107-05-1	Allyl chloride	1.0	U
74-95-3	Dibromomethane	1.0	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
540-59-0	1,2-Dichloroethene (total)	1.0	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 06/16/00
Work Order: DET7W102 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0173099

Client Sample Id: 436-GW-MW01-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U
97-63-2	Ethyl methacrylate	1.0	U
75-69-4	Trichlorofluoromethane	2.0	U
591-78-6	2-Hexanone	10	U
74-88-4	Iodomethane	1.0	U
78-83-1	Isobutyl alcohol	50	U
126-98-7	Methacrylonitrile	1.0	U
75-09-2	Methylene chloride	1.0	U
80-62-6	Methyl methacrylate	1.0	U
107-12-0	Propionitrile	4.0	U
100-42-5	Styrene	1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	0.067	J
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
96-18-4	1,2,3-Trichloropropane	1.0	U
108-05-4	Vinyl acetate	1.0	U
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U
106-93-4	1,2-Dibromoethane (EDB)	1.0	U
78-93-3	2-Butanone (MEK)	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 001
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 06/16/00
Work Order: DET7W102 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0173099

Client Sample Id: 436-GW-MW01-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
108-10-1	4-Methyl-2-pentanone (MIBK)	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 06/16/00
Work Order: DET91102 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0173099

Client Sample Id: 436-GW-MW02-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	1.3	J
75-05-8	Acetonitrile	20	U
107-02-8	Acrolein	10	U
107-13-1	Acrylonitrile	10	U
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	2.0	U
75-15-0	Carbon disulfide	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
126-99-8	Chloroprene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
107-05-1	Allyl chloride	1.0	U
74-95-3	Dibromomethane	1.0	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
540-59-0	1,2-Dichloroethene (total)	1.0	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 06/16/00
Work Order: DET91102 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0173099

Client Sample Id: 436-GW-MW02-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U
97-63-2	Ethyl methacrylate	1.0	U
75-69-4	Trichlorofluoromethane	2.0	U
591-78-6	2-Hexanone	10	U
74-88-4	Iodomethane	1.0	U
78-83-1	Isobutyl alcohol	50	U
126-98-7	Methacrylonitrile	1.0	U
75-09-2	Methylene chloride	1.0	U
80-62-6	Methyl methacrylate	1.0	U
107-12-0	Propionitrile	4.0	U
100-42-5	Styrene	1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
96-18-4	1,2,3-Trichloropropane	1.0	U
108-05-4	Vinyl acetate	1.0	U
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U
106-93-4	1,2-Dibromoethane (EDB)	1.0	U
78-93-3	2-Butanone (MEK)	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 002
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 06/16/00
Work Order: DET91102 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0173099

Client Sample Id: 436-GW-MW02-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
108-10-1	4-Methyl-2-pentanone (MIBK)	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 06/16/00
Work Order: DET93102 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0173099

Client Sample Id: 436-GW-MW03-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	1.3	J
75-05-8	Acetonitrile	20	U
107-02-8	Acrolein	10	U
107-13-1	Acrylonitrile	10	U
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	2.0	U
75-15-0	Carbon disulfide	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
126-99-8	Chloroprene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
107-05-1	Allyl chloride	1.0	U
74-95-3	Dibromomethane	1.0	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
540-59-0	1,2-Dichloroethene (total)	1.0	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 06/16/00
Work Order: DET93102 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0173099

Client Sample Id: 436-GW-MW03-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U
97-63-2	Ethyl methacrylate	1.0	U
75-69-4	Trichlorofluoromethane	2.0	U
591-78-6	2-Hexanone	10	U
74-88-4	Iodomethane	1.0	U
78-83-1	Isobutyl alcohol	50	U
126-98-7	Methacrylonitrile	1.0	U
75-09-2	Methylene chloride	1.0	U
80-62-6	Methyl methacrylate	1.0	U
107-12-0	Propionitrile	4.0	U
100-42-5	Styrene	1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
96-18-4	1,2,3-Trichloropropane	1.0	U
108-05-4	Vinyl acetate	1.0	U
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U
106-93-4	1,2-Dibromoethane (EDB)	1.0	U
78-93-3	2-Butanone (MEK)	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 003
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 06/16/00
Work Order: DET93102 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0173099

Client Sample Id: 436-GW-MW03-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
108-10-1	4-Methyl-2-pentanone (MIBK)	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 06/16/00
Work Order: DET94102 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0173099

Client Sample Id: 436-GW-DUP2-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	1.6	J
75-05-8	Acetonitrile	20	U
107-02-8	Acrolein	10	U
107-13-1	Acrylonitrile	10	U
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	2.0	U
75-15-0	Carbon disulfide	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
126-99-8	Chloroprene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
107-05-1	Allyl chloride	1.0	U
74-95-3	Dibromomethane	1.0	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
540-59-0	1,2-Dichloroethene (total)	1.0	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 06/16/00
Work Order: DET94102 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0173099

Client Sample Id: 436-GW-DUP2-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U
97-63-2	Ethyl methacrylate	1.0	U
75-69-4	Trichlorofluoromethane	2.0	U
591-78-6	2-Hexanone	10	U
74-88-4	Iodomethane	1.0	U
78-83-1	Isobutyl alcohol	50	U
126-98-7	Methacrylonitrile	1.0	U
75-09-2	Methylene chloride	1.0	U
80-62-6	Methyl methacrylate	1.0	U
107-12-0	Propionitrile	4.0	U
100-42-5	Styrene	1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
96-18-4	1,2,3-Trichloropropane	1.0	U
108-05-4	Vinyl acetate	1.0	U
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U
106-93-4	1,2-Dibromoethane (EDB)	1.0	U
78-93-3	2-Butanone (MEK)	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 004
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 06/16/00
Work Order: DET94102 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0173099

Client Sample Id: 436-GW-DUP2-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
108-10-1	4-Methyl-2-pentanone (MIBK)	10	U

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WQ Lab Sample ID:A0F160173 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 06/16/00
Work Order: DETAJ101 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0173099

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
67-64-1	Acetone	2.2	J
75-05-8	Acetonitrile	20	U
107-02-8	Acrolein	10	U
107-13-1	Acrylonitrile	10	U
71-43-2	Benzene	1.0	U
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	2.0	U
75-15-0	Carbon disulfide	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
126-99-8	Chloroprene	1.0	U
124-48-1	Dibromochloromethane	1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
107-05-1	Allyl chloride	1.0	U
74-95-3	Dibromomethane	1.0	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
540-59-0	1,2-Dichloroethene (total)	1.0	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WQ Lab Sample ID:A0F160173 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 06/16/00
Work Order: DETAJ101 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0173099

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	1.0	U
97-63-2	Ethyl methacrylate	1.0	U
75-69-4	Trichlorofluoromethane	2.0	U
591-78-6	2-Hexanone	10	U
74-88-4	Iodomethane	1.0	U
78-83-1	Isobutyl alcohol	50	U
126-98-7	Methacrylonitrile	1.0	U
75-09-2	Methylene chloride	0.16	J B
80-62-6	Methyl methacrylate	1.0	U
107-12-0	Propionitrile	4.0	U
100-42-5	Styrene	1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
108-88-3	Toluene	0.10	J
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
96-18-4	1,2,3-Trichloropropane	1.0	U
108-05-4	Vinyl acetate	1.0	U
75-01-4	Vinyl chloride	1.0	U
1330-20-7	Xylenes (total)	1.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U
106-93-4	1,2-Dibromoethane (EDB)	1.0	U
78-93-3	2-Butanone (MEK)	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WQ Lab Sample ID:A0F160173 005
Method: SW846 8260B
Volatile Organics, GC/MS (8260B)

Sample WT/Vol: 5 / mL Date Received: 06/16/00
Work Order: DETAJ101 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0173099

Client Sample Id: TRIP BLANK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
108-10-1	4-Methyl-2-pentanone (MIBK)	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 001
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET7W103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/04/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-MW01-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	10	U
208-96-8	Acenaphthylene	10	U
98-86-2	Acetophenone	10	U
53-96-3	2-Acetylaminofluorene	10	U
92-67-1	4-Aminobiphenyl	10	U
62-53-3	Aniline	10	U
120-12-7	Anthracene	10	U
92-87-5	Benzidine	100	U
56-55-3	Benzo(a)anthracene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
191-24-2	Benzo(ghi)perylene	10	U
50-32-8	Benzo(a)pyrene	10	U
100-51-6	Benzyl alcohol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
111-44-4	bis(2-Chloroethyl) ether	10	U
108-60-1	2,2'-Oxybis(1-Chloropropane)	10	U
117-81-7	bis(2-Ethylhexyl) phthalate	5.0	U
101-55-3	4-Bromophenyl phenyl ether	10	U
85-68-7	Butyl benzyl phthalate	10	U
106-47-8	4-Chloroaniline	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-58-7	2-Chloronaphthalene	10	U
95-57-8	2-Chlorophenol	10	U
7005-72-3	4-Chlorophenyl phenyl ether	10	U
218-01-9	Chrysene	10	U
2303-16-4	Diallate	20	U
53-70-3	Dibenz(a,h)anthracene	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 001
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET7W103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/04/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-MW01-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
132-64-9	Dibenzofuran	10	U
84-74-2	Di-n-butyl phthalate	10	U
95-50-1	1,2-Dichlorobenzene	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
120-83-2	2,4-Dichlorophenol	10	U
87-65-0	2,6-Dichlorophenol	10	U
84-66-2	Diethyl phthalate	10	U
60-11-7	p-Dimethylaminoazobenzene	10	U
57-97-6	7,12-Dimethylbenz(a)anthrace	10	U
119-93-7	3,3'-Dimethylbenzidine	10	U
105-67-9	2,4-Dimethylphenol	10	U
131-11-3	Dimethyl phthalate	10	U
117-84-0	Di-n-octyl phthalate	10	U
99-65-0	1,3-Dinitrobenzene	10	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
88-85-7	2-sec-Butyl-4,6-dinitropheno	20	U
123-91-1	1,4-Dioxane	10	U
122-39-4	Diphenylamine	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
62-50-0	Ethyl methanesulfonate	10	U
206-44-0	Fluoranthene	10	U
86-73-7	Fluorene	10	U
118-74-1	Hexachlorobenzene	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 001
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET7W103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/04/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-MW01-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
87-68-3	Hexachlorobutadiene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
67-72-1	Hexachloroethane	10	U
1888-71-7	Hexachloropropene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
78-59-1	Isophorone	10	U
120-58-1	Isosafrole	10	U
91-80-5	Methapyrilene	10	U
95-53-4	o-Toluidine	10	U
56-49-5	3-Methylcholanthrene	10	U
66-27-3	Methyl methanesulfonate	10	U
91-57-6	2-Methylnaphthalene	10	U
95-48-7	2-Methylphenol	10	U
108-39-4	3-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
91-20-3	Naphthalene	10	U
130-15-4	1,4-Naphthoquinone	10	U
134-32-7	1-Naphthylamine	10	U
91-59-8	2-Naphthylamine	10	U
88-74-4	2-Nitroaniline	25	U
99-09-2	3-Nitroaniline	25	U
100-01-6	4-Nitroaniline	25	U
98-95-3	Nitrobenzene	10	U
88-75-5	2-Nitrophenol	10	U
100-02-7	4-Nitrophenol	25	U
56-57-5	4-Nitroquinoline-1-oxide	10	U
924-16-3	N-Nitrosodi-n-butylamine	10	U
55-18-5	N-Nitrosodiethylamine	10	U

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 001
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET7W103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/04/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-MW01-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
621-64-7	N-Nitrosodi-n-propylamine	10	U
86-30-6	N-Nitrosodiphenylamine	10	U
10595-95-6	N-Nitrosomethylethylamine	10	U
59-89-2	N-Nitrosomorpholine	10	U
100-75-4	N-Nitrosopiperidine	10	U
930-55-2	N-Nitrosopyrrolidine	10	U
99-55-8	5-Nitro-o-toluidine	10	U
608-93-5	Pentachlorobenzene	10	U
76-01-7	Pentachloroethane	50	U
82-68-8	Pentachloronitrobenzene	10	U
87-86-5	Pentachlorophenol	10	U
62-44-2	Phenacetin	10	U
85-01-8	Phenanthrene	10	U
108-95-2	Phenol	10	U
106-50-3	p-Phenylene diamine	10	U
109-06-8	2-Picoline	10	U
23950-58-5	Pronamide	10	U
129-00-0	Pyrene	10	U
110-86-1	Pyridine	10	U
94-59-7	Safrole	10	U
95-94-3	1,2,4,5-Tetrachlorobenzene	10	U
58-90-2	2,3,4,6-Tetrachlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
99-35-4	1,3,5-Trinitrobenzene	10	U
86-74-8	Carbazole	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 001
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET7W103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/04/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-MW01-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
510-15-6	Chlorobenzilate	10	U
122-09-8	a,a-Dimethylphenethylamine	50	U
140-57-8	Aramite	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 002
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET91103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/04/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-MW02-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	10	U
208-96-8	Acenaphthylene	10	U
98-86-2	Acetophenone	10	U
53-96-3	2-Acetylaminofluorene	10	U
92-67-1	4-Aminobiphenyl	10	U
62-53-3	Aniline	10	U
120-12-7	Anthracene	10	U
92-87-5	Benzidine	100	U
56-55-3	Benzo(a)anthracene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
191-24-2	Benzo(ghi)perylene	10	U
50-32-8	Benzo(a)pyrene	10	U
100-51-6	Benzyl alcohol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
111-44-4	bis(2-Chloroethyl) ether	10	U
108-60-1	2,2'-Oxybis(1-Chloropropane)	10	U
117-81-7	bis(2-Ethylhexyl) phthalate	5.0	U
101-55-3	4-Bromophenyl phenyl ether	10	U
85-68-7	Butyl benzyl phthalate	10	U
106-47-8	4-Chloroaniline	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-58-7	2-Chloronaphthalene	10	U
95-57-8	2-Chlorophenol	10	U
7005-72-3	4-Chlorophenyl phenyl ether	10	U
218-01-9	Chrysene	10	U
2303-16-4	Diallate	20	U
53-70-3	Dibenz(a,h)anthracene	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 002
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET91103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/04/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-MW02-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
132-64-9	Dibenzofuran	10	U
84-74-2	Di-n-butyl phthalate	10	U
95-50-1	1,2-Dichlorobenzene	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
120-83-2	2,4-Dichlorophenol	10	U
87-65-0	2,6-Dichlorophenol	10	U
84-66-2	Diethyl phthalate	10	U
60-11-7	p-Dimethylaminoazobenzene	10	U
57-97-6	7,12-Dimethylbenz(a)anthrace	10	U
119-93-7	3,3'-Dimethylbenzidine	10	U
105-67-9	2,4-Dimethylphenol	10	U
131-11-3	Dimethyl phthalate	10	U
117-84-0	Di-n-octyl phthalate	10	U
99-65-0	1,3-Dinitrobenzene	10	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
88-85-7	2-sec-Butyl-4,6-dinitropheno	20	U
123-91-1	1,4-Dioxane	10	U
122-39-4	Diphenylamine	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
62-50-0	Ethyl methanesulfonate	10	U
206-44-0	Fluoranthene	10	U
86-73-7	Fluorene	10	U
118-74-1	Hexachlorobenzene	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 002
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET91103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/04/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-MW02-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
87-68-3	Hexachlorobutadiene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
67-72-1	Hexachloroethane	10	U
1888-71-7	Hexachloropropene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
78-59-1	Isophorone	10	U
120-58-1	Isosafrole	10	U
91-80-5	Methapyrilene	10	U
95-53-4	o-Toluidine	10	U
56-49-5	3-Methylcholanthrene	10	U
66-27-3	Methyl methanesulfonate	10	U
91-57-6	2-Methylnaphthalene	10	U
95-48-7	2-Methylphenol	10	U
108-39-4	3-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
91-20-3	Naphthalene	10	U
130-15-4	1,4-Naphthoquinone	10	U
134-32-7	1-Naphthylamine	10	U
91-59-8	2-Naphthylamine	10	U
88-74-4	2-Nitroaniline	25	U
99-09-2	3-Nitroaniline	25	U
100-01-6	4-Nitroaniline	25	U
98-95-3	Nitrobenzene	10	U
88-75-5	2-Nitrophenol	10	U
100-02-7	4-Nitrophenol	25	U
56-57-5	4-Nitroquinoline-1-oxide	10	U
924-16-3	N-Nitrosodi-n-butylamine	10	U
55-18-5	N-Nitrosodiethylamine	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 002
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET91103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/04/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-MW02-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
621-64-7	N-Nitrosodi-n-propylamine	10	U
86-30-6	N-Nitrosodiphenylamine	10	U
10595-95-6	N-Nitrosomethylethylamine	10	U
59-89-2	N-Nitrosomorpholine	10	U
100-75-4	N-Nitrosopiperidine	10	U
930-55-2	N-Nitrosopyrrolidine	10	U
99-55-8	5-Nitro-o-toluidine	10	U
608-93-5	Pentachlorobenzene	10	U
76-01-7	Pentachloroethane	50	U
82-68-8	Pentachloronitrobenzene	10	U
87-86-5	Pentachlorophenol	10	U
62-44-2	Phenacetin	10	U
85-01-8	Phenanthrene	10	U
108-95-2	Phenol	10	U
106-50-3	p-Phenylene diamine	10	U
109-06-8	2-Picoline	10	U
23950-58-5	Pronamide	10	U
129-00-0	Pyrene	10	U
110-86-1	Pyridine	10	U
94-59-7	Safrole	10	U
95-94-3	1,2,4,5-Tetrachlorobenzene	10	U
58-90-2	2,3,4,6-Tetrachlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
99-35-4	1,3,5-Trinitrobenzene	10	U
86-74-8	Carbazole	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 002
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET91103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/04/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-MW02-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
510-15-6	Chlorobenzilate	10	U
122-09-8	a,a-Dimethylphenethylamine	50	U
140-57-8	Aramite	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 003
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET93103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/04/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-MW03-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	10	U
208-96-8	Acenaphthylene	10	U
98-86-2	Acetophenone	10	U
53-96-3	2-Acetylaminofluorene	10	U
92-67-1	4-Aminobiphenyl	10	U
62-53-3	Aniline	10	U
120-12-7	Anthracene	10	U
92-87-5	Benzidine	100	U
56-55-3	Benzo(a)anthracene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
191-24-2	Benzo(ghi)perylene	10	U
50-32-8	Benzo(a)pyrene	10	U
100-51-6	Benzyl alcohol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
111-44-4	bis(2-Chloroethyl) ether	10	U
108-60-1	2,2'-Oxybis(1-Chloropropane)	10	U
117-81-7	bis(2-Ethylhexyl) phthalate	4.2	J
101-55-3	4-Bromophenyl phenyl ether	10	U
85-68-7	Butyl benzyl phthalate	10	U
106-47-8	4-Chloroaniline	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-58-7	2-Chloronaphthalene	10	U
95-57-8	2-Chlorophenol	10	U
7005-72-3	4-Chlorophenyl phenyl ether	10	U
218-01-9	Chrysene	10	U
2303-16-4	Diallate	20	U
53-70-3	Dibenz(a,h)anthracene	10	U

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 003
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET93103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/04/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-MW03-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
132-64-9	Dibenzofuran	10	U
84-74-2	Di-n-butyl phthalate	10	U
95-50-1	1,2-Dichlorobenzene	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
120-83-2	2,4-Dichlorophenol	10	U
87-65-0	2,6-Dichlorophenol	10	U
84-66-2	Diethyl phthalate	10	U
60-11-7	p-Dimethylaminoazobenzene	10	U
57-97-6	7,12-Dimethylbenz(a)anthrace	10	U
119-93-7	3,3'-Dimethylbenzidine	10	U
105-67-9	2,4-Dimethylphenol	10	U
131-11-3	Dimethyl phthalate	10	U
117-84-0	Di-n-octyl phthalate	10	U
99-65-0	1,3-Dinitrobenzene	10	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
88-85-7	2-sec-Butyl-4,6-dinitropheno	20	U
123-91-1	1,4-Dioxane	10	U
122-39-4	Diphenylamine	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
62-50-0	Ethyl methanesulfonate	10	U
206-44-0	Fluoranthene	10	U
86-73-7	Fluorene	10	U
118-74-1	Hexachlorobenzene	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 003
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET93103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/04/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-MW03-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
87-68-3	Hexachlorobutadiene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
67-72-1	Hexachloroethane	10	U
1888-71-7	Hexachloropropene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
78-59-1	Isophorone	10	U
120-58-1	Isosafrole	10	U
91-80-5	Methapyrilene	10	U
95-53-4	o-Toluidine	10	U
56-49-5	3-Methylcholanthrene	10	U
66-27-3	Methyl methanesulfonate	10	U
91-57-6	2-Methylnaphthalene	10	U
95-48-7	2-Methylphenol	10	U
108-39-4	3-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
91-20-3	Naphthalene	10	U
130-15-4	1,4-Naphthoquinone	10	U
134-32-7	1-Naphthylamine	10	U
91-59-8	2-Naphthylamine	10	U
88-74-4	2-Nitroaniline	25	U
99-09-2	3-Nitroaniline	25	U
100-01-6	4-Nitroaniline	25	U
98-95-3	Nitrobenzene	10	U
88-75-5	2-Nitrophenol	10	U
100-02-7	4-Nitrophenol	25	U
56-57-5	4-Nitroquinoline-1-oxide	10	U
924-16-3	N-Nitrosodi-n-butylamine	10	U
55-18-5	N-Nitrosodiethylamine	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 003
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET93103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/04/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-MW03-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
621-64-7	N-Nitrosodi-n-propylamine	10	U
86-30-6	N-Nitrosodiphenylamine	10	U
10595-95-6	N-Nitrosomethylethylamine	10	U
59-89-2	N-Nitrosomorpholine	10	U
100-75-4	N-Nitrosopiperidine	10	U
930-55-2	N-Nitrosopyrrolidine	10	U
99-55-8	5-Nitro-o-toluidine	10	U
608-93-5	Pentachlorobenzene	10	U
76-01-7	Pentachloroethane	50	U
82-68-8	Pentachloronitrobenzene	10	U
87-86-5	Pentachlorophenol	10	U
62-44-2	Phenacetin	10	U
85-01-8	Phenanthrene	10	U
108-95-2	Phenol	10	U
106-50-3	p-Phenylene diamine	10	U
109-06-8	2-Picoline	10	U
23950-58-5	Pronamide	10	U
129-00-0	Pyrene	10	U
110-86-1	Pyridine	10	U
94-59-7	Safrole	10	U
95-94-3	1,2,4,5-Tetrachlorobenzene	10	U
58-90-2	2,3,4,6-Tetrachlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
99-35-4	1,3,5-Trinitrobenzene	10	U
86-74-8	Carbazole	10	U

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 003
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET93103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/04/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-MW03-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
510-15-6	Chlorobenzilate	10	U
122-09-8	a,a-Dimethylphenethylamine	50	U
140-57-8	Aramite	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 004
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET94103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/05/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-DUP2-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	10	U
208-96-8	Acenaphthylene	10	U
98-86-2	Acetophenone	10	U
53-96-3	2-Acetylaminofluorene	10	U
92-67-1	4-Aminobiphenyl	10	U
62-53-3	Aniline	10	U
120-12-7	Anthracene	10	U
92-87-5	Benzidine	100	U
56-55-3	Benzo(a)anthracene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
191-24-2	Benzo(ghi)perylene	10	U
50-32-8	Benzo(a)pyrene	10	U
100-51-6	Benzyl alcohol	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
111-44-4	bis(2-Chloroethyl) ether	10	U
108-60-1	2,2'-Oxybis(1-Chloropropane)	10	U
117-81-7	bis(2-Ethylhexyl) phthalate	5.3	
101-55-3	4-Bromophenyl phenyl ether	10	U
85-68-7	Butyl benzyl phthalate	10	U
106-47-8	4-Chloroaniline	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-58-7	2-Chloronaphthalene	10	U
95-57-8	2-Chlorophenol	10	U
7005-72-3	4-Chlorophenyl phenyl ether	10	U
218-01-9	Chrysene	10	U
2303-16-4	Diallate	20	U
53-70-3	Dibenz(a,h)anthracene	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name: Severn Trent Laboratories, Inc. SDG Number: MP012

Matrix: (soil/water) WG Lab Sample ID: A0F160173 004
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET94103 Date Extracted: 06/17/00
Dilution factor: 1 Date Analyzed: 07/05/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-DUP2-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
132-64-9	Dibenzofuran	10	U
84-74-2	Di-n-butyl phthalate	10	U
95-50-1	1,2-Dichlorobenzene	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
120-83-2	2,4-Dichlorophenol	10	U
87-65-0	2,6-Dichlorophenol	10	U
84-66-2	Diethyl phthalate	10	U
60-11-7	p-Dimethylaminoazobenzene	10	U
57-97-6	7,12-Dimethylbenz(a)anthrace	10	U
119-93-7	3,3'-Dimethylbenzidine	10	U
105-67-9	2,4-Dimethylphenol	10	U
131-11-3	Dimethyl phthalate	10	U
117-84-0	Di-n-octyl phthalate	10	U
99-65-0	1,3-Dinitrobenzene	10	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
51-28-5	2,4-Dinitrophenol	25	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
88-85-7	2-sec-Butyl-4,6-dinitropheno	20	U
123-91-1	1,4-Dioxane	10	U
122-39-4	Diphenylamine	10	U
122-66-7	1,2-Diphenylhydrazine	10	U
62-50-0	Ethyl methanesulfonate	10	U
206-44-0	Fluoranthene	10	U
86-73-7	Fluorene	10	U
118-74-1	Hexachlorobenzene	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 004
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET94103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/05/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-DUP2-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
87-68-3	Hexachlorobutadiene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
67-72-1	Hexachloroethane	10	U
1888-71-7	Hexachloropropene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
78-59-1	Isophorone	10	U
120-58-1	Isosafrole	10	U
91-80-5	Methapyrilene	10	U
95-53-4	o-Toluidine	10	U
56-49-5	3-Methylcholanthrene	10	U
66-27-3	Methyl methanesulfonate	10	U
91-57-6	2-Methylnaphthalene	10	U
95-48-7	2-Methylphenol	10	U
108-39-4	3-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
91-20-3	Naphthalene	10	U
130-15-4	1,4-Naphthoquinone	10	U
134-32-7	1-Naphthylamine	10	U
91-59-8	2-Naphthylamine	10	U
88-74-4	2-Nitroaniline	25	U
99-09-2	3-Nitroaniline	25	U
100-01-6	4-Nitroaniline	25	U
98-95-3	Nitrobenzene	10	U
88-75-5	2-Nitrophenol	10	U
100-02-7	4-Nitrophenol	25	U
56-57-5	4-Nitroquinoline-1-oxide	10	U
924-16-3	N-Nitrosodi-n-butylamine	10	U
55-18-5	N-Nitrosodiethylamine	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 004
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET94103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/05/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-DUP2-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
621-64-7	N-Nitrosodi-n-propylamine	10	U
86-30-6	N-Nitrosodiphenylamine	10	U
10595-95-6	N-Nitrosomethylethylamine	10	U
59-89-2	N-Nitrosomorpholine	10	U
100-75-4	N-Nitrosopiperidine	10	U
930-55-2	N-Nitrosopyrrolidine	10	U
99-55-8	5-Nitro-o-toluidine	10	U
608-93-5	Pentachlorobenzene	10	U
76-01-7	Pentachloroethane	50	U
82-68-8	Pentachloronitrobenzene	10	U
87-86-5	Pentachlorophenol	10	U
62-44-2	Phenacetin	10	U
85-01-8	Phenanthrene	10	U
108-95-2	Phenol	10	U
106-50-3	p-Phenylene diamine	10	U
109-06-8	2-Picoline	10	U
23950-58-5	Pronamide	10	U
129-00-0	Pyrene	10	U
110-86-1	Pyridine	10	U
94-59-7	Safrole	10	U
95-94-3	1,2,4,5-Tetrachlorobenzene	10	U
58-90-2	2,3,4,6-Tetrachlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
99-35-4	1,3,5-Trinitrobenzene	10	U
86-74-8	Carbazole	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 004
Method: SW846 8270C
Base/Neutrals and Acids (8270C)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET94103 Date Extracted:06/17/00
Dilution factor: 1 Date Analyzed: 07/05/00
Moisture %:

QC Batch: 0168304

Client Sample Id: 436-GW-DUP2-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
510-15-6	Chlorobenzilate	10	U
122-09-8	a,a-Dimethylphenethylamine	50	U
140-57-8	Aramite	10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F150214 001
Method: SW846 8310
Hydrocarbons, Polynuclear Aromatic (HPLC - 8310)

Sample WT/Vol: 1000 / mL Date Received: 06/15/00
Work Order: DEQAX105 Date Extracted:06/16/00
Dilution factor: 1 Date Analyzed: 06/20/00
Moisture %:

QC Batch: 0167453

Client Sample Id: 425-GW-MW01-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	1.0	U
208-96-8	Acenaphthylene	1.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	0.10	U
50-32-8	Benzo(a)pyrene	0.10	U
205-99-2	Benzo(b)fluoranthene	0.10	U
191-24-2	Benzo(ghi)perylene	0.10	U
207-08-9	Benzo(k)fluoranthene	0.10	U
218-01-9	Chrysene	0.10	U
53-70-3	Dibenz(a,h)anthracene	0.10	U
206-44-0	Fluoranthene	0.10	U
86-73-7	Fluorene	0.066	J
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	U
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	0.13	J
129-00-0	Pyrene	0.10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 001
Method: SW846 8310
Hydrocarbons, Polynuclear Aromatic (HPLC - 8310)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET7W105 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/21/00
Moisture %:
QC Batch: 0172095

Client Sample Id: 436-GW-MW01-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	1.0	U
208-96-8	Acenaphthylene	1.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	0.10	U
50-32-8	Benzo(a)pyrene	0.10	U
205-99-2	Benzo(b)fluoranthene	0.10	U
191-24-2	Benzo(ghi)perylene	0.10	U
207-08-9	Benzo(k)fluoranthene	0.10	U
218-01-9	Chrysene	0.10	U
53-70-3	Dibenz(a,h)anthracene	0.10	U
206-44-0	Fluoranthene	0.10	U
86-73-7	Fluorene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	U
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	1.0	U
129-00-0	Pyrene	0.10	U

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 002
Method: SW846 8310
Hydrocarbons, Polynuclear Aromatic (HPLC - 8310)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET91105 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/21/00
Moisture %:

QC Batch: 0172095

Client Sample Id: 436-GW-MW02-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	1.0	U
208-96-8	Acenaphthylene	1.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	0.10	U
50-32-8	Benzo(a)pyrene	0.10	U
205-99-2	Benzo(b)fluoranthene	0.10	U
191-24-2	Benzo(ghi)perylene	0.10	U
207-08-9	Benzo(k)fluoranthene	0.10	U
218-01-9	Chrysene	0.10	U
53-70-3	Dibenz(a,h)anthracene	0.10	U
206-44-0	Fluoranthene	0.10	U
86-73-7	Fluorene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	U
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	1.0	U
129-00-0	Pyrene	0.10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 003
Method: SW846 8310
Hydrocarbons, Polynuclear Aromatic (HPLC - 8310)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET93104 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/21/00
Moisture %:
QC Batch: 0172095

Client Sample Id: 436-GW-MW03-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	1.0	U
208-96-8	Acenaphthylene	1.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	0.10	U
50-32-8	Benzo(a)pyrene	0.10	U
205-99-2	Benzo(b)fluoranthene	0.10	U
191-24-2	Benzo(ghi)perylene	0.10	U
207-08-9	Benzo(k)fluoranthene	0.10	U
218-01-9	Chrysene	0.10	U
53-70-3	Dibenz(a,h)anthracene	0.10	U
206-44-0	Fluoranthene	0.10	U
86-73-7	Fluorene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	U
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	1.0	U
129-00-0	Pyrene	0.10	U

FORM I

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 004
Method: SW846 8310
Hydrocarbons, Polynuclear Aromatic (HPLC - 8310)

Sample WT/Vol: 1000 / mL Date Received: 06/16/00
Work Order: DET94105 Date Extracted:06/20/00
Dilution factor: 1 Date Analyzed: 06/21/00
Moisture %:

QC Batch: 0172095

Client Sample Id: 436-GW-DUP2-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	1.0	U
208-96-8	Acenaphthylene	1.0	U
120-12-7	Anthracene	2.0	U
56-55-3	Benzo(a)anthracene	0.10	U
50-32-8	Benzo(a)pyrene	0.10	U
205-99-2	Benzo(b)fluoranthene	0.10	U
191-24-2	Benzo(ghi)perylene	0.10	U
207-08-9	Benzo(k)fluoranthene	0.10	U
218-01-9	Chrysene	0.10	U
53-70-3	Dibenz(a,h)anthracene	0.10	U
206-44-0	Fluoranthene	0.10	U
86-73-7	Fluorene	1.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	U
90-12-0	1-Methylnaphthalene	2.0	U
91-57-6	2-Methylnaphthalene	2.0	U
91-20-3	Naphthalene	2.0	U
85-01-8	Phenanthrene	1.0	U
129-00-0	Pyrene	0.10	U

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG
Method: RSK SOP-175
Dissolved Gases in Water

Lab Sample ID:A0F160173 002

mg/L

Sample WT/Vol: 42 / mL
Work Order: DET91104
Dilution factor: 1
Moisture %:

Date Received: 06/16/00
Date Extracted:06/29/00
Date Analyzed: 06/29/00

QC Batch: 0184105

Client Sample Id: 436-GW-MW02-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	380	E

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 002
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 42 / mL Date Received: 06/16/00
Work Order: DET91204 Date Extracted:06/29/00
Dilution factor: 25 Date Analyzed: 06/29/00
Moisture %:

QC Batch: 0184105

Client Sample Id: 436-GW-MW02-001 -RE 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	770	D

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 004
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 42 / mL Date Received: 06/16/00
Work Order: DET94104 Date Extracted:06/29/00
Dilution factor: 1 Date Analyzed: 06/29/00
Moisture %:

QC Batch: 0184105

Client Sample Id: 436-GW-DUP2-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	450	E

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 004
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 42 / mL Date Received: 06/16/00
Work Order: DET94204 Date Extracted:06/29/00
Dilution factor: 25 Date Analyzed: 06/29/00
Moisture %:

QC Batch: 0184105

Client Sample Id: 436-GW-DUP2-001 -RE 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	1600	D

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 002
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 42 / mL Date Received: 06/16/00
Work Order: DET91104 Date Extracted:06/29/00
Dilution factor: 1 Date Analyzed: 06/29/00
Moisture %:

QC Batch: 0184105

Client Sample Id: 436-GW-MW02-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	380	E

TETRA TECH NUS, INC.

Lab Name:Severn Trent Laboratories, Inc. SDG Number:MP012

Matrix: (soil/water) WG Lab Sample ID:A0F160173 002
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 42 / mL Date Received: 06/16/00
Work Order: DET91204 Date Extracted:06/29/00
Dilution factor: 25 Date Analyzed: 06/29/00
Moisture %:

QC Batch: 0184105

Client Sample Id: 436-GW-MW02-001 -RE 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	770	D

TETRA TECH NUS, INC.

Lab Name: Severn Trent Laboratories, Inc. SDG Number: MP012

Matrix: (soil/water) WG Lab Sample ID: A0F160173 004
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 42 / mL Date Received: 06/16/00
Work Order: DET94104 Date Extracted: 06/29/00
Dilution factor: 1 Date Analyzed: 06/29/00
Moisture %:

QC Batch: 0184105

Client Sample Id: 436-GW-DUP2-001

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	450	E

TETRA TECH NUS, INC.

Lab Name: Severn Trent Laboratories, Inc. SDG Number: MP012

Matrix: (soil/water) WG Lab Sample ID: A0F160173 004
Method: RSK SOP-175
Dissolved Gases in Water mg/L

Sample WT/Vol: 42 / mL Date Received: 06/16/00
Work Order: DET94204 Date Extracted: 06/29/00
Dilution factor: 25 Date Analyzed: 06/29/00
Moisture %:

QC Batch: 0184105

Client Sample Id: 436-GW-DUP2-001 -RE 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
74-82-8	Methane	1600	D

Commited To *Your* Success

CASE NARRATIVE

Date:	June 27, 2000
STL Order Number:	C006484
Project Name:	A0F160173-NS MAYPORT
Project Location:	OHIO
Methods:	Petroleum Hydrocarbons (FL-PRO)

STL Sample ID	***Client Sample ID***
C006484-1	436-GW-MW01-001
C006484-2	436-GW-MW02-001
C006484-3	436-GW-MW03-001
C006484-4	436-GW-DUP1-001

The samples listed above were received at the laboratory on 17-JUN-00 in good condition at a temperature of 3°C.

There were no problems associated with the analysis of these samples.

Lance W. Larson
STL-Fl Project Manager

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DET7W **Client ID:** 436-GW-MW01-001

Matrix: Water **Units:** ug/L **Prep Date:** 6/27/00 **Prep Batch:** 0179098

Weight: NA **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Lead	220.35	1.7	3.0	1.7	U	1	ICPST	6/28/00	19:06

Comments: Lot #: A0F160173 Sample #: 1

Version 3.63.6 Beta

U Result is less than the IDL
B Result is between IDL and RL

Form 1 Equivalent

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DET91 **Client ID:** 436-GW-MW02-001

Matrix: Water **Units:** ug/L **Prep Date:** 6/27/00 **Prep Batch:** 0179098

Weight: NA **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Lead	220.35	1.7	3.0	1.7	U	1	ICPST	6/28/00	19:39

Comments: Lot #: A0F160173 Sample #: 2

Version 3.63.6 Beta

U Result is less than the IDL
B Result is between IDL and RL

Form 1 Equivalent

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DET93 **Client ID:** 436-GW-MW03-001

Matrix: Water **Units:** ug/L **Prep Date:** 6/27/00 **Prep Batch:** 0179098

Weight: NA **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Lead	220.35	1.7	3.0	1.7	U	1	ICPST	6/28/00	19:44

Comments: Lot #: A0F160173 Sample #: 3

Version 3.63.6 Beta

U Result is less than the IDL
B Result is between IDL and RL

Form 1 Equivalent

STL North Canton

Metals Data Reporting Form

Sample Results

Lab Sample ID: DET94 **Client ID:** 436-GW-DUP2-001

Matrix: Water **Units:** ug/L **Prep Date:** 6/27/00 **Prep Batch:** 0179098

Weight: NA **Volume:** 50 **Percent Moisture:** NA

Element	WL/ Mass	IDL	Report Limit	Conc	Q	DF	Instr	Anal Date	Anal Time
Lead	220.35	1.7	3.0	1.7	U	1	ICPST	6/28/00	19:49

Comments: Lot #: A0F160173 Sample #: 4

Version 3.63.6 Beta

U Result is less than the IDL
B Result is between IDL and RL

Form 1 Equivalent

TETRA TECH NUS, INC.

Client Sample ID: 436-GW-MW02-001

General Chemistry

Lot-Sample #...: A0F160173-002 **Work Order #...:** DET91 **Matrix.....:** WG
Date Sampled...: 06/15/00 10:48 **Date Received..:** 06/16/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate	ND	0.1	mg/L	MCAWW 353.2	06/16/00	0171378
	Dilution Factor: 1					
Nitrite	ND	0.1	mg/L	MCAWW 353.2	06/16/00	0171377
	Dilution Factor: 1					
Sulfate	**48**	**10**	**mg/L**	**MCAWW 375.4**	**07/09/00**	**0191101**
	Dilution Factor: 2					
Total Sulfide	ND	1.0	mg/L	MCAWW 376.1	06/19-06/20/00	0171417
	Dilution Factor: 1					

TETRA TECH NUS, INC.

Client Sample ID: 436-GW-DUP2-001

General Chemistry

Lot-Sample #...: A0F160173-004 **Work Order #...:** DET94 **Matrix.....:** WG
Date Sampled...: 06/15/00 09:18 **Date Received..:** 06/16/00

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Nitrate	ND	0.1	mg/L	MCAWW 353.2	06/16/00	0171378
		Dilution Factor: 1				
Nitrite	ND	0.1	mg/L	MCAWW 353.2	06/16/00	0171377
		Dilution Factor: 1				
Sulfate	**40**	**5**	**mg/L**	**MCAWW 375.4**	**07/09/00**	**0191101**
		Dilution Factor: 1				
Total Sulfide	ND	1.0	mg/L	MCAWW 376.1	06/19-06/20/00	0171417
		Dilution Factor: 1				

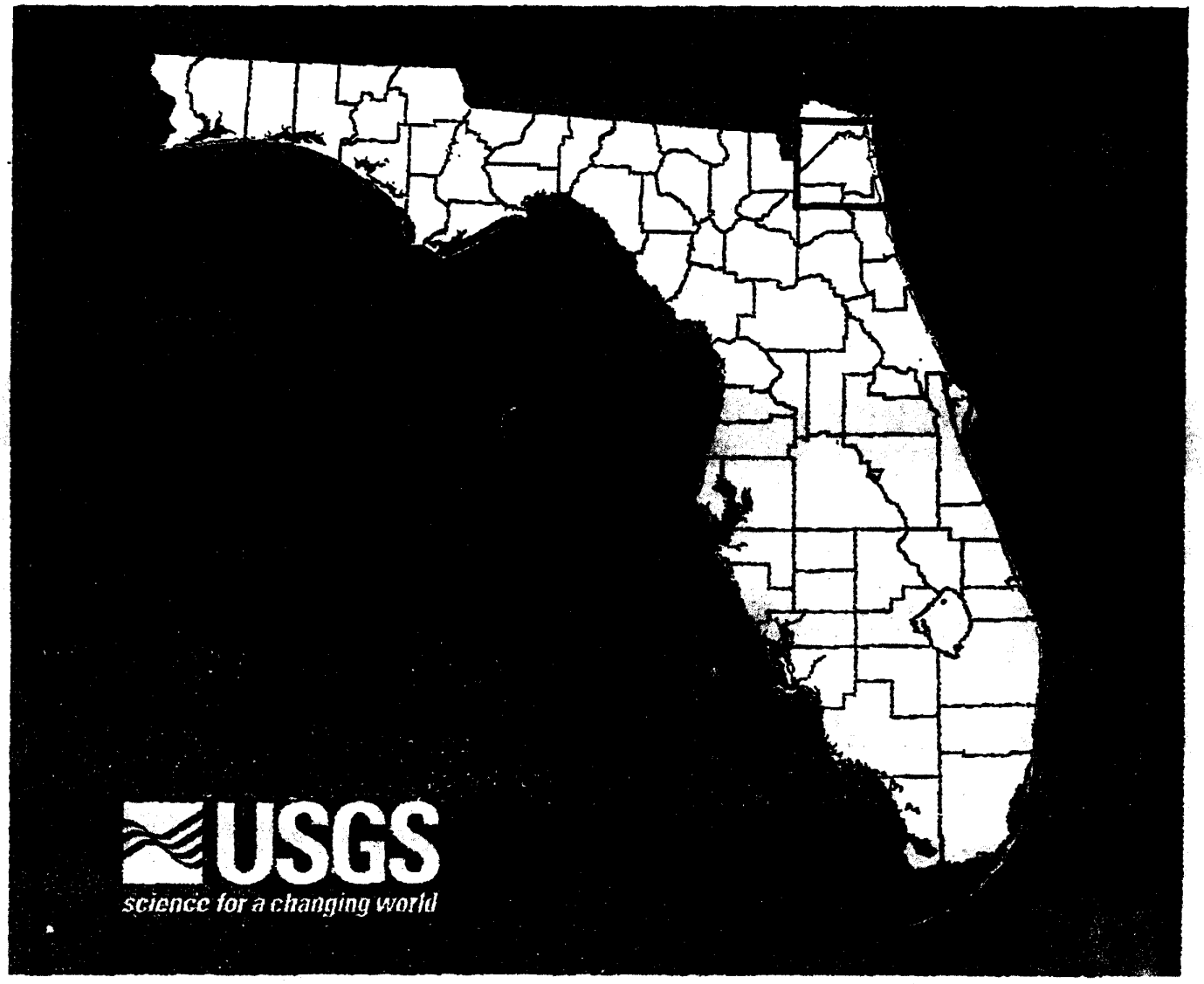
APPENDIX I

U.S. GEOLOGICAL SURVEY REPORT 97-4262

Ground-Water Flow in the Surficial Aquifer System and Potential Movement of Contaminants from Selected Waste-Disposal Sites at Naval Station Mayport, Florida

U.S. Geological Survey
Water-Resources Investigations Report 97-4262

Prepared in cooperation with the
Southern Division, Naval Facilities Engineering Command, U.S. Navy



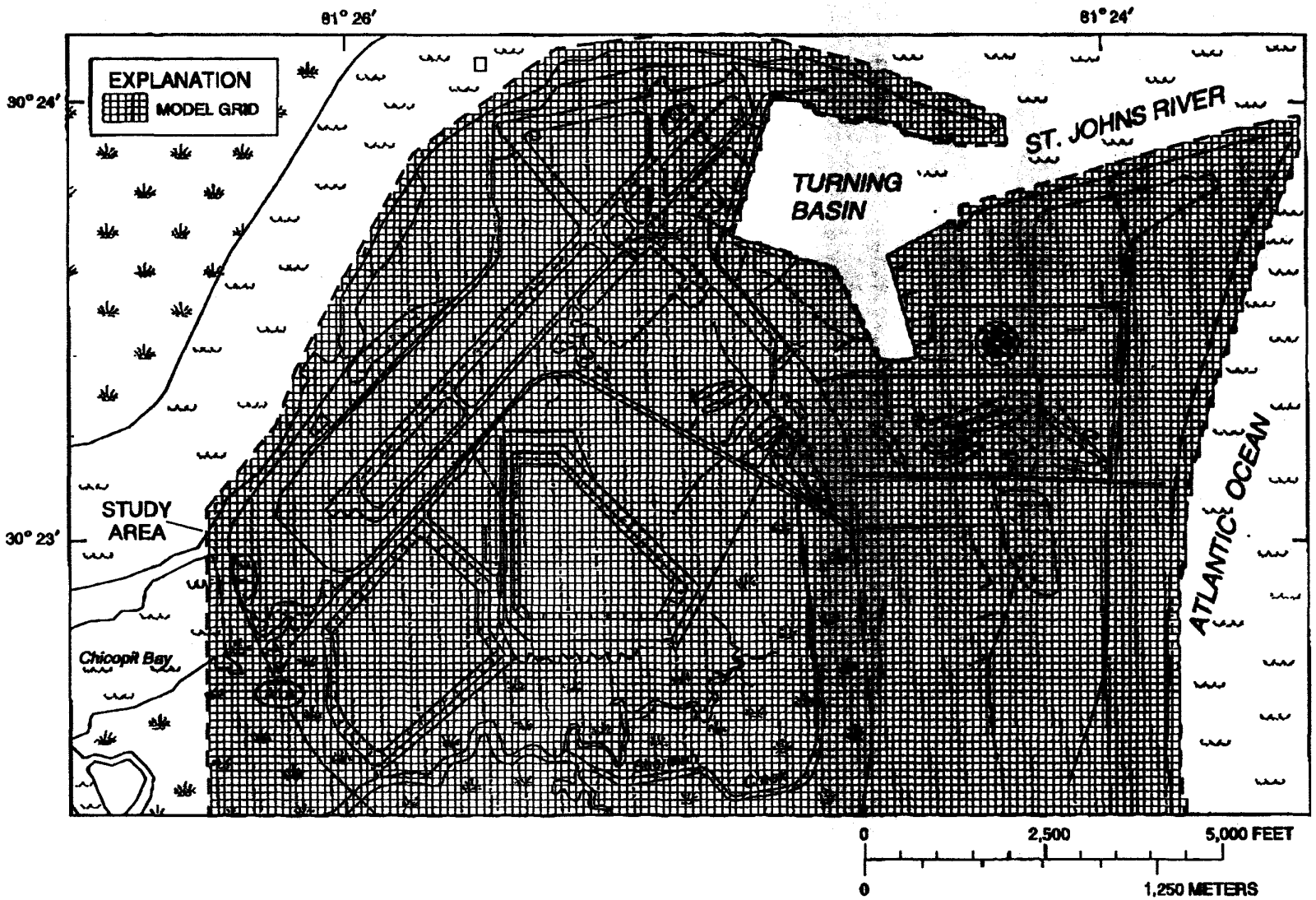


Figure 12. Active model grid.

of lateral hydraulic conductivity estimates, the single-well tests and slug tests can be executed in less time and at a lower cost than the multi-well aquifer tests. About 15 to 20 single-well tests were conducted and analyzed in the same amount of time it took to conduct one multi-well aquifer test at NAVSTA Mayport. Although greater uncertainty is associated with estimates based on data collected during single-well tests and slug tests, the improved efficiencies associated with these tests facilitate an increase in spatial coverage and provide a better description of the spatial variability of the lateral hydraulic conductivity.

Lateral hydraulic conductivities were estimated from the multi-well aquifer tests by fitting a model to the measured drawdowns. The appropriate flow model was dictated by the geology and ground-water flow conditions at the site and the configuration of the pumped well and observation wells. The drawdown response in a single, confined aquifer can be described by the analytical Theis (1935) model. The Theis model was used to analyze the drawdown in well 8-3 which was affected by a nearby sump screened across both the S-zone and the I-zone (table 2). Most of the other multi-well aquifer tests were better described by the numerical model VS2DT (Lappala and others, 1987; Healy, 1990) that accounts for an unconfined aquifer and vertical flow within the aquifer. Six of the multi-well aquifer tests were analyzed by fitting results computed with a variably saturated, radially symmetric, numerical model, VS2DT, to the measured drawdowns (Halford, 1997). Aquifer tests conducted at wells B-1S and B-1I were analyzed with a three-dimensional MODFLOW model to account for the asymmetric effects of Lake Wonder Wood and a nearby drainage canal.

Where the marsh-muck confining unit was about 1 ft thick or less at the test site, the aquifer-test model (either VS2DT or MODFLOW) spanned both the S-zone and the I-zone of the surficial aquifer system. The entire vertical section was simulated for these tests to avoid prescribing boundary conditions within the section. Where the marsh-muck confining unit was more than 1 ft thick, vertical leakage across the confining unit was generally ignored.

Lateral hydraulic conductivity estimates were constrained in all aquifer test analyses by assuming that one value could characterize the entire thickness of either the S-zone or the I-zone at the test site.

Table 2. Lateral and vertical hydraulic conductivity estimates determined from multi-well aquifer tests

[Well locations are shown in figure 3; ft/d, feet per day; gpm, gallons per minute; ft, feet; <, less than; --, not applicable]

Well identifier[a]	Lateral hydraulic conductivity (K_{XY}), ft/d			Vertical hydraulic conductivity (K_Z), ft/d	Vertical anisotropy (K_Z/K_{XY})	Flow rate, gpm	Test duration hour:minute	Maximum drawdown, ft	Initial wetted screen, ft	Aquifer thickness, ft	Marsh-muck confining unit thickness, ft
	Multi-well	Single well[b]	Slug test[c]								
2-17S	8	15	11	8	1	4.6	6:45	4.0	9	18	4
2-38S	80	135	65	12 < 0.002[f]	0.15	5.0	2:15	3.5	10	6	10
8-3S[d]	15	--	--	--	.13	1.0	8:00	--	25	40	0
13-5S	13	33	--	13	1	1.9	7:18	4.0	9	7	1
20-2S	27	35	27	10	0.38	1.7	5:30	2.4	8	8	4
B-1S[e]	30	41	--	--	--	5.4	6:00	3.0	9	24	2
BE-7S	32	58	--	3	.09	4.5	3:10	2.3	8	49	0
B-1I[e]	70	--	--	< 1[f]	--	5.4	6:00	1.2	5	18	2
F-80I[g]	34	48	--	2	.07	20	5:00	12.2	10	49	0

[a] Suffix denotes zone tested.

[b] All single-well tests were analyzed with no more than the first hour of drawdown data.

[c] Lateral hydraulic conductivity estimates from slug tests were reported in U.S. Department of the Navy (1995).

[d] Aquifer was stressed by a 4-ft diameter sump with 25 ft of screen. The drawdown response was simulated with the Theis (1935) solution. Vertical anisotropy was determined by a nearby test in the unsaturated zone. An unspecified air flow rate was induced near the water table (about 7 ft below land surface) and six drawdowns were measured at 10, 20, and 30 ft from the pumped well and 2 and 4 ft below land surface. The maximum drawdown was equivalent to 0.58 ft of water and the compressibility effects of air could be ignored.

[e] Observed drawdowns were fitted to a three-dimensional model that accounted for the effects of Lake Wonder Wood and a nearby canal. The model was simulated with the MODFLOW code.

[f] Maximum vertical hydraulic conductivity of the marsh-muck confining unit at test sites. Based on both the S-zone and I-zone tests.

[g] Aquifer test was performed in 1979 and originally reported by Franks (1980).

Estimates of vertical hydraulic conductivity across the marsh-muck confining unit or within the S-zone were similarly constrained. Preliminary results of aquifer tests in vertically adjacent zones were applied iteratively until "best fit" results were achieved for tests in both zones (table 2).

The single-well aquifer tests were analyzed with the Cooper-Jacob (1946) approximation of the Theis solution. The Cooper-Jacob model of aquifer response can be described by a straight line on a plot of drawdown as a function of the logarithm of time. Lateral hydraulic conductivity (K) values are estimated from flow rate and drawdown measurements by:

$$K = \frac{2.3 Q_{Pump}}{4\pi b s_{\log cycle}}, \qquad (5)$$

where

Q_{Pump} is the rate the well is pumped, in cubic feet per day;

b is the thickness of the aquifer, in feet; and

$s_{\log cycle}$ is the measured rate of drawdown increase, in feet per log-cycle.

For all of the aquifer tests conducted at NAVSTA Mayport, the drawdowns observed in the pumped wells increased semi-logarithmically after the initial well-bore effects dissipated. Using equation 5, a lateral hydraulic conductivity estimate was determined at most of the single-well aquifer test sites (table 3). The limited drawdown data could have been fitted to more sophisticated models but no more than one hydraulic characteristic could have been reasonably estimated.

Although the Cooper-Jacob method provides a simple method of analysis, many of the inherent assumptions of the method are not met or are only partially satisfied at NAVSTA Mayport because a leaky confining unit is present and the surficial aquifer system is unconfined. The combined result of neglecting these factors was that lateral hydraulic conductivity estimates based on single-well tests, K_{single}, were consistently greater than corresponding estimates based on multi-well tests, K_{multi} (table 2).

Table 3. Lateral hydraulic conductivity estimates determined from single-well aquifer tests

[Well locations are shown in figure 3; gpm, gallons per minute; ft, feet; --, not applicable]

Well identifier[a]	Lateral hydraulic conductivity, ft/d			Flow rate, gpm	Test duration hour:minute	Maximum drawdown, ft	Initial wetted screen, ft	Aquifer thickness, ft	Marsh-muck confining unit thickness, ft
	Corrected single-well[b]	Single well	Slug test[c]						
2-32S	58	98	--	1.9	0:09	1.0	7	6	7
2-34S	28	48	--	2.1	0:08	2.4	6	6	14
2-35S	9	15	--	1.2	2:45	6.2	7	7	5
2-36S	15	25	54	3.5	0:06	4.9	9	8	10
2-37S	1	2	--	1.8	0:04	3.0	10	13	10
8-5S	2	4	1.2	0.7	0:06	3.6	9	7	1
15-P2	5	9	5.5	2.0	0:07	2.3	10	50	0
16-4S	34	58	--	1.8	0:16	0.8	4	10	1
23-3S	6	11	2	1.8	0:18	5.1	8	9	5
23-5S[d]	7	12	9	2.0	0:15	.8	8	21	11
23-7S	8	14	1.5	.9	0:16	3.0	8	6	4
CU-4S	5	8	--	1.8	0:14	1.0	6	49	0
1-1I	9	16	--	4.6	0:11	5.0	5	41	2
2-11I	55	92	--	4.6	0:13	2.4	5	44	6
2-12I	47	79	45	5.0	0:15	2.4	5	42	5
2-17I	72	120	93	4.3	2:35	4.6	5	25	4
2-18I	13	22	29	4.8	5:00	2.2	5	58	1
2-23I	49	83	--	4.5	0:21	2.4	5	48	6
2-32I	14	25	--	4.8	0:07	1.0	5	40	7
2-34I[e]	--	--	--	.6	0:07	26.0	5	45	14
2-35I	10	18	--	4.8	6:15	4.0	5	21	5
2-36I	70	117	46	4.8	0:13	2.0	5	13	10
2-37I	3	5	--	1.8	0:12	2.6	5	28	10
2-38I	.6	1.1	1.4	2.4	2:00	19.0	5	46	10
8-5I	14	24	--	4.6	0:11	3.3	5	40	1
16-1I	56	95	--	4.5	0:15	1.9	5	42	0
23-5I	1.1	2	1.3	1.6	0:18	7.8	5	17	11
CU-8I	15	26	--	4.0	0:17	2.9	5	49	0

[a] Suffix denotes zone tested.

[b] The single-well lateral hydraulic conductivity estimates were corrected by equation 6.

[c] Lateral hydraulic conductivity estimates from slug tests were reported in U.S. Department of the Navy (1995).

[d] Pumped for 15 minutes but only the first minute was analyzed due to proximity of St. Johns River.

[e] Specific capacity was less than 0.02 gallon per minute per foot.

A log-log graph of K_{multi} versus K_{single} suggests a linear relation exists between the logarithms of the two variables (fig. 13), which can be described by:

$$K_{Multi} = 0.53 K_{Single}^{1.03}. \qquad (6)$$

Equation 6 adequately corrects the initial estimates from single-well aquifer tests, as indicated by the regression coefficient ($r^2 = 0.89$), and is considered to provide the best estimate of lateral hydraulic conductivity at NAVSTA Mayport. The corrected values of lateral hydraulic conductivity from the single-well tests were used in the calibrated model (table 3).

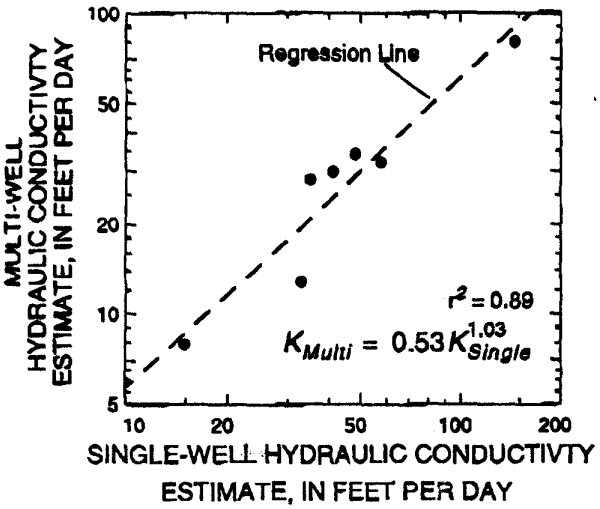


Figure 13. Relation between lateral hydraulic conductivity values estimated by single-well tests and multi-well tests.

Additional lateral hydraulic conductivity estimates at NAVSTA Mayport were determined from slug tests (U.S. Department of the Navy, 1995), 59 in the S-zone and 5 in the I-zone (table 4). The slug tests were analyzed by the Bouwer and Rice (1976) method which empirically corrects for the effects of partially penetrating wells in an unconfined aquifer.

Table 4. Lateral hydraulic conductivity estimates determined from slug tests

[Lateral hydraulic conductivity in feet per day; all other values in feet; <, less than; well locations are shown in figure 3]

Well identifier[a]	Lateral hydraulic conductivity[b]	Initial wetted screen	Aquifer thickness	Marsh-muck confining unit thickness
1-P1	20	5	18	3
1-P2	25	5	15	1
1-P3	18	8	14	7
2-18S	5	10	8	1
2-22S	7	10	6	3
2-25S	3	10	18	5
2-26S	10	10	18	5
2-31S	29	10	9	11
2-33S	34	10	9	5
2-P11	8	4	7	2
2-P2	8	5	11	3
2-P4	13	5	10	4
2-P5	6	5	6	2
2-P6	6	5	2	3
2-P8	5	5	5	5

[a] Suffix denotes zone tested.

[b] Lateral hydraulic conductivity estimates were reported in U.S. Department of the Navy (1995).

Table 4. Lateral hydraulic conductivity estimates determined from slug tests--(Continued)

[Lateral hydraulic conductivity in feet per day; all other values in feet; <, less than; well locations are shown in figure 3]

Well identifier[a]	Lateral hydraulic conductivity[b]	Initial wetted screen	Aquifer thickness	Marsh-muck confining unit thickness
2-P9	18	5	9	1
8-4S	7	6	43	0
8-6S	2	7	44	0
8-7S	2	7	44	0
8-8S	1.0	6	8	<1
8-P2	7	5	44	0
8-P3	0.8	5	45	<1
8-P4	10	7	10	3
13-8S	45	10	7	5
13-P1	18	5	8	5
13-P4	16	5	61	0
13-P5	1.3	5	4	3
14-3S	13	9	47	0
14-4S	10	9	47	0
14-5S	11	8	47	0
14-6S	11	9	47	0
14-7S	8	9	47	0
14-8S	11	8	47	0
14-9S	8	9	47	0
14-10S	18	9	47	0
14-11S	21	9	48	0
14-12S	14	6	48	0
14-13S	9	9	47	0
14-14S	13	9	47	0
14-P1	12	5	47	0
14-P2	22	5	46	0
15-1S	3	9	9	1
15-P3	6	10	9	3
16-2S	5	7	43	0
17-P2	23	5	51	0
18-1S	14	8	48	0
18-2S	9	8	47	0
18-3S	17	8	47	0
23-1S	2	9	8	3
23-2S	1.0	10	8	4
23-4S	5	9	15	8
23-6S	3	7	12	5
24-1S	2	10	8	3
44-1S	5	7	14	3
44-2S	1.0	6	12	3
44-3S	5	7	17	7
45-2S	8	8	19	9
56-1S	36	10	5	3
CU-5S	6	6	47	0
2-15I	12	10	50	5
2-25I	50	5	46	5
2-31I	9	5	23	11
2-33I	7	5	49	5
15-5I	15	5	55	0

[a] Suffix denotes zone tested.

[b] Lateral hydraulic conductivity estimates were reported in U.S. Department of the Navy (1995).

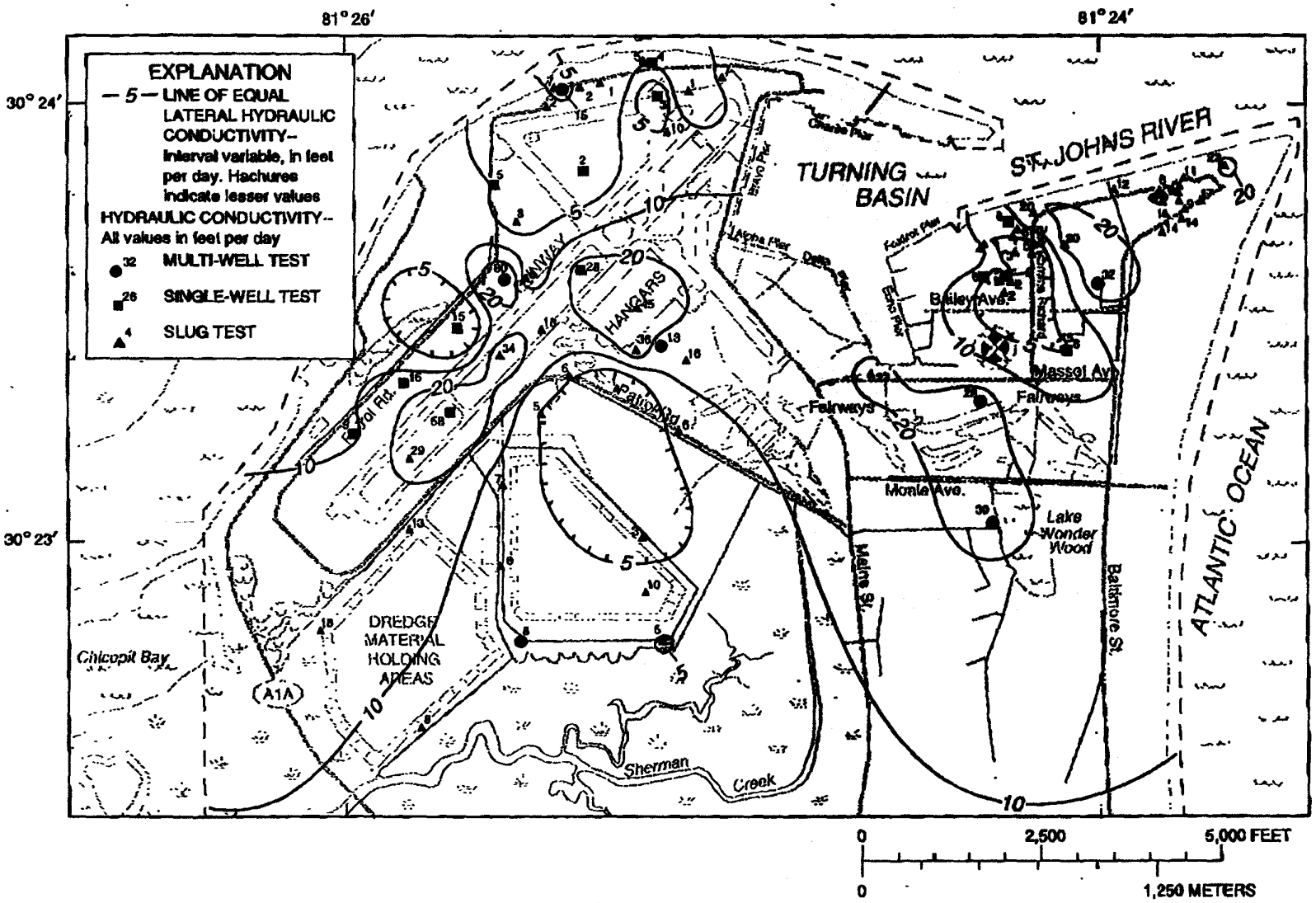


Figure 15. Lateral hydraulic conductivity of the S-zone (layer 1).

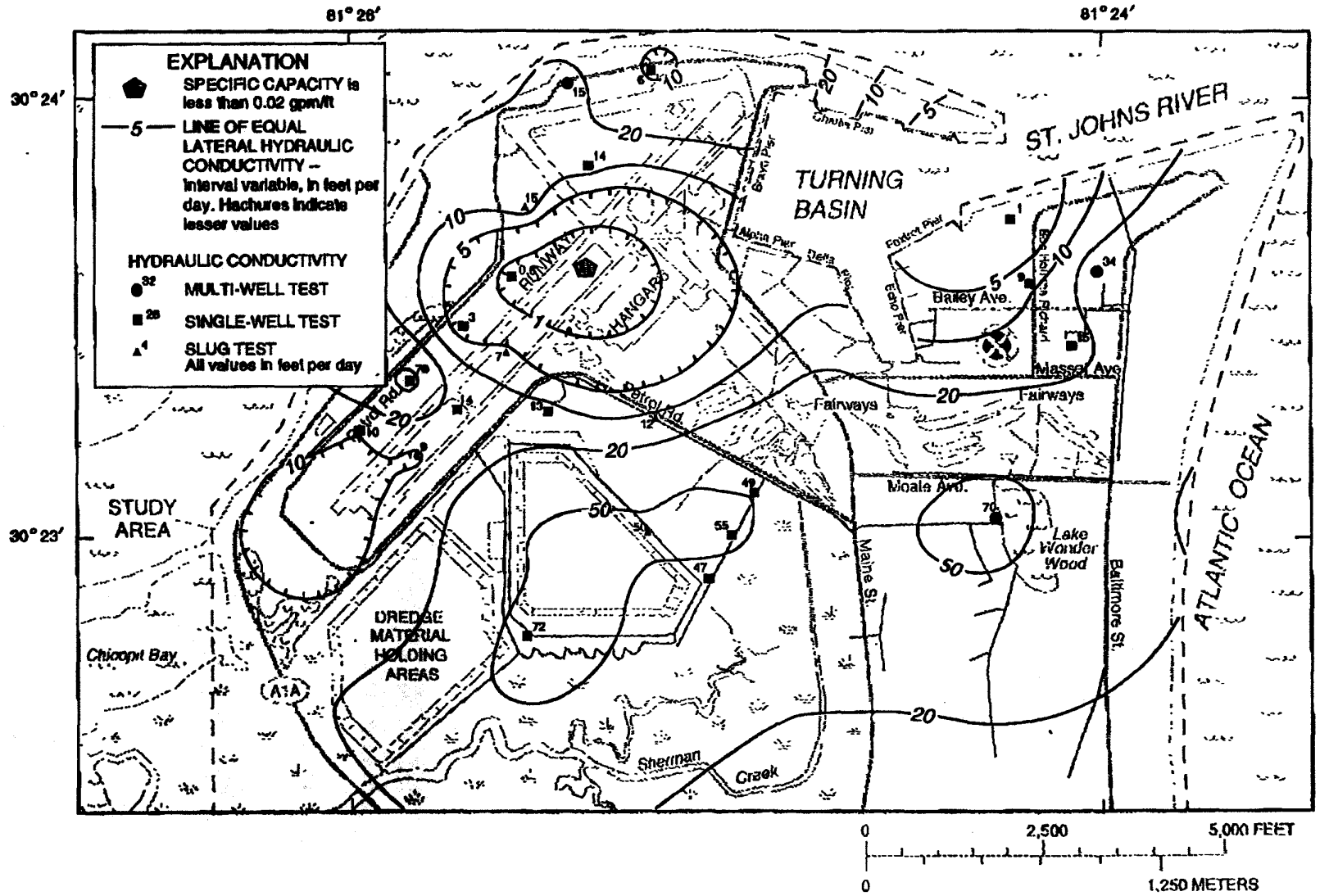


Figure 16. Lateral hydraulic conductivity of the I-zone (layer 2).

Chicopit Bay, Sherman Creek, and the unnamed canals that drain Lake Wonder Wood and the golf course area along Patrol Road also are tidally-influenced. The tidal range varies from about 6 ft at Sherman Creek and SR A1A to about 2 ft at the far reaches of the unnamed canals that drain Lake Wonder Wood and the golf course area along Patrol Road. The average stage of these features is also about 1 ft above sea level.

Measurable tidal effects propagate throughout most of the surficial aquifer system (fig. 17). Within 200 ft of the St. Johns River, vertical tidal displacements of 0.5 ft or more were observed in the S-zone near SWMU-6/7 and in the I-zone east of the turning basin. Tidal displacements decreased away from the shoreline but were still measurable in wells 8-5S and 8-5I by the runways and near the F-80 aquifer test site (fig. 17). East of the dredge material holding area and west of Lake Wonder Wood, ground-water displacements of more than 0.1 ft were responses to tidal fluctuations in the adjacent canals, not in the St. Johns River or the Atlantic Ocean (fig. 17).

The tidal displacement data can be used to independently evaluate the lateral hydraulic conductivity of the surficial aquifer system. If the tidal displacements do not significantly change the saturated thickness, then an analytical solution that describes the displacements in a one-dimensional, confined aquifer due to tidal forcing (Cooper and others, 1964) can be described by:

$$\Delta h_{Tide} = \frac{h_0}{2} e^{-x\sqrt{\frac{\pi S}{t_0 Kb}}} \sin\left(2\pi \frac{t}{t_0} - x\sqrt{\frac{\pi S}{t_0 Kb}}\right) , \quad (9)$$

where

h_0 is the amplitude of the tidal signal, in feet;
x is the distance from the tidal signal, in feet;
t_0 is the period of the tidal cycle, in days (about 0.52 day or 12.5 hours); and
t is the elapsed time since the beginning of a tidal cycle.

Equation 9 shows that the amplitude of water-level displacement in a given well is a function of the distance from the tidal signal and of the aquifer diffusivity, *Kb/S*.

Hydraulic characteristic estimates imposed by equation 9 tend to be qualitative because the appropriate specific yield or storage coefficient is unknown and can vary over three orders of magnitude or more. Specific yield estimates from multi-well aquifer tests of the S-zone ranged from 0.04 to 0.12 at clean sites and was about 0.004 near SWMU-6/7, where free product occurs at the water table. Storage coefficient estimates from multi-well tests of the I-zone ranged from 3×10^{-4} to 6×10^{-4}. Quantitative analysis is further complicated by the vertical transmission of the tidal signal between the I-zone and S-zone which causes diffusivity estimates from equation 9 to reflect a composite storage coefficient for both zones.

Relative differences between lateral and vertical hydraulic conductivity can be inferred between sites if the spatial variability of specific yield and storage coefficient are assumed to be minimal. Average diffusivities in the areas near wells 8-5S, 8-5I, and the F-80 aquifer test site (fig. 17) are about 500,000 feet squared per day (ft^2/d) based on an attenuation of the tidal amplitude to about 0.01 of the source and distances of between 1,000 and 1,500 ft (table 5). The differences in tidal displacements in the S-zone and I-zone at these three sites suggest that the vertical hydraulic conductivity near wells 8-5S and 8-5I is much less than near the F-80 aquifer-test site (fig. 17). The diffusivity of the area between the southwestern end of the runway and the St. Johns River is about 100,000 ft^2/d which suggests the transmissivity of the surficial aquifer system in this area should be about five times less than near well 8-5I or the F-80 aquifer-test site.

Vertical ground-water displacements were greater in the S-zone than in the I-zone east of the dredge material holding area and west of Lake Wonder Wood because the tidal signal originated in the adjacent canals (fig. 17). The vertical displacement in the I-zone at these sites probably was the result of the loading effect of the canals on the marsh-muck confining unit. The similar range of displacement in the S-zone and I-zone east of the dredge material holding area suggests that the leakance between the two zones is less in this area than west of Lake Wonder Wood.

Tidal fluctuation affects ground-water movement but does not affect the average ground-water flow rate or direction. Tidal fluctuation increases the potential for dispersion when the maximum tidally driven component of flow is greater than the topographically driven component of lateral ground-water flow. In areas near the shoreline, flow paths and dispersion are increased because shallow flow paths can be reversed and deeper flow paths along the freshwater/saltwater interface oscillate. Away from the shoreline and canals, the maximum

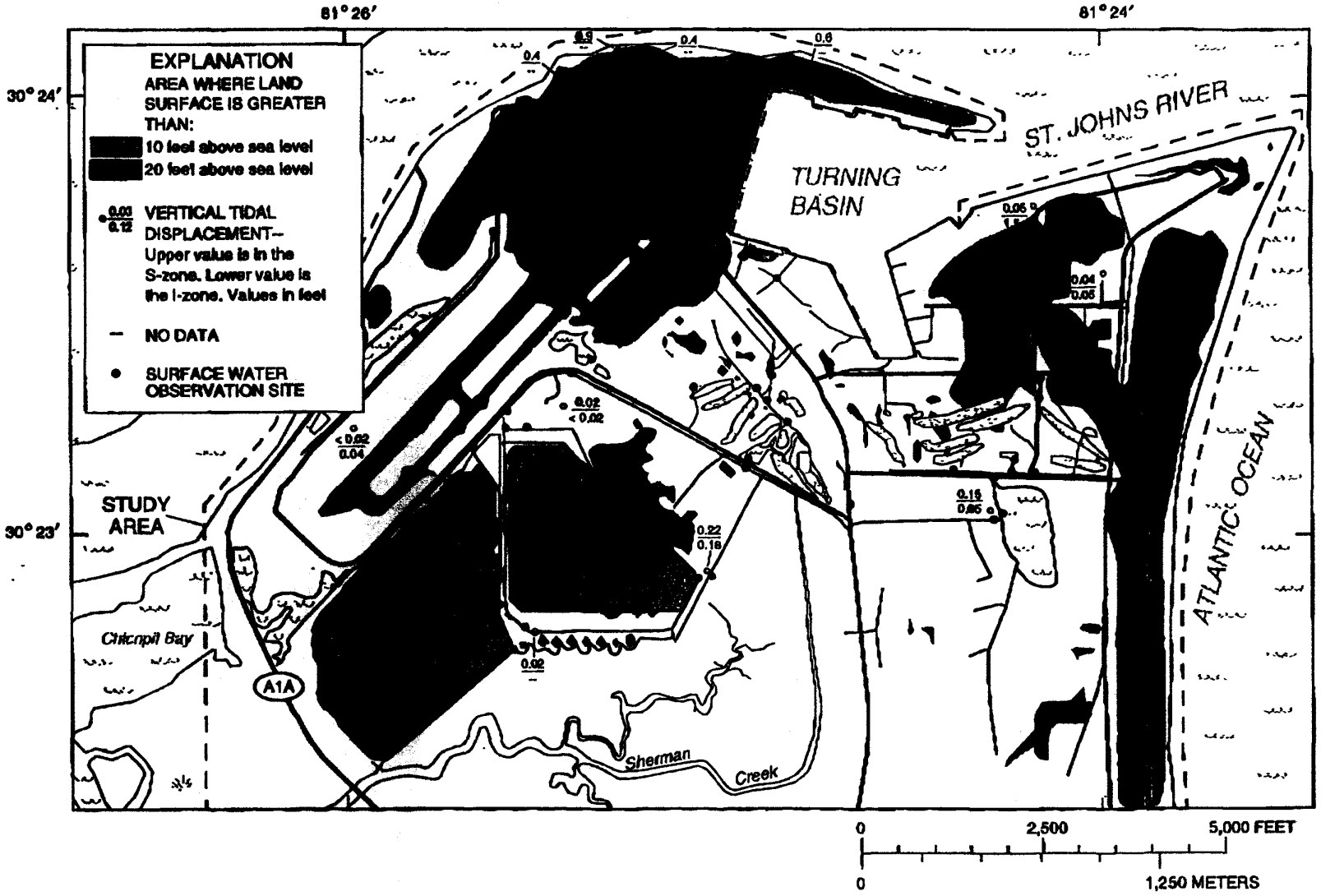


Figure 17. Generalized land surface altitudes in the study area, surface-water observation sites, and vertical tidal displacement measurement sites.

Lateral hydraulic conductivity estimates based on slug test results are reported to be within 25 percent of actual value (Bouwer and Rice, 1976) under ideal conditions, but the discrepancy is expected to be greater in practice.

Lateral hydraulic conductivity values were estimated using results from pumping tests and slug tests at 15 wells. Values based on the pumping tests and slug tests ranged from 0.4 to 80 feet per day (ft/d) and from 1.2 to 93 ft/d, respectively. The geometric averages of the two sets of estimates are the same (10 ft/d) but the median discrepancy between any two estimates was about 50 percent of the greater estimate. The maximum discrepancies between values at a single site resulted from tests at wells 23-7S and 2-36S. The slug test underestimated the single-well test results at 23-7S by a factor of 4 (1.5 ft/d compared to 7 ft/d), and overestimated the single-well test results at 2-36S by a factor of 4 (54 ft/d compared to 13 ft/d).

The areal distribution of lateral hydraulic conductivity in the S-zone (layer 1) and the I-zone (layer 2) were estimated by kriging the log of the test estimates of hydraulic conductivity. Ordinary kriging was used to interpolate and extrapolate from the test site locations (point values) to the model nodes because it provides the best linear, unbiased estimate (Isaaks and Srivastava, 1989). Ordinary kriging can be used because no spatial trends exist in the log-hydraulic conductivity values of either the S-zone or the I-zone.

Spatial interpolation by kriging is based on the internal structure of the data set (autocorrelation). This structure, if present, is examined by plotting the squared difference in measured values, γ_{ij}, against the distance between locations i and j. A scatter plot of γ_{ij} as a function of distance will show a general increase in γ_{ij} as pairs become further apart. An overall structure, however, is hard to determine because of the variability which exists at any given point (Isaaks and Srivastava, 1989).

An underlying internal structure is made more apparent by averaging γ_{ij} over intervals (lags) to obtain:

$$\gamma(h) = \frac{1}{2N(h)} \sum_{(i,j)|h_{ij}=h} (Y_i - Y_j)^2 \quad , \qquad (7)$$

where

h is the average distance between log-hydraulic conductivity values in an interval;

$N(h)$ is the number of pairs in an interval; and

Y is a measured log-hydraulic conductivity value.

A plot of $\gamma(h)$ versus h produces an empirical variogram (fig. 14). Variograms of log-hydraulic conductivity differences showed little uncertainty (nugget effect) associated with the measured values relative to the variance of Y in either the S-zone or the I-zone (fig. 14). For about the first 1,000 to 1,500 ft, $\gamma(h)$ increased rapidly with distance. Beyond about 4,000 ft, $\gamma(h)$ remained near the variance of Y in both the S-zone and the I-zone which was 0.25 and 0.62 log (ft/d)^2, respectively (fig. 14). The variability in γ_{ij} as a function of data pair orientation was not considered because the available data were insufficient to define anisotropic variograms.

Exponential variograms (fig. 14) provide the functional form of the relation between $\gamma(h)$ and distance. The empirical variograms of Y in the S-zone and the I-zone were approximated by:

$$\tilde{\gamma}_{ij} = \sigma^2\left(1 - \exp\frac{-3h}{a}\right) \quad , \qquad (8)$$

where

σ^2 is the variance of log-hydraulic conductivity, in log (ft/d)^2, and

a is the range, in feet.

Range is the primary variogram parameter that affects kriging estimates. As range increases, more measured values influence the estimate. Both the S-zone and the I-zone exponential variograms were defined by a range of 3,000 ft.

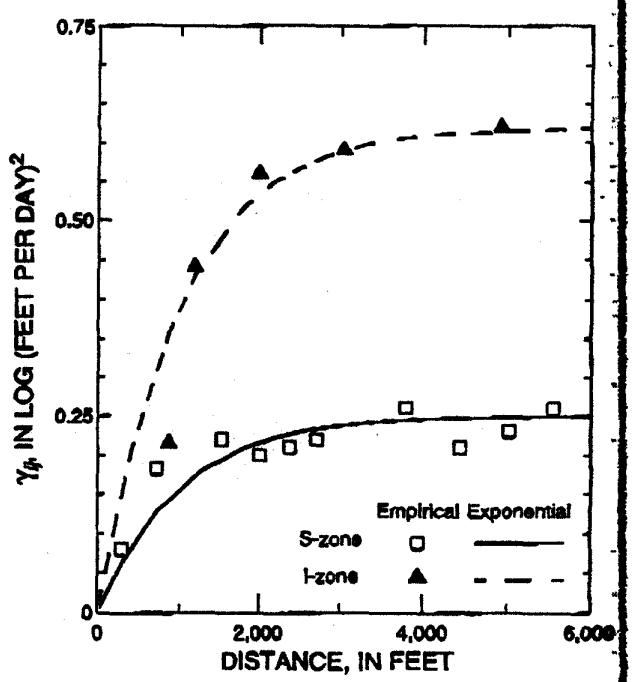


Figure 14. Empirical and exponential variograms of log hydraulic conductivity in the S-zone (layer 1) and the I-zone (layer 2).

Kriging estimates for each model node were generated from a weighted linear combination of the point estimates of log-hydraulic conductivity. The weights were determined by solving the kriging system of equations that minimizes the estimation error, subject to the constraints of unbiasedness (Isaaks and Srivastava, 1989). When solving the kriging system of equations, the exponential variogram placed more emphasis on measurements (point values) that were closer to a node location.

The hydraulic conductivity distribution of the S-zone (layer 1) was kriged from 79 measurements (7 multi-well aquifer tests, 13 single-well tests, and 59 slug tests) and the S-zone exponential variogram (fig. 14). Many measurements were along the runways and north of the golf course (fig. 15). A few measurements were near the dredge material holding areas; no measurements were available south of Lake Wonder Wood. Three principal areas of relatively low hydraulic conductivity in the S-zone were identified near SWMU-6/7, between the hangars and the eastern dredge material holding area, and north of the baseball fields (fig. 15).

The hydraulic conductivity distribution of the I-zone (layer 2) was kriged from 23 point estimates from 2 multi-well aquifer tests, 15 single-well tests, 5 slug tests, and a specific capacity test. The specific capacity test was less than 0.02 gallons per minute per foot (gal/min)/ft at well 2-34I and a hydraulic conductivity of 0.1 ft/d was assigned to this site. The I-zone exponential variogram (fig. 14) described the spatial structure of the lateral hydraulic conductivity measurements. Most of the measurements were near the runways and around the eastern dredge material holding area (fig. 16). There were no measurements beneath the golf course areas, along the Atlantic Ocean, or south of Lake Wonder Wood. Two areas of relatively low hydraulic conductivity in the I-zone were identified near the center of the runways and near Foxtrot pier (fig. 16).

The transmissivity (T) distribution of the I-zone (layer 2) was used in place of the hydraulic conductivity distribution in the flow model because the thickness of the I-zone is not a function of the water table. The transmissivity distribution of the I-zone was calculated by multiplying the lateral hydraulic conductivity distribution (fig. 16) by the corresponding thickness for layer 2 (fig. 8).

The initial areal distribution of leakance between layers 1 and 2 was defined by the presence or absence of the marsh-muck confining unit. Where the marsh-muck confining unit was 1 ft thick or greater (fig. 6), the marsh-muck confining unit was assumed to control the vertical movement of water. The initial leakance estimate for these areas was calculated by dividing the preliminary estimate of vertical hydraulic conductivity of the confining unit (0.001 ft/d) by the thickness of the marsh-muck confining unit (fig. 6). The vertical hydraulic conductivity of the aquifer was assumed to control the vertical movement of water where the marsh-muck confining unit was less than 1 ft thick (fig. 6). The initial leakance estimate for areas where the marsh-muck confining unit was thin or missing was calculated by multiplying the lateral hydraulic conductivity of the S-zone (fig. 15) by the vertical anisotropy determined from multi-well test results (table 2) and dividing it by the average internode distance between layers 1 and 2 (30 ft). A vertical anisotropy of $K_Z/K_{XY} = 0.1$ was applied consistently and is the rounded average of the non-unity values listed in table 2.

Different vertical leakances were assigned beneath Sherman Creek and Lake Wonder Wood. Sherman Creek is about 10 ft deep at SR A1A and was dredged between 1969 and 1972 from south of the dredge material holding areas to the canal along Patrol Road (fig. 1). Because the marsh-muck confining unit was assumed to be breached along the length of Sherman Creek, the leakance beneath the creek was arbitrarily set 1,000 times greater than the leakance of the surrounding marsh-muck confining unit in order to simulate the breach. Lake Wonder Wood, created between 1960 and 1965, was dredged to about 20 ft below sea level, and is well connected with the I-zone. Leakance below the lake was estimated during model calibration.

Tidal Effects and Surface-Water Features

The dominant surface-water features surrounding NAVSTA Mayport are the St. Johns River and the Atlantic Ocean along the northern and eastern edges, respectively (fig. 1). Both features are deep, tidally-influenced, saltwater bodies that communicate directly with the S-zone and the I-zone of the surficial aquifer system. The typical tidal range is about 6 ft but can be as much as 10 ft (U.S. Department of the Navy, 1995). The average stage of the St. Johns River and the Atlantic Ocean near NAVSTA Mayport is about 1 ft above sea level.

$$\nabla (Kb\nabla h) + q + (P - Q_S) - ET = S\frac{\partial h}{\partial t} \quad , \quad (4)$$

where

∇ is del, the vector differential operator;
K is hydraulic conductivity, in feet per day;
b is thickness, in feet;
h is hydraulic head, in feet;
q is a source or sink, in feet per day;
$(P - Q_S)$ is precipitation minus surface runoff, in feet per day;
ET is evapotranspiration, in feet per day;
S is storage coefficient in confined aquifers and the specific yield in unconfined aquifers, dimensionless; and
t is time, in days.

Description of the Ground-Water Flow Model

To implement a finite-difference model, the study area was discretized into a rectangular grid of cells by row and column. The active model grid covered an area of about 4.4 mi^2 and was divided into 107 rows of 152 columns (fig. 12). Uniform, square cells that measured 100 ft on a side were used throughout the simulated area. Of the 32,528 model cells, 8,126 cells were inactive beyond the study area and in areas covered by the St. Johns River, the turning basin, and the Atlantic Ocean.

The grid was oriented along a north-south axis for convenience. Neither a majority of known stresses or boundary conditions were aligned along any particular axis. No measurements of anisotropy were available and a lateral anisotropy ratio of 1:1 was used for simulation. Values of aquifer and confining-unit hydraulic properties were assigned to the center of each cell, defined as a node, by interpolation from observed point values.

The model was vertically discretized into two layers to simulate the S-zone and I-zone of the surficial aquifer system (fig. 9). Vertical impedance to flow within the surficial aquifer system was simulated by assigning leakance values at each cell between model layers. The leakance is the average vertical hydraulic conductivity of the aquifer or confining unit material between nodes divided by the vertical distance between corresponding nodes in adjacent model layers and is in units of feet per day per foot (d^{-1}). Leakage between the S-zone and the I-zone primarily is controlled by the thickness of the marsh-muck confining unit in areas where the confining unit is more than 1 ft thick. Vertical movement of water was assumed to be controlled by the vertical hydraulic conductivity of the aquifer where the confining unit is 1 ft thick or less.

Hydraulic Characteristics

Multi-well aquifer tests, single-well aquifer tests, and slug tests were conducted at NAVSTA Mayport to estimate the hydraulic properties of the surficial aquifer system. The lateral hydraulic conductivities estimated by these tests were the final values used in the ground-water flow model. Because there is no pumpage from the surficial aquifer and the surface-water features are tidally influenced, ground-water discharge could not be independently quantified and the lateral hydraulic conductivity distribution could not be reasonably estimated by model calibration.

An aquifer test consists of applying a known stress to an aquifer; measuring the change in water level, drawdown or recovery, due to that stress; and inferring the hydraulic properties of the aquifer. For the multi-well and the single-well aquifer tests, the aquifer was stressed by pumping at a constant, known rate. The principal difference between the multi-well tests and the single-well tests is the measurement of drawdowns in observation wells in addition to the pumped well. For slug tests, the aquifer was stressed by removing a known volume from a well and measuring the water level recovery.

Lateral hydraulic conductivity estimates from multi-well tests are considered most representative of aquifer hydraulic characteristics because the amount of water exchanged and, therefore, the volume of aquifer affected usually are greater than during slug tests or single-well tests. The median volumes removed during the multi-well, single-well, and slug tests at NAVSTA Mayport were about 900, 40, and 0.4 gallons (gal), respectively. Hydraulic conductivity estimates generally are averaged over a greater volume of aquifer by the inclusion of drawdown measurements from several observation wells. An increased number of observation well locations also increases the uniqueness of hydraulic conductivity estimates, even when fitting the test data to more complex models that account for unconfined conditions and vertical flow within the aquifer.

In addition to multi-well aquifer tests, single-well tests and slug tests were used to estimate lateral hydraulic conductivities. Although the multi-well aquifer tests provide the most representative estimates