Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62467-04-D-005

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NSWC CRANE
5090.3a

Rev. 0
07/08

Interim Measures Work Plan
for
SWMU 13 - Mine Fill B

Naval Surface Warfare Center Crane
Crane, Indiana

Contract Task Order 20

July 2008

NAVFAC
Naval Facilities Engineering Command
Midwest
201 Decatur Avenue
Building 1A, Code EV
Great Lakes, Illinois 60088

TETRA TECH NUS, Inc.

DEPARTMENT OF THE NAVY
CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
300 HIGHWAY 361
CRANE, INDIANA 47522-5001

IN REPLY REFER TO:
5090/S4.7.3
Ser 0592/8213
6 AUG 2008

U.S. Environmental Protection Agency, Region V
Waste, Pesticides, & Toxics Division
Waste Management Branch
Corrective Action Section LU-9J
77 West Jackson Blvd.
Chicago, IL 60604

Dear Mr. Ramanauskas:

Crane Division, Naval Surface Warfare Center submits the revised Interim Measures Work Plan (IMWP) for Solid Waste Management Unit (SWMU) 13, Mine Fill B. The IMWP was revised to include the Building 171 sump investigation results and incorporates the resulting volume and excavation changes. As such, the IMWP is presented for your review and approval as a Draft Final in enclosure (1). The permit required Certification Statement is provided as enclosure (2).

If you require any further information, my point of contact is Mr. Thomas J. Brent, Code PRCR4-TB, at 812-854-6160, email thomas.brent@navy.mil.

Sincerely,

Thomas J. Brent, acting
J. M. HUNSICKER
Environmental Protection Mgr
By direction of the Commanding Officer

Enclosures: 1. Draft Final SWMU 13 IMWP
2. Certification Statement

Copy to:
ADMINISTRATIVE RECORD
NAVFAC MW (Howard Hickey) (w/o encl)
IDEM (Doug Griffin)
TTNUS (Ralph Basinski) (w/o encl)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Thomas P. Brent

SIGNATURE

Environmental Protection Mgr

TITLE

8/6/08

DATE

Comprehensive Long-term Environmental Action Navy

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030707/P

INTERIM MEASURES WORK PLAN
SWMU 13 - MINE FILL B

NAVAL SURFACE WARFARE CENTER CRANE
CRANE, INDIANA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Southern Division
Naval Facilities Engineering Command Midwest
201 Decatur Avenue
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Submitted by:
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CONTRACT NO. N62467-04-D-0055
CONTRACT TASK ORDER 20

JULY 2008

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ACRONYMS

amsl	above mean sea level
bgs	below ground surface
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-term Environmental Action Navy
CTO	Contract Task Order
DNR	Department of Natural Resources
DQO	data quality objective
DRMO	Defense Reutilization Marketing Office
EMAC	Environmental Multiple Award Contract
EP	Extraction Procedure
ESA	Endangered Species Act
HMX	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
HSWA	Hazardous and Solid Waste Amendments
IAS	Initial Assessment Study
IDEM	Indiana Department of Environmental Management
IDOT	Indiana Department of Transportation
IM	Interim Measure
IMWP	Interim Measures Work Plan
IR	Installation Restoration
LDPE	Low density polyethylene
MFB	Mine Fill B
mg/kg	milligram(s) per kilogram
MSDS	Material Safety Data Sheet
msl	mean sea level
NSWC	Naval Surface Warfare Center
OICC	Officer in Charge of Construction
PCB	polychlorinated biphenyl
ppm	parts per million
Puz	Upper Pennsylvanian water-bearing zone
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
RFA	RCRA Facility Assessment

RFI	RCRA Facility Investigation
SWMU	Solid Waste Management Unit
TCLP	Toxicity Characteristic Leaching Procedure
TNT	2,4,6-trinitrotoluene
TSCA	Toxic Substances Control Act
TtNUS	Tetra Tech NUS, Inc.
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOCs	volatile organic compounds

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of this document is to present the Interim Measures Work Plan (IMWP) for the Mine Fill B (MFB), which has been designated Solid Waste Management Unit (SWMU) 13, at Naval Surface Warfare Center (NSWC) Crane located in Crane, Indiana. The IMWP provides requirements for the excavation and off-site disposal of polychlorinated biphenyl (PCB) contaminated soils and sediment located in the vicinity of Buildings 166 and 171 and within the drainage channels that receive surface water runoff from these areas. The IMWP was prepared for the United States Navy, Naval Facilities Engineering Command, Engineering Field Division South by Tetra Tech NUS, Inc. (TtNUS) under Contract Task Order (CTO) 0020 of the Comprehensive Long-Term Environmental Action Navy (CLEAN) IV Contract Number N62467-04-D-0055.

This work is being performed under the Navy's Installation Restoration (IR) Program. The following are the four distinct phases of work conducted for IR sites:

- Phase 1 is the Preliminary Assessment [formerly known as the Initial Assessment Study (IAS)]
- Phase 2 is the Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA)
- Phase 3 is the RCRA Facility Investigation (RFI)/Corrective Measures Proposal
- Phase 4 is the Corrective Measures Implementation

This IMWP has been prepared under Phase 4 of the IR Program as part of an interim measure. The IMWP defines activities associated with corrective measures conducted to address PCB-contaminated soil and sediment in the vicinity of Buildings 166 and 171 and PCB-contaminated sediments in downgradient culverts and drainage channels.

1.2 FACILITY DESCRIPTION

NSWC Crane is located in the southern portion of Indiana, approximately 75 miles southwest of Indianapolis and 71 miles northwest of Louisville, Kentucky, immediately east of Crane Village and Burns City (Figure 1-1). NSWC Crane encompasses 62,463 acres (approximately 98 square miles), most of which are located in the northern portion of Martin County. Smaller portions of NSWC Crane are located in Greene, Daviess, and Lawrence Counties. NSWC Crane is located in a rural, sparsely populated area. Most of NSWC Crane is forested, and the surrounding area is wooded or farmed land. NSWC Crane

provides material, technical, and logistical support to the Navy for equipment, shipboard weapons systems, and nonexpendable ordnance items. In addition, NSWC Crane supports the Crane Army Ammunition Activity with production, renovation, storage, shipment, demilitarization, and disposal of conventional ammunition.

1.3 REGULATORY SUMMARY

1.3.1 NSWC Crane

Following promulgation of the RCRA hazardous waste regulatory program, NSWC Crane filed notification and application to operate as a RCRA hazardous waste treatment, storage, or disposal facility in October 1980. Interim status was granted subject to operating requirements and applicable technical standards found in Title 40 of the Code of Federal Regulations (CFR), Part 265.

Corrective action programs established as part of the 1984 RCRA Hazardous and Solid Waste Amendments (HSWA) required NSWC Crane to address past releases of hazardous waste or hazardous constituents at SWMUs. Accordingly, NSWC Crane submitted a Hazardous Waste Management Report, and an RFA was conducted to characterize the potential for releases of hazardous waste or constituents from approximately 100 SWMUs identified during the RFI (TtNUS, 2005).

On December 23, 1989, United States Environmental Protection Agency (USEPA) issued the federal portion of the final RCRA Part B Permit for NSWC Crane to the Navy. USEPA renewed the permit in 1995. The Indiana Department of Environmental Management (IDEM) now has responsibility for the Federal Corrective Action Permit. IDEM renewed the Corrective Action Permit on October 18, 2001. However, certain ongoing corrective actions, including corrective actions at SWMU 13, will continue under the USEPA/IDEM Work Sharing Agreement for Corrective Action Activities at NSWC Crane.

1.3.2 SWMU 13 - Mine Fill B

SWMU 13 is located in the central portion of NSWC Crane as shown on Figure 1-1. Figure 1-2 is an aerial photograph of SWMU 13 and Figure 1-3 is a map showing the facility locations at MFB. MFB has been in use since 1941 when NSWC Crane was commissioned, and explosive ordnance was produced at MFB from 1941 until 1973. Since 1973, the facilities at MFB have been used to renovate ordnance and equipment. This IMWP focuses on the PCB-contaminated soils and sediments in the vicinity of Buildings 166 and 171. The therminol boilers located near Buildings 166 and 171 were used to heat oil-containing PCBs. The heated oil was then transported to Buildings 166 and 171 (i.e., the melt buildings), where the oil was used as a heat-transfer medium in the melting of explosive mixtures (Halliburton NUS, 1992).

Building 169, located between Buildings 166 and 171, housed inert operations (Halliburton NUS, 1992). The therminol boilers operations were not associated with activities in Building 169 (i.e., no PCB containing materials were associated with activities conducted at Building 169).

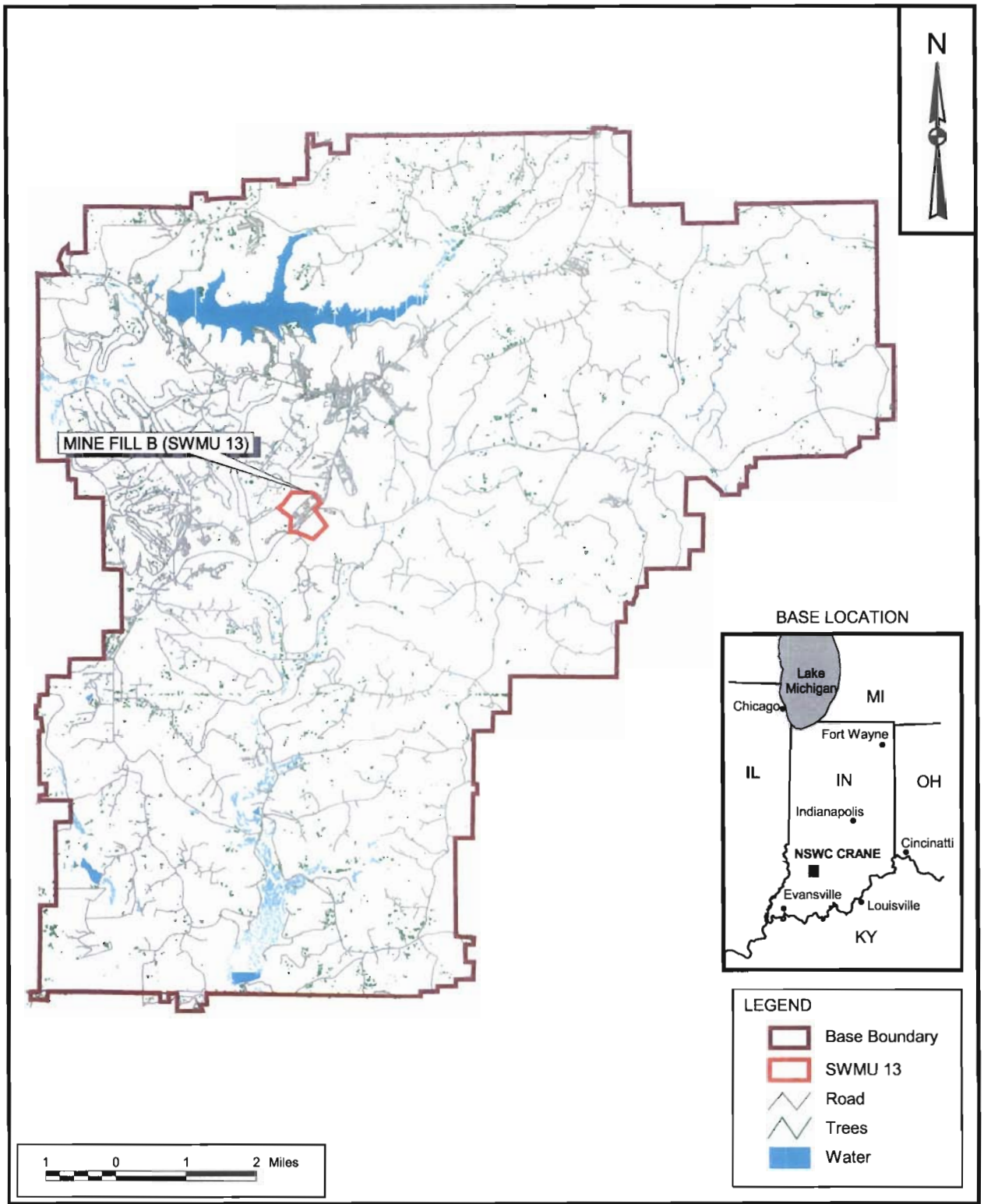
The major source of PCB contamination at MFB resulted from the therminol boilers activities associated with Buildings 166 and 171 where oils containing PCBs leaked. The therminol boilers, associated equipment, and piping were removed in the mid- to late-1980s and disposed off-site in accordance with Toxic Substances Control Act (TSCA) regulations.

MFB was remediated in 1999, 2000, and 2001 as part of a bioremediation program that included sampling, excavation, on-site treatment through bioremediation (composting) of explosives-contaminated soil, and backfilling of the compost at MFB. The types of analytes measured before and after the remediation included volatile organic compounds (VOCs), explosives, metals, and PCBs (Aroclor 1242, 1254, and 1260).

1.4 REPORT ORGANIZATION

The following highlights the information contained in the remainder of this document:

- Section 2.0 summarizes site characteristics including site description, summary of environmental investigations conducted at SWMU 13, and nature and extent of contamination.
- Section 3.0 presents the IMWP.
- Section 4.0 presents the erosion and sediment controls.
- Section 5.0 presents the verification sampling and analysis plan.



DRAWN BY	DATE	Tetra Tech NUS, Inc.	CONTRACT NUMBER	OWNER NO.
J. LAMEY	8/27/01		112G00352	0020
CHECKED BY	DATE	BASE AND SITE LOCATION MAP	APPROVED BY	DATE
T. SMITH	2/16/07	SWMU 13 - MINE FILL B		
COST/SCHEDULE-AREA		INTERIM MEASURES WORK PLAN	APPROVED BY	DATE
SCALE		NSWC CRANE	DRAWING NO.	REV
AS NOTED		CRANE, INDIANA	FIGURE 1 - 1	0

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P:\GIS\CRANE_NSWC\MAPDOCS\APR\NEWSWMU13.APR SWMU 13 AERIAL LAYOUT - VERTICAL 07/29/08 JEE

DRAWN BY J. ENGLISH	DATE 07/29/08	AERIAL PHOTOGRAPH - SWMU 13 BOUNDARY	CONTRACT NUMBER 112G00352
CHECKED BY T. SMITH	DATE 07/29/08	SWMU 13 - MINE FILL B	APPROVED BY — DATE —
COST/SCHEDULE-AREA		NSWC CRANE	APPROVED BY — DATE —
SCALE AS NOTED	NAVFAC	CRANE, INDIANA	DRAWING NO. FIGURE 1-2 REV 0

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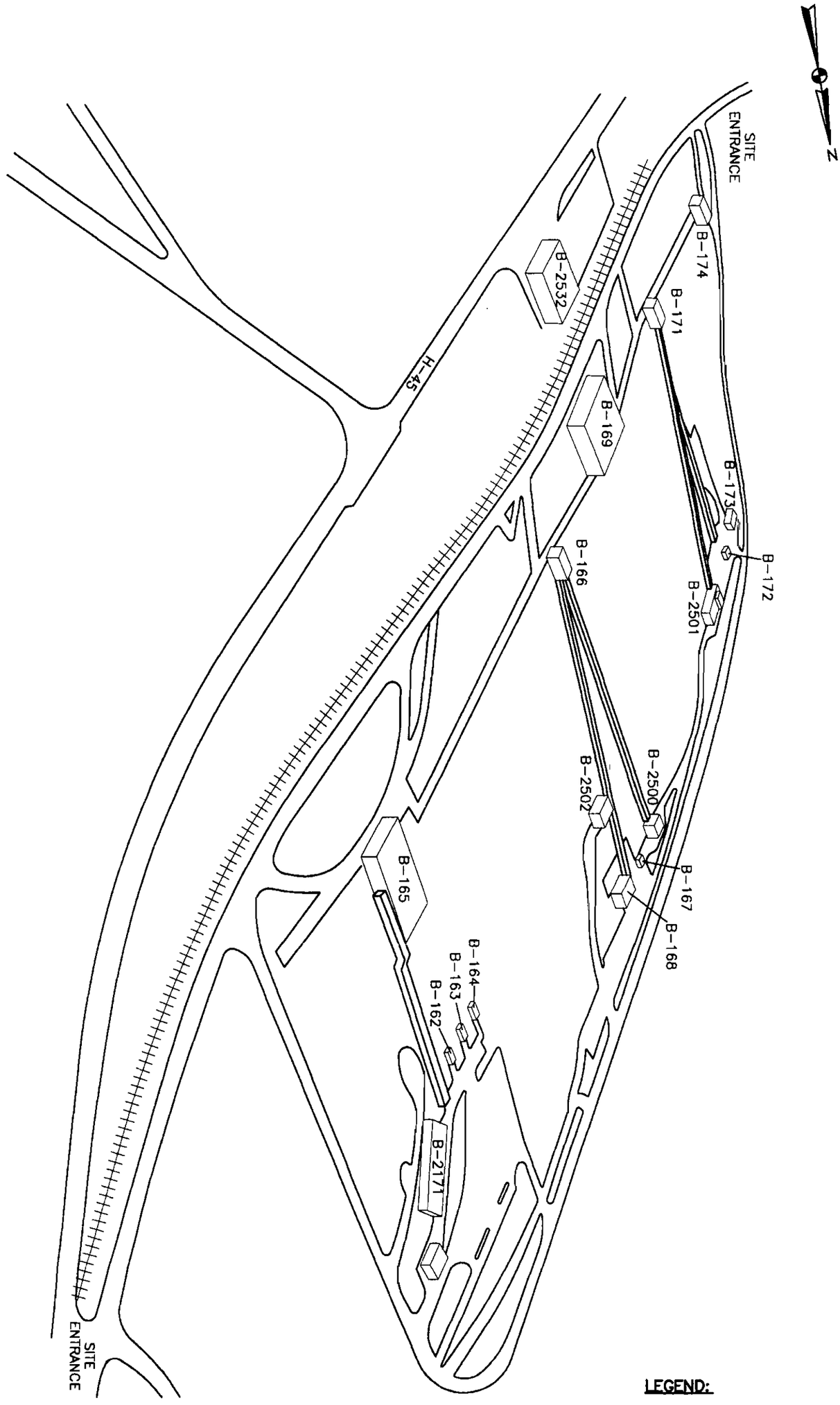

LEGEND:

RAILROAD TRACKS

DRAWN BY MF DATE 3/15/07	NAVFAC	MINE FILL B AREA MAP IMWP FOR SWMU 13 – MINE FILL B INTERIM MEASURES WORK PLAN NSWC CRANE CRANE, INDIANA	CONTRACT NO. 0020
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REVISED BY DATE			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1-3 REV. 0

FORM CADD NO. SDIV-BV.DWG - REV 1 - 9/10/98

2.0 SITE SUMMARY

2.1 SITE SUMMARY

This section describes the physical and geophysical conditions of areas to be addressed in the SWMU 13 IMWP. These descriptions were excerpted from the SWMU 13 RFI Report (TtNUS, 2005).

2.1.1 Physiography and Topography

MFB is located in the Crawford Upland area of the NSWC facility. MFB lies on top of a ridge that was flattened to some extent in the 1940s prior to the construction of buildings, roads, and associated parking and staging areas. Figure 2-1 shows the current topography of the MFB area. The areas in between buildings and roads are grass covered. The active operations of MFB lie within an elongated trapezoid with a long axis that runs northeast-southwest. At the fenceline on the northwestern side of MFB, the ridge top ends and the land surface slopes steeply down to an unnamed tributary of Boggs Creek. On the southwestern side of the main road (Highway 45), the other side of the ridge drops steeply in elevation to the southeast. Both sides of the ridge beyond the fenceline and the main road are heavily forested, except along numerous rights-of-way that contain power lines, pipelines, and other utilities.

Elevations at MFB range from a low of approximately 550 feet above mean sea level (amsl) along the unnamed tributary of Boggs Creek up to approximately 720 feet amsl along the main roadway on the northeastern side of MFB. Thus, there is a total relief in the area of approximately 170 feet.

2.1.2 Surface Water Hydrology

The topography at MFB consists of a ridge that runs along Highway 45 in a northeast-southwest orientation with gradual slopes to the northwest across MFB. This crest of the ridge forms the MFB surface water divide. The sides of the ridge consist of steeper slopes to the northwest and southeast that lead down to the adjacent stream valleys. Several man-made ditch systems located throughout MFB convey surface water runoff away from the buildings toward the sides of the ridge.

Surface drainage at MFB is routed through storm sewers and drainage channels located throughout the relatively flat portion of the ridgetop. The drainage channels lead to larger drainageways and gullies that flow down both sides of the ridge in northwest and southeast directions. Drainage from the northwestern side of the rail line flows to the northwest, down the side of the ridge, and into the unnamed tributary of Boggs Creek.

Because the rail line essentially lies along the crest of the ridge, a large majority of the surface drainage from MFB flows northwest toward the northwest fenceline and down the side of the ridge via the gullies described above into the unnamed tributary of Boggs Creek.

Drainage gullies leading away from the southeastern side of the rail line flow southeast, down the side of the ridge, and eventually join to form two unnamed tributaries of Turkey Creek, which lies approximately 5,000 feet (1 mile) southeast of MFB. A small area in the southwestern corner of MFB drains southwest and eventually flows directly into Boggs Creek about 4,000 feet southwest of MFB.

During initial RFI sampling events, surface water sampling stations and staff gauges located on the southeastern side of the ridge were either dry or the flow rates were small [less than 10 gallons per minute (gpm)]. On the west side of MFB along the fenceline, surface water flow ranged from 0 gpm to moderate (10 to 50 gpm) in the drainageways. Thus, more surface water drains from the northwestern side of MFB compared to the southeastern side. At the base of the ridge on the northeastern side of the SWMU, flow rates in the gullies were generally between 10 and 100 gpm during or immediately after a storm event. The streambed of the unnamed tributary of Boggs Creek located northwest of MFB was often dry. There were about 15 to 25 gpm of flow visible in the streambed in late October 2003. The flow rates observed in the stream channel in late October and mid-November 2004 were much greater, about 160 to 700 gpm. Because of the steep terrain and generally impermeable nature of the shallow bedrock, the flow rates in gullies and the receiving stream tend to be very flashy (i.e., flow rates can quickly rise and decline during and immediately following storm events).

2.1.3 Geology

Bedrock underlying NSWC Crane consists of sedimentary rocks from the Lower Pennsylvanian-age Mansfield Formation of the Raccoon Creek Group and the underlying Upper Mississippian-age Stephensport and West Baden Groups. The Pennsylvanian-age sandstones, siltstone, shales, coal beds, and thin limestone units of the Mansfield Formation can reach thicknesses of 250 to 300 feet at NSWC Crane in the central and western portions of the facility. Below the Pennsylvanian rock lie Mississippian-age limestone and sandstone formations of the Stephensport Group, including the Glen Dean, Golconda, and Beech Creek Limestones, and the Big Clifty Sandstone.

The elevation of the erosional unconformity separating the Pennsylvanian and Mississippian rocks is estimated to be between 500 to 550 feet amsl near SWMU 13 (Barnhill, 1993), or approximately 168 to 218 feet below the top of the ridge. This places the base of the Pennsylvanian rock below the elevation

of the tributary stream on the northwestern side of SWMU 13. Monitoring well 13MWT50, located along the base of the ridge on the northwestern side of MFB, has penetrated to the lowest elevation at MFB (bottom elevation of 532.77 feet amsl). This boring encountered gray shale and gray shaley siltstone in the lower part of the borehole, which is assumed to be Pennsylvanian in age. Boreholes did not penetrate any limestone formations (e.g., Glen Dean, Golconda, or Beech Creek limestones) or sandstone units that might be Mississippian in age, so it is inferred that the Mississippian unconformity and Mississippian age rock formations lie below 532 feet amsl at MFB. Therefore, all of the bedrock that lies above stream level consists of Pennsylvanian rock and is at least 186 feet thick from the top of the ridge.

Pennsylvanian bedrock was encountered beneath natural unconsolidated materials and fill, and consisted of discontinuous layers of siltstones, sandstones, shales, and coal seams. Most fractures found in the bedrock were horizontal bedding plane fractures. The top of the ridge is capped with sandstone and siltstone that is weathered and stained brown because of iron oxidation. These rock units extend from the ridgetop down to about 630 to 635 feet amsl. When grouped together, the ridge-capping sandstone and siltstone units form what is termed the Upper Pennsylvanian water-bearing zone (Puz).

A veneer of natural soil and fill materials blankets the top and the sideslopes of the MFB ridge. In some cases, the fill extends to the bedrock surface. The fill material includes cinders, gravel, sand, and sandstone fragments. Natural unconsolidated materials, residual soils of the Raccoon Creek Group, underlie the fill and exist at the ground surface wherever fill is not present. The residual soils on the ridgetop and sideslopes consist predominantly of fine materials, including varying amounts of clay, silt, and sand. In the valley bottom on the western side of SWMU 13, 8 to 15 feet of unconsolidated overburden materials, assumed to be a mixture of residual soil, colluvium, and stream alluvium, were encountered. These materials were a mixture of clayey sand, clayey sandy silt, gravel, and rock fragments.

2.1.4 Hydrogeology

The maximum thickness of overburden encountered on the ridgetop at MFB was 17.5 feet. Elsewhere, the overburden was generally 10 feet thick or less. While drilling through the overburden on top of the ridge, no saturated conditions or flowing water was observed. Therefore, it is concluded that very little if any groundwater is stored at the interface between bedrock and overburden. Surface water located in drainage gullies is not hydraulically connected to the bedrock groundwater. The surface water, where it exists, is believed to be perched on top of the clayey residual soils overlying the bedrock surface. In

general, the ridgetop sandstone aquifer is recharged by downward infiltration through the residual soil, and recharge occurs more readily where the soil is thin or disturbed and supplanted with fill material.

PCBs are relatively insoluble and tend to remain attached to soil particles close to where they were spilled. Therefore, they are not typically found in groundwater underlying PCB-contaminated sites. As a result, PCBs are considered to be immobile in groundwater systems and thus were not analyzed in groundwater samples taken at SWMU 13.

2.2 PREVIOUS INVESTIGATIONS

The major sources of contamination at MFB were the washdown of explosive formulations from building roofs onto the ground surface and exhausts vented from ventilation systems. Also, the therminol boilers located in the vicinity of Buildings 166 and 171 leaked oils containing PCBs. The boilers and surrounding contaminated soil were removed in 1989, but subsequent soil samples collected near the former locations of the boilers indicated that PCB concentrations greater than 10 mg/kg were present in residual soils.

Surface Water Sampling (1972, 1978, and 1979) - Selected surface water samples were collected in drains and drainage channels in 1972, 1978, and 1979 by the Department of the Army (Halliburton NUS, 1992). Samples were collected adjacent to and in the vicinity of the SWMU 13 buildings. TNT, cyclotrimethylenetrinitramine (RDX), and cyclotetramethylenetetranitramine (HMX) were detected in most samples, and concentrations in the samples collected nearer the buildings were greater than the concentrations found further away from the buildings.

Initial Assessment Survey (1985) - As part of the Initial Assessment Survey (IAS) for MFB, eight soil samples were collected around Buildings 167 and 172 at a depth of 20 inches in 1985 and analyzed for explosives (Halliburton NUS, 1992). Concentrations of TNT ranged from 4.8 to 2,410 mg/kg, concentrations of HMX ranged from 10.8 to 2,020 mg/kg, and concentrations of RDX ranged from 20.6 to 24,100 mg/kg. The data indicated that the area around Building 172 was much more contaminated than the area around Building 167.

Interim Measures (1999 - 2002) - MFB was remediated between June 1999 to January 2002 as part of the bioremediation program that included sampling, excavation, on-site treatment through bioremediation (composting) of explosives-contaminated soil, and backfilling of the compost at MFB. The types of analytes measured before and after the remediation included VOCs, explosives, metals, and PCBs (Aroclor 1242, 1254, and 1260).

RCRA Facility Investigation (2003, 2004, and 2006) - Based upon the results of the IAS and the IM remediation, TtNUS conducted a RFI for SWMU 13. The IAS documented that residual PCB contamination remained in the soil near Buildings 166 and 171 where the therminol boilers were operated (Halliburton NUS, 1992). It is believed that oils containing PCBs were heated in the therminol boilers and then transported to the melt buildings where the oil was used as a heat-transfer medium in the melting of explosive mixtures. In 1992, PCB contamination was detected near Buildings 166 and 171 (Halliburton NUS, 1992). Some soils containing PCBs were removed during IM remediation of explosives-contaminated soil at MFB, but PCBs were not the focus of the bioremediation (composting) of explosives-contaminated soil that occurred between 1999 and 2002.

Drainage Trench Investigation (2008) - During the RFI a sediment sample was collected from the sump located northwest of Building 171. This sample (13SD57) contained a 36 mg/kg of Total PCBs (Figure 2-2). Due to this sample result a field investigation to determine the origin of the sediment within the sump was conducted. During the field investigation sediment was discovered in the Building 171 trench drains that convey flow to the sump where sample 13SD57 was collected. These factors warranted the collection of samples from the Building 171 drainage trenches. Therefore, the May 2008 Drainage Trench Investigation was conducted to determine the need to remediate the drainage trenches/piping that conveys stormwater flow to the sump northwest of Building 171. The investigation included the collection of eight sediment samples, two soil samples, and associated quality assurance quality control samples. These samples were analyzed for PCBs and explosives. The results of this effort are included in this report. Table 2-1 summarizes the May 2008 sampling program, Table 2-2 presents the positive detections, Appendix A presents the sample log sheets, analytical results, and data validation letters for the sampling event, and Figure 2-4 identifies the locations and positive results for the 2008 sampling event. As indicated on Figure 2-4, PCB contamination is present within the drainage structures that convey storm water flow to the sump located northwest of Building 171.

2.3 EXTENT OF CONTAMINATION

The explosives contaminated soils bioremediation IM removed incidental and limited PCB contamination in the soil at SWMU 13. Verification samples collected following the IM identified isolated areas where PCB contamination remained in the subsurface soil. In addition, the soil and sediment sampling events associated with the RFI and Drainage Trench Investigation, conducted within the drainage channel network surrounding SWMU 13, verified PCB contamination within the surface soil and within several drainage channels and trench drains.

For SWMU 13, a cleanup goal of 1 mg/kg for the protection of ecological receptors has been established for the surface soil (ground surface to 2 feet bgs) and sediments regardless of depth. Although this cleanup goal will not remove all of the SWMU 13 PCB contamination present in the soil and sediment, it eliminates the unacceptable human health risk and reduces ecological risk such that average concentrations will meet ecological requirements. This PCB cleanup goal has been used and found acceptable by IDEM for similar cleanup operations at a nearby General Motors site and at cleanup projects in the Lower Fox River, Illinois, and Green Bay, Wisconsin. This PCB cleanup goal also represents the TSCA High Occupancy Standard (1 mg/kg).

The TSCA Low Occupancy Standard (25 mg/kg) will be used for subsurface soils (2 feet bgs and deeper). The extent of soil and sediment contamination that requires removal under this IM is identified in Figures 2-2, 2-3, and 2-4.

TABLE 2-1

SUMMARY OF MAY 2008 INVESTIGATION SAMPLING
SWMU 13
NSWC CRANE
CRANE, INDIANA

Sample Location	Sample Number	Date Sampled	Depth Interval (ft bgs)	Analyte	
				Explosives	PCBs
13SD69	13SD069	5/29/2008	NA	X	X
13SD70	13SD070	5/29/2008	NA	X	X
13SD71	13SD071	5/29/2008	NA	X	X
13SD72	13SD072	5/29/2008	NA	X	X
13SD73	13SD073	5/29/2008	NA	X	X
13SD74	13SD074	5/29/2008	NA	X	X
13SD75	13SD075	5/29/2008	NA	X	X
13SD76	13SD076	5/29/2008	NA	X	X
13SB108	13SB1080304	5/29/2008	3 - 4	X	X
	13SB1080506	5/29/2008	5 - 6	X	X

NA - Sediment samples collected from the surface of the concrete trench dains
ft bgs - Feet below ground surface
PCBs - Polychorinated biphenyls
X - Indicates Parameters were analyzed for this sample.

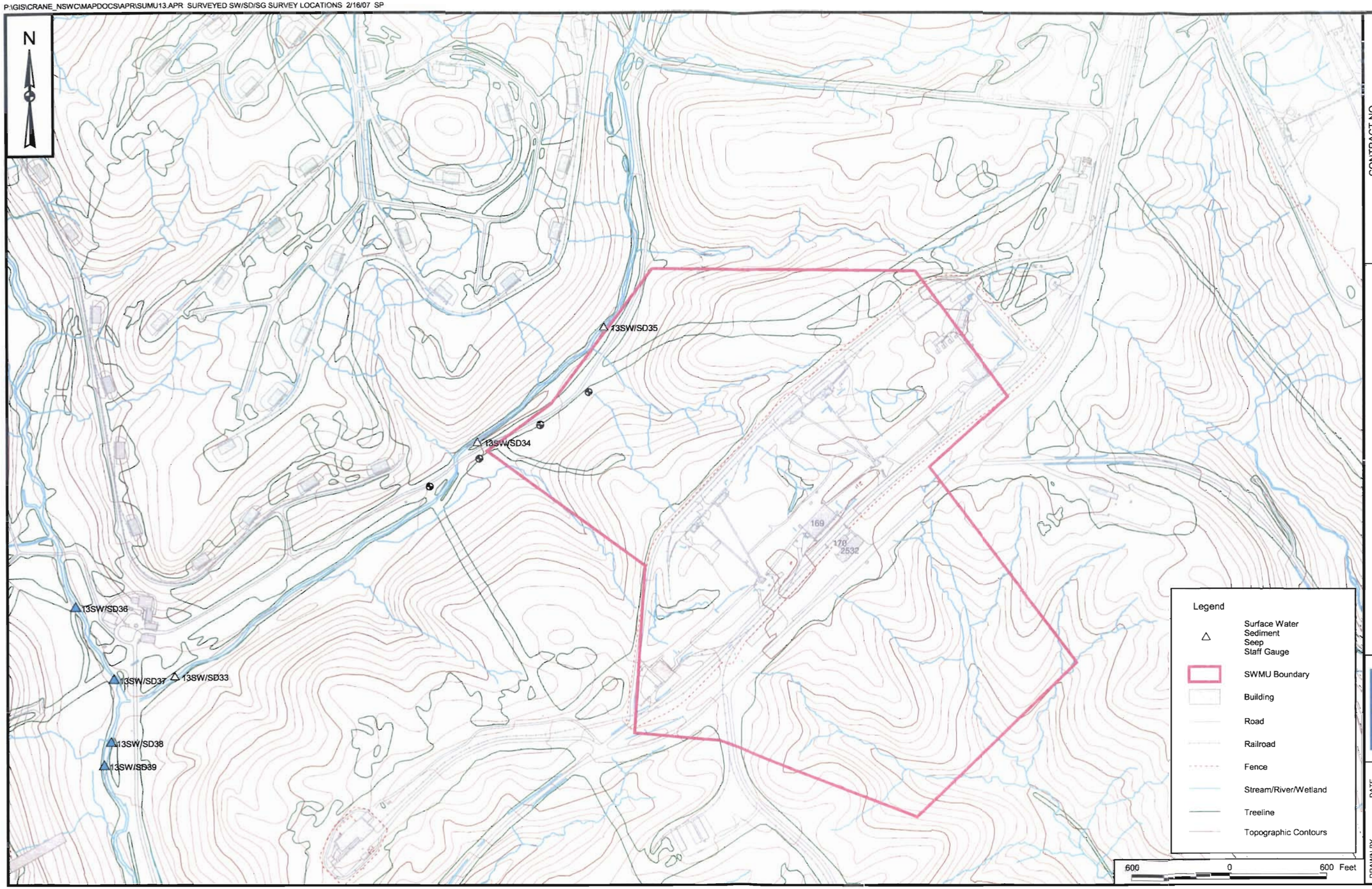
TABLE 2-2

SUMMARY OF MAY 2008 POSITIVE DETECTIONS
INTERIM MEASURES WORK PLAN SWMU 13 - MINE FILL B
NSWC CRANE
CRANE, INDIANA

Sample Location	13SB108	13SB108	13SD69	13SD70	13SD71	13SD72	13SD73	13SD74	13SD75	13SD76
Sample Number	13SB1080304	13SB1080506	13SD069	13SD070	13SD071	13SD072	13SD073	13SD074	13SD075	13SD076
Sample Date	05/29/08	05/29/08	05/29/08	05/29/08	05/29/08	05/29/08	05/29/08	05/29/08	05/29/08	05/29/08
Sample Matrix	SO	SO	SD	SD	SD	SD	SD	SD	SD	SD
Sample Interval	3 - 4 ft	5 - 6 ft	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides/PCBs (ug/kg)										
AROCLOR-1248	150 J	150 J	12000 J	2000 J	1300	540 J	43000	6100 J	5200 J	20000 J
TOTAL PCBS	150 J	150 J	12000 J	2000 J	1300	540 J	43000	6100 J	5200 J	20000 J
Explosives (mg/kg)										
1,3,5-TRINITROBENZENE	0.10 U	0.17 J	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.10 U	0.099 U	0.099 U
2,4,6-TRINITROTOLUENE	0.48	0.92	0.099 U	0.20 J	0.25	0.13 J	1.6 J	5.5	0.48	92
2-AMINO-4,6-DINITROTOLUENE	0.19 J	0.43	0.099 U	0.099 U	0.10 J	0.099 U	0.15 J	0.42	0.14 J	1.1
4-AMINO-2,6-DINITROTOLUENE	0.54	1.4	0.099 U	0.099 U	0.22	0.15 J	0.19 J	0.82	0.35	2.6 J
HMX	0.19 J	0.27	0.56	1.8	3.8	4.9	4.6 J	27	3.0	49
RDX	0.38	0.72	0.84	1.0	3.2	3.7	2.5 J	22	8.7	270

NA - Not applicable
SO - Subsurface soil sample
SD - Sediment sample collected from the concrete surface of the Building 171 trench drains
J - Result is estimated
U - Parameter is non-detect at the indicated detection limit

P:\GIS\CRANE_NSWC\MAPDOCS\APR\SUMU13.APR SURVEYED SW/SD/SG SURVEY LOCATIONS 2/16/07 SP



CONTRACT NO.
112G00352

APPROVED BY ___ DATE ___

APPROVED BY ___ DATE ___

DRAWING NO. FIGURE 2 - 1

REV _

TOPOGRAPHIC AREA MAP
SWMU 13 - MINE FILL B
INTERIM MEASURES WORK PLAN
NSWC CRANE
CRANE, INDIANA

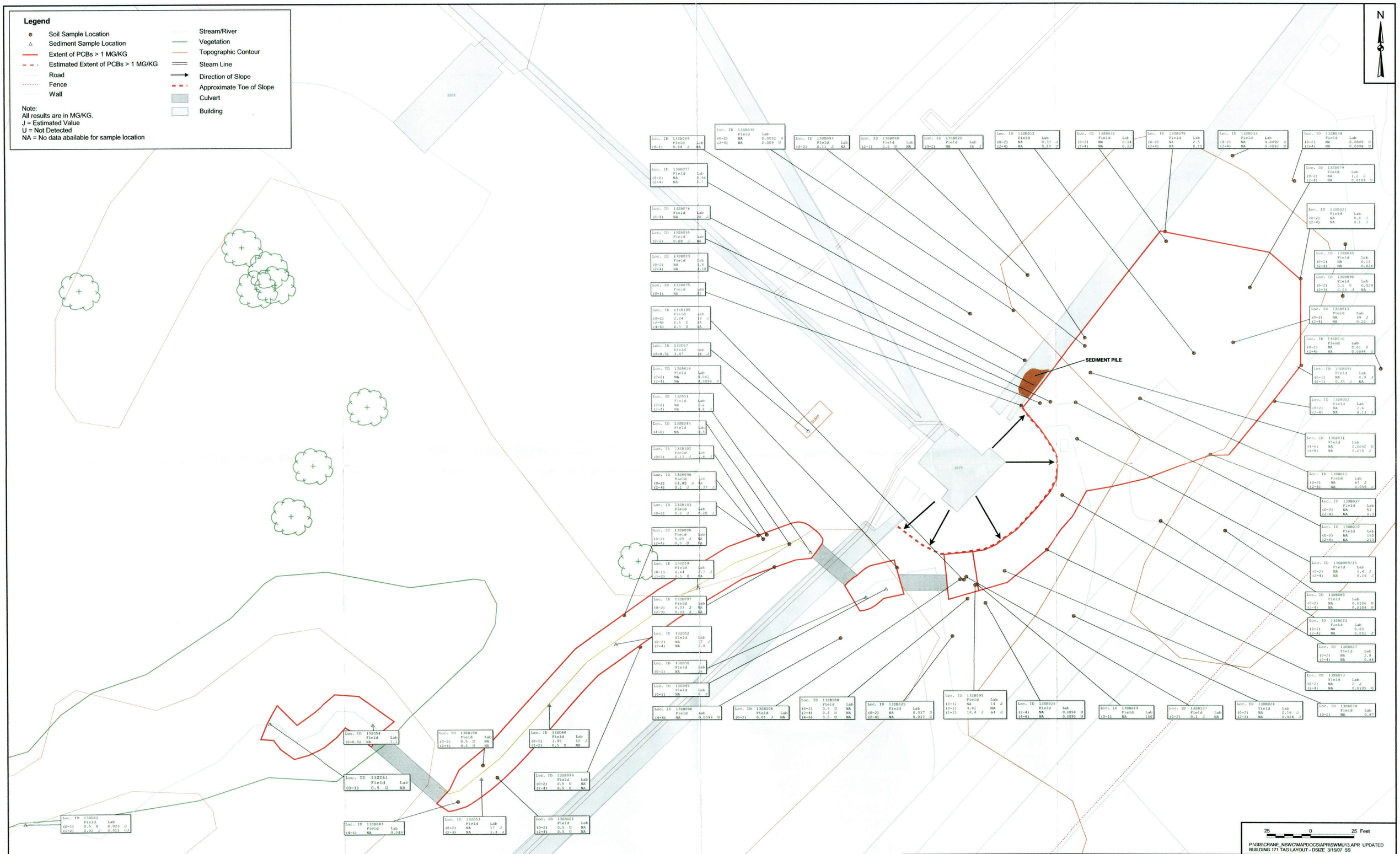
NAVFAC

DRAWN BY C. FOSTER DATE 12/29/04

CHECKED BY T. SMITH DATE 2/16/07

COST/SCHED-AREA

SCALE AS NOTED



DRAWN BY	DATE
S. PAXTON	2/16/07
CHECKED BY	DATE
T. SMITH	3/15/07
REVISED BY	DATE

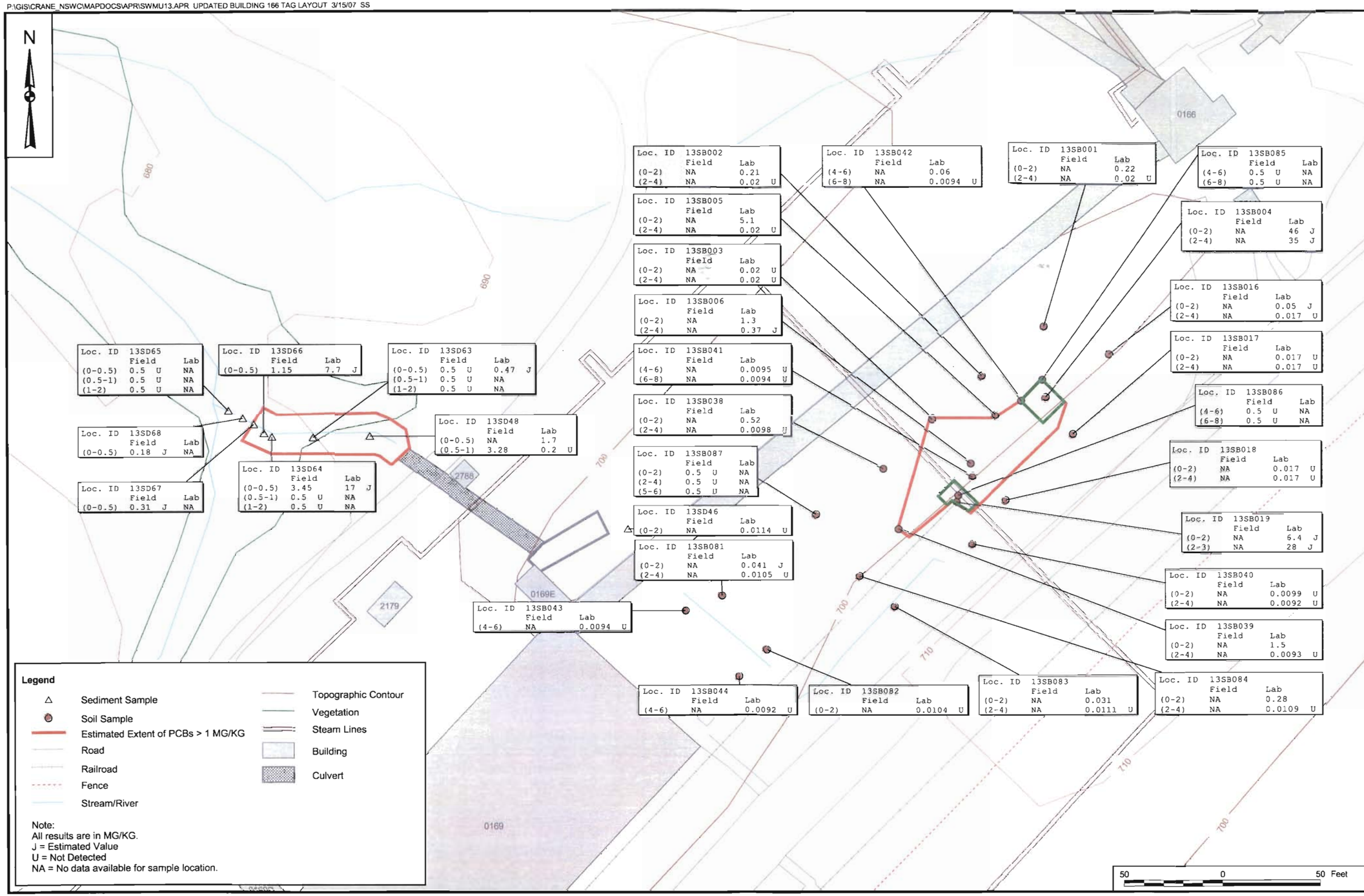
SCALE
AS NOTED

NAVFAC

EXTENT OF PCB CONTAMINATION (BUILDING 171 AREA)
SWMU 13 - MINE FILL B
INTERIM MEASURES WORK PLAN
NSWC CRANE
CRANE, INDIANA

CONTRACT NO.
CTO 0357
OWNER NO.
APPROVED BY DATE
DRAWING NO. FIGURE 2 - 2
REV. 0

P:\GIS\CRANE_NSWC\MAPDOCS\APR\SWMU13.APR UPDATED BUILDING 166 TAG LAYOUT 3/15/07 SS



CONTRACT NO. 112G00352

APPROVED BY ____ DATE ____

APPROVED BY ____ DATE ____

DRAWING NO. FIGURE 2 - 3

REV 0

EXTENT OF PCB CONTAMINATION (BUILDING 166 AREA)
SWMU 13 - MINE FILL B
INTERIM MEASURES WORK PLAN
NSWC CRANE
CRANE, INDIANA

NAVFAC

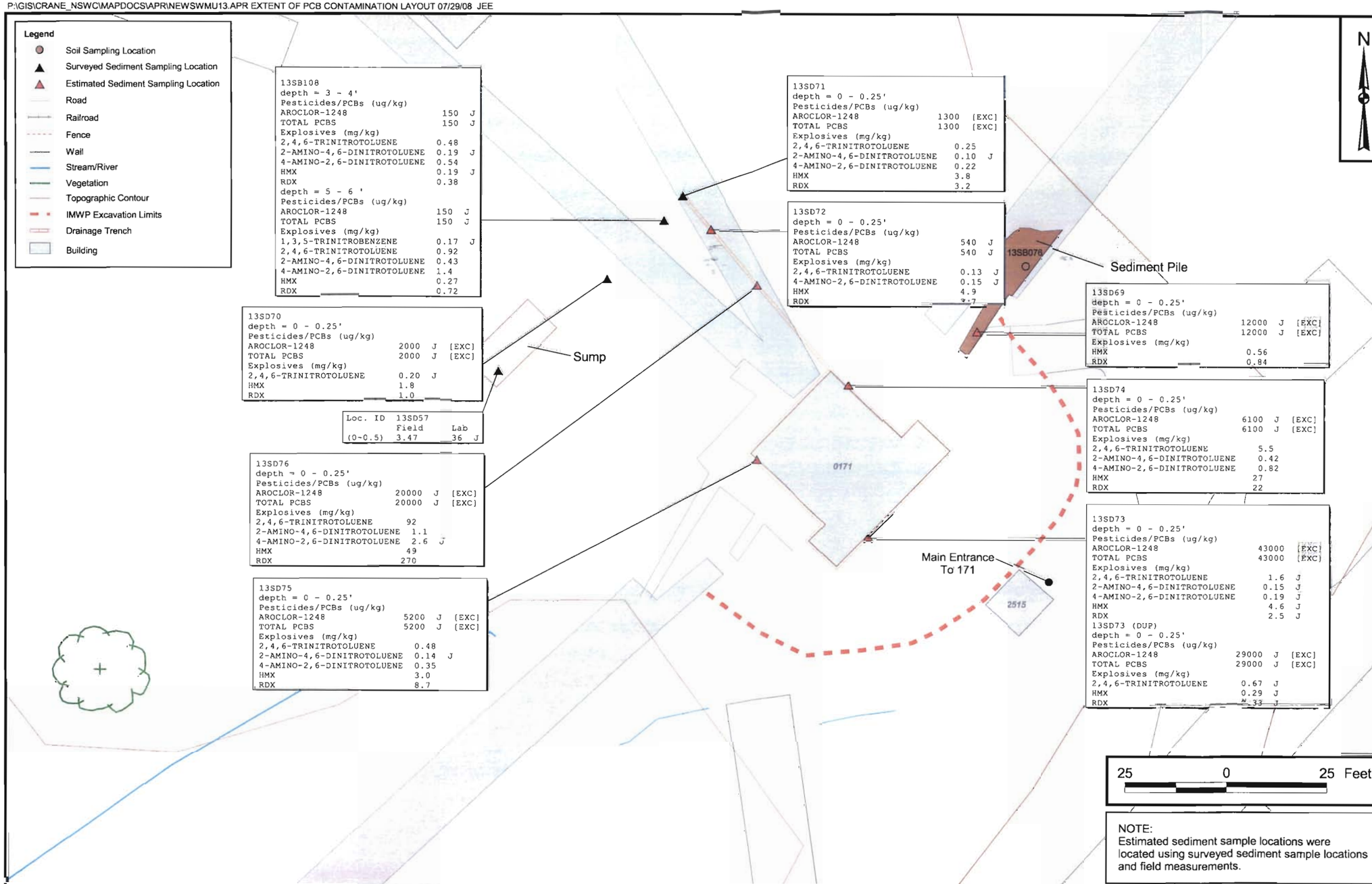
DRAWN BY S. PAXTON DATE 2/16/07

CHECKED BY T. SMITH DATE 3/15/07

COST/SCHED-AREA

SCALE AS NOTED

P:\GIS\CRANE_NSWC\MAPDOCS\APR\NEWSWMU13.APR EXTENT OF PCB CONTAMINATION LAYOUT 07/29/08 JEE



NOTE:
Estimated sediment sample locations were located using surveyed sediment sample locations and field measurements.

CONTRACT NO. 0020

APPROVED BY ___ DATE ___

APPROVED BY ___ DATE ___

DRAWING NO. FIGURE 2-4

REV _

EXTENT OF CONTAMINATION
IN THE DRAINAGE SYSTEM AROUND BUILDING 171
SWMU 13 - MINE FILL B
INTERIM MEASURES WORK PLAN
NSWC CRANE
CRANE INDIANA

DRAWN BY S. STROZ DATE 07/17/08

CHECKED BY T. SMITH DATE 07/29/08

COST/SCHED-AREA

SCALE AS NOTED

3.0 INTERIM MEASURES WORK PLAN

The intent of this IM is to remove surface soils [0 to 2 feet below ground surface (bgs)] and sediments with PCB concentrations greater than 1 mg/kg from the SWMU 13 area, the Building 171 trench drains, and the impacted downgradient drainage channels. The activities associated with this IMWP are intended to result in the elimination of unacceptable human health risks and reduce the ecological risks to within acceptable limits within the surface soils and sediments associated with SWMU 13. It is not intended that the completion of this IMWP will result in the removal of all PCB contamination from the SWMU 13 subsurface soil. However, the Navy may elect to add one of the following options to this IMWP.

- Option 1 - Additional excavation to include subsurface excavation (excavation at depths greater than 2 feet below ground surface) to remove PCB contamination at concentrations greater than 25 mg/kg.

- Option 2 - Additional excavation to include subsurface excavation (excavation at depth greater than 2 feet below ground surface) to remove PCB contamination at concentrations greater than 1 mg/kg.

The remainder of this section describes the activities and volumes associated with the removal of PCB contamination in the surface soil and sediment. Additional activities and volumes associated with the two subsurface excavation options are also presented.

3.1 DESCRIPTION OF THE INTERIM MEASURES

The IMWP specifies the removal of contaminated surface soils and sediments within and adjacent to SWMU 13. In addition, the IMWP specifies the restoration of the drainage channels impacted by PCB contamination and all other areas disturbed by IMWP activities. The contaminated sediments and surface soils to be removed have been identified as containing PCB concentrations in excess of the cleanup goal of 1 mg/kg. The contaminated soils to be removed under SWMU 13 IMWP Options 1 and 2 have been identified as containing PCB concentration in excess of the subsurface cleanup goals of 25 (Option 1) and 1 mg/kg (Option 2). The excavation volumes presented in this IMWP are in-place estimates; in an unconsolidated state, these volumes will increase once excavated.

A work assignment responsibility chart (Table 3-1) identifies the responsibilities that Environmental Multiple Award Contract (EMAC) contractor, NSWC Crane, and TtNUS have in the implementation of this IMWP.

Specifically, the IMWP consists of the following major components:

- Building 166 Excavation (southwest of Building 166) - An area approximately 105 feet (length) by 50 feet (width) by 2 feet (depth) southwest of Building 166 contains PCB concentrations greater than 1 mg/kg. This surface soil will be excavated, characterized for disposal purposes, and transported and disposed off-site. The location of the surface soil excavation is identified on Figure 3-1. Under Options 1 and 2, two additional excavation areas measuring approximately 15 feet by 15 feet require excavation from 2 to 4 feet bgs. These excavation areas are located within the limits of the surface soil excavation limits. The soil within these excavation areas are identified as having PCB concentrations greater than 25 mg/kg (Option 1) and greater than 1 mg/kg (Option 2). The limits of the optional excavation are identified in Figure 3-2 (Option 1) and Figure 3-3 (Option 2). Materials excavated under Options 1 and 2 will be handled and disposed in the same manner as the excavated surface soils. In the event bedrock is encountered, competent bedrock will determine the exact depth of excavation. If determined necessary through verification sampling, excavation of weathered bedrock will be performed. Based on existing data (Figure 2-3), PCB concentrations within this excavation area are less than 50 mg/kg and are therefore not TSCA regulated.

- Building 171 Soil Excavation (south and east of Building 171) - An area approximately 200 feet (length) by 110 feet (width) by 2 feet (depth) south and east of Building 171 contains PCB concentrations greater than 1 mg/kg. This surface soil will be excavated, characterized for disposal purposes, and transported and disposed off-site. The location of the surface soil excavation is identified on Figure 3-1. Based on available data (Figure 2-2), a portion of this area contains PCB concentrations greater than 50 mg/g (TSCA regulated soil). The limits of these areas are identified on Figures 3-1 and 3-4. Under Option 1, one additional excavation area measuring approximately 18 feet by 16 feet requires excavation from 2 to 4 feet bgs. This excavation area is located within the limits of the surface soil excavation limits. The subsurface soil within the Option 1 excavation area is identified as having PCB concentrations greater than 25 mg/kg. The limits of the Option 1 excavation are identified in Figure 3-2. Materials excavated under Option 1 will be handled and disposed in the same manner as the excavated surface soils. Under Option 2, one additional excavation area measuring approximately 30 feet by 25 feet requires excavation from 2 to 4 feet bgs. This excavation area is located within the surface soil excavation limits. The soil within the Option 2 excavation area is identified as having PCB concentrations greater than 1 mg/kg. The limits of the Option 2 excavation are identified in Figure 3-3. Materials excavated under Option 2 will be handled and disposed in the same manner as the excavated surface soils. In the event bedrock is encountered,

competent bedrock will determine the exact depth of excavation. If determined necessary through verification sampling, excavation of weathered bedrock will be performed.

- Sediment Removal - Sediments with PCB concentrations greater than 1 mg/kg are present within the tunnel that connects Buildings 171 and 169. The sediments are located within two piles deposited by stormwater. The piles measures approximately 6 feet (length) by 5 feet (width) by 1.5 feet (height) and approximately 20 feet (length) by 8 feet (width) by 1 foot (depth). These sediments will be removed from the tunnel structure, characterized for disposal purposes, and transported and disposed off-site. The location of the sediments is identified on Figure 3-1. There is no additional volume associated with the removal of this sediment under Option 1 or Option 2. Based on available data (Figure 2-2), the PCB concentrations in these sediments are less than 50 mg/kg and the sediments are therefore not TSCA regulated soil.

- Sediment Excavation - Sediments with PCB concentrations greater than 1 mg/kg are present within the drainage channels (approximately 470 linear feet of drainage channel) that collect and convey surface water runoff from SWMU 13 and the surrounding area. These sediments will be excavated from the drainage channels, dewatered, characterized for disposal purposes, and transported and disposed off-site. The locations of the drainage channels from which sediment will be excavated are identified on Figure 3-1. Based on available data (Figures 2-2 and 2-3), PCB concentrations in this sediment are less than 50 mg/kg and the sediments are therefore not TSCA regulated soil. The typical excavation requirement for the drainage channels is provided in Figure 3-6. Under Option 1, no additional soil requires excavation from the drainage channels that collect surface water runoff from the SWMU 13 and surrounding areas. However, under Option 2, 270 linear feet of the drainage channel located southwest of Building 171 requires soil excavation from 2 to 4 feet bgs. This excavation area is located within the limits of surface sediment excavation described above. The soil within the Option 2 excavation areas is identified as having PCB concentrations greater than 1 mg/kg. The limits of the Option 2 excavation are identified in Figure 3-3. Materials excavated under Option 2 will be handled and disposed in the same manner as the excavated surface sediments. Competent bedrock will determine the exact depth of excavation, in the event bedrock is encountered. If determined necessary through verification sampling, excavation of weathered bedrock will be performed. Based on available data (Figure 2-2), the PCB concentrations in these sediments are less than 50 mg/kg and the sediments are therefore not TSCA regulated soil.

- Underground Culverts - Underground culvert pipes (approximately 140 feet) will be cleaned of sediment. The sediment removed from the pipes will be characterized for disposal, transported, and

disposed off-site. The chemical composition of this sediment is unknown. The locations of the contaminated culverts are shown in Figure 3-1. There is no additional volume associated with the removal of sediment from the culverts under Option 1 or Option 2.

- Sump and Associated Drains - A sump located northwest of Building 171 [approximately 20 feet (length) by 10 feet (width) by 10 feet (depth)] will be cleaned of sediment. Additionally, the drainage system that feeds the sump also contains contaminated sediments with PCB concentrations greater than 1 mg/kg. This drainage system (approximately 200 feet of trench drain and piping) will be cleaned of sediment. The sediment removed from the sump and associated drainage system will be characterized for disposal purposes, transported, and disposed off-site. The location of the sump and associated drains are identified in Figures 3-1 and 3-5. There is no additional volume associated with the removal of this sediment under Option 1 or Option 2. Based on available data (Figures 2-2 and 2-4), the PCB concentrations within these sediments are less than 50 mg/kg and these sediments are therefore not TSCA regulated soil.

- Dewatering of Soils and Sediments - Prior to off-site disposal, soils and sediments may need dewatering to meet transportation and disposal requirements. The water drained during dewatering will be containerized, filtered, characterized, and transported off-site to a NSWC Crane-approved disposal facility. The volume of water collected through dewatering is not expected to be a large quantity, unless excavation/removal is performed during periods of heavy rain.

- Sampling and Analysis - Following the excavation/removal of PCB-contaminated soils and sediments to the specified limits, the exposed surfaces of the excavation areas will be sampled to verify contaminant removal. The Navy may require additional excavation based on the analytical results of the verification sampling. At the completion of this IM and following the removal of the support facilities (e.g., dewatering pad, decontamination pad, and material storage area), the Navy will require verification samples to confirm that the lining systems of the support facilities did not fail during the implementation of this IM. If it is determined that the lining system under any of the support facilities did fail, potentially resulting in the contamination of the soils below the support facilities, the EMAC contractor will be required to remove that contamination at their own expense. Section 5.0 presents sampling and analysis procedures.

- Off-Site Disposal of Soil and Sediment - Excavated soil and sediment containing PCBs will be disposed at an appropriate off-site facility based on the in-place (in-situ) concentration of PCBs. Soil and sediment with in-situ PCB concentrations greater than or equal to 50 mg/kg will be surgically

removed and segregated from soils with in-situ PCB concentrations less than 50 mg/kg. Soils with PCB concentrations greater than or equal to 50 mg/kg will be disposed in an NSWC Crane-approved TSCA landfill. Soil and sediment with PCB concentrations less than 50 ppm will be disposed at an NSWC Crane-approved solid waste landfill.

- Backfilling and Restoration of Excavations - After the verification of PCB-contaminated soil removal [removal of surface soil containing PCB concentrations greater than 1 mg/kg and subsurface soil containing PCB concentrations greater than 25 mg/kg (Option 1) or 1 mg/kg (Option 2)], the excavated areas will be backfilled and regraded to match pre-construction grades and to match surrounding grades. In addition, the backfilled area will be restored to pre-construction conditions using permanent stabilization practices that include vegetation.

- Backfilling and Restoration of Drainage Channels - After the verification of PCB-contaminated sediment removal [removal of sediment containing PCB concentrations greater than 1 mg/kg and subsurface soil containing PCB concentrations greater than 1 mg/kg (Option 2)], the drainage channels will be backfilled to pre-construction conditions and restored using stabilization practices that include the use of vegetation.

3.2 PERFORMANCE STANDARDS

For the purposes of defining the excavation areas and performance standards associated with each excavation area presented on Figures 3-1, 3-2, and 3-3, the following is a summary of the excavation areas and the associated performance standards:

Excavation Location Identification	Performance Standards	Applicable Subsurface Excavation Options
Surface Soil Area Southwest of Building 166	Surface Soil Excavation and Restoration	Options 1 or 2
Surface Soil Area South and East of Building 171	Surface Soil Excavation and Restoration	Options 1 or 2
Drainage Channel North of Building 169E	Drainage Channel Excavation and Restoration	None
Drainage Channel Southwest of Building 171	Drainage Channel Excavation and Restoration	Option 2
Underground Culvert Pipes	Culvert, Sump, and Drain Cleaning	None
Sump and Associated Drains of Building 171 Area	Culvert, Sump, and Drain Cleaning	None
Sediment Piles	Sediment Pile Removal	None

Performance standards for the IMWP are presented in the following sections.

3.2.1 Surface Soil Excavation

All surface soils excavated from SWMU 13 that are identified as having PCB concentrations greater than 1 mg/kg will be removed, characterized, and disposed at an NSWC Crane-approved off-site non-hazardous or TSCA regulated waste disposal facility. Soil from each removal area and TSCA regulated soil will be stockpiled or containerized separately for characterization or direct loaded based on the results contained in this IMWP. If the excavated soil is stockpiled, the soil will be placed on a handling or dewatering pad located adjacent to each excavation area or at a central location. The handling pad will be constructed in accordance with Section 3.2.14. Alternatively, removed soil may be placed in roll-off boxes or other approved containers placed adjacent to each excavation area or in a central location. If a central storage area is selected, appropriate measures, such as lining the roll-off boxes or containers, or providing sealed tailgates must be used to prevent loss of material stored in roll-off boxes or containers during transportation. The stockpiled soil will remain on site until waste characterization has been completed.

The planned initial excavation for the surface soil area located southwest of Building 166 measures approximately 105 feet by 50 feet by 2 feet bgs for a total of 220 cubic yards of excavated surface soils. There is no TSCA regulated soil associated with this excavation. The planned initial excavation for the surface soil area located south and east of Building 171 measures approximately 200 feet by varying widths of up to 110 feet by 2 feet bgs for a total of 890 cubic yards of non-TSCA regulated soil and 390 cubic yards of TSCA regulated soil (based on in-place PCB concentrations). The TSCA regulated material (PCB concentrations greater than 50 mg/kg) must be excavated and handled separately. The initial surface soil excavation limits are shown on Figure 3-1. Northing and easting coordinates for the initial surface soil excavation area nodes are provided in Table 3-2 and on Figure 3-4. The volume of soil removed from each excavation area is based on the area of each excavation and the 2 foot excavation depth. The volume calculations are provided in Appendix B and summarized below:

Surface Soil Area	Area	Depth of Excavation	Volume of Surface Soil	Weight of Surface Soil
Area Northeast of Building 169	2,950 square feet	2 feet bgs	220 cubic yards	330 tons
Area South and East of Building 171*	12,090 square feet	2 feet bgs	890 cubic yards	1,320 tons

Surface Soil Area	Area	Depth of Excavation	Volume of Surface Soil	Weight of Surface Soil
Area South and East of Building 171**	5,230 square feet	2 feet bgs	390 cubic yards	580 tons
Total Surface Soil to be Excavated			**1,500 cubic yards**	**2,230 tons**

* Non-TSCA Regulated Material
** TSCA Regulated Material

Physical features outside the excavation limits will not be removed during the excavation of surface soils. Physical features include, but are not limited to, buildings, concrete pads, railroad track, and paved roads. The Contracting Officer will clearly identify the physical features not to be removed or disturbed prior to implementation of this IMWP. The volume estimates presented in this IMWP assume that these physical features remain in place.

Sediment that accumulates in the erosion and sediment control devices (see Section 4.0) prior to verification that all contaminated surface soils have been removed from the excavation areas will be stockpiled, dewatered (if necessary), and characterized for proper disposition (e.g. use as backfill, disposed as TSCA regulated soil, or disposed as non-hazardous material). Following verification of contaminant removal, sediment that accumulated in the erosion and sediment control devices will be stockpiled, dewatered (if necessary), and characterized for proper disposition.

The implementation of subsurface soil excavation Option 1 will increase the total in-place excavation volume from 1,500 cubic yards to 1,560 cubic yards. Thirty cubic yards of the 60 additional cubic yards of soil is TSCA regulated soil. Under Option 2 the in-place excavation volume will increase to 1,600 cubic yards. Seventy cubic yards of the 100 additional cubic yards of soil is TSCA regulated soil. Northing and easting coordinates for the Option 1 and Option 2 excavations are provided in Table 3-2. Areas included in the Option 1 and 2 excavations are identified on Figures 3-2 and 3-3, respectively.

3.2.2 Drainage Channel Excavation

All sediments excavated from SWMU 13 drainage channel excavation areas that are identified as having PCB concentrations greater than the 1 mg/kg will be removed, characterized, and disposed at a NSWC Crane-approved off-site non-hazardous or TSCA regulated waste disposal facility. Sediments removed from the drainage channels must be segregated based on in-place PCB concentrations. Due to the water content of the sediment within the SWMU 13 drainage channels, it is anticipated that dewatering will need to be performed to reduce the water content of the excavated sediments for off-site transportation and

disposal. Dewatering may be performed by dewatering the channels (using a pump around) or stockpiling excavated sediment on material handling pad(s). If the soil is stockpiled, either directly adjacent to the excavation or at a central location, the sediment will be placed on a handling or dewatering pad and the water will be collected for characterization and handling in accordance with Section 3.2.6. The handling pad(s) will be constructed in accordance with Section 3.2.14. In the event that a central storage area is selected, appropriate measures, such as lining the roll-off boxes or providing sealed tailgates, must be used to prevent loss of material stored during transportation. Alternatively, soils dewatered in place may be placed directly into roll-off boxes or other approved containers placed adjacent to each excavation. The stockpiled soil will remain on site until waste characterization has been completed.

The initial drainage channel excavation limits are shown on Figure 3-1. The extent of excavation in each drainage channel is defined by sediment sample analytical results that indicate PCB concentrations greater than 1 mg/kg. The volume of sediment to be removed from each of the drainage channels is based on the length of channel, a 2 foot excavation along the perimeter of the drainage channel, and a 1 foot depth excavation that extends 5 feet beyond the limits of the 2 foot perimeter excavation. Based on in-place analytical data, there is no TSCA regulated soil (PCB concentrations greater than 50 mg/kg) associated with the drainage channel excavation areas. Figure 3-6 presents the typical drainage channel excavation details. The extent of excavation in each drainage channel is identified on Figure 3-1. Table 3-2 provides the northing and easting coordinates that represent the extent of sediment removal in each drainage channel. The calculations for the volume of excavated sediment to be removed from the drainage channels are provided in Appendix A. The average dimensions of excavation for each drainage channel are summarized below.

Drainage Channel	Soil Sediment Thickness	Area per Foot of Excavation	Channel Length	Volume of Sediment
Drainageway Channels	2 feet	23 square feet	470 feet	800 cubic yards
Overflow Areas	1 feet	10 square feet	470 feet	170 cubic yards
Total Volume of Sediment to be Excavated from Drainageways				**970 cubic yards**

Sediment that accumulates in the erosion and sediment control devices (see Section 4.0) prior to verification that all contaminated surface soils have been removed from the excavation areas will be stockpiled, dewatered (if necessary), and characterized for proper disposition (e.g. use as backfill, disposed as TSCA regulated soil, or disposed as non-hazardous material). Following verification of contaminant removal, sediment that accumulated in the erosion and sediment control devices will be stockpiled, dewatered (if necessary), and characterized for proper disposition.

The implementation of subsurface soil excavation Option 1 does not increase the volume of soil and sediment to be removed from the drainage channels since at depth PCB concentrations within the drainage channels are less than 25 mg/kg. However, the implementation of subsurface soil excavation Option 2 will increase the total in place excavation volume within the drainage channels from 970 cubic yards to 1,290 cubic yards. Based on in-place analytical data, sediment removed from the drainage channels under Option 2 is not TSCA regulated. Areas included in the Option 2 excavation are identified on Figure 3-3.

3.2.3 Culvert, Sump, and Drain Cleaning

Culvert cleaning will be performed within the culverts that are found within the limits of drainage channel excavation. Sump cleaning will be performed within the sump located northwest of Building 171. Drain cleaning will be performed in the drainage trenches located around Building 171 that conveys flow to the sump located northeast of Building 171. Although sediment samples have not been collected from the culverts that are associated with the drainage channels being excavated, these culverts will be cleaned to remove the potential of recontaminating the remediated drainage channels. The identified sump and drains have been selected for cleaning because sediment within the sump contains PCBs at concentrations that exceed the cleanup goals for SWMU 13.

Cleaning of culverts (4 culverts totaling 185 feet), sump (approximately 10 ft wide by 20 foot long by 10 feet deep), and drains (230 feet of trench drains and drain pipes) will be performed using applicable power washing equipment and collection systems. Washing culverts, sumps, and drains is estimated to generate 30 cubic yards of sediment for off-site disposal. The locations of the culverts, sump, and drains are identified on Figures 3-1 and 3-5. Culverts will be cleaned from the upstream to the downstream end. Sump walls will be cleaned prior to cleaning the sump floor. Drains will also be cleaned from the upstream to downstream end and must be cleared prior to sump cleaning. All drains from the sump will be blocked to prevent the migration of sediments and cleaning liquids from the sump. The collection system will allow for containment of all sediments and liquids generated during the culvert, sump, and drain cleaning processes. Detergents will not be used during the cleaning process. Following the cleaning process, the collected sediments will be dewatered and consolidated with the drainage channel sediments for characterization and off-site disposal. All collected liquids will be filtered to remove suspended sediments and handled according to Section 3.2.6. Following the cleaning of culverts, drains, sumps, and concrete surfaces, TtNUS will collect verification wipe samples to verify that the surfaces have been adequately cleaned. Refer to Section 5.0 for sampling requirements.

3.2.4 Sediment Pile Removal

Two piles of sediment measuring approximately 5 feet (width) by 6 feet (length) by 1.5 feet (height) and approximately 20 feet (length) by 8 feet (width) by 1 foot (depth) are located within the tunnel that connects Building 171 and Building 169. The location of the piles are identified on Figure 3-1. Sampling of these piles of sediment indicates that the sediment contains PCB contamination at concentrations that exceed the cleanup goals for SWMU 13. However, these concentrations are below 50 mg/kg and therefore are not TSCA regulated. Due to the access restrictions associated with the tunnel in which the sediment piles are located, it is anticipated that hand tools will be required to remove the estimated 8 cubic yards of sediment. In addition, pressure washing of the tunnel walls and floor areas that are in contact with the piles of sediment is required. During the pressure washing process, all floor drains within the area of the sediment piles will be cleaned to remove any residual sediment that may have accumulated within the drainage system. Following the removal of the sediment piles and the pressure washing process, all sediments removed will be dewatered (if necessary) and consolidated with the drainage channel sediments for characterization and off-site disposal. Collected liquids will be filtered to remove suspended sediment and handled in accordance with Section 3.2.6. Following the cleaning of the surfaces from which sediment was removed, TtNUS will collect verification wipe samples to verify that the surfaces have been adequately cleaned. Refer to Section 5 for wipe sampling requirements.

3.2.5 Temporary Access Roads

Because the contaminated soil and sediment are not located in areas that are readily accessible by the existing roadways, temporary access roads will be constructed to provide access to the individual excavation areas. The temporary access roads will be removed after completion of verification sampling and analysis activities and restoration of the excavation areas. Temporary access roads will be constructed by placing geotextile on the existing ground surface and placing coarse aggregate on top of the geotextile (minimum 6-inch thickness). Upon removal of the access road, if coarse aggregate is verified clean (i.e., not contaminated from the process of hauling materials), the coarse aggregate will be salvaged for Navy use. The coarse aggregate will be transported to a location identified by the OICC. This location will be identified prior to the start of work. The EMAC contractor will stockpile the coarse aggregate at the OICC identified location.

3.2.6 Dewatering

Excavated soils and sediments that require dewatering prior to off-site transportation and disposal may be dewatered at a central location or adjacent to individual excavation areas. This material will be placed on dewatering pad(s) at a lift thickness no greater than 3 feet and allowed to drain by gravity. Dewatering

pad(s) must be construction in accordance with Section 3.2.14. Following dewatering, the EMAC contractor will collect the required disposal characterization samples and mix the sediment lift to promote additional dewatering. It is estimated that following the second day of dewatering, the moisture content of the soils and sediments will have been sufficiently reduced and the soil and sediment will not require the addition of an absorbing agent to be suitable for transportation and disposal. The EMAC contractor must transport the dewatered soil and collected water to an off-site disposal facility as soon as possible (within 90 days) to avoid exceeding any time restrictions on contaminated material storage.

Water that has drained from the staged soil and sediment and water removed from excavations will be containerized for characterization prior to off-site disposal, and where applicable, managed in accordance with TSCA regulations. Water generated from the process of cleaning culverts, drains, and sumps will be containerized for characterization. If characterization results indicate the presence of Total PCB at concentrations greater than or equal to 0.5 µg/L, the containerized water must be disposed off-site at a NSWC Crane-approved disposal facility. If the characterization results indicate total PCBs at concentrations less than 0.5 µg/L, the containerized water, with NSWC Crane-approval, can be discharged to a NSWC Crane-approved stabilized drainage channel or storm drain.

3.2.7 Verification Sampling and Analysis

Verification samples will be collected from the excavation floors and sidewalls to determine the PCB concentrations for soils left in place following the implementation of this IMWP. Based on the comparison of verification sample results to the 1 and 25 mg/kg cleanup goals, the Navy may or may not direct the EMAC contractor to perform additional excavation and soil removal. Verification samples will also be collected from the surface soil below the decontamination pad, material storage area, dewatering pad(s), and temporary access roads. In addition, verification wipe samples will be collected from all of the cleaned surfaces (culverts, drainage trenches, and sumps). Based on the comparison of the verification wipe sample results to the 10 µg per 100 square centimeters cleaning requirement, the Navy may or may not direct the EMAC contractor to perform additional surface cleaning. Verification sampling and analysis procedures are provided in Section 5.0.

3.2.8 Disposal

Excavated soils and sediments will be sampled and analyzed for waste disposal characterization using the methods required by the NSWC Crane-approved waste disposal facility. The soils and sediments will be sampled following the dewatering process, if dewatering is required. In order to prevent loss of material stored in containers or trucks, measures such as lining containers and trucks or providing sealed

tailgates on trucks, along with tarping containers or trucks, will be performed. The EMAC contractor is responsible for satisfying all disposal requirements (solid and liquid) and providing TtNUS with all disposal facility sampling requirements including disposal facility name, contact information (including permit number), waste profile, and responsible parties. This information will then be incorporated into the SWMU Quality Assurance Project Plan (QAPP). The following is a summary of the volumes (in-place) expected to be disposed off-site:

	Total	**Non-TSCA Regulated**	**TSCA Regulated**
Volume of Soils and Sediment	2,120 cubic yards	2,120 cubic yards	390 cubic yards
Volume of Soil and Sediments (Option 1)	60 cubic yards*	30 cubic yards	30 cubic yards
Volume of Soil and Sediments (Option 2)	420 cubic yards*	350 cubic yards	70 cubic yards

* Reported number represents additional volume. The total volume for implementation of Option 1 is equal to 2,750 cubic yards and the total volume for implementation of Option 2 is equal to 2,930 cubic yards.

3.2.9 Backfilling

Excavation areas will be backfilled to pre-construction conditions. The backfill soil obtained from an off-site borrow source will have properties similar to the native SWMU 13 surface soils. These soils will be subject to analytical testing to assure that the material satisfies the following requirements:

- Total petroleum hydrocarbon, diesel range organics, EPA SW-845 8015M DRO - less than 1 part per million (ppm)
- Total petroleum hydrocarbon, gasoline range organics, EPA SW-845 8015M GRO - less than 1 ppm
- Sum of benzene, toluene, ethylbenzene, and xylenes, EPA SW-846 5030 / 8021 - less than 1 ppm
- Characteristic waste determination (ignitability, corrosivity, reactivity, and toxicity), EPA SW-846 1311 - shall not fail the test for characteristic waste
- Total PCB, EPA SW-846 8082 - less than 1 ppm

Additionally, the backfill material will meet the following physical characteristics for each of the excavation areas.

Excavation Backfill - Backfill soil for the surface soil excavation areas and the drainage channel excavations will be placed in 1-foot thick lifts and compacted by track-walking across the backfilled area with a track-type equipment. The backfill material shall meet the following physical characteristics:

- ASTM D 2487, Group Symbols GW, GP, GM, SW, SP, or SM
- ASTM D 4318, Liquid limit, 35 maximum
- ASTM D 4318, Plasticity index, 12 maximum
- Maximum of 25 percent by weight passing ASTM D 1140, No. 200 sieve
- Maximum particle size of 1 inch

The following is a summary of the off-site barrow volumes needed to restore the site following excavation.

	Total	Common Fill	Topsoil*
Baseline Restoration	2,510 cubic yards	1,850 cubic yards	660 cubic yards
Option 1 Restoration	2,570 cubic yards	1,910 cubic yards	660 cubic yards
Option 2 Restoration	2,930 cubic yards	2,270 cubic yards	660 cubic yards

*Topsoil volumes based on 6 inches of topsoil over the entire excavation area.

3.2.10 Restoration

Following backfilling, the entire limits of disturbance will be restored/stabilized using permanent stabilization practices. Restoration will consist of surface preparation, fertilizing, seeding, and mulching, where appropriate. Seeding procedures and procedures for associated activities (fertilizing and mulching) are presented in detail in Section 4.4.

3.2.11 Erosion and Sediment Control

Before excavation activities begin, erosion and sediment controls will be established to prevent impacts to surface water bodies downgradient of the disturbance areas, namely Boggs Creek (see Section 4.0). During excavation, backfilling, and restoration operations and until vegetation is established, the erosion and sediment controls will be regularly inspected and maintained. Erosion and sediment control requirements to be complied with during IMWP implementation include the Indiana Handbook for Erosion Control in Developing Areas (IDEM, 1992).

3.2.12 Gravel Construction Entrance

Ingress to and egress from the disturbed areas will be controlled using a gravel construction entrance, which is described in detail in Section 4.0. The EMAC contractor is required to minimize the amount of disturbance to the wooded areas where excavation activities will be performed. This requirement may result in the use of several temporary access trails. If this is the case, the EMAC contractor will be required to have a gravel construction entrance at the end of each temporary access trail that connects to NSWC Crane facility roads.

3.2.13 Decontamination Pad

A temporary decontamination pad will be set up to clean equipment used to excavate and transport contaminated soils and sediments. The pad will be sized to accommodate all the equipment to be used at the site and will be constructed in a manner that contains all the contaminated materials removed from equipment and the liquids used to clean the equipment. Contaminated materials removed from the equipment will be disposed off-site with the excavated sediment and soil. Wash water will be filtered, characterized, and disposed at a NSWC Crane-approved off-site disposal facility. Additional decontamination pad requirements are discussed in Section 4.5. Care will be taken to keep off-road transport equipment clean to minimize the spread of contaminated soils and sediments to areas adjacent to the excavations or the temporary access trails. Any soil or sediment removal from these areas and the associated disposal and restoration costs will be the responsibility of the EMAC contractor.

3.2.14 Dewatering Pad

A temporary dewatering pad will be set up to dewater excavated soils and sediments. The dewatering pad will be sized to accommodate excavated soils and sediments and loading equipment as necessary. The dewatering pad will be constructed in such a manner that it will retain all materials and allow the water that drains by gravity from the sediment to be collected in a sump. At a minimum, the dewatering pad(s) will be constructed of an 8-mil thick polyethylene geomembrane overlain by a 6-inch thick gravel drainage layer. To ensure that contamination was not spread to the soil below the dewatering pad(s), verification samples will be collected from the footprint of the dewatering pad following the removal of the pad to verify the integrity of the liner. During rain events and downtime, stockpiled materials within the dewatering pads must be covered with a minimum 8-mil thick polyethylene sheeting to prevent movement of material to surrounding areas and to minimize the collection of additional water. The geomembrane cover will be secured daily using ballast in the form of sandbags and rope or equivalent methods. Dewatering pad(s) must be constructed so that water discharges to a containment system. Prior to off-site disposal of contained water, the water must be filtered and characterized. Following the filtering and

characterization of the water, the water will be disposed at a NSWC Crane-approved off-site disposal facility.

3.2.15 Clearing

Clearing will be performed only within the limits of disturbance shown on the figures. Clearing activities will be kept to a minimum to minimize impacts to natural habitat. Cleared vegetation will be chipped and handled as directed by the OICC. Standing trees will not be removed from April 1 through September 30 to comply with Indiana bat regulations, which are further addressed Section 3.5.2. Prior to starting clearing activities, the EMAC contractor will meet with the NWSC Crane Biologist to define the clearing activities and receive approval to proceed. Additionally, minor tree clearing (e.g., small areas of non-habitat value trees) must be approved by the NSWC Crane Natural Resources Office.

3.3 SEQUENCE OF IMWP IMPLEMENTATION

The generalized sequence of construction activities is presented below. This sequence of construction is subject to change based on the EMAC contractor's Work Plan.

1. Hold a pre-IMWP implementation meeting with the NSWC Crane Officer in Charge of Construction (OICC), Contracting Officer, EMAC contractor, and TtNUS representative, at a minimum. The EMAC contractor must provide a minimum of 7 days notice to OICC and TtNUS prior to pre-IMWP implementation meeting.

2. Inspect SWMU 13 to verify existing site conditions and overhead and underground utility locations, and obtain all required permits as detailed in Table 3-1. The EMAC contractor must provide a minimum of 7 days notice to OICC and TtNUS prior to start of construction activities.

3. Install perimeter controls for the gravel construction entrance(s) and construct the gravel construction entrance(s). Install the remaining perimeter controls as indicated in the Erosion and Sediment Control Plan (Section 4.0).

4. Clear areas for support features including, but not limited to, the decontamination pad, dewatering pad, and materials storage area. Construct the support features.

5. Excavate surface soil from the surface soil excavation area and remove the pile of sediment within the tunnel between Buildings 171 and 169. TtNUS will collect verification samples as identified in

Section 5.0 of this IMWP. Perform additional excavation, if required by the OICC. Following verification of contaminated surface soil removal, restore the disturbed excavation area as required. Following excavation and dewatering (if required), collect disposal characterization samples from excavated soils. Following disposal characterization, load and transport surface soil to the NSWC Crane-approved off-site disposal facility.

6. Excavate/remove sediment material from the drainage channel excavation areas, beginning at the uppermost reaches of required excavation and continuing excavation in the direction of drainage channel flow. Remove sediment from the drainage culverts and clean the culverts as culverts are encountered. TtNUS will collect verification samples as identified in Section 5.0 of this IMWP. Perform additional excavation if required by the OICC. Following verification of contaminated sediment removal, restore the drainage channels as required. Allow excavated sediments placed in the dewatering pad to dewater by gravity, mixing excavated sediments daily to promote additional dewatering. Following dewatering, collect disposal characterization samples from the dewatered sediment. Following disposal characterization, load and transport sediment to the NSWC Crane-approved off-site disposal facility. During excavation, maintain erosion and sediment controls.

7. Remove the identified sediment piles, clean drains, remove accumulated sediment from sump and clean sump. Collect all generated sediment and cleaning liquids from cleaning process. During cleaning process do not allow cleaning liquids or removed sediment to migrate beyond the limits of drain and sump cleaning. Dewater collected sediment if necessary and characterize and dispose of sediment and collected liquids at a NSWC Crane approved off-site disposal facility.

8. Following transportation and disposal of all excavated surface soil and sediments, remove the dewatering pad, decontamination pad, and materials storage area, and collect verification samples from within the footprint of the support features and from the temporary access trails as described in Section 5.0. Following verification that the temporary access trails and the ground below the support features was not impacted by construction activities, regrade as necessary and establish permanent stabilization.

9. Following permanent stabilization of all disturbed areas, and with the approval of the OICC, remove all remaining perimeter controls and immediately stabilize all remaining disturbed areas.

3.4 STORMWATER CONTROLS

The SWMU 13 ground surface hydrology, grading, and cover will not be altered due to IMWP implementation activities. Pre- and post-development runoff from the limits of disturbance will be the same; therefore, permanent stormwater detention capacity is not required and pre- and post-construction stormwater runoff calculations were not prepared.

The disturbed area will be greater than 1 acre; therefore, an IDEM Storm Water General Permit is required (stormwater permits are required for disturbances greater than 1 acre). However, because the IM activities do not include working in and around a water course, the IDEM 401 Permit and Department of Natural Resources (DNR) Construction in Floodway Permit are not required (refer to Table 3-1). IMWP implementation activities will require the use of best management practices for erosion and sediment control and stormwater pollution prevention as described in Section 4.0.

3.5 OTHER IMWP IMPLEMENTATION REQUIREMENTS

3.5.1 Utilities

The EMAC contractor is responsible for obtaining utility locations, and adequately protecting any utilities located in the active work areas before any earth-disturbing activities begin. Steam lines traverse excavation areas at SWMU 13, the EMAC contractor will provide appropriate temporary support for the steam line support structures during excavation (prior to installation the proposed temporary support systems must be approved by the OICC).

3.5.2 Protection of Natural Resources

Threatened and endangered species or species of special concern protected under Indiana or Federal regulations exist or may exist in SWMU 13 and will therefore be protected. Protected bird species that may use SWMU 13 as part of their home ranges include the bald eagle, osprey, sharp-shinned hawk, red-shouldered hawk, broad-winged hawk, black and white warbler, hooded warbler, and the worm-eating warbler (B&RE, 1997). Also, the Indiana bat, a federal endangered species, is known to forage at NSWC Crane. During the spring and summer, Indiana bats roost in trees and forage for insects primarily in riparian and upland forests. The most important characteristic of roost trees is thought to be structural-exfoliating bark with space for bats to roost between the bark and the bole of the tree. To a limited extent, tree cavities and crevices are also used for roosting.

In 1997, NSWC Crane received a letter from the United States Fish and Wildlife Service (USFWS) stating that, in their opinion, NSWC Crane had an abundance of Indiana bat habitat and that any activity that would result in the clearing of woody vegetation may affect the Indiana bat and would require consultation under the Endangered Species Act (ESA). The USFWS recommended interim guidelines for protecting Indiana bats and their habitat from silvicultural activities, and these recommendations were immediately implemented by NSWC Crane under the timber management program.

Because of the Indiana bat and its potential habitat, the cutting of trees at NSWC Crane is restricted to certain times during the year, and the cutting of shagbark hickory trees (potential Indiana bat habitat) is limited. A summary of Indiana bat-related restrictions prepared by the NSA Crane Natural Resources Office (i.e., "bat primer") is as follows:

- Woody vegetation that is 3 inches in diameter or greater at 4.5 feet above the ground surface may not be removed from April 1 through September 30.

- Standing dead trees may not be removed from April 1 through September 30.

- Timber harvesting may occur from October 1 through March 31 without a case-by-case consultation provided the interim guidelines for silvicultural treatment issued to the NSWC Crane Natural Resources Office by the USFWS are followed.

- During emergency situations, necessary and prudent tree removal is allowed at all times without consultation.

- Tree removal from residential settings and industrial areas for safety reasons is allowed from October 1 through March 31 without further consultation. This includes tree trimming.

- Tree removal within 25 feet of railroad tracks and within 50 feet of explosive storage and explosive operating buildings is allowed from October 1 through March 31 without further consultation.

- Brush clearing of woody vegetation less than 3 inches in diameter at 4.5 feet above the ground may occur at any time of the year without consultation.

- All other tree removal or clearing projects not covered above must be submitted to the USFWS for informal consultation on a case-by-case basis.

As noted in Section 3.2.15, approval for minor tree clearing between the dates of April 1 and September 30 may be obtained from the NSA Crane Natural Resources Office depending on the species of trees involved.

3.5.3 Traffic Control Plan

Access to NSWC Crane is via four gates: the Main Gate referred to as the Bloomington Gate (Gate House No. 1) in the north, Burns City Gate (Gate House No. 2) in the west, Bedford Gate (Gate House No. 3) in the east, and Crane Gate (Gate house No. 4) in the northwest. NSWC Crane will be accessed by the EMAC contractor only through the Crane Gate. All vehicles will pass through the Crane Gate via the traffic routing plan shown on Figure 3-4. The EMAC contractor is not permitted to travel within restricted areas of the facility. All waste hauling vehicles will be weighed upon arrival and at time of departure using the certified weight scale located at the Defense Reutilization and Marketing Office (DRMO) (Building 1940). The DRMO scale is operated during normal business hours, and weight tickets are available. The DRMO scale is the preferred scale for contractors' use. Alternatively, the Army scale (Building 2913) may be used. The Army scale is no longer manned and weight tickets are not available. However, a weight readout is available at the Army scale.

3.5.4 EMAC Contractor Requirements

The EMAC contractor will be required to perform all IMWP implementation activities in accordance with the EMAC Basic Contract, NSWC Crane Contractor's Operations Manual (NSWC Crane, 2002), and supplemental specifications provided in Appendix C.

The IWMP will be implemented by the EMAC contractor, NSWC Crane, and TtNUS, with work assignments summarized on Table 3-1.

3.6 IMPLEMENTATION

The EMAC contractor will coordinate all field work through the OICC.

IMWP implementation may be impacted by NSWC Crane activities and the facility's "Protective Measures". NSWC Crane will implement a corresponding set of "Protective Measures" based on the warnings provided by the Homeland Security Advisory System in the form of graduated "Threat Conditions." The EMAC contractor will be subject to any implemented "Protective Measures."

The Navy will provide a full-time oversight representative during IMWP implementation. The EMAC contractor will provide a minimum of 7 days notification to the OICC and the Navy's oversight representative prior to mobilization.

TABLE 3-1

WORK ASSIGNMENT RESPONSIBILITY CHART
INTERIM MEASURES WORK PLAN SWMU 13 – MINE FILL B
NSWC CRANE
CRANE, INDIANA

WORK ITEM	EMAC CONTRACTOR[1]	NSWC CRANE	TtNUS
Pre-IMWP Implementation Meeting	X	X	X
Interim Measure Implementation	X		
EMAC Contractor Work Plan [1]	X		
Locations and Flagging of Excavation Limits (see Table 3-2)	X		
Site Specific Health and Safety Plan / Activity Hazard Analysis	X		
Project Quality Control Plan	X		
Environmental Conditions Report	[1]		X
Permits			
- Safety & Building Availability Permit (ESO 8020/11)	X		
- Digging Permit (NWSCC 11000/3)	X	[4]	
- Flame Tool / Hot Work Permit (NWSCC 11320)	X		
- HERO Permit (approval for portable radios)	X		
- Tree Clearing Permit		X	
- IDEM Storm Water General Permit			X
- IDEM 401 Permit			X
- DNR Construction in the Floodway Permit			X
Field Work Reports and Submittals [5]	X		
Sampling and Analysis	X[6]		X[6]
Wastewater Disposal (Decontamination Water)	X[7]		
CTO Closure Report	[8]		X
IDEM TSCA Notification	[9]	X[9]	

NOTES:

1. In addition to the listed items, the EMAC contractor is required to perform all IMWP implementation activities in accordance with the EMAC Basic Contract, NSWC Crane Contractor's Operations Manual (NSWC Crane, 2002), and supplemental specifications provided in Appendix C.
2. EMAC Contractor Work Plan includes, but is not limited to, an excavation and handling plan, waste management plan, environmental protection plan, erosion and sediment control plan, stormwater pollution prevention plan, and transportation and disposal plan.
3. EMAC contractor will participate in documenting environmental conditions before, during, and after implementation of the interim measures.
4. EMAC contractor completes the permit form. NSWC Crane performs the utility clearance.
5. EMAC contractor will furnish items identified in the Basic Contract, NSWC Crane Contractor's Operations Manual, and the Supplemental Specifications provided in Appendix C.
6. EMAC contractor will be responsible for the collection of characterization samples required for off-site disposal of excavated surface soils and sediments. TtNUS will collect verification samples from the excavation areas and from the surface soils below the support facilities following the removal of the support facilities. The EMAC contractor will need to coordinate and accommodate TtNUS sampling and field activities.
7. EMAC Contractor will be responsible for collection, storage, characterization, and discharge of wastewater to the NSWC Crane approved stabilized drainage channel, storm drain, or wastewater treatment plant. Contaminated wastewater will be taken off-site by the EMAC Contractor for disposal.
8. EMAC Contractor will furnish items identified in the Supplemental Specifications provided in Appendix C.
9. The Navy is required to notify IDEM of TSCA and Non-TSCA disposal facilities 30 days prior to start of construction.

CTO - Contract Task Order
EMAC - Environmental Multiple Award Contract
HERO - Hazards of Electromagnetic Radiation to Ordnance
IDEM - Indiana Department of Environmental Management
IMWP - Interim Measures Work Plan
NSWC - Naval Surface Warfare Center
TSCA - Toxic Substances Control Act
TtNUS - Tetra Tech NUS, Inc
X - Indicates responsible party

TABLE 3-2

NORTHING AND EASTING COORDINATES FOR SOIL AND SEDIMENT EXCAVATION
INTERIM MEASURES WORK PLAN SWMU 13 – MINE FILL B
NSWC CRANE
CRANE, INDIANA

EXCAVATION NODE	EASTING	NORTHING
INITIAL EXCAVATION (Figure 3-1)		
C1	3,023,049.77	1,308,889.86
C2	3,023,115.95	1,308,884.87
C3	3,023,154.86	1,308,851.68
C4	3,023,366.17	1,308,987.19
C5	3,023,387.82	1,308,972.64
C6	3,023,413.25	1,308,972.91
C7	3,023,440.97	1,308,966.84
C8	3,023,457.96	1,308,970.56
C9	3,023,677.15	1,309,608.63
C10	3,023,756.16	1,309,596.78
E1	3,023,458.83	1,308,964.61
E2	3,023,455.57	1,308,986.95
E3	3,023,462.34	1,308,987.99
E4	3,023,480.57	1,308,999.19
E5	3,023,503.74	1,309,028.36
E6	3,023,503.22	1,309,042.94
E7	3,023,483.95	1,309,069.51
E8	3,023,563.90	1,309,170.81
E9	3,023,626.14	1,309,158.57
E10	3,023,644.11	1,309,142.94
E11	3,023,643.93	1,309,093.64
E12	3,023,602.44	1,309,042.42
E13	3,023,591.76	1,309,042.16
E14	3,023,535.25	1,309,023.93
E15	3,023,521.08	1,309,021.40
E16	3,023,513.00	1,309,006.81
E17	3,023,498.01	1,308,987.99
E18	3,023,475.18	1,308,969.33
E19	3,024,008.90	1,309,550.95
E20	3,024,003.18	1,309,555.12
E21	3,024,019.32	1,309,612.41
E22	3,024,052.13	1,309,612.41
E23	3,024,065.68	1,309,621.26
E24	3,024,076.09	1,309,632.20
E25	3,024,088.59	1,309,619.70
E26	3,024,084.43	1,309,607.20
E27	3,024,040.15	1,309,563.45
E28	3,024,030.78	1,309,569.70
INITIAL EXCAVATION (Figure 3-1) TSCA SOIL DELINEATION		
C7	3,023,440.97	1,308,966.84
E1	3,023,458.83	1,308,964.61
E2	3,023,455.57	1,308,986.95
E3	3,023,462.34	1,308,987.99
E18	3,023,475.18	1,308,969.33
E12	3,023,602.44	1,309,042.42
E13	3,023,591.76	1,309,042.16
E14	3,023,535.25	1,309,023.93

TABLE 3-2

NORTHING AND EASTING COORDINATES FOR SOIL AND SEDIMENT EXCAVATION
INTERIM MEASURES WORK PLAN SWMU 13 – MINE FILL B
NSWC CRANE
CRANE, INDIANA

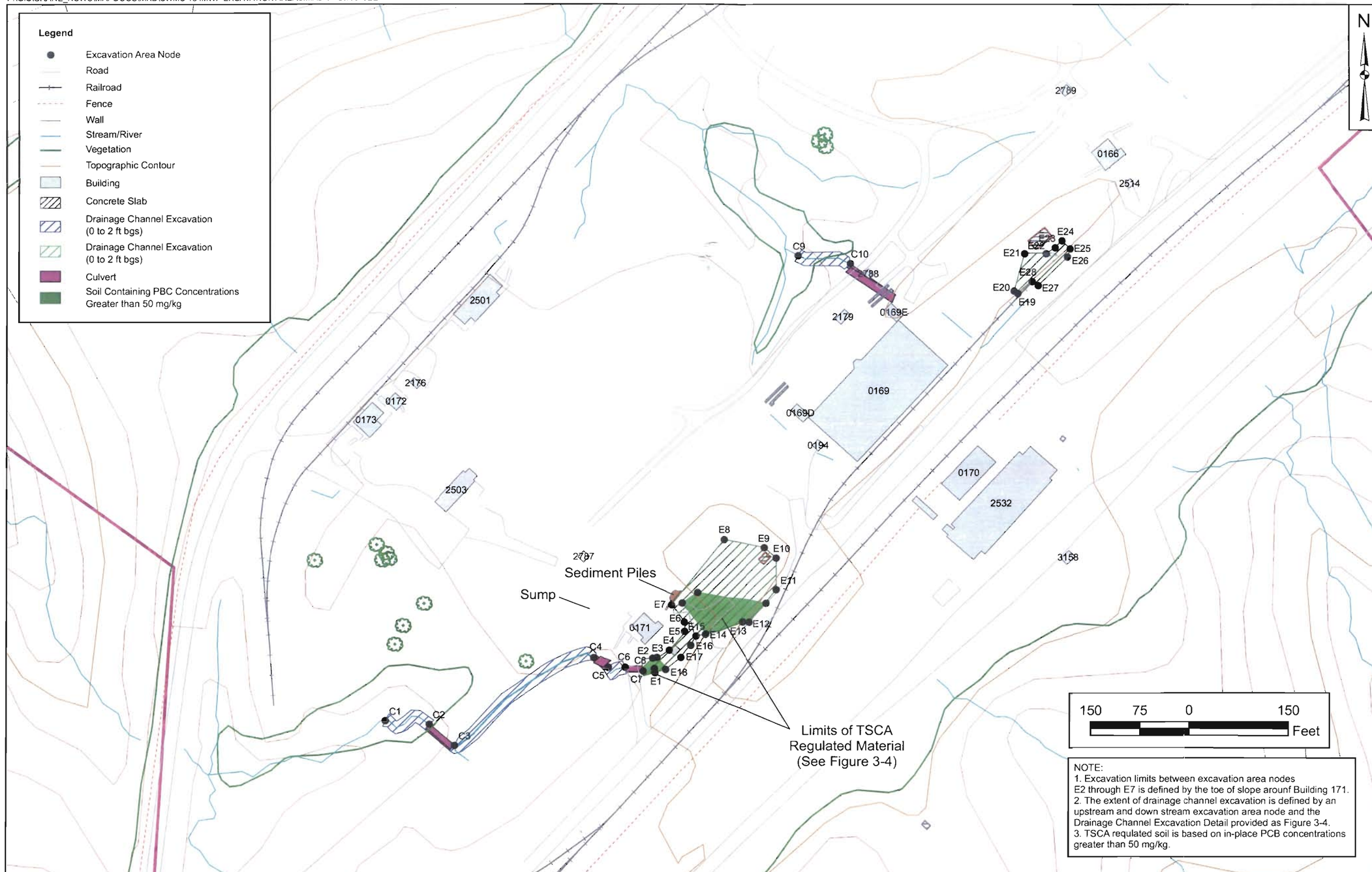
EXCAVATION NODE	EASTING	NORTHING
E30	3,023,500.23	1,309,072.78
E31	3,023,523.65	1,309,089.23
E32	3,023,628.59	1,309,072.06

OPTION 1 - ADDITIONAL EXCAVTION (Figure 3-2)		
01	3,023,517.61	1,309,084.42
02	3,023,528.84	1,309,073.09
03	3,023,516.75	1,309,061.25
04	3,023,505.60	1,309,072.44
05	3,024,076.89	1,309,609.90
06	3,024,023.59	1,309,572.17
07	3,024,031.74	1,309,580.33
08	3,024,043.43	1,309,568.77
OPTION 1 - ADDITIONAL EXCAVTION (Figure 3-2) TSCA SOIL DELINEATION		
01	3,023,517.61	1,309,084.42
02	3,023,528.84	1,309,073.09
03	3,023,516.75	1,309,061.25
04	3,023,505.60	1,309,072.44

OPTION 2 - ADDITIONAL EXCAVTION (Figure 3-3)		
09	3,023,535.13	1,309,074.34
10	3,023,515.54	1,309,054.84
11	3,023,498.81	1,309,071.39
12	3,023,518.22	1,309,091.16
OPTION 2 - ADDITIONAL EXCAVTION (Figure 3-3) TSCA SOIL DELINEATION		
09	3,023,535.13	1,309,074.34
10	3,023,515.54	1,309,054.84
11	3,023,498.81	1,309,071.39
12	3,023,518.22	1,309,091.16

Note: Excavation nodes identified in this table for Initial Excavation will be locate and flag in the field by the EMAC contractor (see Table 3-1). The locations of the excavation nodes are subject to Navy approval prior to excavation.

P:\GIS\CRANE_NSWC\MAPDOCS\MXD\SWMU 13 IMWP EXCAVATION AREAS.MXD 07/29/08 JEE



NOTE:
1. Excavation limits between excavation area nodes E2 through E7 is defined by the toe of slope arounf Building 171.
2. The extent of drainage channel excavation is defined by an upstream and down stream excavation area node and the Drainage Channel Excavation Detail provided as Figure 3-4.
3. TSCA requlated soil is based on in-place PCB concentrations greater than 50 mg/kg.

CONTRACT NO. 112G00352

APPROVED BY ___ DATE ___

APPROVED BY ___ DATE ___

DRAWING NO. FIGURE 3-1

REV 0

IMWP EXCAVATION AREAS
SWMU 13 - MINE FILL B
INTERIM MEASURES WORK PLAN
NSWC CRANE
CRANE INDIANA

NAVFAC

DRAWN BY S. STROZ DATE 07/18/08

CHECKED BY T. SMITH DATE 07/29/08

COST/SCHED-AREA

SCALE AS NOTED

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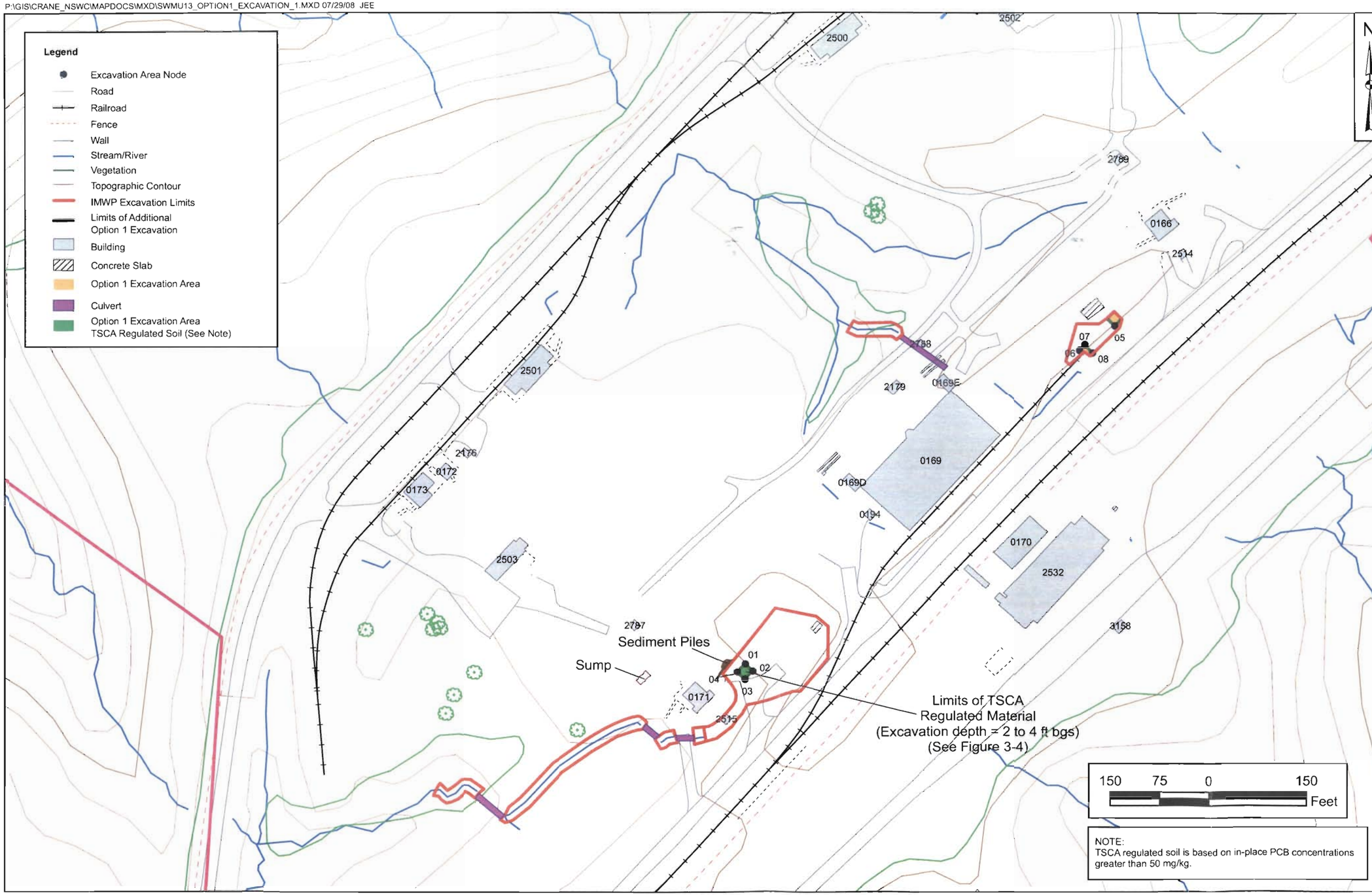

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CONTRACT NO. 112G00352

APPROVED BY ___ DATE ___

APPROVED BY ___ DATE ___

DRAWING NO. FIGURE 3-2

REV 0

OPTION 1 - EXCAVATION AREA
SWMU 13 - MINE FILL B
INTERIM MEASURES WORK PLAN
NSWC CRANE
CRANE INDIANA

NAVFAC

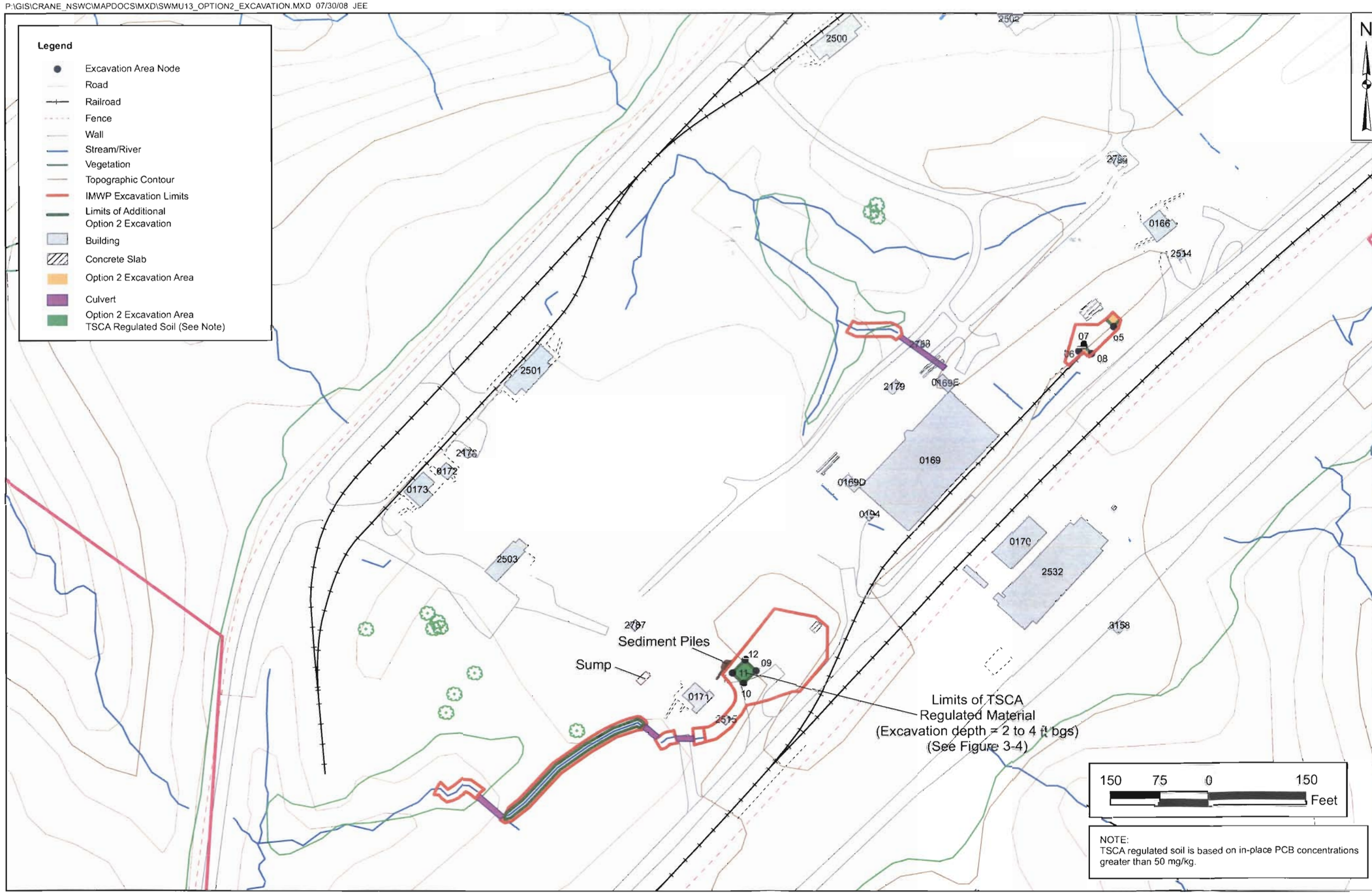
DRAWN BY S. STROZ DATE 07/21/08

CHECKED BY T. SMITH DATE 07/29/08

COST/SCHED-AREA

SCALE AS NOTED

P:\GIS\CRANE_NSWC\MAPDOCS\MXD\SWMU13_OPTION2_EXCAVATION.MXD 07/30/08 JEE



CONTRACT NO. 112G00352

APPROVED BY ___ DATE ___

APPROVED BY ___ DATE ___

DRAWING NO. FIGURE 3-3

REV 0

OPTION 2 - EXCAVATION AREA
SWMU 13 - MINE FILL B
INTERIM MEASURES WORK PLAN
NSWC CRANE
CRANE INDIANA

NAVFAC

DRAWN BY S. STROZ DATE 07/21/08

CHECKED BY T. SMITH DATE 07/30/08

COST/SCHED-AREA

SCALE AS NOTED

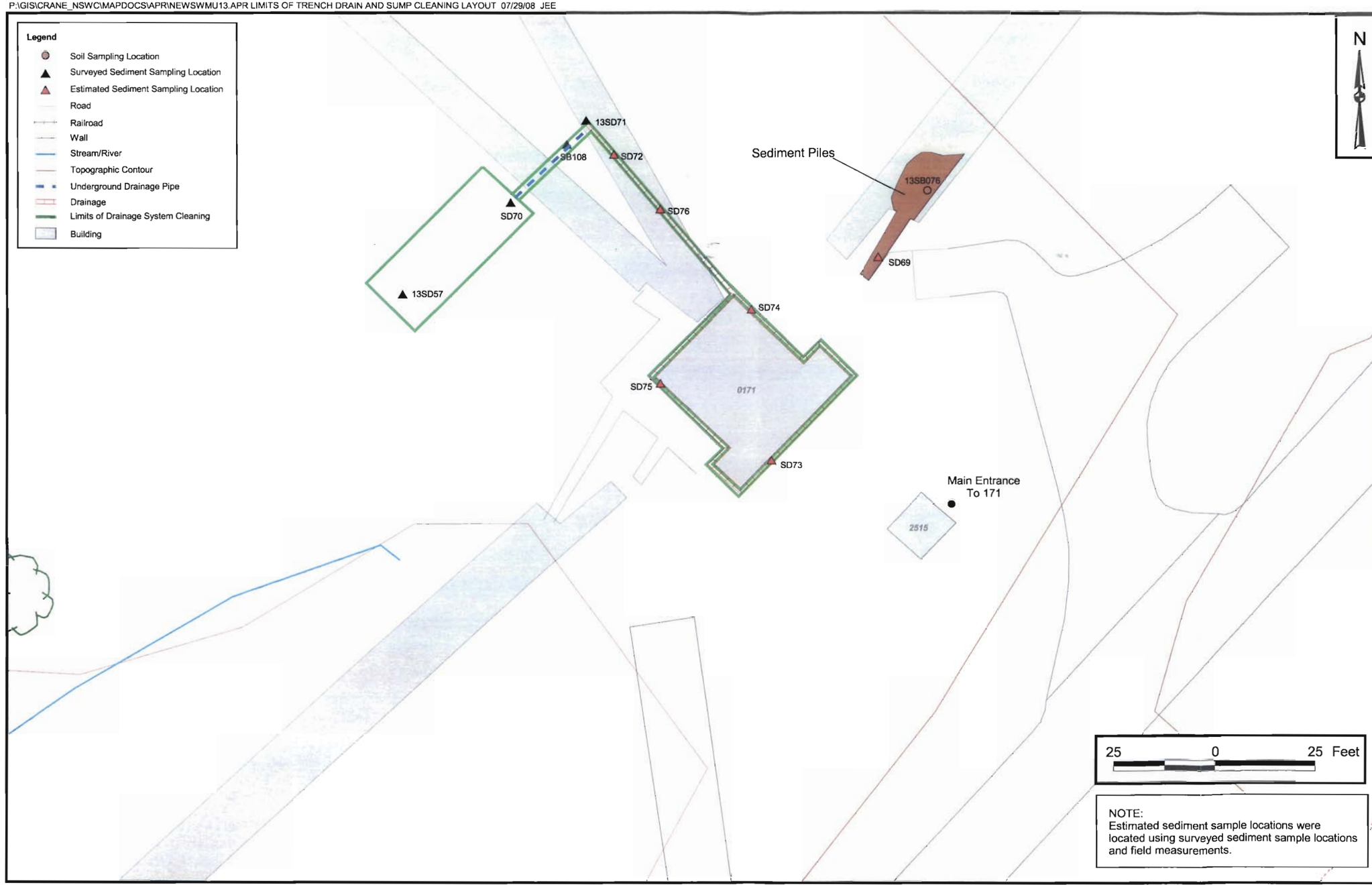
P:\GIS\CRANE_NSWC\MAPDOCS\MXD\SWMU 13 TSCA LIMITS.MXD 07/30/08 JEE

NOTE:
Soil associated with Excavation Options 1 and 2 by Excavation nodes 01, 02, 03, and 04 (Option 1) and 09, 10, 11, and 12 (Option 2) require offsite disposal as TSCA regulated soil.

LIMITS OF TSCA REGULATED SOIL
SWMU 13 - MINE FILL B
INTERIM MEASURES WORK PLAN
NSWC CRANE
CRANE INDIANA

CONTRACT NO. 112G00352		
APPROVED BY	DATE	
APPROVED BY	DATE	
DRAWING NO. FIGURE 3-4		REV 0
DRAWN BY S. STROZ	DATE 07/21/08	
CHECKED BY T. SMITH	DATE 07/30/08	
COST/SCHED-AREA		
SCALE AS NOTED		

P:\GIS\CRANE_NSWC\MAPDOCS\APR\NEWSWMU13.APR LIMITS OF TRENCH DRAIN AND SUMP CLEANING LAYOUT 07/29/08 JEE



NOTE:
Estimated sediment sample locations were located using surveyed sediment sample locations and field measurements.

CONTRACT NO. 0020

APPROVED BY ___ DATE ___

APPROVED BY ___ DATE ___

DRAWING NO. FIGURE 3-5

REV _

LIMITS OF BUILDING 171 TRENCH DRAIN AND SUMP CLEANING
SWMU 13 - MINE FILL B
INTERIM MEASURES WORK PLAN
NSWC CRANE
CRANE INDIANA

NAVFAC

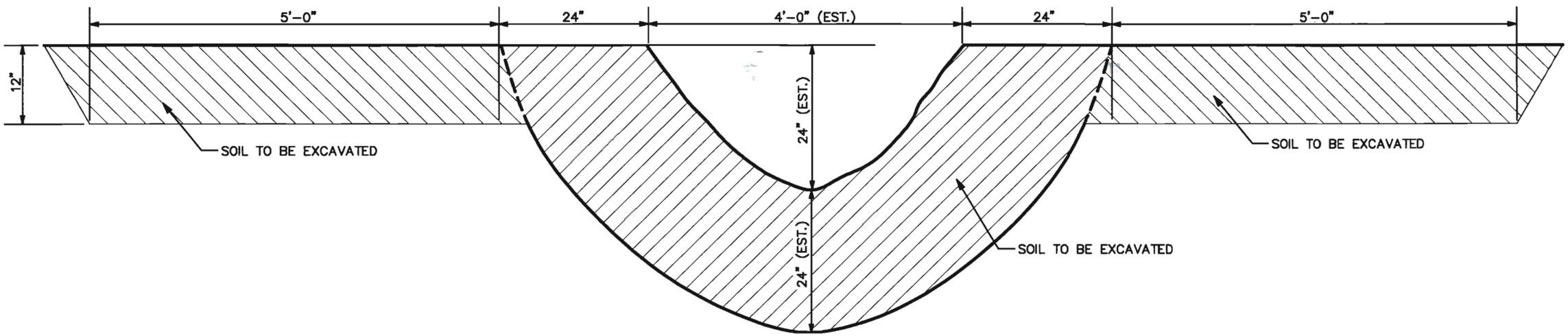
DRAWN BY S. STROZ DATE 07/22/08

CHECKED BY T. SMITH DATE 07/29/08

COST/SCHED-AREA

SCALE AS NOTED

ACAD: 0352CD08.dwg 05/07/08 MF PIT



DRAINAGE CHANNEL EXCAVATION

LEGEND:

CHANNEL EXCAVATION

CHANNEL OVERFLOW EXCAVATION

NOTES:

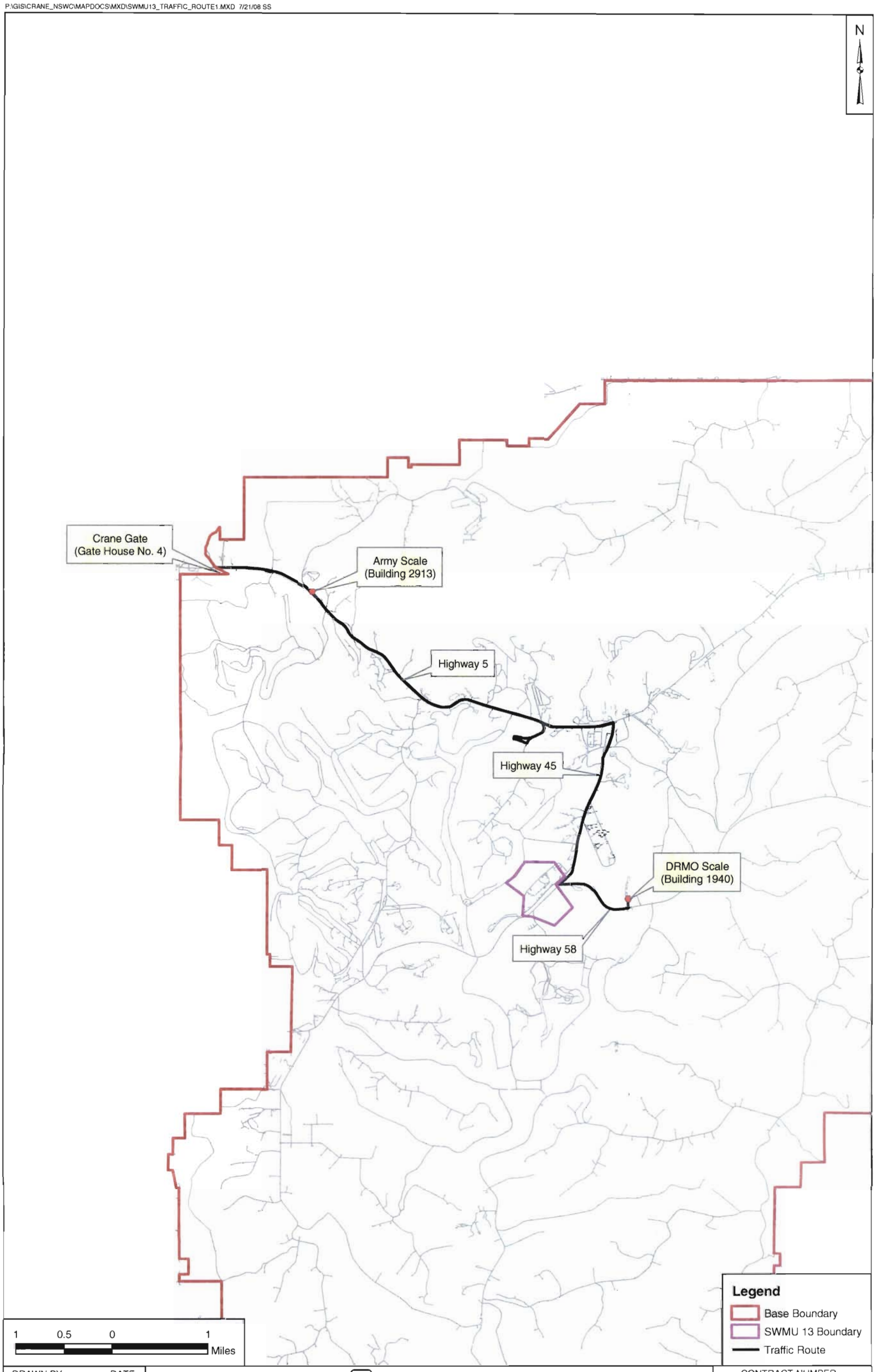
1. BRUSH HOG EXCAVATION AREA TO EXPOSE TOP OF DRAINAGE CHANNEL BANKS.
2. DRAINAGE CHANNEL DIMENSIONS INDICATE AVERAGE OF DRAINAGE CHANNEL FIELD MEASUREMENTS.
3. FOR PORTION OF CHANNEL WITHOUT WELL DEFINED LIMITS, THE NAVY REPRESENTATIVE WILL INDICATE THE REQUIRED INITIAL EXCAVATION LIMITS.
4. ASIDE FROM THE ESTIMATED DRAINAGE CHANNEL DIMENSIONS, PROVIDED DIMENSIONS DELINEATE THE EXTENT OF EXCAVATION.

DRAWN BY MF	DATE 4/7/08	DRAINAGE CHANNEL EXCAVATION DETAIL SWMU 13 – MINE FILL B INTERIM MEASURES WORK PLAN NSWC CRANE CRANE, INDIANA	CONTRACT NO. 0352
CHECKED BY	DATE		OWNER NO. 0020
REVISED BY	DATE		APPROVED BY / DATE
SCALE NOT TO SCALE			DRAWING NO. FIGURE 3–6 / REV. 0

NAVFAC

FORM CADD NO. TTNUS-BH.DWG – REV 1 – 9/10/98

P:\GIS\CRANE_NSWC\MAPDOCS\MXD\SWMU13_TRAFFIC_ROUTE1.MXD 7/21/08 SS



DRAWN BY S.STROZ	DATE 7/21/08	Tetra Tech NUS, Inc.	CONTRACT NUMBER 112G00352
CHECKED BY T. SMITH	DATE 7/21/08	TRAFFIC ROUTING PLAN SWMU 13 - MINE FILL B INTERIM MEASURES WORK PLAN NSWC CRANE CRANE, INDIANA	APPROVED BY — DATE —
REVISED BY —	DATE —		APPROVED BY — DATE —
SCALE AS NOTED			FIGURE NO. FIGURE 3-7 / REV 0

4.0 EROSION AND SEDIMENT CONTROL PLAN

4.1 PURPOSE

The purpose of this section is to provide the steps that will be taken to minimize and/or eliminate erosion and sedimentation during the implementation of the IMWP at SWMU 13. The erosion and sediment control plan has been developed in accordance with the guidelines defined in the Indiana Handbook for Erosion Control in Developing Areas (Handbook) (IDEM, 1992). Relevant standards and specifications from the Handbook are included in this section and Appendix C. The erosion and sediment control devices described in this text can be modified based on construction equipment and techniques presented in the EMAC contractor's Work Plan. Selected erosion and sediment control devices must be identified in the Erosion and Sediment Control Plan submitted with the EMAC contractor Work Plan. After the Erosion and Sediment Control Plan is approved, no changes can be made without approval by the OICC and the IDEM.

4.2 EROSION AND SEDIMENT CONTROL REQUIREMENTS

Erosion and sediment control measures are implemented to reduce or eliminate erosion and sedimentation of soils that would be detrimental to surface water quality. Some of the SWMU 13 drainage channels to be excavated only carry flow from stormwater runoff during rain events; the remaining drainage channels and streams have a base flow and support aquatic life. Surface drainage at MFB is routed through storm sewers and ditches located throughout the relatively flat portion of the ridgetop. The ditches lead to larger drainageways and gullies that flow down both sides of the ridge in northwest and southeast directions. Drainage from the northwestern side of the rail line flows to the northwest, down the side of the ridge, and into the unnamed tributary of Boggs Creek. Drainage gullies leading away from the southeastern side of the rail line flow southeast, down the side of the ridge, and eventually coalesce to form two unnamed tributaries of Turkey Creek, which lies approximately 5,000 feet (1 mile) southeast of MFB.

IMWP implementation activities for SWMU 13 consist of excavation and off-site disposal of PCB-contaminated surface soils and sediments, backfilling excavations, and restoration of disturbed areas. Surface soil will be excavated from one area located northeast of Building 169 and another area south and east of Building 171. Sediment will be excavated from drainage channels and associated culverts that feed the unnamed tributary of Boggs Creek. Additionally, sediment will be removed from the sump located northwest of Building 171 and from the tunnel connecting Buildings 171 and 169. Because of site conditions, access roads will need to be constructed to allow access to the excavation areas.

Considering the type of IMWP activities and access issues, the proposed erosion and sediment control measures include the following:

- Silt Fence - Placed along the downslope sides of the surface soil excavation area and the gravel construction entrance to provide a temporary sediment barrier. Silt fencing consists of synthetic filter fabric and wooden posts.

- In-stream Sediment Trap - Placed within the drainage channels from which PCB-contaminated sediments will be removed to provide a temporary sediment barrier while allowing flow within the disturbed channel. Multiple in-stream sediment traps will be required based on the proposed segments of channel to be disturbed within a given time period. In-stream sediment traps are constructed of gravel, riprap, and filter fabric and will not be placed greater than 300 feet apart.

- Gravel Construction Entrances - Placed as a controlled site entrance to reduce the amount of sediment transported by construction vehicles onto facility and public roads.

- Dust Control - Utilized to prevent surface and air movement of dust from exposed soil surfaces and to reduce the amount of airborne substances that may present health hazards, traffic safety problems, or harm plant/animal life.

- Permanent Seeding - Utilized to establish perennial vegetation on disturbed areas by planting seeds of native grasses.

The construction, implementation, and maintenance of these erosion and sediment control devices will be in accordance with the Handbook. Figure 4-1 presents the proposed excavation areas along with the limits of disturbance and the locations of the proposed erosion and sediment control devices. Figure 4-2 presents typical details of the erosion and sediment control devices proposed for the IMWP implementation (i.e., silt fence, gravel construction entrance, and in-stream sediment trap). Permanent seeding is discussed in Section 4.4. Dust control will be addressed in the EMAC contractor's Work Plan. All erosion and sediment controls will remain in place until all upstream areas have been stabilized. Completion of stabilization will be determined by the OICC.

4.3 INSPECTION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROLS

In general, all erosion and sediment control measures will be checked daily and after each runoff-producing rainfall event. Any required repairs will be made immediately. The following items will be checked:

The stone construction entrance will be maintained in a condition that will minimize tracking sediment onto facility or public roads.

- Silt fence will be checked for undermining or deterioration of the fabric. Sediment will be removed when the level of sediment causes bulging or reaches one-half of the fabric height.

- In-stream sediment traps will be checked for undermining or erosion around the edges of the trap(s). Sediment will be removed when the level of sediment reaches one-half the height of the in-stream sediment trap or when the quantity of flow through the in-stream sediment trap is significantly reduced.

- Seeded areas will be checked regularly to ensure that a good growth of vegetation is maintained and these areas will be fertilized and reseeded, as needed.

- The fuel and lubricant materials storage area will be checked to ensure that stored containers are not leaking and that the lining system is functioning properly.

All erosion and sediment control devices will be inspected and maintained until the OICC has formally accepted the permanent stabilization of the disturbed areas. The EMAC contractor will maintain a log book of all erosion and sediment control device inspections and maintenance. This log book will be available at the site at all times for inspection by duly authorized officials including NSWC Crane personnel and the IDEM.

4.4 SITE RESTORATION

All areas disturbed by the IMWP implementation activities (excavation and support facility areas) will be restored/stabilized using appropriate soils, and permanent seeding. Activities to establish permanent stabilization will be implemented as soon as possible following the establishing of final grades. The establishment of permanent vegetation includes site/seed bed preparation, seeding, and mulching of the following locations:

- Restored surface soil excavation areas
- Banks of the drainage channels
- Drainage channel beds where applicable
- Surface soils below support facilities

The procedures and requirements for permanent seeding activities are presented in Section 3.12 of the Handbook. The seed mixture recommended for use at SWMU 13 is a standard Indiana seed mixture for open and disturbed areas. The seed mixture includes perennial Ryegrass and Tall fescue. Planting rates and optimum soil pH for this mixture are presented in Exhibit 3.12-C of the Handbook (this exhibit is provided in Appendix D). Following seeding, the seeded areas will be covered with temporary erosion control matting (e.g., coconut fiber matting) to provide additional stabilization until vegetation is established. In the event that disturbed areas are brought to final grade outside of the optimal growing season for the permanent seed mixture, the disturbed areas will be temporarily stabilized using a temporary seed mixture. The procedures and requirements for establishing temporary stabilization are presented in Section 3.11 of the Handbook. As indicated in the Handbook, erosion and sediment control devices will remain in place until permanent stabilization is established over the disturbed areas. Therefore, erosion and sediment control devices will not be removed by the EMAC contractor until directed by the OICC.

Sections 3.11 through 3.15 (Temporary Seeding, Permanent Seeding, Dormant and Frost Seeding, and Mulching) of the Handbook are provided in Appendix D.

4.5 RESPONSE PROCEDURES FOR SPILL MITIGATION

Potential non-stormwater discharges anticipated during IMWP implementation activities include wash water resulting from decontamination efforts associated with field equipment and vehicles, fuel and lubricant spills from vehicle fueling, lubrication, and maintenance, and spills of fertilizers and small quantities of laboratory chemicals used in sample collection, and other flammable substances.

All decontamination wash water will be collected in a lined decontamination and equipment wash pad area. All waters generated from decontamination and/or other washing activities will be collected, characterized, and transported to the NSWC Crane wastewater treatment facility, if approved by NSWC Crane, or to an approved off-site treatment facility. All vehicle fueling, lubrication, and maintenance will be performed utilizing drip pans to contain any spills that may occur or within the decontamination pad to contain spills. Containers of detergents and vehicle maintenance fluids (oil, grease, antifreeze, hydraulic

fluid, etc.) will be stored within an enclosed, lined, diked area along with the equipment fuel, which is stored in tanks. This area, referred to as the materials storage area, will be bermed and lined with a 60-mil low-density polyethylene (LDPE) geomembrane and will be sized to contain 110 percent of the volume stored within the area. A small sump or low point in the liner will be designed to serve as a collection and monitoring point for any leaks or spills from the containers stored within the materials storage area. When not in use, chemicals, paints, and other flammable substances will be stored in a flammable storage cabinet located within the EMAC contractor's equipment trailer.

Good housekeeping procedures will be followed to reduce risks associated with these materials. These procedures include, but are not limited to, keeping materials in their original containers whenever possible, maintaining original labels and Material Safety Data Sheets (MSDSs), and using proper disposal methods for surplus materials. Accidental spills that may occur will be contained as appropriate for the spilled medium (liquid or solid) and collected and containerized immediately after discovery of the spill. Containerized material will be characterized for off-site transportation and disposal. The following spill mitigation equipment should be available on site during construction activities:

- Drip pans
- Oil-dry or similar compound
- Absorbent socks
- Shovels
- 55-gallon drums or storage tank (for containerization)
- Labels for contents identification

Following spill cleanup, the cause of the spill will be investigated, and material storage and handling procedures will be reviewed and revised where appropriate. All spills will be reported to the NSWC Crane Environmental Department.

P:\GIS\CRANE_NSWC\MAPDOCS\APR\SWMU13.APR\ BUILDING 171 SEDIMENT AND EROSION LAYOUT 3/16/07 KM

CONTRACT NO.
112G00352

APPROVED BY ___ DATE ___

APPROVED BY ___ DATE ___

DRAWING NO. FIGURE 4-1

REV 0

EROSION AND SEDIMENT CONTROL PLAN
SWMU 13 - MINE FILL B
INTERIM MEASURES WORK PLAN
NSWC CRANE
CRANE, INDIANA

NAVFAC

DRAWN BY	DATE
S. STROZ	11/14/06
CHECKED BY	DATE
T. SMITH	3/16/06
COST/SCHED-AREA	

SCALE
AS NOTED

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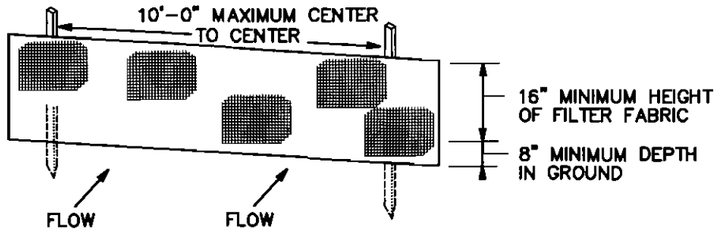
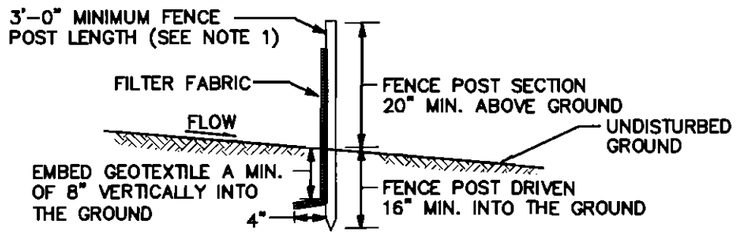
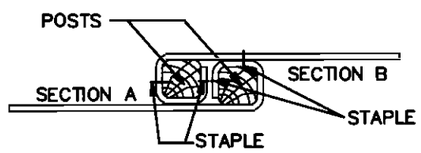


PERSPECTIVE VIEW



CROSS SECTION

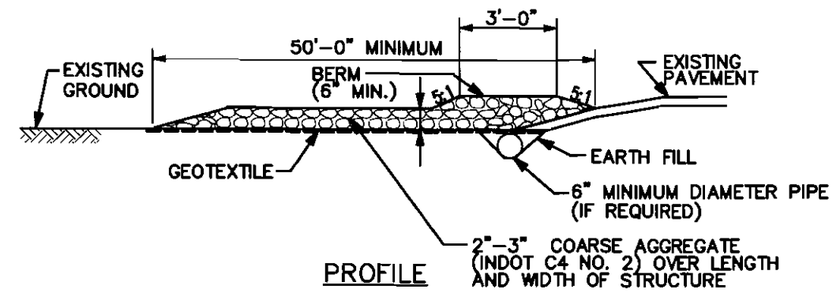


TOP VIEW – JOINING TWO
ADJACENT SILT FENCE SECTIONS

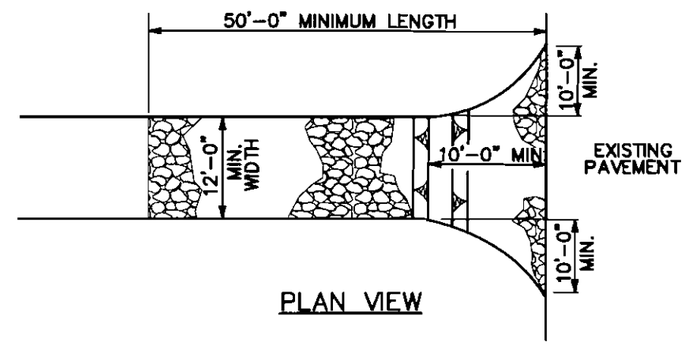
NOTES:

1. WOOD POSTS SHALL BE 1.5" BY 1.5" SQUARE (MIN) CUT OR 1.75" DIAMETER (MIN) ROUND AND SHALL BE OF SOUND QUALITY HARDWOOD. STEEL POSTS WILL BE STANDARD T OR U SECTION WEIGHING NOT LESS THAN 1.00 POUND PER LINEAR FOOT.
2. FILTER FABRIC SHALL BE FASTENED SECURELY TO EACH FENCE POST WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
3. INSTALL SILT FENCE PARALLEL TO THE CONTOUR OF THE LAND.

SILT FENCE



PROFILE

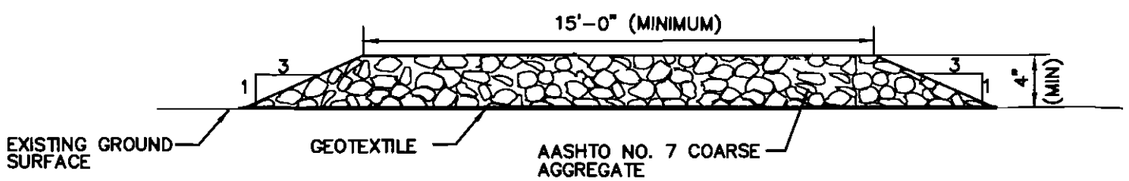


PLAN VIEW

NOTES:

1. ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED THROUGH THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE.
2. IF REQUIRED PIPE SHOULD BE SIZED ACCORDING TO THE AMOUNT OF RUNOFF TO BE CONVEYED. A 6" MINIMUM DIAMETER WILL BE REQUIRED.

GRAVEL CONSTRUCTION ENTRANCE



TEMPORARY SITE ACCESS ROAD

NOT TO SCALE

DRAWN BY MF	DATE 5/16/06	NAVFAC	EROSION AND SEDIMENT CONTROL DEVICES SWMU 13 - MINE FILL B INTERIM MEASURES WORK PLAN NSWC CRANE CRANE, INDIANA
CHECKED BY	DATE		
REVIEWED BY	DATE		
SCALE AS NOTED			

CONTRACT NO. 0362	
OWNER NO. 0020	
APPROVED BY	DATE
DRAWING NO. FIGURE 4-2A	REV. 0

FORM CADD NO. TTNUS-BH.DWG – REV 1 – 9/10/98

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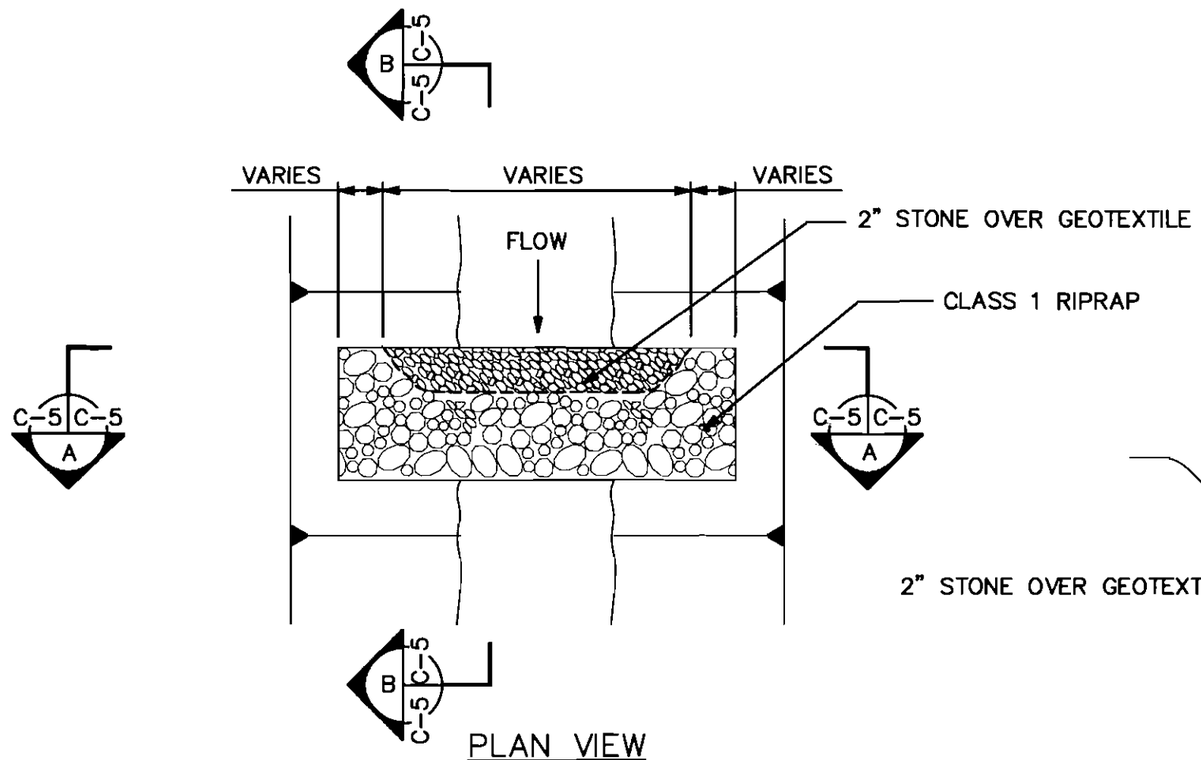
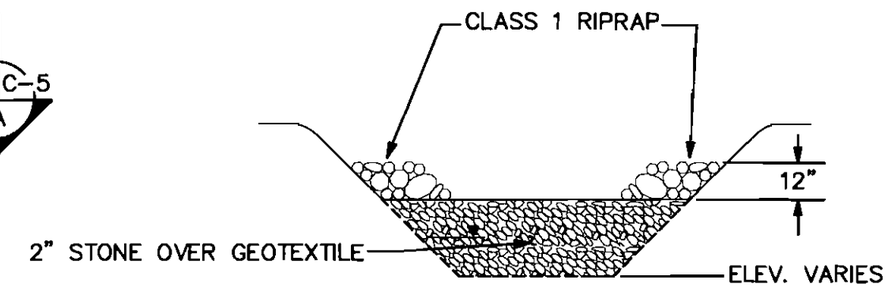
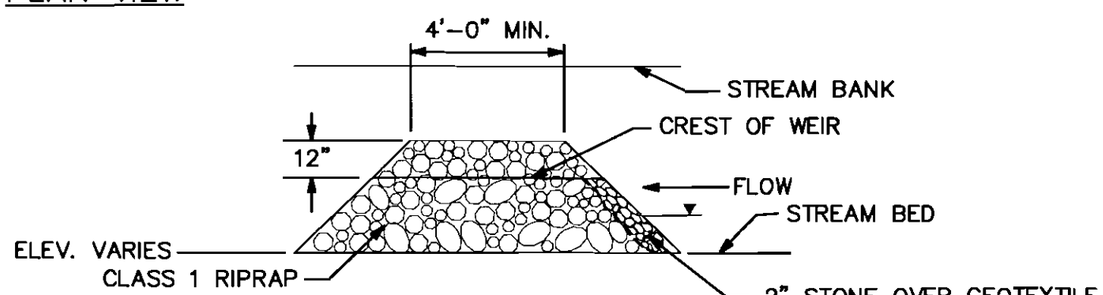


PLAN VIEW



SECTION A–A



SECTION B–B

NOTE:

1. GABION BASKETS – GABION BASKETS WITH GEOTEXTILE CAN BE USED INSTEAD OF STONE.

IN–STREAM SEDIMENT TRAP

NOT TO SCALE

DRAWN BY MF	DATE 5/16/06	NAVFAC	EROSION AND SEDIMENT CONTROL DEVICES (SHEET 2 OF 2) SWMU 17 - PCB CAPACITOR BURIAL/POLE YARD INTERIM MEASURES WORK PLAN NSWC CRANE CRANE, INDIANA
CHECKED BY	DATE		
REVISED BY	DATE		
SCALE AS NOTED			

CONTRACT NO. 0352	
OWNER NO. 0020	
APPROVED BY	DATE
DRAWING NO. FIGURE 4-2B	REV. 0

FORM CADD NO. TTNUS-BH.DWG – REV 1 – 9/10/98

5.0 VERIFICATION SAMPLING PLAN

5.1 PURPOSE

The purpose of this section is to present the types of verification samples to be collected during and following the implementation of the IMWP. The types of verification samples include the samples collected from within the excavation areas to verify the removal of soils and sediments with PCB concentrations in excess of cleanup goals, wipe samples collected from the surfaces of cleaned culverts, trench drains, sumps, and concrete surfaces, the samples collected from surface soils located beneath support facilities (decontamination pad, dewatering pad(s), and material storage area) and the surfaces of the temporary access roads after IMWP implementation is complete to ensure that IMWP implementation did not contaminate support facility areas. This section also presents criteria and procedures used to evaluate verification sample data to determine the acceptability of residual soil contamination, if present. Verification samples will be collected by TtNUS. The sampling procedures, sample locations, and fixed-base laboratory analytical methods will be addressed in the QAPP Addendum (provided under separate cover).

5.2 VERFICATION SAMPLING OF EXCAVATION AREAS

The IMWP implementation includes the excavation and off-site disposal of soils and sediments containing PCB concentrations greater than 1 mg/kg (25 mg/kg for subsurface excavation Option 1 and 1 mg/kg for subsurface excavation Option 2). These excavation areas are shown on Figures 3-1, 3-2, and 3-3. Based on the excavation area, verification samples will be collected from the excavation floors and sidewalls to determine if all the surface soil and sediment with PCB concentrations greater than the cleanup goals have been removed. In general, as indicated in the QAPP, excavation floor samples will be collected at a rate of one composite sample for every 1,000 square feet of exposed surface area and excavation side wall samples will be collected at a rate of one composite sample for every 25 linear feet of exposed side wall. The following paragraphs describe the verification sampling procedures to be performed for each of the excavation areas.

- Soil Excavation Areas - Verification samples will be collected from the excavation sidewalls and excavation floor in the two soil excavation areas. Three excavation floor samples will be collected and 13 excavation side wall samples will be collected from the excavation located southwest of Building 166. From the excavation area south and east of Building 171, 18 excavation floor samples and 29 excavation side wall samples will be collected. Verification samples wil be composite samples as described in the QAPP (TtNUS 2006). Each composite sample will be made up of soil collected

from four aliquots. The verification samples will be analyzed for PCBs. The results of the verification samples will be evaluated to determine if PCB contamination remains within the excavated floor and/or sidewalls at concentrations greater than 1 mg/kg. In the event that a verification sample result from an excavation side wall exceeds 1 mg/kg, the Navy may direct the EMAC contractor to extend the excavation in the appropriate direction(s). The extent of additional excavation will depend on the location and concentration of the exceedance. Following additional excavation, additional verification samples will be collected by TtNUS. Excavation expansion may continue, at the discretion of the Navy, until all verification sample results indicate PCB concentrations less than 1 mg/kg. Because the initial excavation will be 2 feet in depth, the results of the verification samples collected from the excavation floor will be compared to the subsurface criteria (25 mg/kg). If PCB concentrations are detected in the excavation floor verification samples at concentrations greater than 25 mg/kg, the Navy may require additional excavation to a greater depth (Option 1). In the event subsurface excavation Option 2 is performed, all verification sample results will be compared to 1 mg/kg.

- Drainage Channel Excavation Areas - Verification samples will be collected from the exposed drainage channel base and sidewalls and the exposed overflow area floors. As shown on Figure 5-1, due to the irregular shape of the drainage channel excavation, two verification samples will be collected from the exposed overflow floor areas (Areas 1 and 5) located on each side of the channel, two verification samples will be collected from the two exposed drainage channel sidewall surfaces (Areas 2 and 4), and one verification sample will be collected along the exposed drainage channel base where the exposed base is not bedrock (Area 3). Verification samples will be composite samples as described in the QAPP (TtNUS, 2006). Each composite sample will be made up of soil collected from four aliquots. These five verification samples make up one set of verification samples. At a minimum, one set of verification samples will be collected from each drainage channel segment. Where the drainage channel length allows, one set of verification samples will be collected for every 100 linear feet of drainage channel excavation. Therefore, based on the proposed length of drainage channel excavation (470 feet split across four channel segments), seven sets of samples, consisting of five verification samples per set, will be collected from the proposed SWMU 13 drainage channel excavation areas. In the event that a drainage pipe is encountered during the drainage channel excavation process, the frequency of verification sample collection will be increased to one set of verification samples for every 25 linear feet of drainage channel excavation for a distance of 100 feet downstream of the exposed drainage pipe. The verification samples will be analyzed for PCBs. The results of these verification samples will be evaluated to determine whether PCB contamination remains in the exposed surface soil at concentrations greater than 1 mg/kg. In the event that a verification sample result exceeds 1 mg/kg (from floor samples or sidewall samples), the Navy may direct that the excavation be extended in the appropriate direction(s) to remove this soil. The extent

of additional excavation will depend on the location and concentration of the exceedances. Additional verification samples will be collected following any additional excavation. Excavation expansion may continue until verification samples indicate that PCB concentrations are less than 1 mg/kg. In the event bedrock is encountered and verification samples indicate that additional excavation is required, excavation will continue if bedrock is weathered. If the bedrock is not weathered, excavation will not continue. The length of drainage channel excavation is based on the results of the RFI and 2006 sediment-sampling events. The results of the verification sample will not increase the length of drainage channel excavation areas.

- Support Facility Areas - The frequency of verification sampling collected from the soils located beneath the support facilities after IMWP implementation has been completed is the same as that for excavation samples (one verification sample for every 1,000 square feet of area disturbed). Due to the nature of the support facilities, side wall samples are not included in the support facility verification sampling program. Based on the anticipated areas of the support facilities, it is estimated that three verification samples will be collected from the support facility areas (decontamination pad, dewatering pad, and materials storage area). In addition, verification samples will be collected from the temporary access roads. The verification samples will be composite samples as described in the QAPP (TtNUS 2006). Each composite sample will be made up of soil collected from four aliquots. Verification samples will be collected at a rate of one composite sample for every 1,000 square feet of temporary access road (i.e., if the access road is 10 feet wide, one verification sample will be collected every 100 linear feet of access road). A minimum of one verification sample will be collected from each length of temporary access road. Based on the proposed locations of temporary access roads, eight verification samples will be collected from the temporary access roads and eight verification samples will be collected from the remaining support facilities. The results of these verification samples will be evaluated to determine if PCB contamination was introduced to the temporary access trails or the surface soils below the foot print of the support facilities at concentrations greater than 1 mg/kg. In the event that a verification sample result exceeds 1 mg/kg, 6 inches of soil will be removed from the associated temporary access road section or support facility footprint (support facility footprint equals the actual footprint plus an additional 10 feet in all directions). Following additional excavation, additional verification samples will be collected by TtNUS. Excavation expansion may continue until all verification samples indicate PCB concentrations are less than 1 mg/kg. All excavation of surface soil and the associated handling and disposal of that material, resulting from spills and failures of temporary support facilities, will be done at EMAC contractor's expense.

- Wipe Sampling - The frequency at which verification wipe samples will be collected will be based on the number of surfaces cleaned and the type of surface being cleaned. Verification wipe samples will be collected from each end of all cleaned culverts and drain pipes. Based on the number of culverts requiring cleaning and the anticipated drainage pipes associated with the trench drains that feed the sump located northwest of Building 171, it is estimated that 12 verification wipe samples will be collected from cleaned culverts and drain pipes. Verification wipe samples will be collected from the floors and walls of the trench drains that convey water from Building 171 to the sump located northwest of Building 171 at a rate of 3 wipe samples (1 on the floor of the trench and 1 from each trench wall) per every 50 feet of trench drain. Based on the length of trench drain it is estimated that 12 verification wipe samples will be collected from the trench drain system. Verification wipe samples will be collected from each surface of the cleaned sump and concrete area at a rate of one wipe sample per surface. Based on the sump and concrete surface to be cleaned of sediment, it is estimated that 7 verification wipe samples will be collected from the cleaned surfaces. All collected verification wipe samples will be analyzed for total PCBs and the results of the verification wipe samples will be compared to 10 µg of total PCB per 100 square centimeters. In the event that the total PCB concentration in the verification wipe samples is non-detect or less than or equal to 10 µg per 100 square centimeter cleaning is complete. If the total PCB concentration in a wipe sample is greater than 10 µg per 100 square centimeters the Navy may or may not direct the EMAC contractor to re-clean the surface associated with the elevated result. If re-cleaning is required additional verification wipe samples will be collected. Procedures for the collection of wipe samples are presented in the QAPP.

In order to minimize EMAC contractor downtime associated with waiting for sampling results the following describes the sampling process and provides durations associated with the analysis of each type of verification sample.

- All verification samples will be analyzed with PCB field test kits. Due to the cost associated with using the PCB test kits and the time associated with performing the test kit analysis, the samples will be analyzed in batches. Batches will consist of more than 10 samples. Smaller batches can, and will, be analyzed as appropriate. However, the smaller the number of samples in each batch, the longer the average time of sample analysis. That is, it takes 2 to 3 hours to prepare and run a PCB test kit batch whether there is one sample in the batch or 15 samples in the batch.

- Once the PCB test kit analysis is complete, TtNUS will contact the Navy and provide the results. If these results are non-detect the Navy will inform the EMAC contractor of the sample results and TtNUS will send the non-detect (by test kit) samples to a fixed base laboratory for confirmation. In the

event that the PCB test kit tests positive for PCBs, TtNUS will inform the Navy of the results and the Navy may or may not direct the EMAC contractor to perform additional excavation. The EMAC contractor should note that although the PCB field test kit analysis takes only 2 to 3 hours, because TtNUS has to report the results to the Navy and because the Navy needs to evaluate those results, the EMAC contractor should expect a 24 hour delay from TtNUS collecting the verification sample, the Navy reporting PCB test kit results to the EMAC contractor, and the Navy's decision whether or not to extend the excavation.

- If the Navy directs the EMAC contractor to perform additional excavation, TtNUS will collect additional verification samples following that excavation and the analysis process will be repeated.

- Once samples are sent to a fixed base laboratory the analytical turn-around time is 3 days plus one day for sample shipment to the laboratory. However, depending upon the time of day the verification samples are collected, PCB test kit results may not be available until after the final Federal Express pickup for shipment, resulting in 2 days for sample shipment to the fixed base laboratory. Once the fixed base laboratory results are available TtNUS will contact the Navy and the Navy will evaluate the analytical results. Therefore, the EMAC contractor should expect a 4 to 5 day delay between TtNUS collecting the verification sample, TtNUS reporting sample results to the Navy, and the Navy decision whether or not to extend the excavation, and the Navy reporting the fixed base laboratory results to the EMAC contractor.

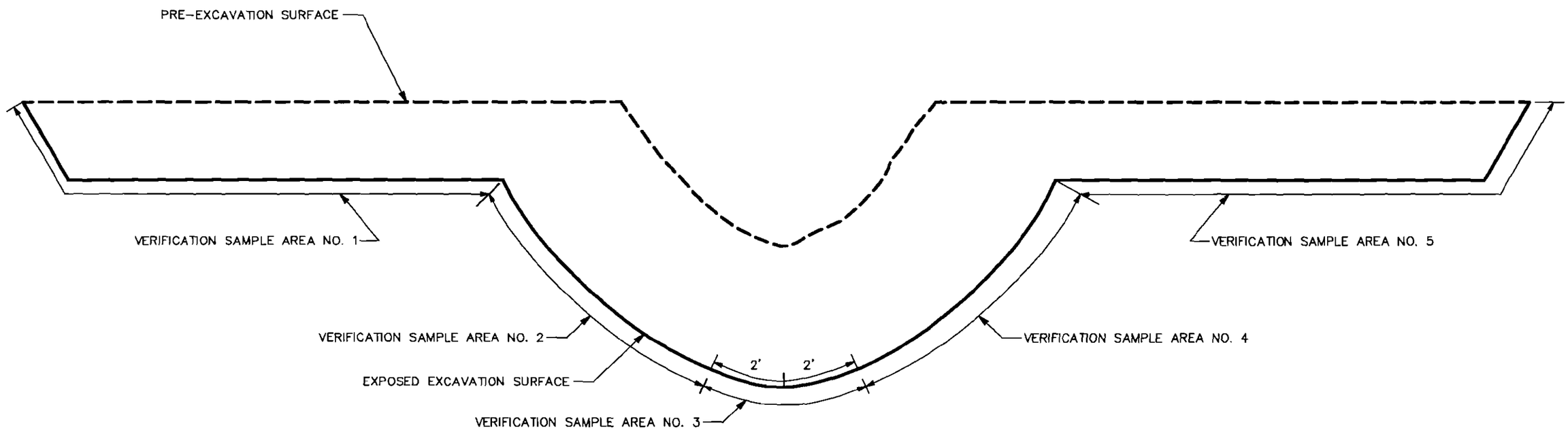
- In the event the fixed base laboratory results exceed the site cleanup goals, the Navy may or may not direct the EMAC contractor to perform additional excavation. If the Navy directs the EMAC contractor to perform additional excavation, TtNUS will collect additional verification samples following that excavation and the analysis process starting with PCB test kit analysis will be repeated.

5.3 SAMPLING LOCATIONS

The numbers and locations of verification samples for the excavation areas and support facilities will be identified in a QAPP Addendum that will be provided under separate cover.

ACAD: 0352CD08.dwg 06/16/08 CK PIT

DRAINAGE CHANNEL VERIFICATION SAMPLING



NOTE:

FOR EVERY 100 FEET OF DRAINAGE CHANNEL EXCAVATION, A MINIMUM OF ONE SET OF FIVE VERIFICATION SAMPLES WILL BE COLLECTED. AS AN EXCEPTION, IF DRAINAGE PIPES ARE ENCOUNTERED (EXPOSED) DURING EXCAVATION WITHIN THE DRAINAGE CHANNELS THE SAMPLING FREQUENCY WILL BE INCREASED TO ONE SET OF FIVE VERIFICATION SAMPLES FOR EVERY 25 FEET OF DRAINAGE CHANNEL FROM THE DRAINAGE PIPE DISCHARGE LOCATION TO A DISTANCE OF 100 FEET DOWN STREAM OF THE DISCHARGE LOCATION.

DRAWN BY CK	DATE 6/16/08	DRAINAGE CHANNEL VERIFICATION SAMPLING SWMU 13 – MINE FILL B INTERIM MEASURES WORK PLAN NSWC CRANE CRANE, INDIANA	CONTRACT NO. 0352
CHECKED BY	DATE		OWNER NO. 0020
REVISED BY	DATE		APPROVED BY / DATE
SCALE NOT TO SCALE			DRAWING NO. FIGURE 5–1 / REV. 0

NAVFAC

FORM CADD NO. TTNUS–BH.DWG – REV 1 – 9/10/98

REFERENCES

Halliburton NUS, 1992. RCRA Facility Investigation Phase I Environmental Monitoring Reports, Solid Waste Management Units 19/00, 08/17, 12/14, 13/14, Naval Surface Warfare Center, Crane Division, Crane, Indiana, August 1992.

IDEM (Indiana Department of Environmental Management), 1992. Indiana Handbook for Erosion Control in Developing Areas, Department of Natural Resources.

NSWC (Naval Surface Warfare Center) Crane, 2002. Contractor's Operations Manual, Naval Surface Warfare Center Crane Division, http://www.crane.navy.mil/contacts/ContractorsOperationsManual.pdf. March.

Tetra Tech NUS, Inc. (TtNUS), 2005. Resource Conservation and Recovery Act Facility Investigation Report for Mine Fill B (SWMU 13), Naval Surface Warfare Center Crane Division, Crane, Indiana. July.

TtNUS, 2006. Quality Assurance Project Plan for SWMUs 8, 15, 18, 19, 20, and the Old Gun Tub Storage Lot for Interim Measures at SWMU 7 (Old Rifle Range), SWMU 8 (Building 106 Pond), SWMU 13 (Mine Fill B), and SWMU 17 (PCB Burial/Pole Yard) Addendum No. 1, Naval Surface Warfare Center Crane Division, Crane, Indiana. November.

APPENDIX A

MAY 2008 INVESTIGATION

APPENDIX A.1

SAMPLE LOGS

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSWC Crane SWMU 13 Bldg 171
Project No.: 112G00517

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 13SD069
Sample Location: 13SD69
Sampled By: JIM GEORGE
C.O.C. No.:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 5-29-08 Time: 0935 Method: DIRECT FILL Monitor Reading (ppm):	0 - 3"	BRN	TR SAND SILT + CLAY WET

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

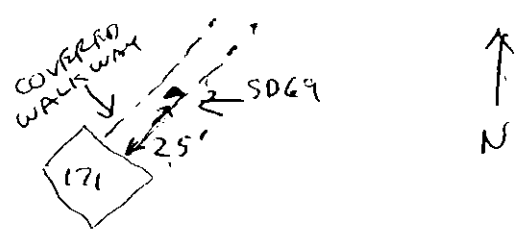
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCBs SW-846 8082	WMG ~~4oz jar~~ 8oz	✓	—
Explosives SW-846 8330	~~WMG 4oz jar~~		

OBSERVATIONS / NOTES:

+RESIDUAL SOIL/SEDIMENT
- NO APPARENT DRAINAGE
- BIRD NEST ABOVE LOCATIO
- CONCRETE FLOOR/PASSAGEWAY

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSWC Crane SWMU 13 Bldg 171
Project No.: 112G00517

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 13SD070
Sample Location: 13SD70
Sampled By: RLR
C.O.C. No.: 4636

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 5/29/08 Time: 1115 Method: DIRECT FILL/BREAK Monitor Reading (ppm):	0-3"	DK BRN	SAND + SILT WET

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

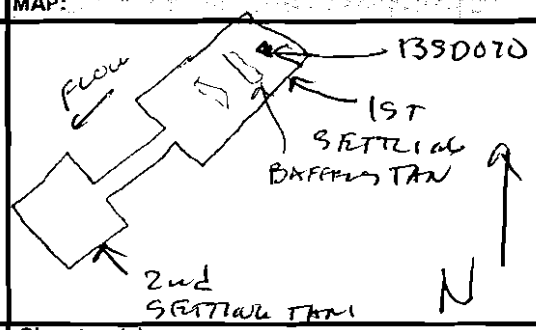
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCBs SW-846 8082 3	WMG ~~4oz~~ jar 8oz		-
Explosives SW-846 8330 3	WMG ~~4oz~~ jar		

OBSERVATIONS / NOTES:

-6" STANDING WATER

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSWC Crane SWMU 13 Bldg 171
Project No.: 112G00517

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 13SD071
Sample Location: 13SD71
Sampled By: FWR
C.O.C. No.: 4636

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 5/29/08 Time: 0954 Method: DIRECT FILL Monitor Reading (ppm): —	0-3"	DK BRN	SILT + CLAY MOIST

COMPOSITE SAMPLE DATA:

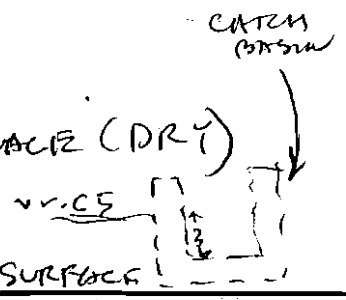
Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

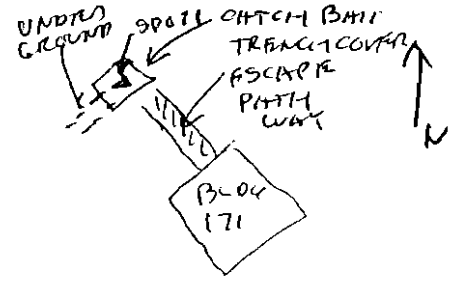
Analysis	Container Requirements	Collected	Other
PCBs SW-846 8082 3	WMG ~~4oz jar~~ 8oz jar	✓	
Explosives SW-846 8330 3	WMG ~~4oz jar~~		

OBSERVATIONS / NOTES:

- CATCH BASIN
- FEW WORMS
- NO FLOW / DRAINAGE (DRY)
- RUN MS/MSD
- 3' BELOW GROUND SURFACE



MAP:



Circle if Applicable:

MS/MSD ✓ | Duplicate ID No.: —

Signature(s): Fred N Ross

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSWC Crane SWMU 13 Bldg 171
Project No.: 112G00517

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 13SD072
Sample Location: 13SD72
Sampled By: PWR
C.O.C. No.: 4635

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/29/08	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1002	0-3"	MOD BRN	SILT, SAND+GRAVEL MOIST
Method: DIRECT FILL			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

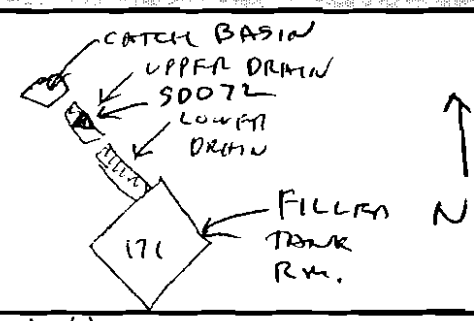
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCBs SW-846 8082 3	WMG ~~4oz jar~~ 8oz	✓	
Explosives SW-846 8330 3	WMG ~~4oz jar~~	✓	

OBSERVATIONS / NOTES:

- DRY LOCATION (NO WATER) NO FLOW
- NO WORMS
- COVERED W/IRON GRATE WALK WAY

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Fred Williamson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSWC Crane SWMU 13 Bldg 171
Project No.: 112G00517

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 13SD073
Sample Location: 13SD73
Sampled By: FWR
C.O.C. No.: 4636

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 5-29-08 Time: 0945 Method: DIRECT FILL Monitor Reading (ppm): —	0-3"	MOD BRN	SILT + CLAY MOIST

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

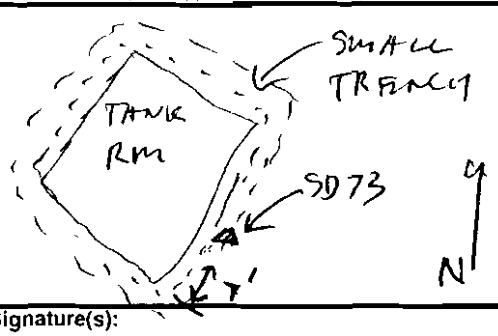
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCBs SW-846 8082	WMG ~~4oz jar~~ 3 8oz	✓	
Explosives SW-846 8330	WMG ~~4oz jar~~ 3	✓	

OBSERVATIONS / NOTES:

- NO FLOW
- CRACKED CEMENT WALLS DRAINING INTO SMALL ~~TRENCH~~ TRENCH AROUND BLDG 171 (FILLER TANK RM)

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	13FD052908

Signature(s): Fred Wlanner

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSWC Crane SWMU 13 Bldg 171
Project No.: 112G00517

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 13SD074
Sample Location: 13SD74
Sampled By: FWR
C.O.C. No.: 463C

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5-29-08	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0942	0-3"	DK BRN	SILT + CLAY MOIST
Method: DIRECT FILL			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

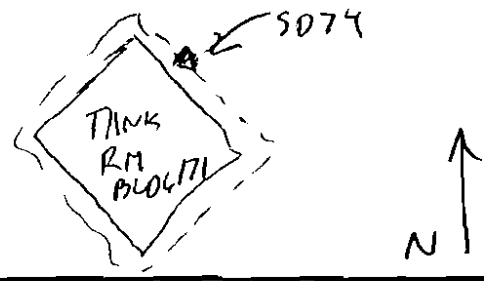
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCBs SW-846 8082	WMG 4oz jar		
Explosives SW-846 8330	WMG 4oz jar		

OBSERVATIONS / NOTES:

NO FLOW
DRY
SMALL TRENCH AROUND
TANK RM.

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSWC Crane SWMU 13 Bldg 171
Project No.: 112G00517

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 13SD075
Sample Location: 13SD75
Sampled By: FWR
C.O.C. No.: 4636

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 5-29-08 Time: 0950 Method: DIRECT FILL Monitor Reading (ppm): —	0-3'	DK BRN	SILT + CLAY MOIST

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

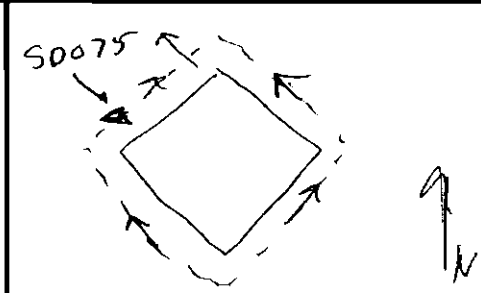
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCBs SW-846 8082 3	WMG ~~4oz Jar~~ 8oz		
Explosives SW-846 8330 3	WMG ~~4oz Jar~~		

OBSERVATIONS / NOTES:

NO FLOW
DRY
SMALL TRENCH AROUND
TANK RM

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Fred Williams

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSWC Crane SWMU 13 Bldg 171
Project No.: 112G00517

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 13SD076
Sample Location: 13SD76
Sampled By: FWR
C.O.C. No.: 4636

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 5-29-08 Time: 1012 Method: DIRECT FILL Monitor Reading (ppm): —	0-3"	DK BRN	SAND + SILT WET

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

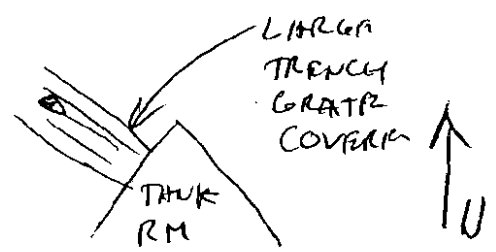
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCBs SW-846 8082	WMG ~~4oz jar~~ 8oz	✓	
Explosives SW-846 8330	WMG ~~4oz jar~~	✓	

OBSERVATIONS / NOTES:

- SOME STANDING WATER
- NO FLOW
- ?

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSWC Crane SWMU 13 Bldg 171
Project No.: 112G00517

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 13SB1080304
Sample Location: 13SB108
Sampled By: FWR
C.O.C. No.: 4636

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 5-28-08 Time: 1045 Method: HAND AUGER Monitor Reading (ppm): —	3'-4'	BRN	SAND/GRAVEL MOIST

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

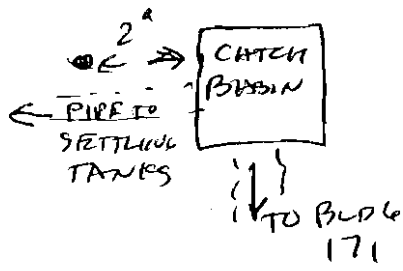
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCBs SW-846 8082	WMG ~~4oz jar~~ 8oz	✓	
Explosives SW-846 8330	WMG ~~4oz jar~~		

OBSERVATIONS / NOTES:

TOP - DISCHARGE PIPE
@ CATCH BASIN
@ 3' BELOW G.S.

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	

Signature(s): [illegible]

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page__ of __

Project Site Name: NSWC Crane SWMU 13 Bldg 171
Project No.: 112G00517

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 13SB1080506
Sample Location: 13SB108
Sampled By: FWR
C.O.C. No.: 4636

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 5-29-08 Time: 1055 Method: HAND AUGER Monitor Reading (ppm): —	5'-6'	BRN	SAND/GRAVEL/SILT CLAY WET

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

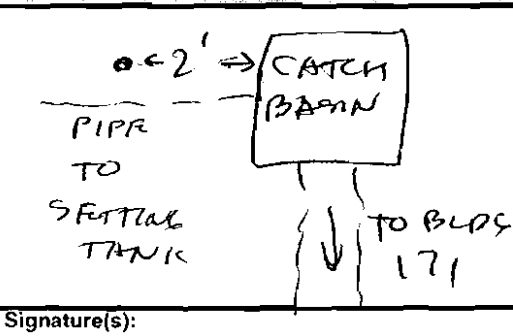
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCBs SW-846 8082	WMG ~~4oz jar~~ 8oz	✓	
Explosives SW-846 8330	WMG ~~4oz jar~~	✓	

OBSERVATIONS / NOTES:

WET WATER TABLE ~6'

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

APPENDIX A.2

SUMMARY OF MAY 2008 ANALYTICAL RESULTS

TABLE A-1

MAY 2008 ANALYTICAL DATA
INTERIM MEASURES WORK PLAN SWMU 13 MINE FILL B
NSWC CRANE
CRANE, INDIANA

Sample Number	13SB1080304	13SB1080506	13SD069	13SD070	13SD071	13SD072	13SD073	13SD074	13SD075	13SD076
Sample Location	13SB108	13SB108	13SD69	13SD70	13SD71	13SD72	13SD73	13SD74	13SD75	13SD76
Sample Date	20080529	20080529	20080529	20080529	20080529	20080529	20080529	20080529	20080529	20080529
Sample Matrix	SO	SO	SD	SD	SD	SD	SD	SD	SD	SD
Sample Depth	3 - 4 ft	5 - 6 ft	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides/PCBs (ug/kg)										
AROCLOR-1016	4.2 U	4.2 U	4.8 U	5.0 U	4.7 U	4.5 U	21 U	5.6 U	4.8 U	4.9 U
AROCLOR-1221	4.2 U	4.2 U	4.8 U	5.0 U	4.7 U	4.5 U	21 U	5.6 U	4.8 U	4.9 U
AROCLOR-1232	4.2 U	4.2 U	4.8 U	5.0 U	4.7 U	4.5 U	21 U	5.6 U	4.8 U	4.9 U
AROCLOR-1242	4.2 U	4.2 U	4.8 U	5.0 U	4.7 U	4.5 U	21 U	5.6 U	4.8 U	4.9 U
AROCLOR-1248	150 J	150 J	12000 J	2000 J	1300	540 J	43000	6100 J	5200 J	20000 J
AROCLOR-1254	4.2 U	4.2 U	4.8 U	5.0 U	4.7 U	4.5 U	21 U	5.6 U	4.8 U	4.9 U
AROCLOR-1260	4.2 U	4.2 U	4.8 U	5.0 U	4.7 U	4.5 U	21 U	5.6 U	4.8 U	4.9 U
TOTAL PCBS	150 J	150 J	12000 J	2000 J	1300	540 J	43000	6100 J	5200 J	20000 J
Explosives (mg/kg)										
1,3,5-TRINITROBENZENE	0.10 U	0.17 J	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.10 U	0.099 U	0.099 U
1,3-DINITROBENZENE	0.10 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.10 U	0.099 U	0.099 U
2,4,6-TRINITROTOLUENE	0.48	0.92	0.099 U	0.20 J	0.25	0.13 J	1.6 J	5.5	0.48	92
2,4-DINITROTOLUENE	0.10 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.10 U	0.099 U	0.099 U
2,6-DINITROTOLUENE	0.10 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.10 U	0.099 U	0.099 U
2-AMINO-4,6-DINITROTOLUENE	0.19 J	0.43	0.099 U	0.099 U	0.10 J	0.099 U	0.15 J	0.42	0.14 J	1.1
2-NITROTOLUENE	0.10 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.10 U	0.099 U	0.099 U
3-NITROTOLUENE	0.10 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.10 U	0.099 U	0.099 U
4-AMINO-2,6-DINITROTOLUENE	0.54	1.4	0.099 U	0.099 U	0.22	0.15 J	0.19 J	0.82	0.35	2.6 J
4-NITROTOLUENE	0.10 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.10 U	0.099 U	0.099 U
HMX	0.19 J	0.27	0.56	1.8	3.8	4.9	4.6 J	27	3.0	49
NITROBENZENE	0.10 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.10 U	0.099 U	0.099 U
RDX	0.38	0.72	0.84	1.0	3.2	3.7	2.5 J	22	8.7	270
TETRYL	0.10 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.099 U	0.10 U	0.099 U	0.099 U

NA - Not applicable
SO - Subsurface soil sample
SD - Sediment sample collected from the concrete surface of the Building 171 trench drains
J - Result is estimated
U - Parameter is non-detect at the indicated detection limit

APPENDIX A.3

MAY 2008 DATA VALIDATION PACKAGE

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	R. BASINSKI	DATE:	JULY 14, 2008
FROM:	EDWARD SEDLMYER	COPIES:	DV FILE
SUBJECT:	ORGANIC DATA VALIDATION – EXP/PCB CTO 048, NSWC CRANE SDG TT051701		

SAMPLES: 11 / Soil

13FD052908	13SB1080304	13SB1080506
13SD069	13SD070	13SD071
13SD072	13SD073	13SD074
13SD075	13SD076	

1 / Aqueous

13RB05290801

OVERVIEW

The sample set for CTO 048, NSWC CRANE, SDG TT51701 consists of one (1) rinse blank and eleven (11) soil environmental samples. All samples were analyzed for explosives (EXP) and polychlorinated biphenyls (PCBs).

The samples were collected by TetraTech NUS on May 29, 2008 and analyzed by PACE Analytical Laboratories, Seattle, WA. All analyses were conducted in accordance with USEPA SW 846 Method 8330 and 8082. The data contained in this SDG were validated with regard to the following parameters:

*	Data completeness
*	Holding times
*	Initial and continuing calibration
*	Blank results
*	Surrogate spike recoveries
*	Blank Spike/Blank Spike Duplicate Results
	Matrix Spike/Matrix Spike Duplicate Results
*	Detection Limits
	Field Duplicate Results
	Compound Quantitation
*	Compound Identification

The symbol (*) indicates that all quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

PCB

The percent difference between columns exceeded 25% for the following compounds. The positive results were reported as estimated (J), for the compounds below:

Sample	Compound	%D
13SD069	Aroclor-1248	33.39%
13SD072	Aroclor-1248	40.2%
13SD074	Aroclor-1248	33.64%
13SD075	Aroclor-1248	31.23%
13FD052908	Aroclor-1248	30.29%
13SD076	Aroclor-1248	31.89%
13SD070	Aroclor-1248	26.13%
13SB1080304	Aroclor-1248	35.01%
13SB1080506	Aroclor-1248	33.31%

The matrix spike / matrix spike duplicate (MS/MSD) performed on sample 13SD071 had percent recoveries greater than the quality control limit for Aroclor-1016. No action was taken on this basis because Aroclor-1016 was not detected in any associated samples.

Samples 13FD052908, 13SD069, 13SD073, 13SD074, 13SD075, and 13SD076 required dilutions because of detections for Aroclor-1248 greater than the linear calibration range of the instrument. The Aroclor-1248 results were reported from the diluted analysis.

EXP

The percent difference between columns exceeded 25% for the following compounds. The positive results were reported as estimated (J), for the compounds below:

Sample	Compound	%D
13SD076	4-Amino-2,6-dinitrotoluene	34.9%
13RB05290801	HMX	65.8%
	RDX	25.3%

The field duplicate precision exceeded the 50% relative percent difference (RPD) quality control criterion for 2,4,6-trinitrotoluene, HMX, and RDX in the field duplicate pair 13SD073 and 13FD052908. The positive results for the aforementioned compounds in samples 13SD073 and 13FD052908 were qualified as estimated (J).

The laboratory reported the surrogate percent recoveries from one column only. No qualifications were made on this basis.

EXECUTIVE SUMMARY

Laboratory Performance Issues: None.

Other Factors Affecting Data Quality: Qualifications were made based percent difference between analytical columns for the explosive and PCB analyses. The MS/MSD percent recoveries for one Aroclor in the PCB fraction had a non-compliance. Field duplicate imprecision was noted for three compounds in the explosive fraction.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999) and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006). The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the DoD QSM."

Tetra Tech NUS

Edward Sedlmyer
Chemist/Data Validator

Tetra Tech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Data Validation Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's r < 0.995 / ICP PDS Recovery Noncompliance
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; e.g. chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient r < 0.995
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 00517

SDG: TT51701 MEDIA: WATER DATA FRACTION: EXP

nsample	13RB05290801
samp_date	5/29/2008 1:40:00 PM
lab_id	TT51701-012
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,3,5-TRINITROBENZENE	0.25	U	
1,3-DINITROBENZENE	0.25	U	
2,4,6-TRINITROTOLUENE	0.25	U	
2,4-DINITROTOLUENE	0.25	U	
2,6-DINITROTOLUENE	0.25	U	
2-AMINO-4,6-DINITROTOLUENE	0.25	U	
2-NITROTOLUENE	0.25	U	
3-NITROTOLUENE	0.25	U	
4-AMINO-2,6-DINITROTOLUENE	0.25	U	
4-NITROTOLUENE	0.25	U	
HMX	0.47	J	PU
NITROBENZENE	0.25	U	
RDX	0.52	J	U
TETRYL	0.25	U	

PROJ_N 00517

SDG: TT51701 MEDIA: SOIL DATA FRACTION: EXP

nsample	13FD052908
samp_date	5/29/2008
lab_id	TT51701-007
qc_type	NM
units	MG/KG
Pct_Solids	100.0
DUP_OF:	13SD073

Parameter	Result	Val Qual	Qual Code
1,3,5-TRINITROBENZENE	0.099	U	
1,3-DINITROBENZENE	0.099	U	
2,4,6-TRINITROTOLUENE	0.67	J	G
2,4-DINITROTOLUENE	0.099	U	
2,6-DINITROTOLUENE	0.099	U	
2-AMINO-4,6-DINITROTOLUENE	0.099	U	
2-NITROTOLUENE	0.099	U	
3-NITROTOLUENE	0.099	U	
4-AMINO-2,6-DINITROTOLUENE	0.099	U	
4-NITROTOLUENE	0.099	U	
HMX	0.29	J	G
NITROBENZENE	0.099	U	
RDX	0.33	J	G
TETRYL	0.099	U	

nsample	13SB1080304
samp_date	5/29/2008 10:45:00 AM
lab_id	TT51701-010
qc_type	NM
units	MG/KG
Pct_Solids	100.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,3,5-TRINITROBENZENE	0.10	U	
1,3-DINITROBENZENE	0.10	U	
2,4,6-TRINITROTOLUENE	0.48		
2,4-DINITROTOLUENE	0.10	U	
2,6-DINITROTOLUENE	0.10	U	
2-AMINO-4,6-DINITROTOLUENE	0.19	J	P
2-NITROTOLUENE	0.10	U	
3-NITROTOLUENE	0.10	U	
4-AMINO-2,6-DINITROTOLUENE	0.54		
4-NITROTOLUENE	0.10	U	
HMX	0.19	J	P
NITROBENZENE	0.10	U	
RDX	0.38		
TETRYL	0.10	U	

nsample	13SB1080506
samp_date	5/29/2008 10:55:00 AM
lab_id	TT51701-011
qc_type	NM
units	MG/KG
Pct_Solids	100.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,3,5-TRINITROBENZENE	0.17	J	P
1,3-DINITROBENZENE	0.099	U	
2,4,6-TRINITROTOLUENE	0.92		
2,4-DINITROTOLUENE	0.099	U	
2,6-DINITROTOLUENE	0.099	U	
2-AMINO-4,6-DINITROTOLUENE	0.43		
2-NITROTOLUENE	0.099	U	
3-NITROTOLUENE	0.099	U	
4-AMINO-2,6-DINITROTOLUENE	1.4		
4-NITROTOLUENE	0.099	U	
HMX	0.27		
NITROBENZENE	0.099	U	
RDX	0.72		
TETRYL	0.099	U	

PROJ_NO: 00517

SDG: TT51701 MEDIA: SOIL DATA FRACTION: EXP

nsample	13SD069	nsample	13SD070	nsample	13SD071
samp_date	5/29/2008 9:35:00 AM	samp_date	5/29/2008 11:15:00 AM	samp_date	5/29/2008 9:54:00 AM
lab_id	TT51701-001	lab_id	TT51701-009	lab_id	TT51701-002
qc_type	NM	qc_type	NM	qc_type	NM
units	MG/KG	units	MG/KG	units	MG/KG
Pct_Solids	100.0	Pct_Solids	100.0	Pct_Solids	100.0
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,3,5-TRINITROBENZENE	0.099	U	
1,3-DINITROBENZENE	0.099	U	
2,4,6-TRINITROTOLUENE	0.099	U	
2,4-DINITROTOLUENE	0.099	U	
2,6-DINITROTOLUENE	0.099	U	
2-AMINO-4,6-DINITROTOLUENE	0.099	U	
2-NITROTOLUENE	0.099	U	
3-NITROTOLUENE	0.099	U	
4-AMINO-2,6-DINITROTOLUENE	0.099	U	
4-NITROTOLUENE	0.099	U	
HMX	0.56		
NITROBENZENE	0.099	U	
RDX	0.84		
TETRYL	0.099	U	

Parameter	Result	Val Qual	Qual Code
1,3,5-TRINITROBENZENE	0.099	U	
1,3-DINITROBENZENE	0.099	U	
2,4,6-TRINITROTOLUENE	0.20	J	P
2,4-DINITROTOLUENE	0.099	U	
2,6-DINITROTOLUENE	0.099	U	
2-AMINO-4,6-DINITROTOLUENE	0.099	U	
2-NITROTOLUENE	0.099	U	
3-NITROTOLUENE	0.099	U	
4-AMINO-2,6-DINITROTOLUENE	0.099	U	
4-NITROTOLUENE	0.099	U	
HMX	1.8		
NITROBENZENE	0.099	U	
RDX	1.0		
TETRYL	0.099	U	

Parameter	Result	Val Qual	Qual Code
1,3,5-TRINITROBENZENE	0.099	U	
1,3-DINITROBENZENE	0.099	U	
2,4,6-TRINITROTOLUENE	0.25		
2,4-DINITROTOLUENE	0.099	U	
2,6-DINITROTOLUENE	0.099	U	
2-AMINO-4,6-DINITROTOLUENE	0.10	J	P
2-NITROTOLUENE	0.099	U	
3-NITROTOLUENE	0.099	U	
4-AMINO-2,6-DINITROTOLUENE	0.22		
4-NITROTOLUENE	0.099	U	
HMX	3.8		
NITROBENZENE	0.099	U	
RDX	3.2		
TETRYL	0.099	U	

PROJ_No. 00517

SDG: TT51701 MEDIA: SOIL DATA FRACTION: EXP

nsample	13SD072	nsample	13SD073	nsample	13SD074
samp_date	5/29/2008 10:02:00 AM	samp_date	5/29/2008 9:45:00 AM	samp_date	5/29/2008 9:42:00 AM
lab_id	TT51701-003	lab_id	TT51701-004	lab_id	TT51701-005
qc_type	NM	qc_type	NM	qc_type	NM
units	MG/KG	units	MG/KG	units	MG/KG
Pct_Solids	100.0	Pct_Solids	100.0	Pct_Solids	100.0
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,3,5-TRINITROBENZENE	0.099	U	
1,3-DINITROBENZENE	0.099	U	
2,4,6-TRINITROTOLUENE	0.13	J	P
2,4-DINITROTOLUENE	0.099	U	
2,6-DINITROTOLUENE	0.099	U	
2-AMINO-4,6-DINITROTOLUENE	0.099	U	
2-NITROTOLUENE	0.099	U	
3-NITROTOLUENE	0.099	U	
4-AMINO-2,6-DINITROTOLUENE	0.15	J	P
4-NITROTOLUENE	0.099	U	
HMX	4.9		
NITROBENZENE	0.099	U	
RDX	3.7		
TETRYL	0.099	U	

Parameter	Result	Val Qual	Qual Code
1,3,5-TRINITROBENZENE	0.099	U	
1,3-DINITROBENZENE	0.099	U	
2,4,6-TRINITROTOLUENE	1.6	J	G
2,4-DINITROTOLUENE	0.099	U	
2,6-DINITROTOLUENE	0.099	U	
2-AMINO-4,6-DINITROTOLUENE	0.15	J	P
2-NITROTOLUENE	0.099	U	
3-NITROTOLUENE	0.099	U	
4-AMINO-2,6-DINITROTOLUENE	0.19	J	P
4-NITROTOLUENE	0.099	U	
HMX	4.6	J	G
NITROBENZENE	0.099	U	
RDX	2.5	J	G
TETRYL	0.099	U	

Parameter	Result	Val Qual	Qual Code
1,3,5-TRINITROBENZENE	0.10	U	
1,3-DINITROBENZENE	0.10	U	
2,4,6-TRINITROTOLUENE	5.5		
2,4-DINITROTOLUENE	0.10	U	
2,6-DINITROTOLUENE	0.10	U	
2-AMINO-4,6-DINITROTOLUENE	0.42		
2-NITROTOLUENE	0.10	U	
3-NITROTOLUENE	0.10	U	
4-AMINO-2,6-DINITROTOLUENE	0.82		
4-NITROTOLUENE	0.10	U	
HMX	27		
NITROBENZENE	0.10	U	
RDX	22		
TETRYL	0.10	U	

PROJ_NO: 00517

SDG: TT51701 MEDIA: SOIL DATA FRACTION: EXP

nsample	13SD075	nsample	13SD076
samp_date	5/29/2008 9:50:00 AM	samp_date	5/29/2008 10:12:00 AM
lab_id	TT51701-006	lab_id	TT51701-008
qc_type	NM	qc_type	NM
units	MG/KG	units	MG/KG
Pct_Solids	100.0	Pct_Solids	100.0
DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,3,5-TRINITROBENZENE	0.099	U	
1,3-DINITROBENZENE	0.099	U	
2,4,6-TRINITROTOLUENE	0.48		
2,4-DINITROTOLUENE	0.099	U	
2,6-DINITROTOLUENE	0.099	U	
2-AMINO-4,6-DINITROTOLUENE	0.14	J	P
2-NITROTOLUENE	0.099	U	
3-NITROTOLUENE	0.099	U	
4-AMINO-2,6-DINITROTOLUENE	0.35		
4-NITROTOLUENE	0.099	U	
HMX	3.0		
NITROBENZENE	0.099	U	
RDX	8.7		
TETRYL	0.099	U	

Parameter	Result	Val Qual	Qual Code
1,3,5-TRINITROBENZENE	0.099	U	
1,3-DINITROBENZENE	0.099	U	
2,4,6-TRINITROTOLUENE	92		
2,4-DINITROTOLUENE	0.099	U	
2,6-DINITROTOLUENE	0.099	U	
2-AMINO-4,6-DINITROTOLUENE	1.1		
2-NITROTOLUENE	0.099	U	
3-NITROTOLUENE	0.099	U	
4-AMINO-2,6-DINITROTOLUENE	2.6	J	U
4-NITROTOLUENE	0.099	U	
HMX	49		
NITROBENZENE	0.099	U	
RDX	270		
TETRYL	0.099	U	

PROJ_N 00517

SDG: TT51701 MEDIA: WATER DATA FRACTION: PEST/PCB

nsample	13RB05290801
samp_date	5/29/2008 1:40:00 PM
lab_id	TT51701-012
qc_type	NM
units	UG/L
Pct_Solids	
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	0.26	U	
AROCLOR-1221	0.26	U	
AROCLOR-1232	0.26	U	
AROCLOR-1242	0.26	U	
AROCLOR-1248	0.26	U	
AROCLOR-1254	0.26	U	
AROCLOR-1260	0.26	U	

PROJ_NO: 00517

SDG: TT51701 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample	13FD052908
samp_date	5/29/2008
lab_id	TT51701-007
qc_type	NM
units	UG/KG
Pct_Solids	65.0
DUP_OF:	13SD073

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	5.3	U	
AROCLOR-1221	5.3	U	
AROCLOR-1232	5.3	U	
AROCLOR-1242	5.3	U	
AROCLOR-1254	5.3	U	
AROCLOR-1260	5.3	U	

nsample	13FD052908DL
samp_date	5/29/2008
lab_id	TT51701-007DL
qc_type	NM
units	UG/KG
Pct_Solids	65.0
DUP_OF:	13SD073

Parameter	Result	Val Qual	Qual Code
AROCLOR-1248	29000	J	U

nsample	13SB1080304
samp_date	5/29/2008 10:45:00 AM
lab_id	TT51701-010
qc_type	NM
units	UG/KG
Pct_Solids	84.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	4.2	U	
AROCLOR-1221	4.2	U	
AROCLOR-1232	4.2	U	
AROCLOR-1242	4.2	U	
AROCLOR-1248	150	J	U
AROCLOR-1254	4.2	U	
AROCLOR-1260	4.2	U	

PROJ_N 00517

SDG: TT51701 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample	13SB1080506
samp_date	5/29/2008 10:55:00 AM
lab_id	TT51701-011
qc_type	NM
units	UG/KG
Pct_Solids	82.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	4.2	U	
AROCLOR-1221	4.2	U	
AROCLOR-1232	4.2	U	
AROCLOR-1242	4.2	U	
AROCLOR-1248	150	J	U
AROCLOR-1254	4.2	U	
AROCLOR-1260	4.2	U	

nsample	13SD069
samp_date	5/29/2008 9:35:00 AM
lab_id	TT51701-001
qc_type	NM
units	UG/KG
Pct_Solids	70.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	4.8	U	
AROCLOR-1221	4.8	U	
AROCLOR-1232	4.8	U	
AROCLOR-1242	4.8	U	
AROCLOR-1254	4.8	U	
AROCLOR-1260	4.8	U	

nsample	13SD069DL
samp_date	5/29/2008 9:35:00 AM
lab_id	TT51701-001DL
qc_type	NM
units	UG/KG
Pct_Solids	70.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1248	12000	J	U

PROJ_NO: 00517

SDG: TT51701 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample	13SD070	nsample	13SD071	nsample	13SD072
samp_date	5/29/2008 11:15:00 AM	samp_date	5/29/2008 9:54:00 AM	samp_date	5/29/2008 10:02:00 AM
lab_id	TT51701-009	lab_id	TT51701-002	lab_id	TT51701-003
qc_type	NM	qc_type	NM	qc_type	NM
units	UG/KG	units	UG/KG	units	UG/KG
Pct_Solids	70.0	Pct_Solids	74.0	Pct_Solids	75.0
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	5.0	U	
AROCLOR-1221	5.0	U	
AROCLOR-1232	5.0	U	
AROCLOR-1242	5.0	U	
AROCLOR-1248	2000	J	U
AROCLOR-1254	5.0	U	
AROCLOR-1260	5.0	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	4.7	U	
AROCLOR-1221	4.7	U	
AROCLOR-1232	4.7	U	
AROCLOR-1242	4.7	U	
AROCLOR-1248	1300		
AROCLOR-1254	4.7	U	
AROCLOR-1260	4.7	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	4.5	U	
AROCLOR-1221	4.5	U	
AROCLOR-1232	4.5	U	
AROCLOR-1242	4.5	U	
AROCLOR-1248	540	J	U
AROCLOR-1254	4.5	U	
AROCLOR-1260	4.5	U	

SDG: TT51701 MEDIA: SOIL DATA FRACTION: PEST/PCB

sample	13SD073	nsample	13SD073DL	nsample	13SD074
amp_date	5/29/2008 9:45:00 AM	samp_date	5/29/2008 9:45:00 AM	samp_date	5/29/2008 9:42:00 AM
b_id	TT51701-004	lab_id	TT51701-004DL	lab_id	TT51701-005
c_type	NM	qc_type	NM	qc_type	NM
nits	UG/KG	units	UG/KG	units	UG/KG
ct_Solids	65.0	Pct_Solids	65.0	Pct_Solids	62.0
UP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
ROCLOR-1016	21	U	
ROCLOR-1221	21	U	
ROCLOR-1232	21	U	
ROCLOR-1242	21	U	
ROCLOR-1254	21	U	
ROCLOR-1260	21	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1248	43000		

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	5.6	U	
AROCLOR-1221	5.6	U	
AROCLOR-1232	5.6	U	
AROCLOR-1242	5.6	U	
AROCLOR-1254	5.6	U	
AROCLOR-1260	5.6	U	

PROJ_NO: 00517

SDG: TT51701 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample	13SD074DL	nsample	13SD075	nsample	13SD075DL
samp_date	5/29/2008 9:42:00 AM	samp_date	5/29/2008 9:50:00 AM	samp_date	5/29/2008 9:50:00 AM
lab_id	TT51701-005DL	lab_id	TT51701-006	lab_id	TT51701-006DL
qc_type	NM	qc_type	NM	qc_type	NM
units	UG/KG	units	UG/KG	units	UG/KG
Pct_Solids	62.0	Pct_Solids	74.0	Pct_Solids	74.0
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1248	6100	J	U

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	4.8	U	
AROCLOR-1221	4.8	U	
AROCLOR-1232	4.8	U	
AROCLOR-1242	4.8	U	
AROCLOR-1254	4.8	U	
AROCLOR-1260	4.8	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1248	5200	J	U

ısample	13SD076
;amp_date	5/29/2008 10:12:00 AM
ab_Id	TT51701-008
ıc_type	NM
ınits	UG/KG
?ct_Solids	73.0
)UP_OF:	

Parameter	Result	Val Qual	Qual Code
ROCLOR-1016	4.9	U	
ROCLOR-1221	4.9	U	
ROCLOR-1232	4.9	U	
ROCLOR-1242	4.9	U	
ROCLOR-1254	4.9	U	
ROCLOR-1260	4.9	U	

nsample	13SD076DL
samp_date	5/29/2008 10:12:00 AM
lab_id	TT51701-008DL
qc_type	NM
units	UG/KG
Pct_Solids	73.0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1248	20000	J	U

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

1
AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
13RB05290801

Lab Name: Pace Analytical Services, In
Contract: N/A
SDG No.: TT51701
Run Sequence: R028576
Matrix: (SOIL/WATER) Water
Lab Sample ID: TT51701-012
Sample wt/vol: 960.0 (g/mL) mL
Lab File ID: Q6030837.d
% Moisture: _____ Decanted: (Y/N) N
Date Collected: 05/29/2008
Extraction: (Type) SEPF
Date Extracted: 06/03/2008
Concentrated Extract Volume: 10000.0(uL)
Date Analyzed: 06/04/2008
Injection Volume: 0.5 (uL)
Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH: <2
Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/L	Q
12674-11-2	AROCLOR-1016	0.26	U
11104-28-2	AROCLOR-1221	0.26	U
11141-16-5	AROCLOR-1232	0.26	U
53469-21-9	AROCLOR-1242	0.26	U
12672-29-6	AROCLOR-1248	0.26	U
11097-69-1	AROCLOR-1254	0.26	U
11096-82-5	AROCLOR-1260	0.26	U

Comments:

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13FD052908

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-007

Sample wt/vol: 5.23 (g/mL) gm

Lab File ID: Q6030826.d

% Moisture: 35.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	5.3	U
11104-28-2	AROCLOR-1221	5.3	U
11141-16-5	AROCLOR-1232	5.3	U
53469-21-9	AROCLOR-1242	5.3	U
12672-29-6	AROCLOR-1248	28000	
11097-69-1	AROCLOR-1254	5.3	U
11096-82-5	AROCLOR-1260	5.3	U

Comments:

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13FD052908-DL

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-007DL

Sample wt/vol: 5.23 (g/mL) gm

Lab File ID: Q6040806.d

% Moisture: 35.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	53	U
11104-28-2	AROCLOR-1221	53	U
11141-16-5	AROCLOR-1232	53	U
53469-21-9	AROCLOR-1242	53	U
12672-29-6	AROCLOR-1248	29000	
11097-69-1	AROCLOR-1254	53	U
11096-82-5	AROCLOR-1260	53	U

Comments:

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SB1080304

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-010

Sample wt/vol: 5.14 (g/mL) gm

Lab File ID: Q6030831.d

% Moisture: 16.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	4.2	U
11104-28-2	AROCLOR-1221	4.2	U
11141-16-5	AROCLOR-1232	4.2	U
53469-21-9	AROCLOR-1242	4.2	U
12672-29-6	AROCLOR-1248	150	
11097-69-1	AROCLOR-1254	4.2	U
11096-82-5	AROCLOR-1260	4.2	U

Comments:

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SB1080506

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-011

Sample wt/vol: 5.20 (g/mL) gm

Lab File ID: Q6030832.d

% Moisture: 18.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0 (uL)

Date Analyzed: 06/04/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	4.2	U
11104-28-2	AROCLOR-1221	4.2	U
11141-16-5	AROCLOR-1232	4.2	U
53469-21-9	AROCLOR-1242	4.2	U
12672-29-6	AROCLOR-1248	150	
11097-69-1	AROCLOR-1254	4.2	U
11096-82-5	AROCLOR-1260	4.2	U

Comments:

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD069

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R026576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-001

Sample wt/vol: 5.35 (g/mL) gm

Lab File ID: Q6030820.d

% Moisture: 30.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) PFEX

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0 (uL)

Date Analyzed: 06/04/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	4.8	U
11104-28-2	AROCLOR-1221	4.8	U
11141-16-5	AROCLOR-1232	4.8	U
53469-21-9	AROCLOR-1242	4.8	U
12672-29-6	AROCLOR-1248	13000	P
11097-69-1	AROCLOR-1254	4.8	U
11096-82-5	AROCLOR-1260	4.8	U

Comments:

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD069-DL

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-001DL

Sample wt/vol: 5.35 (g/mL) gm

Lab File ID: Q6040804.d

% Moisture: 30.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	48	U
11104-28-2	AROCLOR-1221	48	U
11141-16-5	AROCLOR-1232	48	U
53469-21-9	AROCLOR-1242	48	U
12672-29-6	AROCLOR-1248	12000	
11097-69-1	AROCLOR-1254	48	U
11096-82-5	AROCLOR-1260	48	U

Comments:

1
AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
13SD070

Lab Name: Pace Analytical Services, In
Contract: N/A
SDG No.: TT51701
Run Sequence: R028576
Matrix: (SOIL/WATER) Soil
Lab Sample ID: TT51701-009
Sample wt/vol: 5.10 (g/mL) gm
Lab File ID: Q6030830.d
% Moisture: 30.0 Decanted: (Y/N) N
Date Collected: 05/29/2008
Extraction: (Type) SONC
Date Extracted: 06/02/2008
Concentrated Extract Volume: 10000.0 (uL)
Date Analyzed: 06/04/2008
Injection Volume: 0.5 (uL)
Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH:
Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	5.0	U
11104-28-2	AROCLOR-1221	5.0	U
11141-16-5	AROCLOR-1232	5.0	U
53469-21-9	AROCLOR-1242	5.0	U
12672-29-6	AROCLOR-1248	2000	
11097-69-1	AROCLOR-1254	5.0	U
11096-82-5	AROCLOR-1260	5.0	U

Comments:

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD071

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-002

Sample wt/vol: 5.19 (g/mL) gm

Lab File ID: Q6030821.d

% Moisture: 26.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0 (uL)

Date Analyzed: 06/04/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	4.7	U
11104-28-2	AROCLOR-1221	4.7	U
11141-16-5	AROCLOR-1232	4.7	U
53469-21-9	AROCLOR-1242	4.7	U
12672-29-6	AROCLOR-1248	1300	
11097-69-1	AROCLOR-1254	4.7	U
11096-82-5	AROCLOR-1260	4.7	U

Comments:

1
AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD072

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-003

Sample wt/vol: 5.29 (g/mL) gm

Lab File ID: Q6030822.d

% Moisture: 25.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) PFEX

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	4.5	U
11104-28-2	AROCLOR-1221	4.5	U
11141-16-5	AROCLOR-1232	4.5	U
53469-21-9	AROCLOR-1242	4.5	U
12672-29-6	AROCLOR-1248	540	P
11097-69-1	AROCLOR-1254	4.5	U
11096-82-5	AROCLOR-1260	4.5	U

Comments:

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD073

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-004

Sample wt/vol: 5.31 (g/mL) gm

Lab File ID: Q6030810.d

% Moisture: 35.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0(uL)

Date Analyzed: 06/03/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	21	U
11104-28-2	AROCLOR-1221	21	U
11141-16-5	AROCLOR-1232	21	U
53469-21-9	AROCLOR-1242	21	U
12672-29-6	AROCLOR-1248	45000	
11097-69-1	AROCLOR-1254	21	U
11096-82-5	AROCLOR-1260	21	U

Comments:

1
AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.
13SD073-DL

Lab Name: Pace Analytical Services, In
Contract: N/A
SDG No.: TT51701
Run Sequence: R028576
Matrix: (SOIL/WATER) Soil
Lab Sample ID: TT51701-004DL
Sample wt/vol: 5.31 (g/mL) gm
Lab File ID: Q6040805.d
% Moisture: 35.0 Decanted: (Y/N) N
Date Collected: 05/29/2008
Extraction: (Type) SONC
Date Extracted: 06/02/2008
Concentrated Extract Volume: 10000.0(uL)
Date Analyzed: 06/04/2008
Injection Volume: 0.5 (uL)
Dilution Factor: 40.0
GPC Cleanup: (Y/N) N pH:
Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	210	U
11104-28-2	AROCLOR-1221	210	U
11141-16-5	AROCLOR-1232	210	U
53469-21-9	AROCLOR-1242	210	U
12672-29-6	AROCLOR-1248	43000	
11097-69-1	AROCLOR-1254	210	U
11096-82-5	AROCLOR-1260	210	U

Comments:

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD074

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-005

Sample wt/vol: 5.18 (g/mL) gm

Lab File ID: Q6030824.d

% Moisture: 38.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	5.6	U
11104-28-2	AROCLOR-1221	5.6	U
11141-16-5	AROCLOR-1232	5.6	U
53469-21-9	AROCLOR-1242	5.6	U
12672-29-6	AROCLOR-1248	5800	
11097-69-1	AROCLOR-1254	5.6	U
11096-82-5	AROCLOR-1260	5.6	U

Comments:

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD074-DL

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-005DL

Sample wt/vol: 5.18 (g/mL) gm

Lab File ID: Q6030811.d

% Moisture: 38.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0 (uL)

Date Analyzed: 06/03/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	22	U
11104-28-2	AROCLOR-1221	22	U
11141-16-5	AROCLOR-1232	22	U
53469-21-9	AROCLOR-1242	22	U
12672-29-6	AROCLOR-1248	6100	
11097-69-1	AROCLOR-1254	22	U
11096-82-5	AROCLOR-1260	22	U

Comments:

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD075

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-006

Sample wt/vol: 5.12 (g/mL) gm

Lab File ID: Q6030825.d

% Moisture: 26.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	4.8	U
11104-28-2	AROCLOR-1221	4.8	U
11141-16-5	AROCLOR-1232	4.8	U
53469-21-9	AROCLOR-1242	4.8	U
12672-29-6	AROCLOR-1248	5100	
11097-69-1	AROCLOR-1254	4.8	U
11096-82-5	AROCLOR-1260	4.8	U

Comments:

1
AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD075-DL

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: RG28576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-006DL

Sample wt/vol: 5.12 (g/mL) gm

Lab File ID: Q6030812.d

% Moisture: 26.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0 (uL)

Date Analyzed: 06/03/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	19	U
11104-28-2	AROCLOR-1221	19	U
11141-16-5	AROCLOR-1232	19	U
53469-21-9	AROCLOR-1242	19	U
12672-29-6	AROCLOR-1248	5200	
11097-69-1	AROCLOR-1254	19	U
11096-82-5	AROCLOR-1260	19	U

Comments:

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD076

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-008

Sample wt/vol: 5.04 (g/mL) gm

Lab File ID: Q6030829.d

% Moisture: 27.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	4.9	U
11104-28-2	AROCLOR-1221	4.9	U
11141-16-5	AROCLOR-1232	4.9	U
53469-21-9	AROCLOR-1242	4.9	U
12672-29-6	AROCLOR-1248	18000	
11097-69-1	AROCLOR-1254	4.9	U
11096-82-5	AROCLOR-1260	4.9	U

Comments:

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD076-DL

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-008DL

Sample wt/vol: 5.04 (g/mL) gm

Lab File ID: Q6040807.d

% Moisture: 27.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	49	U
11104-28-2	AROCLOR-1221	49	U
11141-16-5	AROCLOR-1232	49	U
53469-21-9	AROCLOR-1242	49	U
12672-29-6	AROCLOR-1248	20000	
11097-69-1	AROCLOR-1254	49	U
11096-82-5	AROCLOR-1260	49	U

Comments:

1

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13RB05290801

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Water

Lab Sample ID: TT51701-012

Sample wt/vol: 1000.0 (g/mL) mL

Lab File ID: F6060805.D

% Moisture: _____ Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SPE

Date Extracted: 06/03/2008

Concentrated Extract Volume: 5000.0 (uL)

Date Analyzed: 06/05/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: _____

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/L	Q
2691-41-0	HMX	0.47	J
121-82-4	RDX	0.52	
99-35-4	1,3,5-TRINITROBENZENE	0.25	U
99-65-0	1,3-DINITROBENZENE	0.25	U
98-95-3	NITROBENZENE	0.25	U
479-45-8	TETRYL	0.25	U
118-96-7	2,4,6-TRINITROTOLUENE	0.25	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	0.25	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	0.25	U
606-20-2	2,6-DINITROTOLUENE	0.25	U
121-14-2	2,4-DINITROTOLUENE	0.25	U
88-72-2	2-NITROTOLUENE	0.25	U
99-99-0	4-NITROTOLUENE	0.25	U
99-08-1	3-NITROTOLUENE	0.25	U

Comments:

1

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13FD052908

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-007

Sample wt/vol: 5.03 (g/mL) gm

Lab File ID: 06040809.D

% Moisture: 0.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 20000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: mg/Kg	Q
2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1	0.29	
121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5	0.33	
99-35-4	1,3,5-Trinitrobenzene	0.099	U
98-95-3	Nitrobenzene	0.099	U
479-45-8	Tetryl (Methyl-2,4,6-trinitrophyeny	0.099	U
118-96-7	2,4,6-Trinitrotoluene (TNT)	0.67	
19406-51-0	4-Amino-2,6-dinitrotoluene	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.099	U
606-20-2	2,6-Dinitrotoluene	0.099	U
121-14-2	2,4-Dinitrotoluene	0.099	U
88-72-2	2-Nitrotoluene	0.099	U
99-99-0	4-Nitrotoluene	0.099	U
99-08-1	3-Nitrotoluene	0.099	U
99-65-0	1,3-Dinitrobenzene	0.099	U

Comments:

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SB1080304

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-010

Sample wt/vol: 5.01 (g/mL) gm

Lab File ID: F6060820.D

% Moisture: 0.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 20000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: mg/Kg	Q
2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1	0.19	J
121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5	0.38	
99-35-4	1,3,5-Trinitrobenzene	0.10	U
98-95-3	Nitrobenzene	0.10	U
479-45-8	Tetryl (Methyl-2,4,6-trinitrophyeny	0.10	U
118-96-7	2,4,6-Trinitrotoluene (TNT)	0.48	
19406-51-0	4-Amino-2,6-dinitrotoluene	0.54	
35572-78-2	2-Amino-4,6-dinitrotoluene	0.19	J
606-20-2	2,6-Dinitrotoluene	0.10	U
121-14-2	2,4-Dinitrotoluene	0.10	U
88-72-2	2-Nitrotoluene	0.10	U
99-99-0	4-Nitrotoluene	0.10	U
99-08-1	3-Nitrotoluene	0.10	U
99-65-0	1,3-Dinitrobenzene	0.10	U

Comments:

1

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SB1080506

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-011

Sample wt/vol: 5.03 (g/mL) gm

Lab File ID: 06040814.D

% Moisture: 0.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 20000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: mg/Kg	Q
2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1	0.27	
121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5	0.72	
99-35-4	1,3,5-Trinitrobenzene	0.17	J
98-95-3	Nitrobenzene	0.099	U
479-45-8	Tetryl (Methyl-2,4,6-trinitrophyeny	0.099	U
118-96-7	2,4,6-Trinitrotoluene (TNT)	0.92	
19406-51-0	4-Amino-2,6-dinitrotoluene	1.4	
35572-78-2	2-Amino-4,6-dinitrotoluene	0.43	
606-20-2	2,6-Dinitrotoluene	0.099	U
121-14-2	2,4-Dinitrotoluene	0.099	U
88-72-2	2-Nitrotoluene	0.099	U
99-99-0	4-Nitrotoluene	0.099	U
99-08-1	3-Nitrotoluene	0.099	U
99-65-0	1,3-Dinitrobenzene	0.099	U

Comments:

1

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD069

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-001

Sample wt/vol: 5.03 (g/mL) gm

Lab File ID: 06040805.D

% Moisture: 0.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 20000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: mg/Kg	Q
2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1	0.56	
121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5	0.84	
99-35-4	1,3,5-Trinitrobenzene	0.099	U
98-95-3	Nitrobenzene	0.099	U
479-45-8	Tetryl (Methyl-2,4,6-trinitrophyeny	0.099	U
118-96-7	2,4,6-Trinitrotoluene (TNT)	0.099	U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.099	U
606-20-2	2,6-Dinitrotoluene	0.099	U
121-14-2	2,4-Dinitrotoluene	0.099	U
88-72-2	2-Nitrotoluene	0.099	U
99-99-0	4-Nitrotoluene	0.099	U
99-08-1	3-Nitrotoluene	0.099	U
99-65-0	1,3-Dinitrobenzene	0.099	U

Comments:

1

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD070

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-009

Sample wt/vol: 5.04 (g/mL) gm

Lab File ID: F6060819.D

% Moisture: 0.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 20000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: mg/Kg	Q
2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1	1.8	
121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5	1.0	
99-35-4	1,3,5-Trinitrobenzene	0.099	U
98-95-3	Nitrobenzene	0.099	U
479-45-8	Tetryl (Methyl-2,4,6-trinitrophyeny	0.099	U
118-96-7	2,4,6-Trinitrotoluene (TNT)	0.20	J
19406-51-0	4-Amino-2,6-dinitrotoluene	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.099	U
606-20-2	2,6-Dinitrotoluene	0.099	U
121-14-2	2,4-Dinitrotoluene	0.099	U
88-72-2	2-Nitrotoluene	0.099	U
99-99-0	4-Nitrotoluene	0.099	U
99-08-1	3-Nitrotoluene	0.099	U
99-65-0	1,3-Dinitrobenzene	0.099	U

Comments:

1

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD071

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-002

Sample wt/vol: 5.06 (g/mL) gm

Lab File ID: F6060809.D

% Moisture: 0.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 20000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: mg/Kg	Q
2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1	3.8	
121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5	3.2	
99-35-4	1,3,5-Trinitrobenzene	0.099	U
98-95-3	Nitrobenzene	0.099	U
479-45-8	Tetryl (Methyl-2,4,6-trinitrophyeny	0.099	U
118-96-7	2,4,6-Trinitrotoluene (TNT)	0.25	
19406-51-0	4-Amino-2,6-dinitrotoluene	0.22	
35572-78-2	2-Amino-4,6-dinitrotoluene	0.10	J
606-20-2	2,6-Dinitrotoluene	0.099	U
121-14-2	2,4-Dinitrotoluene	0.099	U
88-72-2	2-Nitrotoluene	0.099	U
99-99-0	4-Nitrotoluene	0.099	U
99-08-1	3-Nitrotoluene	0.099	U
99-65-0	1,3-Dinitrobenzene	0.099	U

Comments:

1

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD072

[illegible] Analytical Services, In	Contract: N/A
[illegible]	Run Sequence: R028606
[illegible]/WATER) Soil	Lab Sample ID: TT51701-003
[illegible]: 5.04 (g/mL) gm	Lab File ID: F6060810.D
[illegible]: 0.0 Decanted: (Y/N) N	Date Collected: 05/29/2008
[illegible] Type) SONC	Date Extracted: 06/02/2008
[illegible] Extract Volume: 20000.0(uL)	Date Analyzed: 06/04/2008
[illegible] Volume: 50.0 (uL)	Dilution Factor: 1.0
[illegible] (Y/N) N pH:	Sulfur Cleanup: (Y/N) N

	COMPOUND	CONCENTRATION UNITS: mg/Kg	Q
[illegible]	HMX (Octahydro-1,3,5,7-tetranitro-1	4.9	
[illegible]	RDX (Hexahydro-1,3,5-trinitro-1,3,5	3.7	
[illegible]	1,3,5-Trinitrobenzene	0.099	U
[illegible]	Nitrobenzene	0.099	U
[illegible]	Tetryl (Methyl-2,4,6-trinitrophyeny	0.099	U
[illegible]	2,4,6-Trinitrotoluene (TNT)	0.13	J
[illegible]	4-Amino-2,6-dinitrotoluene	0.15	J
[illegible]	2-Amino-4,6-dinitrotoluene	0.099	U
[illegible]	2,6-Dinitrotoluene	0.099	U
[illegible]	2,4-Dinitrotoluene	0.099	U
[illegible]	2-Nitrotoluene	0.099	U
[illegible]	4-Nitrotoluene	0.099	U
[illegible]	3-Nitrotoluene	0.099	U
[illegible]	1,3-Dinitrobenzene	0.099	U

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD073

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-004

Sample wt/vol: 5.03 (g/mL) gm

Lab File ID: F6060811.D

% Moisture: 0.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 20000.0(uL)

Date Analyzed: 06/05/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: mg/Kg	Q
2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1	4.6	
121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5	2.5	
99-35-4	1,3,5-Trinitrobenzene	0.099	U
98-95-3	Nitrobenzene	0.099	U
479-45-8	Tetryl (Methyl-2,4,6-trinitrophyeny	0.099	U
118-96-7	2,4,6-Trinitrotoluene (TNT)	1.6	
19406-51-0	4-Amino-2,6-dinitrotoluene	0.19	J
35572-78-2	2-Amino-4,6-dinitrotoluene	0.15	J
606-20-2	2,6-Dinitrotoluene	0.099	U
121-14-2	2,4-Dinitrotoluene	0.099	U
88-72-2	2-Nitrotoluene	0.099	U
99-99-0	4-Nitrotoluene	0.099	U
99-08-1	3-Nitrotoluene	0.099	U
99-65-0	1,3-Dinitrobenzene	0.099	U

Comments:

1

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD074

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-005

Sample wt/vol: 5.01 (g/mL) gm

Lab File ID: F6060812.D

% Moisture: 0.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 20000.0(uL)

Date Analyzed: 06/05/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: mg/Kg	Q
2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1	27	E
121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5	22	E
99-35-4	1,3,5-Trinitrobenzene	0.10	U
98-95-3	Nitrobenzene	0.10	U
479-45-8	Tetryl (Methyl-2,4,6-trinitrophyeny	0.10	U
118-96-7	2,4,6-Trinitrotoluene (TNT)	5.5	
19406-51-0	4-Amino-2,6-dinitrotoluene	0.82	
35572-78-2	2-Amino-4,6-dinitrotoluene	0.42	
606-20-2	2,6-Dinitrotoluene	0.10	U
121-14-2	2,4-Dinitrotoluene	0.10	U
88-72-2	2-Nitrotoluene	0.10	U
99-99-0	4-Nitrotoluene	0.10	U
99-08-1	3-Nitrotoluene	0.10	U
99-65-0	1,3-Dinitrobenzene	0.10	U

Comments:

1

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD074-DL

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-005DL

Sample wt/vol: 5.01 (g/mL) gm

Lab File ID: F6060814.D

% Moisture: 0.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 20000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: mg/Kg	Q
2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1	27	
121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5	22	
99-35-4	1,3,5-Trinitrobenzene	1.0	U
98-95-3	Nitrobenzene	1.0	U
479-45-8	Tetryl (Methyl-2,4,6-trinitrophyeny	1.0	U
118-96-7	2,4,6-Trinitrotoluene (TNT)	5.3	
19406-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U

Comments:

1

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD075

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-006

Sample wt/vol: 5.05 (g/mL) gm

Lab File ID: F6060815.D

% Moisture: 0.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 20000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: mg/Kg	Q
2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1	3.0	
121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5	8.7	
99-35-4	1,3,5-Trinitrobenzene	0.099	U
98-95-3	Nitrobenzene	0.099	U
479-45-8	Tetryl (Methyl-2,4,6-trinitrophyeny	0.099	U
118-96-7	2,4,6-Trinitrotoluene (TNT)	0.48	
19406-51-0	4-Amino-2,6-dinitrotoluene	0.35	
35572-78-2	2-Amino-4,6-dinitrotoluene	0.14	J
606-20-2	2,6-Dinitrotoluene	0.099	U
121-14-2	2,4-Dinitrotoluene	0.099	U
88-72-2	2-Nitrotoluene	0.099	U
99-99-0	4-Nitrotoluene	0.099	U
99-08-1	3-Nitrotoluene	0.099	U
99-65-0	1,3-Dinitrobenzene	0.099	U

Comments:

1

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD076

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-008

Sample wt/vol: 5.04 (g/mL) gm

Lab File ID: F6060817.D

% Moisture: 0.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 20000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: mg/Kg	Q
2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1	42	E
121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5	220	E
99-35-4	1,3,5-Trinitrobenzene	0.099	U
98-95-3	Nitrobenzene	0.099	U
479-45-8	Tetryl (Methyl-2,4,6-trinitrophyeny	0.099	U
118-96-7	2,4,6-Trinitrotoluene (TNT)	80	E
19406-51-0	4-Amino-2,6-dinitrotoluene	2.6	
35572-78-2	2-Amino-4,6-dinitrotoluene	1.1	
606-20-2	2,6-Dinitrotoluene	0.099	U
121-14-2	2,4-Dinitrotoluene	0.099	U
88-72-2	2-Nitrotoluene	0.099	U
99-99-0	4-Nitrotoluene	0.099	U
99-08-1	3-Nitrotoluene	0.099	U
99-65-0	1,3-Dinitrobenzene	0.099	U

Comments:

1

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD076-DL

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-008DL

Sample wt/vol: 5.04 (g/mL) gm

Lab File ID: F6060818.D

% Moisture: 0.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 20000.0(uL)

Date Analyzed: 06/05/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 20.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: mg/Kg	Q
2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1	49	
121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5	270	
99-35-4	1,3,5-Trinitrobenzene	2.0	U
98-95-3	Nitrobenzene	2.0	U
479-45-8	Tetryl (Methyl-2,4,6-trinitrophyeny	2.0	U
118-96-7	2,4,6-Trinitrotoluene (TNT)	92	
19406-51-0	4-Amino-2,6-dinitrotoluene	3.2	J
35572-78-2	2-Amino-4,6-dinitrotoluene	2.0	U
606-20-2	2,6-Dinitrotoluene	2.0	U
121-14-2	2,4-Dinitrotoluene	2.0	U
88-72-2	2-Nitrotoluene	2.0	U
99-99-0	4-Nitrotoluene	2.0	U
99-08-1	3-Nitrotoluene	2.0	U
99-65-0	1,3-Dinitrobenzene	2.0	U

Comments:

APPENDIX C

SUPPORT DOCUMENTATION

HOLDTIME

TT51701

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
EXP	MG/KG	13SD073	TT51701-004	NM	5/29/2008	6/2/2008	6/5/2008	4.281	2.734	7.015
EXP	MG/KG	13FD052908	TT51701-007	NM	5/29/2008	6/2/2008	6/4/2008	4.688	1.984	6.672
EXP	MG/KG	13SD076	TT51701-008DL	NM	5/29/2008	6/2/2008	6/5/2008	4.262	2.872	7.134
EXP	MG/KG	13SD076	TT51701-008	NM	5/29/2008	6/2/2008	6/4/2008	4.262	2.012	6.274
EXP	MG/KG	13SD075	TT51701-006	NM	5/29/2008	6/2/2008	6/4/2008	4.278	1.956	6.234
EXP	MG/KG	13SD074	TT51701-005	NM	5/29/2008	6/2/2008	6/5/2008	4.283	2.762	7.045
EXP	MG/KG	13SD072	TT51701-003	NM	5/29/2008	6/2/2008	6/4/2008	4.269	1.928	6.198
EXP	MG/KG	13SD071	TT51701-002	NM	5/29/2008	6/2/2008	6/4/2008	4.275	1.901	6.176
EXP	MG/KG	13SD070	TT51701-009	NM	5/29/2008	6/2/2008	6/4/2008	4.219	2.04	6.258
EXP	MG/KG	13SD069	TT51701-001	NM	5/29/2008	6/2/2008	6/4/2008	4.288	1.873	6.161
EXP	MG/KG	13SB1080506	TT51701-011	NM	5/29/2008	6/2/2008	6/4/2008	4.233	2.123	6.356
EXP	MG/KG	13SB1080304	TT51701-010	NM	5/29/2008	6/2/2008	6/4/2008	4.24	2.067	6.307
EXP	MG/KG	13SD074	TT51701-005DL	NM	5/29/2008	6/2/2008	6/4/2008	4.283	2.178	6.462
EXP	UG/L	13RB05290601	TT51701-012	NM	5/29/2008	6/3/2008	6/5/2008	5.014	1.727	6.741
PCB	UG/KG	13SB1080304	TT51701-010	NM	5/29/2008	6/2/2008	6/4/2008	4.066	1.776	5.842

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
PCB	UG/KG	13FD052908	TT51701-007DL	NM	5/29/2008	6/2/2008	6/4/2008	4.514	2.152	6.666
PCB	UG/KG	13SD073	TT51701-004	NM	5/29/2008	6/2/2008	6/3/2008	4.108	1.294	5.402
PCB	UG/KG	13SD076	TT51701-008DL	NM	5/29/2008	6/2/2008	6/4/2008	4.089	2.175	6.264
PCB	UG/KG	13SD076	TT51701-008	NM	5/29/2008	6/2/2008	6/4/2008	4.089	1.73	5.819
PCB	UG/KG	13SD075	TT51701-006DL	NM	5/29/2008	6/2/2008	6/3/2008	4.104	1.340	5.444
PCB	UG/KG	13SD075	TT51701-006	NM	5/29/2008	6/2/2008	6/4/2008	4.104	1.638	5.742
PCB	UG/KG	13SD074	TT51701-005DL	NM	5/29/2008	6/2/2008	6/3/2008	4.11	1.317	5.427
PCB	UG/KG	13FD052908	TT51701-007	NM	5/29/2008	6/2/2008	6/4/2008	4.514	1.661	6.175
PCB	UG/KG	13SD073	TT51701-004DL	NM	5/29/2008	6/2/2008	6/4/2008	4.108	2.129	6.237
PCB	UG/KG	13SD072	TT51701-003	NM	5/29/2008	6/2/2008	6/4/2008	4.096	1.569	5.665
PCB	UG/KG	13SD071	TT51701-002	NM	5/29/2008	6/2/2008	6/4/2008	4.101	1.547	5.648
PCB	UG/KG	13SD070	TT51701-009	NM	5/29/2008	6/2/2008	6/4/2008	4.045	1.753	5.798
PCB	UG/KG	13SD069	TT51701-001DL	NM	5/29/2008	6/2/2008	6/4/2008	4.115	2.106	6.220
PCB	UG/KG	13SD069	TT51701-001	NM	5/29/2008	6/2/2008	6/4/2008	4.115	1.524	5.638
PCB	UG/KG	13SB1080506	TT51701-011	NM	5/29/2008	6/2/2008	6/4/2008	4.059	1.799	5.858
PCB	UG/KG	13SD074	TT51701-005	NM	5/29/2008	6/2/2008	6/4/2008	4.11	1.615	5.725
PCB	UG/L	13RB05290801	TT51701-012	NM	5/29/2008	6/3/2008	6/4/2008	4.816	1.042	5.858

NSWC CRANE
SOIL DATA
TT51701

PROGRAM	CHEMICAL	[illegible]	UNITS	[illegible]	RPD	LD	
EXP	2,4,6-TRINITROTOLUENE	1.6	MG/KG	0.67	81.94	0.93	J
EXP	2-AMINO-4,6-DINITROTOLUENE	0.15 J	MG/KG	ND	200.00	0.15	
EXP	4-AMINO-2,6-DINITROTOLUENE	0.19 J	MG/KG	ND	200.00	0.19	
EXP	HMX	4.6	MG/KG	0.29	176.28	4.31	J
EXP	RDX	2.5	MG/KG	0.33	153.36	2.17	J

Current RPD Quality Control Limit: 50 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

NSWC CRANE
SOIL DATA
TT51701

[illegible]	CHEMICAL	[illegible]	13SD073DL	UNITS	13FD052908DL	RPD	D
PEST/PCB	AROCLOR-1248		43000	UG/KG	29000 J	38.89	14000.00

Current RPD Quality Control Limit: 50 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

Pace Analytical Services, Inc.
940 S. Harney
Seattle, WA 98108

To: Tetra Tech NUS, Inc.
Project No.: CTO 0517
Site Name: Crane NSWC
Project Manager: R. Basinski
SDG No.: TT51701
Date of Report: June 23, 2008

SAMPLE RECEIPT, IDENTIFICATION, AND GENERAL COMMENTS:

Sample Receipt and Identification:

The samples submitted under the laboratory number(s) indicated above were identified and analyzed as tabulated below. The samples were collected and received on the dates noted on the enclosed chain-of-custody copies, Attachment A.

Client Sample Identification	Pace Sample Identification	Testing Analytical Request
13SD069	TT51701-001	PCB/ORD
13SD071	TT51701-002	PCB/ORD
13SD072	TT51701-003	PCB/ORD
13SD073	TT51701-004	PCB/ORD
13SD074	TT51701-005	PCB/ORD
13SD075	TT51701-006	PCB/ORD
13FD052908	TT51701-007	PCB/ORD
13SD076	TT51701-008	PCB/ORD
13SD070	TT51701-009	PCB/ORD
13SB1080304	TT51701-010	PCB/ORD
13SB1080506	TT51701-011	PCB/ORD
13RB05290801	TT51701-012	PCB/ORD

Analytical Request Key:

PCB = Polychlorinated biphenyls (8082)
ORD = Ordnance (8330)

Summary of NELAC test accreditation

Determination	NELAC approved	Basis
2540B Total Solids, soil (by Organics dept.)	NO	AR
8082 PCB Aroclors (Routine) Soil	YES	DB
8082 PCB Aroclors (Routine) Water	YES	
8330 Soil routine, air dried	YES	AD
8330 Water Routine list (SPE Prep)	YES	

We assert that the results reported here relate only to the samples listed in this report.

Pace Analytical Services, Inc.
940 S. Harney
Seattle, WA 98108

Basis key:
DB=Dry basis
AR=As received
AD=Air dried

Sample Receipt Comments:

There were no anomalies associated with the receipt of these samples.

GENERAL REMARKS ON ORGANIC ANALYSES:

The following comments describe general analysis conditions. For remarks specific to the samples reported in this case, see "SPECIFIC REMARKS ON ORGANIC ANALYSIS."

Manual Integrations:
One or more analytes may have been manually integrated on the data system quantitation reports. All manual integrations have been flagged, initialed, and dated by the analyst. A list of the manual integration flags is detailed below.

M	Manual integration due to irregular peak shape
MS	Manual integration due to split peak
MR	Manual integration due to retention time shift
MI	Manual integration of correct isomer
MT	Manual integration due to peak tailing
MB	Manual integration due to irregular baseline

Holding Time Compliance:

PCBs:
The holding time to extraction is 7 days in water and 14 days in soil calculated from the date of collection. In either case, the holding time from extraction to analysis is 40 days. All samples were extracted and analyzed within holding times.

Ordnance Compounds:
The holding time to extraction is 7 days in water and 14 days in soil calculated from the date of collection. The holding time from extraction to analysis is 40 days. All samples were extracted and analyzed within holding times.

PCB Fraction:

MS/MSD Analyses:
Analysis of the MS/MSD extracts yielded high recoveries for Aroclor 1016. (The native sample contained a high concentration of Aroclor 1248 which may have contributed to the Aroclor 1016.) Aroclor 1260 had percent recoveries within the control limits. All recoveries were within the control limits in the blank spike analysis.

Sample Analysis
The extracts for several samples were diluted and analyzed due to the significant presence of target analytes. Data for both analyses were submitted. In some cases a less diluted sample was submitted in the place of the undiluted sample because the target analyte's concentration was too high for the detectors' range.

Ordnance Fraction:

Sample Analyses:
Analyses of sample extracts 13SD074 and 13SD076 resulted in the detection of target analytes at concentrations that exceeded the calibration range. The extracts were diluted accordingly and reanalyzed. Data from both analyses have been submitted.

All quality control parameters were met.

Pace Analytical Services, Inc.
940 S. Harney
Seattle, WA 98108

ABBREVIATIONS

Several abbreviations can appear in our reports. The most commonly employed abbreviations are as follows:

U The analyte of interest was not detected to the limit of detection indicated.

SDL Sample Detection Limit. The SDL can vary from sample to sample, depending on sample size, matrix interferences, moisture content and other sample-specific conditions.

PQL Practical Quantitation Limit. The limit is drawn from the test method and usually represents the SDL multiplied by a matrix-specific factor.

DB Dry Basis. The value reported has been back-calculated to normalize for the moisture content of the sample.

AR As-Received. The value has not been normalized for moisture.

ORGANIC ANALYSES:

B When used in relation to organics fractions, the "B" flag indicates that the analyte of interest was detected in the method blank associated with the sample, as well as in the sample itself. The "B" flag is applied without regard to the relative concentrations detected in the blank and sample.

J The analyte of interest was detected below the routine reporting limit. This value should be regarded as an estimate.

T The flagged values represent the SUM of two co-eluting compounds. The SUM of these two values is shown as though it were a result for each of them. The two figures should not be added together.

E The flagged value was reported from an analysis that exceeded the linear range of the instrument. See additional comments for further discussion of the circumstances. Values so flagged should be considered estimates.

P When a dual column GC technique is employed, this flag indicates that test results from the two columns differ by more than 25%. Generally, we report the higher value.

C The flagged analyte has been confirmed by GC/MS analysis. The value reported may be derived from either the initial of confirmatory (GC/MS) analysis. See specific report comments for details.

~ This result has been identified as non-primary based on the analyst's professional judgment.

CRQL Client requested Quantitation Limit, usually the limit of detection specified at your request. Might also be referred to as Contract Required Quantitation Limit.

Pace Analytical Services, Inc.
940 S. Harney
Seattle, WA 98108

[illegible] OF DATA

Pace Analytical Services, Inc. certifies that these results meet all requirements of the NELAC standards, except where otherwise noted.

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature."

Respectfully submitted,

Shannon Schelinder Project Manager	Harry Romberg Quality Assurance Officer
6/23/08 (DATE)	6/23/08 (DATE)

HOW TO CONTACT US:

All Pace Analytical Services, Inc. staff members can be reached at the same telephone and facsimile numbers: (206) 767-5060 by phone, (206) 767-5063 by FAX.

REQUESTS FOR DUPLICATE COPIES:

This packet has been checked for accuracy. All pages are present and in sequential order. Please see Attachment B for a detailed record.

In the event that duplicate data copies are needed, Pace will accommodate your request at a fee of twenty-five cents ($0.25) per copy, plus shipping. If the data are in storage, there will also be a fee for retrieval.

Pace Analytical Services, Inc.
940 S. Harney
Seattle, WA 98108

ATTACHMENT A

Chain-of-Custody Copies

8

PACE ANALYTICAL SERVICES, INC. - SAMPLE CONFIRMATION LOG

Mtx	Sample ID (SDG-#)	VTSR	Collected On	Client ID	2540B Total Solids, soil (by Organics dept.)	8082 PCB Aroclors (Routine) Soil	8082 PCB Aroclors (Routine) Water	8330 Soil routine, air dried	8330 Water Routine list (SPE Prep)
SO	TT51701-001	05/30/2008 08:30 AM	05/29/2008 09:35 AM	13SD069	A+	P+		P-	
SO	*TT51701-002	05/30/2008 08:30 AM	05/29/2008 09:54 AM	13SD071	A+	P+		P-	
SO	TT51701-003	05/30/2008 08:30 AM	05/29/2008 10:02 AM	13SD072	A+	P+		P-	
SO	TT51701-004	05/30/2008 08:30 AM	05/29/2008 09:45 AM	13SD073	A+	P+		P-	
SO	TT51701-005	05/30/2008 08:30 AM	05/29/2008 09:42 AM	13SD074	A+	P+		P-	
SO	TT51701-006	05/30/2008 08:30 AM	05/29/2008 09:50 AM	13SD075	A+	P+		P-	
SO	TT51701-007	05/30/2008 08:30 AM	05/29/2008 12:00 AM	13FD052908	A+	P+		P-	
SO	TT51701-008	05/30/2008 08:30 AM	05/29/2008 10:12 AM	13SD076	A+	P+		P-	
SO	TT51701-009	05/30/2008 08:30 AM	05/29/2008 11:15 AM	13SD070	A+	P+		P-	
SO	TT51701-010	05/30/2008 08:30 AM	05/29/2008 10:45 AM	13SB1080304	A+	P+		P-	
SO	TT51701-011	05/30/2008 08:30 AM	05/29/2008 10:55 AM	13SB1080506	A+	P+		P-	
WD	TT51701-012	05/30/2008 08:30 AM	05/29/2008 01:40 PM	13RB05290801			IN		P-

Approved By: On:
Notes:

Samples identified with a '*' client has requested QC for

LEGEND: -:Started , +:Completed , IN:Logged In , P:Preparation , A:Analysis , X:Cancelled, PL:Pre-logged
Matrices: Soil=SO, Water=WD

FORM LTL-PM-8.0

Serial 7381

TETRA TECH NUS, INC. T1517 01 CHAIN OF CUSTODY NUMBER 4636 PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00517	CRANE NSWC	R. Badinski	412-921 8308	PACE S. SCHELINDER
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		F. Ramsey	412-921-8838	940 S. HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX 8616 5831 6161		SEATTLE WA 98108

Fred V Ramsey

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☒ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G
PRESERVATIVE USED: NONE NONE

	DATE YEAR 2008	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	PCBs SW-846 8082	Exp SW-846-8330	COMMENTS
1	5/24	0935	13SD069	13 SD69	0	.25	SD	G	1	✓	✓	
2		0957	13SD071	13 SD71	0	.25	SD	G	2	✓	✓	MS/MSD
3		1002	13SD072	13 SD72	0	.25	SD	G	1	✓	✓	
4		0945	13SD073	13 SD73	0	.25	SD	G	1	✓	✓	
5		0942	13SD074	13 SD74	0	.25	SD	G	1	✓	✓	
6		0950	13SD075	13 SD75	0	.25	SD	G	1	✓	✓	
		[illegible]	13FD052908	—	0	.25	SD	G	1	✓	✓	
		10[illegible]	13SD076	13 SD76	0	.25	SD	G	1	✓	✓	
		11[illegible]	13SD070	13[illegible]	0	.25	SD	G	1	✓	✓	
		10[illegible]	13SB080304	13SB10	3'	-4'	SO	G	1	✓	✓	
		105[illegible]	13SB080506	13 SB06	5'	-6'	SO	G	1	✓	✓	
		134[illegible]	13[illegible]052908[illegible]	[illegible]	—		QC	G	4	✓	✓	

	DATE	TIME
	DATE	TIME
	DATE	TIME

FORM NO. 4/02R S-001

Cooler Receipt Form
Pace Analytical Services, Inc.

SDG: TT51701 Taken By: Client

Cooler: AAP291 Transferred: FedEx

COC #: 4636

Project: CTO 0517 NSWC Crane (Tetra Tech NUS, Inc.)

Date samples were received at the laboratory: **5/30/2008**

Date cooler was opened: **5/30/2008 11:34AM**

A. PRELIMINARY EXAMINATION PHASE:

1. Did cooler come with a shipping slip (airbill, etc.)? ..... **YES**
   if YES, record carrier name and airbill number: **861658316161**
2. Were custody seals unbroken and intact at the date and time of arrival? ..... **INTACT**
   Date On Custody Seal: **5/29/2008** Custody Seals Description:
3. Were custody papers sealed in a plastic bag and taped inside to the lid? ..... **YES**
4. Did you screen samples for radioactivity using the Geiger Counter? ..... **NO**
5. Were custody papers filled out properly (ink, signed, etc.)? ..... **YES**
6. Did you sign custody papers in the appropriate place? ..... **YES**
7. If required, was enough cooling material present? ..... **YES**
8. Have designated person initial here to acknowledge receipt of cooler: _____

B. LOG-IN PHASE:

Date samples were logged-in: **5/30/2008 11:34AM**

Logged-in by Hugh Prentice (sign) Hugh Prentice

9. Describe type of packing in cooler:

10. Were all bottles sealed in separate plastic bags? ..... **NO**
11. Were labels in good condition? ..... **YES**
12. Were all bottle labels complete (ID,date,time signature,preservative,etc.)? ..... **YES**
13. Did all bottle labels agree with custody papers? ..... **YES**
14. Were correct containers used for the tests indicated? ..... **YES**
15. Were the correct pHs observed? ..... **YES**
16. Was a sufficient amount of sample sent for tests indicated? ..... **YES**
17. Were bubbles absent in VOA samples? ..... **YES**
18. Temperatures: 2.5

DISCREPANCIES:

Date Printed: 6/2/2008 7:53

2
SOIL ARCCLOR SURROGATE RECOVERY

Analytical Services, Inc. Contract: N/A

[illegible] Run Sequence: R028576

[illegible] LE ID) [illegible] WELL NUMBER	S1 (DCB) #	S2 (TCX) #	S3 () #	S4 () #	TOT OUT
([illegible] 08SDL) [illegible]	124	106			0
[illegible]	135	114			0
[illegible]	160	113			0
[illegible]	132	106			0
[illegible]	103	105			0
[illegible]	103	108			0
[illegible]	99	114			0
[illegible]	96	108			0
[illegible]	96	95			0
[illegible]	98	87			0
[illegible]	106	110			0
[illegible]	94	95			0
[illegible]	108	114			0
([illegible]01-003) [illegible]	100	107			0
[illegible]	102	103			0
([illegible]01-001) [illegible]	105	106			0
([illegible]-006DL) [illegible]	114	96			0
([illegible]01-005DL) [illegible]	120	109			0
([illegible]01-004) 13SD073	122	108			0
(S060208GPBSLG) S060208GPBSLG	105	118			0
(B060208GPBSLG) B060208GPBSLG	100	112			0

Date Printed: 6/13/2008 12:48

FORM II ARO

2

SOIL AROCLOR SURROGATE RECOVERY

[illegible] Analytical Services, Inc. Contract: N/A

[illegible]/01 Run Sequence: R028576

[illegible] LE ID) [illegible] SULE NUMBER	S1 (DCB) #	S2 (TCX) #	S3 () #	S4 () #	TOT OUT
					QC LIMITS
S1 (DCB) =	DECACHLOROBIPHENYL				20-160
S2 (TCX) =	TETRACHLORO-M-XYLENE				20-150
S3 () =					
S4 () =					

[illegible] used to flag recovery values
[illegible] de of contract required QC limits

Date Printed: 6/13/2008 12:48

FORM II ARO

2

WATER AROCLOR SURROGATE RECOVERY

[illegible] Analytical Services, Inc. Contract: N/A

[illegible] Run Sequence: R028576

[illegible] LE ID) [illegible] NUMBER	S1 (DCB) #	S2 (TCX) #	S3 () #	S4 () #	TOT OUT
[illegible]	109	100			0
[illegible]	109	103			0
[illegible]	112	96			0

			QC LIMITS
[illegible]	(DCB) =	DECACHLOROBIPHENYL	40-135
S2	(TCX) =	TETRACHLORO-M-XYLENE	10-129
S3	() =		
	() =		

[illegible] be used to flag recovery values
[illegible] side of contract required QC limits

FORM II ARO

Date Printed: 6/13/2008 12:48

4

AROCLOR METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

B060208GPBSLG

Lab Name: Pace Analytical Services, Inc.

Contract:

SDG No.: TT51701

Lab File ID: Q6030805.d

Lab Sample ID: B060208GPBSLG

Matrix: (SOIL/SED/WATER) Soil

Extraction: (Type) SONC

Sulfur Cleanup: N

Date Extracted: 06/02/2008

Date Analyzed (1): 06/03/2008

Date Analyzed (2): 06/03/2008

Time Analyzed (1): 16:38

Time Analyzed (2): 16:38

Instrument ID (1): HP6890Q

Instrument ID (2): HP6890Q

GC Column(1): RTX-CLP ID: .32 (mm) GC Column(2): RTX-CLPII ID: .32 (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED (1)	DATE ANALYZED (2)	RUN SEQUENCE
01	S060208GPBSLG	S060208GPBSLG	06/03/2008	06/03/2008	R028576
02	13SD073	TT51701-004	06/03/2008	06/03/2008	R028576
03	13SD074-DL	TT51701-005DL	06/03/2008	06/03/2008	R028576
04	13SD075-DL	TT51701-006DL	06/03/2008	06/03/2008	R028576
05	13SD069	TT51701-001	06/04/2008	06/04/2008	R028576
06	13SD071	TT51701-002	06/04/2008	06/04/2008	R028576
07	13SD072	TT51701-003	06/04/2008	06/04/2008	R028576
08	13SD074	TT51701-005	06/04/2008	06/04/2008	R028576
09	13SD075	TT51701-006	06/04/2008	06/04/2008	R028576
10	13FD052908	TT51701-007	06/04/2008	06/04/2008	R028576
11	13SD076	TT51701-008	06/04/2008	06/04/2008	R028576
12	13SD070	TT51701-009	06/04/2008	06/04/2008	R028576
13	13SB1080304	TT51701-010	06/04/2008	06/04/2008	R028576
14	13SB1080506	TT51701-011	06/04/2008	06/04/2008	R028576
15	13SD071MS	TT51701-002MS	06/04/2008	06/04/2008	R028576
16	13SD071MSD	TT51701-002MSD	06/04/2008	06/04/2008	R028576
17	13SD069-DL	TT51701-001DL	06/04/2008	06/04/2008	R028576
18	13SD073-DL	TT51701-004DL	06/04/2008	06/04/2008	R028576
19	13FD052908-DL	TT51701-007DL	06/04/2008	06/04/2008	R028576
20	13SD076-DL	TT51701-008DL	06/04/2008	06/04/2008	R028576
21					
22					
23					
24					
25					
26					

COMMENTS:

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B060208GPBSLG

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: B060208GPBSLG

Sample wt/vol: 5.00 (g/mL) gm

Lab File ID: Q6030805.d

% Moisture: _____ Decanted: (Y/N) N

Date Collected: _____

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0(uL)

Date Analyzed: 06/03/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	9.0	U
11104-28-2	AROCLOR-1221	9.0	U
11141-16-5	AROCLOR-1232	9.0	U
53469-21-9	AROCLOR-1242	9.0	U
12672-29-6	AROCLOR-1248	9.0	U
11097-69-1	AROCLOR-1254	9.0	U
11096-82-5	AROCLOR-1260	9.0	U

Comments:

3E
SOIL AROCLOR BLANK SPIKE RECOVERY

Lab Name: Pace Analytical Services, Inc. Contract: N/A

Lab Code: [illegible] Case No.: R028576 SDG No.: TT51701

Matrix: [illegible]ple ID: S060208GPBSLG

Sample: N/A Units: ug/kg

Analyte	Spike Added	Found	% Rec #	Rec Limit
AROCLOR-1016	1000	914.619	91	77-124
AROCLOR-1260	1000	907.985	91	66-168

- Column to be used to flag recovery and RPD values with an asterisk
- Values outside of QC limits

Spike Recovery: 0 out of 2 outside limits

COMMENTS:

Date Printed: 6/13/2008 12:48

3

SOIL AROCLOR MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

[illegible] Analytical Services, Inc. Contract: N/A

[illegible]nce: R028576 MSD Run Sequence: R028576 SDG No.: TT51701

[illegible]mple No.: 13SD071MS MSD Client Sample No.: 13SD071MSD

[illegible]le ID: TT51701-002MS MSD Lab Sample ID: TT51701-002MSD

Units: ug/kg

[illegible]	SAMPLE CONC	MS SPIKE ADDED	MS CONC	MS % REC #	MSD SPIKE ADDED	MSD CONC	MSD % REC #	%RPD #	QC LIMITS	
									RPD	REC.
[illegible]	0	1300	1882.7	145 *	1290	1667.96	129 *	11	16	42-128
[illegible]	0	1300	1234.24	95	1290	1164.11	90	5	31	49-158

[illegible] column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

[illegible] RPD or percent recovery is not flagged as an exceedence because the Sample [illegible] amount is five times or more than the Spike Added amount.

RPD: 0 out of 2 outside limits

Spike Recovery: 2 out of 4 outside limits

COMMENTS:

4

AROCLOR METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

B060308GPBWLS

Lab Name: Pace Analytical Services, Inc.

Contract:

SDG No.: TT51701

Lab File ID: Q6030835.d

Lab Sample ID: B060308GPBWLS

Matrix: (SOIL/SED/WATER) Water

Extraction: (Type) SEPF

Sulfur Cleanup: N

Date Extracted: 06/03/2008

Date Analyzed (1): 06/04/2008

Date Analyzed (2): 06/04/2008

Time Analyzed (1): 09:10

Time Analyzed (2): 09:10

Instrument ID (1): HP6890Q

Instrument ID (2): HP6890Q

GC Column(1): RTX-CLP ID: .32 (mm) GC Column(2): RTX-CLPII ID: .32 (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED (1)	DATE ANALYZED (2)	RUN SEQUENCE
01	S060308GPBWLS	S060308GPBWLS	06/04/2008	06/04/2008	R028576
02	13RB05290801	TT51701-012	06/04/2008	06/04/2008	R028576
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

COMMENTS:

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B060308GPBWLS

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Water

Lab Sample ID: B060308GPBWLS

Sample wt/vol: 1000.0 (g/mL) mL

Lab File ID: Q6030835.d

% Moisture: _____ Decanted: (Y/N) N

Date Collected: _____

Extraction: (Type) SEPF

Date Extracted: 06/03/2008

Concentrated Extract Volume: 10000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: <2

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/L	Q
12674-11-2	AROCLOR-1016	0.25	U
11104-28-2	AROCLOR-1221	0.25	U
11141-16-5	AROCLOR-1232	0.25	U
53469-21-9	AROCLOR-1242	0.25	U
12672-29-6	AROCLOR-1248	0.25	U
11097-69-1	AROCLOR-1254	0.25	U
11096-82-5	AROCLOR-1260	0.25	U

Comments:

3B
WATER AROCLOR BLANK SPIKE RECOVERY

Lab Name: Pace Analytical Services, Inc. Contract: N/A

Lab Code: Case No.: R028576 SDG No.: TT51701

Matrix: Sample ID: S060308GPBWLS

Sample wt/vol: N/A Units: ug/L

Analyte	Spike Added	Found	% Rec #	Rec Limit
AROCLOR-1016	5.00	4.716	94	25-145
AROCLOR-1260	5.00	4.9696	99	30-145

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

Spike Recovery: 0 out of 2 outside limits

COMMENTS:

Date Printed: 6/13/2008 12:48

FORM III B ARO

SUM - 45

Pace Analytical Services, Inc.
Initial Calibration Linearity Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 22-MAY-2008 18:29
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-1.b\Q51908-1PCB.M
Method : Method 8082✓
Sublist : 8082.sub
Column : RTX-CLP
Column Size : 30m L - 0.32mm ID

GR
5/27/08

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-1.b/Q5220811.d
Level 2: //diana/target/6890q.i/Q51908PCB-1.b/Q5220812.d
Level 3: //diana/target/6890q.i/Q51908PCB-1.b/Q5190810.d
Level 4: //diana/target/6890q.i/Q51908PCB-1.b/Q5220814.d
Level 5: //diana/target/6890q.i/Q51908PCB-1.b/Q5220815.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave CF	%RSD
Aroclor-1016-1	13534480	12913400	12177480	11404380	10806540	12167260	9.1
Aroclor-1016-2	21580360	20126600	18303100	16719200	16412090	18628270	11.9
Aroclor-1016-3	35495640	32441880	31332630	30204160	30425190	31979900	6.7
Aroclor-1016-4	13828120	14208980	13677940	13011990	13005080	13546420	3.9
Aroclor-1016-5	18865000	18001040	16878220	15870140	15475510	17017980	8.4
Aroclor-1221-1	+++++++	+++++++	6353224	+++++++	+++++++	6353224	0.0
Aroclor-1221-2	+++++++	+++++++	4545968	+++++++	+++++++	4545968	0.0
Aroclor-1221-3	+++++++	+++++++	15598140	+++++++	+++++++	15598140	0.0
Aroclor-1232-1	+++++++	+++++++	8767216	+++++++	+++++++	8767216	0.0
Aroclor-1232-2	+++++++	+++++++	11293760	+++++++	+++++++	11293760	0.0
Aroclor-1232-3	+++++++	+++++++	8562712	+++++++	+++++++	8562712	0.0
Aroclor-1232-4	+++++++	+++++++	7297696	+++++++	+++++++	7297696	0.0
Aroclor-1232-5	+++++++	+++++++	6865992	+++++++	+++++++	6865992	0.0

Amount = Response divided by CF

+++ = Standard Level not used in linearity determination.

(= Calibration Factor (Response divided by Concentration).
() = Relative Standard Deviation.

SUM - 46

Pace Analytical Services, Inc.
Initial Calibration Linearity Summary

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave CF	%RSD
Aroclor-1242-1	+++++++	+++++++	24396530	+++++++	+++++++	24396530	0.0
Aroclor-1242-2	+++++++	+++++++	14694700	+++++++	+++++++	14694700	0.0
Aroclor-1242-3	+++++++	+++++++	13292540	+++++++	+++++++	13292540	0.0
Aroclor-1242-4	+++++++	+++++++	7721456	+++++++	+++++++	7721456	0.0
Aroclor-1242-5	+++++++	+++++++	13316530	+++++++	+++++++	13316530	0.0
Aroclor-1248-1	21329120	19944580	17203380	15615040	15120220	17842470	15.2
Aroclor-1248-2	25296320	24797540	21444940	20148310	19658020	22269030	11.8
Aroclor-1248-3	29142080	26409500	23883980	22244350	22725250	24881030	11.6
Aroclor-1248-4	17477160	16931060	15105290	14211620	14462610	15637550	9.5
Aroclor-1248-5	14361120	14502380	12661540	11924180	11878890	13065620	9.8
Aroclor-1254-1	27268520	25718200	23293680	21869140	22194020	24072710	9.7
Aroclor-1254-2	36707360	33739920	31321980	29216420	29405680	32078270	9.9
Aroclor-1254-3	44497200	42129340	41961500	40881030	42922180	42478650	3.2
Aroclor-1254-4	30249600	28840840	29234550	27432400	28877890	28927060	3.5
Aroclor-1254-5	37842200	35501060	35625710	33580940	34665920	35447170	4.4
Aroclor-1260-1	35298080	36560120	35706200	33592820	32766870	34784820	4.5
Aroclor-1260-2	53645800	47929620	45895360	44278880	42841800	46918290	9.0
Aroclor-1260-3	40320200	37041540	35528760	33666380	32996950	35910770	8.2
Aroclor-1260-4	39073440	35343300	34918500	33625140	32792140	35150500	6.9
Aroclor-1260-5	44436400	40546620	39621560	39685900	38259590	40510020	5.8

Amount = Response divided by CF

+++ - Standard Level not used in linearity determination.

CF - Calibration Factor (response divided by concentration).
RSD - Relative Standard Deviation.

SUM - 47

Pace Analytical Services, Inc.
Initial Calibration Linearity Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 19-MAY-2008 19:09
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-1.b\Q51908-1PCB.M
Method : Method 8082
Sublist : Surrogates.sub
Column : RTX-CLP
Column Size : 30m L - 0.32mm ID

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-1.b/Q5190808.d
Level 2: //diana/target/6890q.i/Q51908PCB-1.b/Q5190809.d
Level 3: //diana/target/6890q.i/Q51908PCB-1.b/Q5190810.d
Level 4: //diana/target/6890q.i/Q51908PCB-1.b/Q5190811.d
Level 5: //diana/target/6890q.i/Q51908PCB-1.b/Q5190812.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave CF	%RSD
1 Tetrachloro-m-xylene	655901200	638910400	686248400	683725000	686643400	670285700	3.2
11 Decachlorobiphenyl	1009197000	911369400	868273300	834227200	795754100	883764200	9.3

Amount = Response divided by CF

CF - Calibration Factor (response divided by concentration).
RSD - Relative Standard Deviation.

Pace Analytical Services, Inc.
Initial Calibration Retention Time Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 22-MAY-2008 18:29
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-1.b\Q51908-1PCB.M
Method : Method 8082
Sublist : 8082.sub
Column : RTX-CLP
Column Size : 30m L - 0.32mm ID

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-1.b/Q5220811.d
Level 2: //diana/target/6890q.i/Q51908PCB-1.b/Q5220812.d
Level 3: //diana/target/6890q.i/Q51908PCB-1.b/Q5190810.d
Level 4: //diana/target/6890q.i/Q51908PCB-1.b/Q5220814.d
Level 5: //diana/target/6890q.i/Q51908PCB-1.b/Q5220815.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave RT
Aroclor-1016-1	8.06	8.06	8.06	8.06	8.06	8.060
Aroclor-1016-2	8.73	8.73	8.73	8.73	8.73	8.730
Aroclor-1016-3	9.57	9.56	9.56	9.56	9.56	9.562
Aroclor-1016-4	9.89	9.89	9.89	9.89	9.89	9.890
Aroclor-1016-5	10.46	10.46	10.46	10.46	10.46	10.460
Aroclor-1221-1	+++++++	+++++++	7.68	+++++++	+++++++	7.680
Aroclor-1221-2	+++++++	+++++++	7.98	+++++++	+++++++	7.980
Aroclor-1221-3	+++++++	+++++++	8.06	+++++++	+++++++	8.060
Aroclor-1232-1	+++++++	+++++++	8.73	+++++++	+++++++	8.730
Aroclor-1232-2	+++++++	+++++++	9.53	+++++++	+++++++	9.530
Aroclor-1232-3	+++++++	+++++++	9.79	+++++++	+++++++	9.790
Aroclor-1232-4	+++++++	+++++++	10.46	+++++++	+++++++	10.460
Aroclor-1232-5	+++++++	+++++++	11.13	+++++++	+++++++	11.130

+++ - Standard level not used in linearity determination.
Retention times are expressed as minutes.

Pace Analytical Services, Inc.
Initial Calibration Retention Time Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 22-MAY-2008 18:29
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-1.b\Q51908-1PCB.M
Method : Method 8082
Sublist : 8082.sub
Column : RTX-CLP
Column Size : 30m L - 0.32mm ID

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave RT
Aroclor-1242-1	+++++++	+++++++	9.56	+++++++	+++++++	9.560
Aroclor-1242-2	+++++++	+++++++	9.79	+++++++	+++++++	9.790
Aroclor-1242-3	+++++++	+++++++	10.46	+++++++	+++++++	10.460
Aroclor-1242-4	+++++++	+++++++	11.00	+++++++	+++++++	11.000
Aroclor-1242-5	+++++++	+++++++	11.13	+++++++	+++++++	11.130
Aroclor-1248-1	10.09	10.09	10.09	10.09	10.09	10.090
Aroclor-1248-2	10.46	10.46	10.46	10.46	10.46	10.460
Aroclor-1248-3	11.13	11.13	11.13	11.13	11.13	11.130
Aroclor-1248-4	11.48	11.48	11.48	11.48	11.48	11.480
Aroclor-1248-5	12.08	12.08	12.08	12.08	12.08	12.080
Aroclor-1254-1	11.07	11.06	11.06	11.06	11.06	11.062
Aroclor-1254-2	11.47	11.47	11.47	11.47	11.47	11.470
Aroclor-1254-3	12.08	12.08	12.08	12.08	12.08	12.080
Aroclor-1254-4	12.51	12.50	12.50	12.50	12.50	12.502
Aroclor-1254-5	13.19	13.19	13.19	13.19	13.18	13.188
Aroclor-1260-1	12.35	12.35	12.35	12.35	12.35	12.350
Aroclor-1260-2	12.77	12.76	12.76	12.76	12.76	12.762
Aroclor-1260-3	13.35	13.34	13.35	13.34	13.34	13.344
Aroclor-1260-4	13.72	13.71	13.71	13.71	13.71	13.712
Aroclor-1260-5	14.58	14.58	14.58	14.58	14.58	14.580

+++ - Standard level not used in linearity determination.
Retention times are expressed as minutes.

Pace Analytical Services, Inc.
Initial Calibration Retention Time Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 19-MAY-2008 19:09
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-1.b\Q51908-1PCB.M
Method : Method 8082
Sublist : Surrogates.sub
Column : RTX-CLP
Column Size : 30m L - 0.32mm ID

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-1.b/Q5190808.d
Level 2: //diana/target/6890q.i/Q51908PCB-1.b/Q5190809.d
Level 3: //diana/target/6890q.i/Q51908PCB-1.b/Q5190810.d
Level 4: //diana/target/6890q.i/Q51908PCB-1.b/Q5190811.d
Level 5: //diana/target/6890q.i/Q51908PCB-1.b/Q5190812.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave RT
1 Tetrachloro-m-xylene	7.30	7.30	7.30	7.30	7.30	7.300
11 Decachlorobiphenyl	16.16	16.16	16.16	16.15	16.16	16.158

Retention times are expressed as minutes.

Pace Analytical Services, Inc.
Initial Calibration Amounts Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 22-MAY-2008 18:29
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-1.b\Q51908-1PCB.M
Method : Method 8082
Sublist : 8082.sub
Column : RTX-CLP
Column Size : 30m L - 0.32mm ID

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-1.b/Q5220811.d
Level 2: //diana/target/6890q.i/Q51908PCB-1.b/Q5220812.d
Level 3: //diana/target/6890q.i/Q51908PCB-1.b/Q5190810.d
Level 4: //diana/target/6890q.i/Q51908PCB-1.b/Q5220814.d
Level 5: //diana/target/6890q.i/Q51908PCB-1.b/Q5220815.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
Aroclor-1016-1	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1016-2	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1016-3	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1016-4	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1016-5	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1221-1	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1221-2	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1221-3	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1232-1	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1232-2	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1232-3	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1232-4	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1232-5	+++++++	+++++++	0.12500	+++++++	+++++++

+++ - Standard Level not used in linearity determination.
Standard concentrations are expressed as ng.

Pace Analytical Services, Inc.
Initial Calibration Amounts Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 22-MAY-2008 18:29
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-1.b\Q51908-1PCB.M
Method : Method 8082
Sublist : 8082.sub
Column : RTX-CLP
Column Size : 30m L - 0.32mm ID

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
Aroclor-1242-1	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1242-2	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1242-3	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1242-4	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1242-5	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1248-1	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1248-2	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1248-3	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1248-4	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1248-5	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1254-1	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1254-2	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1254-3	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1254-4	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1254-5	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1260-1	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1260-2	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1260-3	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1260-4	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1260-5	0.02500	0.05000	0.12500	0.25000	0.50000

+++ - Standard Level not used in linearity determination.
Standard concentrations are expressed as ng.

Pace Analytical Services, Inc.
Initial Calibration Amounts Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 19-MAY-2008 19:09
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-1.b\Q51908-1PCB.M
Method : Method 8082
Sublist : Surrogates.sub
Column : RTX-CLP
Column Size : 30m L - 0.32mm ID

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-1.b/Q5190808.d
Level 2: //diana/target/6890q.i/Q51908PCB-1.b/Q5190809.d
Level 3: //diana/target/6890q.i/Q51908PCB-1.b/Q5190810.d
Level 4: //diana/target/6890q.i/Q51908PCB-1.b/Q5190811.d
Level 5: //diana/target/6890q.i/Q51908PCB-1.b/Q5190812.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
1 Tetrachloro-m-xylene	0.00250	0.00500	0.01250	0.02500	0.05000
11 Decachlorobiphenyl	0.00250	0.00500	0.01250	0.02500	0.05000

Standard concentrations are expressed as ng.

Pace Analytical Services, Inc.
Initial Calibration Response Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 22-MAY-2008 18:29
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-1.b\Q51908-1PCB.M
Method : Method 8082
Sublist : 8082.sub
Column : RTX-CLP
Column Size : 30m L - 0.32mm ID

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-1.b/Q5220811.d
Level 2: //diana/target/6890q.i/Q51908PCB-1.b/Q5220812.d
Level 3: //diana/target/6890q.i/Q51908PCB-1.b/Q5190810.d
Level 4: //diana/target/6890q.i/Q51908PCB-1.b/Q5220814.d
Level 5: //diana/target/6890q.i/Q51908PCB-1.b/Q5220815.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
Aroclor-1016-1	338362.00	645670.00	1522185.0	2851096.0	5403269.0
Aroclor-1016-2	539509.00	1006330.0	2287888.0	4179801.0	8206047.0
Aroclor-1016-3	887391.00	1622094.0	3916579.0	7551041.0	15212595
Aroclor-1016-4	345703.00	710449.00	1709743.0	3252998.0	6502538.0
Aroclor-1016-5	471625.00	900052.00	2109778.0	3967536.0	7737753.0
Aroclor-1221-1	+++++++	+++++++	794153.00	+++++++	+++++++
Aroclor-1221-2	+++++++	+++++++	568246.00	+++++++	+++++++
Aroclor-1221-3	+++++++	+++++++	1949767.0	+++++++	+++++++
Aroclor-1232-1	+++++++	+++++++	1095902.0	+++++++	+++++++
Aroclor-1232-2	+++++++	+++++++	1411720.0	+++++++	+++++++
Aroclor-1232-3	+++++++	+++++++	1070339.0	+++++++	+++++++
Aroclor-1232-4	+++++++	+++++++	912212.00	+++++++	+++++++
Aroclor-1232-5	+++++++	+++++++	858249.00	+++++++	+++++++

+++ - Standard Level not used in linearity determination.
Response is in Height units.

Pace Analytical Services, Inc.
Initial Calibration Response Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 22-MAY-2008 18:29
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-1.b\Q51908-1PCB.M
Method : Method 8082
Sublist : 8082.sub
Column : RTX-CLP
Column Size : 30m L - 0.32mm ID

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
Aroclor-1242-1	+++++++	+++++++	3049566.0	+++++++	+++++++
Aroclor-1242-2	+++++++	+++++++	1836838.0	+++++++	+++++++
Aroclor-1242-3	+++++++	+++++++	1661568.0	+++++++	+++++++
Aroclor-1242-4	+++++++	+++++++	965182.00	+++++++	+++++++
Aroclor-1242-5	+++++++	+++++++	1664566.0	+++++++	+++++++
Aroclor-1248-1	533228.00	997229.00	2150422.0	3903760.0	7560110.0
Aroclor-1248-2	632408.00	1239877.0	2680618.0	5037083.0	9829009.0
Aroclor-1248-3	728552.00	1320475.0	2985498.0	5561088.0	11362626
Aroclor-1248-4	436929.00	846553.00	1888161.0	3552906.0	7231304.0
Aroclor-1248-5	359028.00	725119.00	1582692.0	2981046.0	5939443.0
Aroclor-1254-1	681713.00	1285910.0	2911710.0	5472284.0	11097011
Aroclor-1254-2	917684.00	1686996.0	3915247.0	7304105.0	14702842
Aroclor-1254-3	1112430.0	2106467.0	5245187.0	10220758	21461092
Aroclor-1254-4	756240.00	1442042.0	3654319.0	6858100.0	14438943
Aroclor-1254-5	946055.00	1775053.0	4453214.0	8395236.0	17342958
Aroclor-1260-1	882452.00	1828006.0	4463275.0	8398206.0	16383436
Aroclor-1260-2	1341145.0	2396481.0	5736920.0	11069719	21420900
Aroclor-1260-3	1008005.0	1852077.0	4441095.0	8416596.0	16498477
Aroclor-1260-4	976836.00	1767165.0	4364813.0	8406285.0	16396071
Aroclor-1260-5	1110910.0	2027331.0	4952695.0	9921476.0	19129797

+++ - Standard Level not used in linearity determination.
Response is in Height units.

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Pace Analytical Services, Inc.
Initial Calibration Response Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 19-MAY-2008 19:09
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-1.b\Q51908-1PCB.M
Method : Method 8082
Sublist : Surrogates.sub
Column : RTX-CLP
Column Size : 30m L - 0.32mm ID

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-1.b/Q5190808.d
Level 2: //diana/target/6890q.i/Q51908PCB-1.b/Q5190809.d
Level 3: //diana/target/6890q.i/Q51908PCB-1.b/Q5190810.d
Level 4: //diana/target/6890q.i/Q51908PCB-1.b/Q5190811.d
Level 5: //diana/target/6890q.i/Q51908PCB-1.b/Q5190812.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
1 Tetrachloro-m-xylene	1639753.0	3194552.0	8578105.0	17093124	34332169
11 Decachlorobiphenyl	2522993.0	4556847.0	10853416	20855679	39787706

Response is in Height units.

Pace Analytical Services, Inc.
Initial Calibration Linearity Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 22-MAY-2008 18:29
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-2.b\Q51908-2PCB.M
Method : Method 8082
Sublist : 8082.sub
Column : RTX-CLP2
Column Size : 30m L - 0.32mm ID

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-2.b/Q5220811.d
Level 2: //diana/target/6890q.i/Q51908PCB-2.b/Q5220812.d
Level 3: //diana/target/6890q.i/Q51908PCB-2.b/Q5220805.d
Level 4: //diana/target/6890q.i/Q51908PCB-2.b/Q5220814.d
Level 5: //diana/target/6890q.i/Q51908PCB-2.b/Q5220815.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave CF	%RSD
Aroclor-1016-1	13162160	12286440	11585980	10655320	10291520	11596280	10.1
Aroclor-1016-2	35108080	31843300	30409500	29646270	29506400	31302710	7.4
Aroclor-1016-3	19412480	18347560	17066990	16205790	16112780	17429120	8.2
Aroclor-1016-4	14695120	13775360	13276690	12668870	12494860	13382180	6.7
Aroclor-1016-5	18048160	18117400	16681570	15526240	14749090	16644490	8.9
Aroclor-1221-1	+++++++	+++++++	6411592	+++++++	+++++++	6411592	0.0
Aroclor-1221-2	+++++++	+++++++	4369896	+++++++	+++++++	4369896	0.0
Aroclor-1221-3	+++++++	+++++++	13658750	+++++++	+++++++	13658750	0.0
Aroclor-1232-1	+++++++	+++++++	12006150	+++++++	+++++++	12006150	0.0
Aroclor-1232-2	+++++++	+++++++	13645230	+++++++	+++++++	13645230	0.0
Aroclor-1232-3	+++++++	+++++++	7879336	+++++++	+++++++	7879336	0.0
Aroclor-1232-4	+++++++	+++++++	6023176	+++++++	+++++++	6023176	0.0
Aroclor-1232-5	+++++++	+++++++	7266800	+++++++	+++++++	7266800	0.0

Amount = Response divided by CF

+++ - Standard Level not used in linearity determination.

CF - Calibration Factor (response divided by concentration).
RSD - Relative Standard Deviation.

Pace Analytical Services, Inc.
Initial Calibration Linearity Summary

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave CF	%RSD
Aroclor-1242-1	+++++++	+++++++	13183900	+++++++	+++++++	13183900	0.0
Aroclor-1242-2	+++++++	+++++++	13217060	+++++++	+++++++	13217060	0.0
Aroclor-1242-3	+++++++	+++++++	12320370	+++++++	+++++++	12320370	0.0
Aroclor-1242-4	+++++++	+++++++	13095340	+++++++	+++++++	13095340	0.0
Aroclor-1242-5	+++++++	+++++++	11112780	+++++++	+++++++	11112780	0.0
Aroclor-1248-1	24373440	24223780	20979980	19597910	19372590	21709540	11.3
Aroclor-1248-2	26297840	24951020	22041450	20847240	20758970	22979300	10.9
Aroclor-1248-3	27078280	25476780	22630700	21849670	22244320	23855950	9.6
Aroclor-1248-4	19423840	19167980	16393820	16479720	16944670	17682010	8.4
Aroclor-1248-5	14995560	14071320	11946000	11475740	11471070	12792140	12.6
Aroclor-1254-1	27586320	26340460	23706870	22263500	22285850	24436600	9.9
Aroclor-1254-2	31068880	29943220	27239750	26211740	26665130	28225740	7.6
Aroclor-1254-3	41064720	39856260	38180250	38442850	39701470	39449110	3.0
Aroclor-1254-4	27042280	26523320	25414750	24870690	26516640	26073540	3.4
Aroclor-1254-5	33757680	31974840	31060530	30215610	31671520	31736040	4.1
Aroclor-1260-1	41393080	36440040	33158180	31569220	31309370	34773980	12.2
Aroclor-1260-2	49709280	44037760	40589200	39517900	39012060	42573240	10.4
Aroclor-1260-3	39783800	35981620	33287590	31561950	31089720	34340940	10.5
Aroclor-1260-4	40184200	35947580	33948070	32263910	31799830	34828720	9.8
Aroclor-1260-5	46798360	41895760	40335620	38913430	38351800	41258990	8.2

Amount = Response divided by CF

+++ - Standard Level not used in linearity determination.

CF - Calibration Factor (response divided by concentration).
RSD - Relative Standard Deviation.

Pace Analytical Services, Inc.
Initial Calibration Linearity Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 19-MAY-2008 19:09
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-2.b\Q51908-2PCB.M
Method : Method 8082
Sublist : Surrogates.sub
Column : RTX-CLP2
Column Size : 30m L - 0.32mm ID

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-2.b/Q5190808.d
Level 2: //diana/target/6890q.i/Q51908PCB-2.b/Q5190809.d
Level 3: //diana/target/6890q.i/Q51908PCB-2.b/Q5190810.d
Level 4: //diana/target/6890q.i/Q51908PCB-2.b/Q5190811.d
Level 5: //diana/target/6890q.i/Q51908PCB-2.b/Q5190812.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave CF	%RSD
1 Tetrachloro-m-xylene	657850800	642447000	665893800	659316800	663804700	657862600	1.4
11 Decachlorobiphenyl	852218800	798838400	765452700	732800400	713891800	780658000	9.0

Amount = Response divided by CF

CF - Calibration Factor (response divided by concentration).
RSD - Relative Standard Deviation.

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Pace Analytical Services, Inc.
Initial Calibration Retention Time Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 22-MAY-2008 18:29
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-2.b\Q51908-2PCB.M
Method : Method 8082
Sublist : 8082.sub
Column : RTX-CLP2
Column Size : 30m L - 0.32mm ID

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-2.b/Q5220811.d
Level 2: //diana/target/6890q.i/Q51908PCB-2.b/Q5220812.d
Level 3: //diana/target/6890q.i/Q51908PCB-2.b/Q5220805.d
Level 4: //diana/target/6890q.i/Q51908PCB-2.b/Q5220814.d
Level 5: //diana/target/6890q.i/Q51908PCB-2.b/Q5220815.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave RT
Aroclor-1016-1	8.17	8.17	8.17	8.17	8.17	8.170
Aroclor-1016-2	9.68	9.67	9.68	9.67	9.67	9.674
Aroclor-1016-3	9.89	9.89	9.89	9.89	9.89	9.890
Aroclor-1016-4	10.06	10.05	10.06	10.05	10.05	10.054
Aroclor-1016-5	10.64	10.63	10.64	10.63	10.64	10.636
Aroclor-1221-1	+++++++	+++++++	7.79	+++++++	+++++++	7.790
Aroclor-1221-2	+++++++	+++++++	8.06	+++++++	+++++++	8.060
Aroclor-1221-3	+++++++	+++++++	8.17	+++++++	+++++++	8.170
Aroclor-1232-1	+++++++	+++++++	8.17	+++++++	+++++++	8.170
Aroclor-1232-2	+++++++	+++++++	9.68	+++++++	+++++++	9.680
Aroclor-1232-3	+++++++	+++++++	9.89	+++++++	+++++++	9.890
Aroclor-1232-4	+++++++	+++++++	10.06	+++++++	+++++++	10.060
Aroclor-1232-5	+++++++	+++++++	10.64	+++++++	+++++++	10.640

+++ - Standard level not used in linearity determination.
Retention times are expressed as minutes.

Pace Analytical Services, Inc.
Initial Calibration Retention Time Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 22-MAY-2008 18:29
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-2.b\Q51908-2PCB.M
Method : Method 8082
Sublist : 8082.sub
Column : RTX-CLP2
Column Size : 30m L - 0.32mm ID

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave RT
Aroclor-1242-1	+++++++	+++++++	9.89	+++++++	+++++++	9.890
Aroclor-1242-2	+++++++	+++++++	10.63	+++++++	+++++++	10.630
Aroclor-1242-3	+++++++	+++++++	11.22	+++++++	+++++++	11.220
Aroclor-1242-4	+++++++	+++++++	11.29	+++++++	+++++++	11.290
Aroclor-1242-5	+++++++	+++++++	11.64	+++++++	+++++++	11.640
Aroclor-1248-1	10.63	10.63	10.63	10.63	10.63	10.630
Aroclor-1248-2	11.22	11.22	11.22	11.22	11.22	11.220
Aroclor-1248-3	11.29	11.29	11.29	11.29	11.29	11.290
Aroclor-1248-4	11.64	11.64	11.64	11.64	11.64	11.640
Aroclor-1248-5	12.27	12.27	12.27	12.26	12.27	12.268
Aroclor-1254-1	11.27	11.27	11.27	11.27	11.27	11.270
Aroclor-1254-2	11.57	11.56	11.56	11.56	11.56	11.562
Aroclor-1254-3	12.26	12.26	12.26	12.26	12.25	12.258
Aroclor-1254-4	12.60	12.60	12.59	12.59	12.59	12.594
Aroclor-1254-5	13.38	13.38	13.38	13.38	13.38	13.380
Aroclor-1260-1	12.56	12.55	12.56	12.55	12.55	12.554
Aroclor-1260-2	12.86	12.86	12.86	12.86	12.86	12.860
Aroclor-1260-3	13.52	13.51	13.52	13.51	13.52	13.516
Aroclor-1260-4	13.95	13.95	13.95	13.95	13.95	13.950
Aroclor-1260-5	14.84	14.84	14.84	14.84	14.84	14.840

+++ - Standard level not used in linearity determination.
Retention times are expressed as minutes.

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Pace Analytical Services, Inc.
Initial Calibration Retention Time Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 19-MAY-2008 19:09
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-2.b\Q51908-2PCB.M
Method : Method 8082
Sublist : Surrogates.sub
Column : RTX-CLP2
Column Size : 30m L - 0.32mm ID

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-2.b/Q5190808.d
Level 2: //diana/target/6890q.i/Q51908PCB-2.b/Q5190809.d
Level 3: //diana/target/6890q.i/Q51908PCB-2.b/Q5190810.d
Level 4: //diana/target/6890q.i/Q51908PCB-2.b/Q5190811.d
Level 5: //diana/target/6890q.i/Q51908PCB-2.b/Q5190812.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave RT
1 Tetrachloro-m-xylene	7.19	7.18	7.19	7.18	7.18	7.184
11 Decachlorobiphenyl	16.55	16.54	16.55	16.54	16.55	16.546

Retention times are expressed as minutes.

Pace Analytical Services, Inc.
Initial Calibration Amounts Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 22-MAY-2008 18:29
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-2.b\Q51908-2PCB.M
Method : Method 8082
Sublist : 8082.sub
Column : RTX-CLP2
Column Size : 30m L - 0.32mm ID

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-2.b/Q5220811.d
Level 2: //diana/target/6890q.i/Q51908PCB-2.b/Q5220812.d
Level 3: //diana/target/6890q.i/Q51908PCB-2.b/Q5220805.d
Level 4: //diana/target/6890q.i/Q51908PCB-2.b/Q5220814.d
Level 5: //diana/target/6890q.i/Q51908PCB-2.b/Q5220815.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
Aroclor-1016-1	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1016-2	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1016-3	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1016-4	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1016-5	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1221-1	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1221-2	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1221-3	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1232-1	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1232-2	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1232-3	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1232-4	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1232-5	+++++++	+++++++	0.12500	+++++++	+++++++

+++ - Standard Level not used in linearity determination.
Standard concentrations are expressed as ng.

Pace Analytical Services, Inc.
Initial Calibration Amounts Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 22-MAY-2008 18:29
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-2.b\Q51908-2PCB.M
Method : Method 8082
Sublist : 8082.sub
Column : RTX-CLP2
Column Size : 30m L - 0.32mm ID

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
Aroclor-1242-1	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1242-2	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1242-3	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1242-4	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1242-5	+++++++	+++++++	0.12500	+++++++	+++++++
Aroclor-1248-1	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1248-2	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1248-3	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1248-4	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1248-5	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1254-1	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1254-2	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1254-3	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1254-4	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1254-5	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1260-1	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1260-2	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1260-3	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1260-4	0.02500	0.05000	0.12500	0.25000	0.50000
Aroclor-1260-5	0.02500	0.05000	0.12500	0.25000	0.50000

+++ - Standard Level not used in linearity determination.
Standard concentrations are expressed as ng.

Pace Analytical Services, Inc.
Initial Calibration Amounts Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 19-MAY-2008 19:09
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-2.b\Q51908-2PCB.M
Method : Method 8082
Sublist : Surrogates.sub
Column : RTX-CLP2
Column Size : 30m L - 0.32mm ID

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-2.b/Q5190808.d
Level 2: //diana/target/6890q.i/Q51908PCB-2.b/Q5190809.d
Level 3: //diana/target/6890q.i/Q51908PCB-2.b/Q5190810.d
Level 4: //diana/target/6890q.i/Q51908PCB-2.b/Q5190811.d
Level 5: //diana/target/6890q.i/Q51908PCB-2.b/Q5190812.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
1 Tetrachloro-m-xylene	0.00250	0.00500	0.01250	0.02500	0.05000
11 Decachlorobiphenyl	0.00250	0.00500	0.01250	0.02500	0.05000

Standard concentrations are expressed as ng.

Pace Analytical Services, Inc.
Initial Calibration Response Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 22-MAY-2008 18:29
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-2.b\Q51908-2PCB.M
Method : Method 8082
Sublist : 8082.sub
Column : RTX-CLP2
Column Size : 30m L - 0.32mm ID

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-2.b/Q5220811.d
Level 2: //diana/target/6890q.i/Q51908PCB-2.b/Q5220812.d
Level 3: //diana/target/6890q.i/Q51908PCB-2.b/Q5220805.d
Level 4: //diana/target/6890q.i/Q51908PCB-2.b/Q5220814.d
Level 5: //diana/target/6890q.i/Q51908PCB-2.b/Q5220815.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
Aroclor-1016-1	329054.00	614322.00	1448248.0	2663830.0	5145762.0
Aroclor-1016-2	877702.00	1592165.0	3801187.0	7411567.0	14753202
Aroclor-1016-3	485312.00	917378.00	2133374.0	4051448.0	8056391.0
Aroclor-1016-4	367378.00	688768.00	1659586.0	3167218.0	6247431.0
Aroclor-1016-5	451204.00	905870.00	2085196.0	3906561.0	7374546.0
Aroclor-1221-1	+++++++	+++++++	801449.00	+++++++	+++++++
Aroclor-1221-2	+++++++	+++++++	546237.00	+++++++	+++++++
Aroclor-1221-3	+++++++	+++++++	1707344.0	+++++++	+++++++
Aroclor-1232-1	+++++++	+++++++	1500769.0	+++++++	+++++++
Aroclor-1232-2	+++++++	+++++++	1705654.0	+++++++	+++++++
Aroclor-1232-3	+++++++	+++++++	984917.00	+++++++	+++++++
Aroclor-1232-4	+++++++	+++++++	752897.00	+++++++	+++++++
Aroclor-1232-5	+++++++	+++++++	908350.00	+++++++	+++++++

+++ - Standard Level not used in linearity determination.
Response is in Height units.

Pace Analytical Services, Inc.
Initial Calibration Response Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 22-MAY-2008 18:29
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-2.b\Q51908-2PCB.M
Method : Method 8082
Sublist : 8082.sub
Column : RTX-CLP2
Column Size : 30m L - 0.32mm ID

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
Aroclor-1242-1	+++++++	+++++++	1647987.0	+++++++	+++++++
Aroclor-1242-2	+++++++	+++++++	1652132.0	+++++++	+++++++
Aroclor-1242-3	+++++++	+++++++	1540046.0	+++++++	+++++++
Aroclor-1242-4	+++++++	+++++++	1636917.0	+++++++	+++++++
Aroclor-1242-5	+++++++	+++++++	1389097.0	+++++++	+++++++
Aroclor-1248-1	609336.00	1211189.0	2622498.0	4899477.0	9686293.0
Aroclor-1248-2	657446.00	1247551.0	2755181.0	5211809.0	10379483
Aroclor-1248-3	676957.00	1273839.0	2828838.0	5462417.0	11122159
Aroclor-1248-4	485596.00	958399.00	2049228.0	4119930.0	8472333.0
Aroclor-1248-5	374914.00	703566.00	1493250.0	2868934.0	5735533.0
Aroclor-1254-1	689658.00	1317023.0	2963359.0	5565875.0	11142925
Aroclor-1254-2	776722.00	1497161.0	3404969.0	6552936.0	13332565
Aroclor-1254-3	1026618.0	1992813.0	4772531.0	9610713.0	19850733
Aroclor-1254-4	676057.00	1326166.0	3176844.0	6217673.0	13258318
Aroclor-1254-5	843942.00	1598742.0	3882566.0	7553903.0	15835761
Aroclor-1260-1	1034827.0	1822002.0	4144772.0	7892306.0	15654684
Aroclor-1260-2	1242732.0	2201888.0	5073650.0	9879476.0	19506030
Aroclor-1260-3	994595.00	1799081.0	4160949.0	7890487.0	15544859
Aroclor-1260-4	1004605.0	1797379.0	4243509.0	8065977.0	15899916
Aroclor-1260-5	1169959.0	2094788.0	5041952.0	9728357.0	19175899

+++ - Standard Level not used in linearity determination.
Response is in Height units.

Pace Analytical Services, Inc.
Initial Calibration Response Summary

Start Cal Date: 19-MAY-2008 14:11
End Cal Date : 19-MAY-2008 19:09
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : Falcon
Method File : \\diana\target\6890q.i\Q51908PCB-2.b\Q51908-2PCB.M
Method : Method 8082
Sublist : Surrogates.sub
Column : RTX-CLP2
Column Size : 30m L - 0.32mm ID

Calibration Files:
Level 1: //diana/target/6890q.i/Q51908PCB-2.b/Q5190808.d
Level 2: //diana/target/6890q.i/Q51908PCB-2.b/Q5190809.d
Level 3: //diana/target/6890q.i/Q51908PCB-2.b/Q5190810.d
Level 4: //diana/target/6890q.i/Q51908PCB-2.b/Q5190811.d
Level 5: //diana/target/6890q.i/Q51908PCB-2.b/Q5190812.d

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
1 Tetrachloro-m-xylene	1644627.0	3212235.0	8323672.0	16482921	33190234
11 Decachlorobiphenyl	2230547.0	3994192.0	9568159.0	18322210	35694589

Response is in Height units.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-1.b/Q5200812.d
Injection Date : 20-MAY-2008 16:00
Sample Info : AR1660 2nd (L3)
Misc. Info : Method 8082
Laboratory ID : AR1660 2nd (L3)
Instrument ID : 6890Q.i Operator : GailR
Method : Q51908-1PCB.m Method Sublist : AR1660S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1016	1	8.06	7.99 - 8.13	1493409	0.12274	0.123
	2	8.73	8.66 - 8.80	2332040	0.12519	0.125
	3	9.56	9.50 - 9.64	4003261	0.12518	0.125
	4	9.89	9.82 - 9.96	1724014	0.12727	0.127
	5	10.46	10.39 - 10.53	2068790	0.12156	0.122
			Average Amount :		0.12439	
			Expected Amount :		0.12500	
			Percent Difference :		-0	
Aroclor-1260	1	12.35	12.28 - 12.42	4392759	0.12628	0.126
	2	12.76	12.70 - 12.84	5674467	0.12094	0.121
	3	13.34	13.28 - 13.42	3702094	0.10309	0.103
	4	13.71	13.64 - 13.78	3702384	0.10533	0.105
	5	14.58	14.51 - 14.65	4880661	0.12048	0.120
			Average Amount :		0.11522	
			Expected Amount :		0.12500	
			Percent Difference :		-8	

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.30	7.25 - 7.35	0.012500	0.010590	-15	
Decachlorobiphenyl	16.15	16.06 - 16.26	0.012500	0.010956	-12	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-2.b/Q5200812.d
Injection Date : 20-MAY-2008 16:00
Sample Info : AR1660 2nd (L3)
Misc. Info : Method 8082
Laboratory ID : AR1660 2nd (L3)
Instrument ID : 6890Q.i Operator : GR
Method : Q51908-2PCB.m Method Sublist : AR1660S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP2 Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1016	1	8.17	8.10 - 8.24	1415614	0.12207	0.122
	2	9.67	9.60 - 9.74	3858703	0.12327	0.123
	3	9.89	9.82 - 9.96	2122488	0.12178	0.122
	4	10.05	9.98 - 10.12	1663089	0.12428	0.124
	5	10.63	10.56 - 10.70	2019308	0.12132	0.121
			Average Amount :		0.12254	
			Expected Amount :		0.12500	
			Percent Difference :		-2	
Aroclor-1260	1	12.55	12.48 - 12.62	4020316	0.11561	0.116
	2	12.86	12.79 - 12.93	5147093	0.12090	0.121
	3	13.51	13.45 - 13.59	3403620	0.099113	0.0991
	4	13.95	13.88 - 14.02	3600233	0.10337	0.103
	5	14.84	14.77 - 14.91	4653086	0.11278	0.113
			Average Amount :		0.11035	
			Expected Amount :		0.12500	
			Percent Difference :		-12	

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.18	7.14 - 7.24	0.012500	0.010633	-15	
Decachlorobiphenyl	16.54	16.45 - 16.65	0.012500	0.010654	-15	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-1.b/Q5220808.d
Injection Date : 22-MAY-2008 14:37
Sample Info : AR1248 2nd CCV
Misc. Info : Method 8082
Laboratory ID : AR1248 2nd CCV
Instrument ID : 6890Q.i Operator : GailR
Method : Q51908-1PCB.m Method Sublist : AR1248S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1248	1	10.09	10.02 - 10.16	2139897	0.11993	0.120
	2	10.46	10.39 - 10.53	2695119	0.12102	0.121
	3	11.13	11.06 - 11.20	2926781	0.11763	0.118
	4	11.48	11.41 - 11.55	1859766	0.11893	0.119
	5	12.08	12.01 - 12.15	1615595	0.12365	0.124

Average Amount : 0.12023
Expected Amount : 0.12500
Percent Difference : -4

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.29	7.24 - 7.34	0.012500	0.010283	-18	
Decachlorobiphenyl	16.15	16.06 - 16.26	0.012500	0.011038	-12	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-2.b/Q5220808.d
Injection Date : 22-MAY-2008 14:37
Sample Info : AR1248 2nd CCV
Misc. Info : Method 8082
Laboratory ID : AR1248 2nd CCV
Instrument ID : 6890Q.i Operator : GR
Method : Q51908-2PCB.M Method Sublist : AR1248S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP2 Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1248	1	10.62	10.56 - 10.70	2585835	0.11911	0.119
	2	11.21	11.15 - 11.29	2670055	0.11619	0.116
	3	11.28	11.22 - 11.36	2781032	0.11658	0.116
	4	11.63	11.57 - 11.71	2077852	0.11751	0.118
	5	12.26	12.20 - 12.34	1572662	0.12294	0.123

Average Amount : 0.11847
Expected Amount : 0.12500
Percent Difference : -5

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.17	7.13 - 7.23	0.012500	0.010008	-20	
Decachlorobiphenyl	16.53	16.45 - 16.65	0.012500	0.010375	-17	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-1.b/Q5220816.d
Injection Date : 22-MAY-2008 19:02
Sample Info : AR1254 2nd CCV
Misc. Info : Method 8082
Laboratory ID : AR1254 2nd CCV
Instrument ID : 6890Q.i Operator : GailR
Method : Q51908-1PCB.m Method Sublist : AR1254
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1254	1	11.06	10.99 - 11.13	2649204	0.11005	0.110
	2	11.46	11.40 - 11.54	3667550	0.11433	0.114
	3	12.08	12.01 - 12.15	5169184	0.12169	0.122
	4	12.50	12.43 - 12.57	3991738	0.13799	0.138
	5	13.18	13.11 - 13.25	4516085	0.12740	0.127

Average Amount : 0.12229
Expected Amount : 0.12500
Percent Difference : -2

Percent Difference = 100 X (Average Amount - Expected Amount) divided by Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-2.b/Q5220816.d
Injection Date : 22-MAY-2008 19:02
Sample Info : AR1254 2nd CCV
Misc. Info : Method 8082
Laboratory ID : AR1254 2nd CCV
Instrument ID : 6890Q.i Operator : GR
Method : Q51908-2PCB.M Method Sublist : AR1254S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP2 Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1254	1	11.27	11.20 - 11.34	2758221	0.11287	0.113
	2	11.56	11.49 - 11.63	3264550	0.11566	0.116
	3	12.25	12.18 - 12.32	4876656	0.12362	0.124
	4	12.59	12.52 - 12.66	3586457	0.13755	0.138
	5	13.38	13.31 - 13.45	4001526	0.12609	0.126
				Average Amount :	0.12316	
				Expected Amount :	0.12500	
				Percent Difference :	-1	

Percent Difference = 100 X (Average Amount - Expected Amount) divided by Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-1.b/Q6030803.d
Injection Date : 03-JUN-2008 15:32
Sample Info : AR1660 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1660 CCV (L3)
Instrument ID : 6890Q.i Operator : GailR
Method : Q51908-1PCB.m Method Sublist : AR1660S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1016	1	8.05	7.99 - 8.13	1551331	0.12750	0.128
	2	8.72	8.66 - 8.80	2299058	0.12342	0.123
	3	9.56	9.49 - 9.63	3795270	0.11868	0.119
	4	9.89	9.82 - 9.96	1625729	0.12001	0.120
	5	10.46	10.39 - 10.53	1993688	0.11715	0.117
				Average Amount :	0.12135	
				Expected Amount :	0.12500	
				Percent Difference :	-3	
Aroclor-1260	1	12.35	12.28 - 12.42	4166387	0.11978	0.120
	2	12.76	12.69 - 12.83	5148312	0.10973	0.110
	3	13.35	13.27 - 13.41	3959501	0.11026	0.110
	4	13.71	13.64 - 13.78	3855317	0.10968	0.110
	5	14.58	14.51 - 14.65	4132103	0.10200	0.102
				Average Amount :	0.11029	
				Expected Amount :	0.12500	
				Percent Difference :	-12	

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.29	7.25 - 7.35	0.012500	0.012814	3	
Decachlorobiphenyl	16.16	16.06 - 16.26	0.012500	0.010195	-18	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-2.b/Q6030803.d
Injection Date : 03-JUN-2008 15:32
Sample Info : AR1660 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1660 CCV (L3)
Instrument ID : 6890Q.i Operator : GR
Method : Q51908-2PCB.m Method Sublist : AR1660S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB 5
Column : RTX-CLP2 Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1016	1	8.15	8.10 - 8.24	1464127	0.12626	0.126
	2	9.66	9.60 - 9.74	3739568	0.11946	0.119
	3	9.87	9.82 - 9.96	2020502	0.11593	0.116
	4	10.04	9.98 - 10.12	1515839	0.11327	0.113
	5	10.62	10.57 - 10.71	1976474	0.11875	0.119
			Average Amount :		0.11873	
			Expected Amount :		0.12500	
			Percent Difference :		-5	
Aroclor-1260	1	12.54	12.48 - 12.62	3986701	0.11465	0.115
	2	12.85	12.79 - 12.93	4869220	0.11437	0.114
	3	13.50	13.45 - 13.59	4128320	0.12022	0.120
	4	13.93	13.88 - 14.02	3974631	0.11412	0.114
	5	14.82	14.77 - 14.91	4657303	0.11288	0.113
			Average Amount :		0.11525	
			Expected Amount :		0.12500	
			Percent Difference :		-8	

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.16	7.13 - 7.23	0.012500	0.012816	3	
Decachlorobiphenyl	16.53	16.45 - 16.65	0.012500	0.010447	-16	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-1.b/Q6030804.d
Injection Date : 03-JUN-2008 16:05
Sample Info : AR1248 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1248 CCV (L3)
Instrument ID : 6890Q.i Operator : GailR
Method : Q51908-1PCB.m Method Sublist : AR1248
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1248	1	10.09	10.02 - 10.16	1997243	0.11194	0.112
	2	10.45	10.39 - 10.53	2519501	0.11314	0.113
	3	11.13	11.06 - 11.20	2653801	0.10666	0.107
	4	11.48	11.41 - 11.55	1683630	0.10766	0.108
	5	12.08	12.01 - 12.15	1390165	0.10640	0.106

Average Amount : 0.10916
Expected Amount : 0.12500
Percent Difference : -13

Percent Difference = 100 X (Average Amount - Expected Amount) divided by Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-2.b/Q6030804.d
Injection Date : 03-JUN-2008 16:05
Sample Info : AR1248 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1248 CCV (L3)
Instrument ID : 6890Q.i Operator : GR
Method : Q51908-2PCB.m Method Sublist : AR1248
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP2 Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1248	1	10.62	10.56 - 10.70	2461928	0.11340	0.113
	2	11.21	11.15 - 11.29	2375684	0.10338	0.103
	3	11.28	11.22 - 11.36	2468133	0.10346	0.103
	4	11.63	11.57 - 11.71	1795124	0.10152	0.102
	5	12.25	12.20 - 12.34	1383561	0.10816	0.108

Average Amount : 0.10598
Expected Amount : 0.12500
Percent Difference : -15

Percent Difference = 100 X (Average Amount - Expected Amount) divided by Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-1.b/Q6030815.d
Injection Date : 03-JUN-2008 22:09
Sample Info : AR1660 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1660 CCV (L3)
Instrument ID : 6890Q.i Operator : GailR
Method : Q51908-1PCB.m Method Sublist : AR1660S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1016	1	8.05	7.99 - 8.13	1516269	0.12462	0.125
	2	8.72	8.66 - 8.80	2269418	0.12183	0.122
	3	9.56	9.49 - 9.63	3806073	0.11901	0.119
	4	9.89	9.82 - 9.96	1634330	0.12065	0.121
	5	10.45	10.39 - 10.53	1970140	0.11577	0.116
			Average Amount :		0.12037	
			Expected Amount :		0.12500	
			Percent Difference :		-4	
Aroclor-1260	1	12.35	12.28 - 12.42	4177350	0.12009	0.120
	2	12.76	12.69 - 12.83	5319868	0.11338	0.113
	3	13.34	13.27 - 13.41	3976411	0.11073	0.111
	4	13.71	13.64 - 13.78	3861361	0.10985	0.110
	5	14.58	14.51 - 14.65	4356695	0.10755	0.108
			Average Amount :		0.11232	
			Expected Amount :		0.12500	
			Percent Difference :		-10	

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.29	7.25 - 7.35	0.012500	0.012548	0	
Decachlorobiphenyl	16.15	16.06 - 16.26	0.012500	0.010400	-17	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-2.b/Q6030815.d
Injection Date : 03-JUN-2008 22:09
Sample Info : AR1660 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1660 CCV (L3)
Instrument ID : 6890Q.i Operator : GR
Method : Q51908-2PCB.m Method Sublist : AR1660S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP2 Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1016	1	8.15	8.10 - 8.24	1476125	0.12729	0.127
	2	9.66	9.60 - 9.74	3789458	0.12106	0.121
	3	9.87	9.82 - 9.96	2078152	0.11923	0.119
	4	10.04	9.98 - 10.12	1586068	0.11852	0.118
	5	10.62	10.57 - 10.71	2001609	0.12026	0.120
				Average Amount :	0.12127	
				Expected Amount :	0.12500	
				Percent Difference :	-3	
Aroclor-1260	1	12.54	12.48 - 12.62	4034036	0.11601	0.116
	2	12.84	12.79 - 12.93	5013815	0.11777	0.118
	3	13.50	13.45 - 13.59	4270720	0.12436	0.124
	4	13.93	13.88 - 14.02	3979899	0.11427	0.114
	5	14.82	14.77 - 14.91	4858125	0.11775	0.118
				Average Amount :	0.11803	
				Expected Amount :	0.12500	
				Percent Difference :	-6	

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.16	7.13 - 7.23	0.012500	0.012701	2	
Decachlorobiphenyl	16.53	16.45 - 16.65	0.012500	0.010926	-13	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-1.b/Q6030816.d
Injection Date : 03-JUN-2008 22:42
Sample Info : AR1248 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1248 CCV (L3)
Instrument ID : 6890Q.i Operator : GailR
Method : Q51908-1PCB.m Method Sublist : AR1248
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1248	1	10.09	10.02 - 10.16	2030362	0.11379	0.114
	2	10.45	10.39 - 10.53	2534122	0.11380	0.114
	3	11.13	11.06 - 11.20	2748475	0.11046	0.110
	4	11.48	11.41 - 11.55	1755890	0.11229	0.112
	5	12.08	12.01 - 12.15	1471881	0.11265	0.113

Average Amount : 0.11260
Expected Amount : 0.12500
Percent Difference : -10

Percent Difference = 100 X (Average Amount - Expected Amount) divided by Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-2.b/Q6030816.d
Injection Date : 03-JUN-2008 22:42
Sample Info : AR1248 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1248 CCV (L3)
Instrument ID : 6890Q.i Operator : GR
Method : Q51908-2PCB.m Method Sublist : AR1248
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP2 Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1248	1	10.62	10.56 - 10.70	2555385	0.11771	0.118
	2	11.21	11.15 - 11.29	2555405	0.11120	0.111
	3	11.28	11.22 - 11.36	2675389	0.11215	0.112
	4	11.62	11.57 - 11.71	1941560	0.10980	0.110
	5	12.25	12.20 - 12.34	1427012	0.11155	0.112

Average Amount : 0.11248
Expected Amount : 0.12500
Percent Difference : -10

Percent Difference = 100 X (Average Amount - Expected Amount) divided by Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-1.b/Q6030827.d
Injection Date : 04-JUN-2008 04:45
Sample Info : AR1660 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1660 CCV (L3)
Instrument ID : 6890Q.i Operator : GailR
Method : Q51908-1PCB.m Method Sublist : AR1660S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1016	1	8.05	7.99 - 8.13	1575247	0.12947	0.129
	2	8.72	8.66 - 8.80	2306242	0.12380	0.124
	3	9.56	9.49 - 9.63	4012192	0.12546	0.125
	4	9.88	9.82 - 9.96	1718990	0.12690	0.127
	5	10.45	10.39 - 10.53	2092083	0.12293	0.123
				Average Amount :	0.12571	
				Expected Amount :	0.12500	
				Percent Difference :	1	
Aroclor-1260	1	12.35	12.28 - 12.42	4375493	0.12579	0.126
	2	12.76	12.69 - 12.83	5683640	0.12114	0.121
	3	13.34	13.27 - 13.41	4206581	0.11714	0.117
	4	13.71	13.64 - 13.78	4152830	0.11814	0.118
	5	14.57	14.51 - 14.65	4794092	0.11834	0.118
				Average Amount :	0.12011	
				Expected Amount :	0.12500	
				Percent Difference :	-4	

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.29	7.25 - 7.35	0.012500	0.012652	1	
Decachlorobiphenyl	16.15	16.06 - 16.26	0.012500	0.011078	-11	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-2.b/Q6030827.d
Injection Date : 04-JUN-2008 04:45
Sample Info : AR1660 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1660 CCV (L3)
Instrument ID : 6890Q.i Operator : GR
Method : Q51908-2PCB.m Method Sublist : AR1660S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP2 Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1016	1	8.15	8.10 - 8.24	1486807	0.12821	0.128
	2	9.65	9.60 - 9.74	3999963	0.12778	0.128
	3	9.87	9.82 - 9.96	2205273	0.12653	0.126
	4	10.04	9.98 - 10.12	1655996	0.12375	0.124
	5	10.62	10.57 - 10.71	2089441	0.12553	0.126
			Average Amount :		0.12636	
			Expected Amount :		0.12500	
			Percent Difference :		1	
Aroclor-1260	1	12.54	12.48 - 12.62	4252368	0.12228	0.122
	2	12.84	12.79 - 12.93	5375247	0.12626	0.126
	3	13.50	13.45 - 13.59	4493631	0.13085	0.131
	4	13.93	13.88 - 14.02	4189974	0.12030	0.120
	5	14.82	14.77 - 14.91	5170815	0.12532	0.125
			Average Amount :		0.12500	
			Expected Amount :		0.12500	
			Percent Difference :		0	

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.16	7.13 - 7.23	0.012500	0.012924	3	
Decachlorobiphenyl	16.52	16.45 - 16.65	0.012500	0.011437	-9	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

: //diana/target/6890q.i/Q51908PCB-1.b/Q6030828.d
: 04-JUN-2008 05:18
: AR1248 CCV (L3)
: Method 8082
: AR1248 CCV (L3)
: 6890Q.i Operator : GailR
: Q51908-1PCB.m Method Sublist : AR1248
: ESTD Integrator : Falcon
: 1.00 Sample Type: CCALIB_5
: RTX-CLP Column Size: 30m 0.32mm

Peak	RT	Window	Response	Amount ng	Conc
1	10.08	10.02 - 10.16	2058286	0.11536	0.115
2	10.45	10.39 - 10.53	2573919	0.11558	0.116
3	11.13	11.06 - 11.20	2813749	0.11309	0.113
4	11.48	11.41 - 11.55	1801612	0.11521	0.115
5	12.08	12.01 - 12.15	1512632	0.11577	0.116

Average Amount : 0.11500
Expected Amount : 0.12500
Percent Difference : -8

Percent Difference = 100 X (Average Amount - Expected Amount) divided by Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-2.b/Q6030828.d
Injection Date : 04-JUN-2008 05:18
Sample Info : AR1248 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1248 CCV (L3)
Instrument ID : 6890Q.i Operator : GR
Method : Q51908-2PCB.m Method Sublist : AR1248
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP2 Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1248	1	10.62	10.56 - 10.70	2588916	0.11925	0.119
	2	11.21	11.15 - 11.29	2670309	0.11620	0.116
	3	11.28	11.22 - 11.36	2802066	0.11746	0.117
	4	11.62	11.57 - 11.71	2026007	0.11458	0.114
	5	12.25	12.20 - 12.34	1454098	0.11367	0.114

Average Amount : 0.11623
Expected Amount : 0.12500
Percent Difference : -7

Percent Difference = 100 X (Average Amount - Expected Amount) divided by Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-1.b/Q6030838.d
Injection Date : 04-JUN-2008 10:49
Sample Info : AR1660 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1660 CCV (L3)
Instrument ID : 6890Q.i Operator : GailR
Method : Q51908-1PCB.m Method Sublist : AR1660S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1016	1	8.05	7.99 - 8.13	1575678	0.12950	0.130
	2	8.72	8.66 - 8.80	2323971	0.12476	0.125
	3	9.56	9.49 - 9.63	3975543	0.12431	0.124
	4	9.88	9.82 - 9.96	1712212	0.12640	0.126
	5	10.45	10.39 - 10.53	2115255	0.12430	0.124
			Average Amount :		0.12585	
			Expected Amount :		0.12500	
			Percent Difference :		1	
Aroclor-1260	1	12.35	12.28 - 12.42	4441067	0.12767	0.128
	2	12.76	12.69 - 12.83	5690624	0.12129	0.121
	3	13.34	13.27 - 13.41	4342783	0.12093	0.121
	4	13.71	13.64 - 13.78	4202383	0.11955	0.120
	5	14.57	14.51 - 14.65	4952975	0.12226	0.122
			Average Amount :		0.12234	
			Expected Amount :		0.12500	
			Percent Difference :		-2	

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.29	7.25 - 7.35	0.012500	0.012889	3	
Decachlorobiphenyl	16.15	16.06 - 16.26	0.012500	0.011459	-8	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-2.b/Q6030838.d
Injection Date : 04-JUN-2008 10:49
Sample Info : AR1660 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1660 CCV (L3)
Instrument ID : 6890Q.i Operator : GR
Method : Q51908-2PCB.m Method Sublist : AR1660S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP2 Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1016	1	8.15	8.10 - 8.24	1485476	0.12810	0.128
	2	9.65	9.60 - 9.74	3904987	0.12475	0.125
	3	9.87	9.82 - 9.96	2171577	0.12459	0.124
	4	10.04	9.98 - 10.12	1636045	0.12226	0.122
	5	10.62	10.57 - 10.71	2117422	0.12721	0.127
			Average Amount :		0.12538	
			Expected Amount :		0.12500	
			Percent Difference :		0	
Aroclor-1260	1	12.54	12.48 - 12.62	4227686	0.12158	0.122
	2	12.84	12.79 - 12.93	5343845	0.12552	0.126
	3	13.50	13.45 - 13.59	4449451	0.12957	0.130
	4	13.93	13.88 - 14.02	4198186	0.12054	0.120
	5	14.82	14.77 - 14.91	5249256	0.12723	0.127
			Average Amount :		0.12488	
			Expected Amount :		0.12500	
			Percent Difference :		-0	

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.16	7.13 - 7.23	0.012500	0.013129	5	
Decachlorobiphenyl	16.52	16.45 - 16.65	0.012500	0.011501	-8	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-1.b/Q6030839.d
Injection Date : 04-JUN-2008 11:22
Sample Info : AR1248 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1248 CCV (L3)
Instrument ID : 6890Q.i Operator : GailR
Method : Q51908-1PCB.m Method Sublist : AR1248
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1248	1	10.08	10.02 - 10.16	2068628	0.11594	0.116
	2	10.45	10.39 - 10.53	2596870	0.11661	0.117
	3	11.13	11.06 - 11.20	2885545	0.11597	0.116
	4	11.48	11.41 - 11.55	1839546	0.11764	0.118
	5	12.08	12.01 - 12.15	1565929	0.11985	0.120

Average Amount : 0.11720
Expected Amount : 0.12500
Percent Difference : -6

Percent Difference = 100 X (Average Amount - Expected Amount) divided by Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-2.b/Q6030839.d
Injection Date : 04-JUN-2008 11:22
Sample Info : AR1248 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1248 CCV (L3)
Instrument ID : 6890Q.i Operator : GR
Method : Q51908-2PCB.m Method Sublist : AR1248
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP2 Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1248	1	10.62	10.56 - 10.70	2573712	0.11855	0.118
	2	11.20	11.15 - 11.29	2681110	0.11667	0.117
	3	11.28	11.22 - 11.36	2815323	0.11801	0.118
	4	11.62	11.57 - 11.71	2042363	0.11550	0.116
	5	12.25	12.20 - 12.34	1487445	0.11628	0.116

Average Amount : 0.11700
Expected Amount : 0.12500
Percent Difference : -6

Percent Difference = 100 X (Average Amount - Expected Amount) divided by Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-1.b/Q6040803.d
Injection Date : 04-JUN-2008 14:19
Sample Info : AR1248 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1248 CCV (L3)
Instrument ID : 6890Q.i Operator : GailR
Method : Q51908-1PCB.m Method Sublist : AR1248S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1248	1	10.09	10.02 - 10.16	2044302	0.11458	0.114
	2	10.46	10.39 - 10.53	2592779	0.11643	0.116
	3	11.14	11.06 - 11.20	2924877	0.11755	0.118
	4	11.49	11.41 - 11.55	1853776	0.11855	0.118
	5	12.08	12.01 - 12.15	1563982	0.11970	0.120
				Average Amount :	0.11736	
				Expected Amount :	0.12500	
				Percent Difference :	-6	

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.29	7.25 - 7.35	0.012500	0.012665	1	
Decachlorobiphenyl	16.16	16.06 - 16.26	0.012500	0.010049	-20	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-2.b/Q6040803.d
Injection Date : 04-JUN-2008 14:19
Sample Info : AR1248 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1248 CCV (L3)
Instrument ID : 6890Q.i Operator : GR
Method : Q51908-2PCB.m Method Sublist : AR1248S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP2 Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1248	1	10.61	10.56 - 10.70	2556920	0.11778	0.118
	2	11.20	11.15 - 11.29	2721706	0.11844	0.118
	3	11.27	11.22 - 11.36	2876021	0.12056	0.120
	4	11.62	11.57 - 11.71	2085885	0.11797	0.118
	5	12.25	12.20 - 12.34	1510153	0.11805	0.118

Average Amount : 0.11856
Expected Amount : 0.12500
Percent Difference : -5

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.15	7.13 - 7.23	0.012500	0.012670	1	
Decachlorobiphenyl	16.53	16.45 - 16.65	0.012500	0.010327	-17	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-1.b/Q6040808.d
Injection Date : 04-JUN-2008 17:05
Sample Info : AR1248 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1248 CCV (L3)
Instrument ID : 6890Q.i Operator : GailR
Method : Q51908-1PCB.m Method Sublist : AR1248S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB_5
Column : RTX-CLP Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1248	1	10.08	10.02 - 10.16	2006394	0.11245	0.112
	2	10.45	10.39 - 10.53	2498002	0.11217	0.112
	3	11.13	11.06 - 11.20	2754395	0.11070	0.111
	4	11.48	11.41 - 11.55	1776254	0.11359	0.114
	5	12.08	12.01 - 12.15	1483948	0.11358	0.114

Average Amount : 0.11250
Expected Amount : 0.12500
Percent Difference : -10

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.28	7.25 - 7.35	0.012500	0.012242	-2	
Decachlorobiphenyl	16.15	16.06 - 16.26	0.012500	0.010247	-18	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

Pace Analytical Services, Inc.
Multicomponent Analyte Summary

Data File : //diana/target/6890q.i/Q51908PCB-2.b/Q6040808.d
Injection Date : 04-JUN-2008 17:05
Sample Info : AR1248 CCV (L3)
Misc. Info : Method 8082
Laboratory ID : AR1248 CCV (L3)
Instrument ID : 6890Q.i Operator : GR
Method : Q51908-2PCB.m Method Sublist : AR1248S
Quantitation : ESTD Integrator : Falcon
Dilution Factor : 1.00 Sample Type: CCALIB 5
Column : RTX-CLP2 Column Size: 30m 0.32mm

Compound	Peak	RT	Window	Response	Amount ng	Conc
Aroclor-1248	1	10.62	10.56 - 10.70	2463579	0.11348	0.113
	2	11.20	11.15 - 11.29	2585872	0.11253	0.112
	3	11.28	11.22 - 11.36	2710363	0.11361	0.114
	4	11.62	11.57 - 11.71	1933478	0.10935	0.109
	5	12.25	12.20 - 12.34	1390396	0.10869	0.109

Average Amount : 0.11153
Expected Amount : 0.12500
Percent Difference : -11

Compound	RT	RT Window	Expected Amount	Actual Amount	%D	Flag
Tetrachloro-m-xylene	7.16	7.13 - 7.23	0.012500	0.012320	-1	
Decachlorobiphenyl	16.52	16.45 - 16.65	0.012500	0.010347	-17	

%D = %Drift = 100 x (Expected Amount - Actual Amount) / Expected Amount.

10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
13SD069

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-001 Date Analyzed: 06/04/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPII ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.09			3200	9107.338	
	2	10.45			6500		
	3	11.13			4300		
	4	11.48			19000		
	5	12.07			12000		
Column 2	1	10.62			6800	12877.25	41.39
	2	11.2			4600		
	3	11.27			15000		
	4	11.62			26000		
	5	12.25			12000		

At least three peaks for each column are required for identification of multicomponent analytes.

Date Printed: 6/13/2008 12:51

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10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
13SD069-DL

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-001DL Date Analyzed: 06/04/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPII ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.09			3800		
	2	10.45			6700		
	3	11.13			4500		
	4	11.48			19000		
	5	12.08			12000	9147.002	
Column 2	1	10.62			6900		
	2	11.21			4500		
	3	11.28			14000		
	4	11.62			24000		
	5	12.25			12000	12201.40	33.39

At least three peaks for each column are required for identification of multicomponent analytes.

Date Printed: 6/13/2008 12:51

10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
13SD071

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-002 Date Analyzed: 06/04/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPII ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.1			1100		
	2	10.46			950		
	3	11.13			820		
	4	11.48			1700		
	5	12.07			840	1085.823	
Column 2	1	10.62			990		
	2	11.21			930		
	3	11.28			1700		
	4	11.62			2300		
	5	12.24			790	1340.743	23.48

At least three peaks for each column are required for identification of multicomponent analytes.

Date Printed: 6/13/2008 12:51

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10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
13SD072

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-003 Date Analyzed: 06/04/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPII ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.1			1400		
	2	10.45			260		
	3	11.13			240		
	4	11.48			440		
	5	12.07			300	538.6	
Column 2	1	10.62			270		
	2	11.21			310		
	3	11.28			490		
	4	11.62			590		
	5	12.25			250	384.154	40.2

At least three peaks for each column are required for identification of multicomponent analytes.

Date Printed: 6/13/2008 , 12:51

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10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
13SD073

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-004 Date Analyzed: 06/03/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPII ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column I	1	10.09			20000		
	2	10.45			28000		
	3	11.13			27000		
	4	11.48			60000		
	5	12.07			36000	34187.66	
Column 2	1	10.62			29000		
	2	11.21			29000		
	3	11.28			54000		
	4	11.62			79000		
	5	12.25			36000	45304.28	32.52

At least three peaks for each column are required for identification of multicomponent analytes.

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10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
13SD073-DL

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-004DL Date Analyzed: 06/04/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPII ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.09			22000		
	2	10.46			29000		
	3	11.13			28000		
	4	11.48			60000		
	5	12.08			37000	35341.08	
Column 2	1	10.62			30000		
	2	11.21			28000		
	3	11.28			50000		
	4	11.62			73000		
	5	12.25			36000	43479.38	23.03

At least three peaks for each column are required for identification of multicomponent analytes.

Date Printed: 6/13/2008 12:51

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10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
13SD074

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-005 Date Analyzed: 06/04/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPII ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.09			3300		
	2	10.45			3800		
	3	11.12			4300		
	4	11.48			8500		
	5	12.07			4500	4872.448	
Column 2	1	10.62			3900		
	2	11.2			4100		
	3	11.27			7900		
	4	11.62			11000		
	5	12.29			2000	5792.74	18.89

At least three peaks for each column are required for identification of multicomponent analytes.

Date Printed: 6/13/2008 12:51

10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
135D074-DL

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-005DL Date Analyzed: 06/03/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPII ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.09			3200		
	2	10.46			3800		
	3	11.13			4000		
	4	11.48			7500		
	5	12.07			4500	4591.87	
Column 2	1	10.62			4000		
	2	11.21			4200		
	3	11.28			7600		
	4	11.62			10000		
	5	12.25			4500	6136.412	33.64

At least three peaks for each column are required for identification of multicomponent analytes.

Date Printed: 6/13/2008 12:51

10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
13SD075

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-006 Date Analyzed: 06/04/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPII ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.1			4.8		
	2	10.45			3100		
	3	11.12			3300		
	4	11.48			6600		
	5	12.07			3500	4122.658	
Column 2	1	10.62			3200		
	2	11.2			3600		
	3	11.27			6300		
	4	11.62			9000		
	5	12.24			3500	5117.086	24.12

At least three peaks for each column are required for identification of multicomponent analytes.

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10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
13SD075-DL

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-006DL Date Analyzed: 06/03/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPII ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.09			2500		
	2	10.45			3300		
	3	11.13			3500		
	4	11.48			6800		
	5	12.07			3800	3978.298	
Column 2	1	10.62			3400		
	2	11.21			3800		
	3	11.28			6300		
	4	11.62			8900		
	5	12.25			3700	5220.606	31.23

At least three peaks for each column are required for identification of multicomponent analytes.

Date Printed: 6/13/2008 12:51

FORM X B

10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
13FD052908

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-007 Date Analyzed: 06/04/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPII ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.09			12000		
	2	10.45			18000		
	3	11.12			17000		
	4	11.48			36000		
	5	12.07			22000	20969.82	
Column 2	1	10.62			18000		
	2	11.21			18000		
	3	11.28			34000		
	4	11.62			49000		
	5	12.24			22000	28189.66	34.43

At least three peaks for each column are required for identification of multicomponent analytes.

Date Printed: 6/13/2008 12:51

10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
13FD052908-DL

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-007DL Date Analyzed: 06/04/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPI1 ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.09			13000		
	2	10.45			19000		
	3	11.13			18000		
	4	11.48			39000		
	5	12.07			22000	22034.26	
Column 2	1	10.62			19000		
	2	11.21			19000		
	3	11.28			34000		
	4	11.62			50000		
	5	12.25			21000	28709.52	30.29

At least three peaks for each column are required for identification of multicomoonent analytes.

Date Printed: 6/13/2008 12:51

FORM X B

10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
13SD076

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-008 Date Analyzed: 06/04/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPI1 ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.09			12000		
	2	10.45			14000		
	3	11.12			12000		
	4	11.47			24000		
	5	12.07			12000	14859.3	
Column 2	1	10.62			15000		
	2	11.2			13000		
	3	11.27			24000		
	4	11.62			34000		
	5	12.29			5400	18206.33	22.52

At least three peaks for each column are required for identification of multicomponent analytes.

Date Printed: 6/13/2008 12:51

FORM X B

10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
13SD076-DL

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT5I701

Lab Sample ID: TT51701-008DL Date Analyzed: 06/04/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPII ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.09			12000		
	2	10.45			15000		
	3	11.12			12000		
	4	11.48			25000		
	5	12.07			13000	15522.74	
Column 2	1	10.62			16000		
	2	11.2			14000		
	3	11.27			25000		
	4	11.62			36000		
	5	12.24			12000	20473.62	31.89

At least three peaks for each column are required for identification of multicomponent analytes.

Date Printed: 6/13/2008 12:51

FORM X B

10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
13SD070

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-009 Date Analyzed: 06/04/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPI1 ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.1			5.0	1573.082	
	2	10.45			1600		
	3	11.12			1300		
	4	11.48			2300		
	5	12.07			1100		
Column 2	1	10.61			1600	1904.094	26.13
	2	11.2			1500		
	3	11.27			2600		
	4	11.62			3100		
	5	12.24			1100		

At least three peaks for each column are required for identification of multicomponent analytes.

Date Printed: 6/13/2008 12:51

10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
133B1080304

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-010 Date Analyzed: 06/04/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPII ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.1			340		
	2	10.45			120		
	3	11.13			83		
	4	11.48			110		
	5	12.05			97	150.817	
Column 2	1	10.62			120		
	2	11.21			110		
	3	11.28			120		
	4	11.62			150		
	5	12.25			48	111.71	35.01

At least three peaks for each column are required for identification of multicomponent analytes.

Date Printed: 6/13/2008 12:51

10 B
AROCLOR IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.
13SB1080506

Lab Name: Pace Analytical Services, Inc. Contract:

Run Sequence: R028576 SDG No.: TT51701

Lab Sample ID: TT51701-011 Date Analyzed: 06/04/2008

Instrument ID (1): HP6890Q Instrument ID (2): HP6890Q

GC Column (1): RTX-CLP ID: 0.32 (mm) GC Column (2): RTX-CLPII ID: 0.32 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION PEAK	CONCENTRATION MEAN	%D
AROCLOR-1248 Column 1	1	10.1			330		
	2	10.45			130		
	3	11.13			84		
	4	11.48			120		
	5	12.06			68	146.433	
Column 2	1	10.62			130		
	2	11.21			100		
	3	11.28			120		
	4	11.62			150		
	5	12.25			51	109.841	33.31

At least three peaks for each column are required for identification of multicomponent analytes.

Date Printed: 6/13/2008 12:51

ORDNANCE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.
B060208HORSLO

Lab Name: Pace Analytical Services, Inc. Contract: N/A

Lab Sample ID: B060208HORSLO SDG No.: TT51701

Matrix: (SOIL/WATER) Soil Date Prepared: 06/02/2008

Lab File ID (1): O60408.b-O6040803.D Lab File ID (2): F60608.b-F6060806.D

Date Analyzed (1): 06/04/2008 Date Analyzed (2):

Time Analyzed (1): 12:07 Time Analyzed (2):

Instrument ID (1): HPLC5 (Oscar) Instrument ID (2): HPLC3 (Felix)

Column(1): Allure C18 ID: 4.60 (mm) Column(2): Synergi - EtPH ID: 4.60 (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC SAMPLES:

CLIENT SAMPLE NO.	LAB SAMPLE ID	COL	LAB FILE ID	DATE/TIME ANALYZED	RUN SEQUENCE
13SD069	TT51701-001	1	O6040805.D	06/04/2008 13:27	R028606
		2	F6060808.D	06/06/2008 15:22	R028606
13SD071	TT51701-002	1	O6040806.D	06/04/2008 14:07	R028606
		2	F6060809.D	06/06/2008 16:02	R028606
13SD072	TT51701-003	1	O6040807.D	06/04/2008 14:47	R028606
		2	F6060810.D	06/06/2008 16:43	R028606
13SD073	TT51701-004	1	O6040836.D	06/05/2008 10:07	R028606
		2	F6060811.D	06/06/2008 17:23	R028606
13SD074	TT51701-005	1	O6040837.D	06/05/2008 10:47	R028606
		2	F6060812.D	06/06/2008 18:03	R028606
13SD075	TT51701-006	1	O6040808.D	06/04/2008 15:27	R028606
		2	F6060815.D	06/06/2008 20:03	R028606
13FD052908	TT51701-007	1	O6040809.D	06/04/2008 16:07	R028606
		2	F6060816.D	06/06/2008 20:43	R028606
13SD076	TT51701-008	1	O6040810.D	06/04/2008 16:47	R028606
		2	F6060817.D	06/06/2008 21:23	R028606
13SD070	TT51701-009	1	O6040811.D	06/04/2008 17:27	R028606
		2	F6060819.D	06/06/2008 22:43	R028606
13SB1080304	TT51701-010	1	O6040812.D	06/04/2008 18:07	R028606
		2	F6060820.D	06/06/2008 23:23	R028606
13SB1080506	TT51701-011	1	O6040814.D	06/04/2008 19:27	R028606
		2	F6060821.D	06/07/2008 00:03	R028606
13SD071MS	TT51701-002MS	1	O6040817.D	06/04/2008 21:27	R028606
		2			
13SD071MSD	TT51701-002MSD	1	O6040818.D	06/04/2008 22:07	R028606
		2			
S060208HORSLO	S060208HORSLO	1	O6040804.D	06/04/2008 12:47	R028606
		2	F6060807.D	06/06/2008 14:42	R028606
13SD074-DL	TT51701-005DL	1	O6040816.D	06/04/2008 20:47	R028606
		2	F6060814.D	06/06/2008 19:23	R028606

COMMENTS:

ORDNANCE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.
B060208HORSLO

Lab Name: Face Analytical Services, Inc. Contract: N/A

Lab Sample ID: B060208HORSLO SDG No.: TT51701

Matrix: (SOIL/WATER) Soil Date Prepared: 06/02/2008

Lab File ID (1): 060408.b-06040803.D Lab File ID (2): F60608.b-F6060806.D

Date Analyzed (1): 06/04/2008 Date Analyzed (2):

Time Analyzed (1): 12:07 Time Analyzed (2):

Instrument ID (1): HPLC5 (Oscar) Instrument ID (2): HPLC3 (Felix)

Column(1): Allure C18 ID: 4.60 (mm) Column(2): Synergi - EtPH ID: 4.60 (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC SAMPLES:

CLIENT SAMPLE NO.	LAB SAMPLE ID	COL	LAB FILE ID	DATE/TIME ANALYZED	RUN SEQUENCE
13SD076-DL	TT51701-008DL	1	O6040840.D	06/05/2008 13:25	R028606
		2	F6060818.D	06/06/2008 22:03	R028606

COMMENTS:

1

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B060208HORSLO

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Soil

Lab Sample ID: B060208HORSLO

Sample wt/vol: 5.00 (g/mL) gm

Lab File ID: 06040803.D

% Moisture: _____ Decanted: (Y/N) N

Date Collected: _____

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 20000.0 (uL)

Date Analyzed: 06/04/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: mg/Kg	Q
2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1	0.10	U
121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5	0.10	U
99-35-4	1,3,5-Trinitrobenzene	0.10	U
98-95-3	Nitrobenzene	0.10	U
479-45-8	Tetryl (Methyl-2,4,6-trinitrophyeny	0.10	U
118-96-7	2,4,6-Trinitrotoluene (TNT)	0.10	U
19406-51-0	4-Amino-2,6-dinitrotoluene	0.10	U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.10	U
606-20-2	2,6-Dinitrotoluene	0.10	U
121-14-2	2,4-Dinitrotoluene	0.10	U
88-72-2	2-Nitrotoluene	0.10	U
99-99-0	4-Nitrotoluene	0.10	U
99-08-1	3-Nitrotoluene	0.10	U
99-65-0	1,3-Dinitrobenzene	0.10	U

Comments:

3B
SOIL ORDNANCE BLANK SPIKE RECOVERY

Lab Name: Pace Analytical Services, Inc. Contract: N/A

BS Run Sequence: R028606 SDG No.: TT51701

BS Lab Sample ID: S060208HORSLO

Level: N/A Units: mg/Kg

Analyte	Spike Added	Found	% Rec #	Rec Limit
HMX (Octahydro-1,3,5,7-tetranitro-1	7.95	7.3502	92	55-125
RDX (Hexahydro-1,3,5-trinitro-1,3,5-	7.90	7.1257	90	55-125
1,3,5-Trinitrobenzene	8.02	6.7027	84	55-125
Nitrobenzene	7.99	7.2495	91	55-125
Tetryl (Methyl-2,4,6-trinitrophyenylnit	8.01	5.1244	64	10-125
2,4,6-Trinitrotoluene (TNT)	8.00	7.5366	94	55-125
4-Amino-2,6-dinitrotoluene	7.94	7.0712	89	55-125
2-Amino-4,6-dinitrotoluene	8.02	6.1898	77	55-125
2,6-Dinitrotoluene	8.01	7.1522	89	55-125
2,4-Dinitrotoluene	8.02	6.632	83	55-125
2-Nitrotoluene	7.94	7.2726	92	55-125
4-Nitrotoluene	7.94	7.324	92	55-125
3-Nitrotoluene	7.90	6.8568	87	55-125
1,3-Dinitrobenzene	8.02	6.8962	86	55-125

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

Spike Recovery: 0 out of 14 outside limits

COMMENTS:

Date Printed: 6/13/2008 14:54

3

SOIL ORDNANCE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Pace Analytical Services, Inc. Contract: N/A

MS Run Sequence: R028606 MSD Run Sequence: R028606 SDG No.: TT51701

MS Client Sample No.: 13SD071MS MSD Client Sample No.: 13SD071MSD

MS Lab Sample ID: TT51701-002MS MSD Lab Sample ID: TT51701-002MSD

Level: N/A Units: mg/Kg

COMPOUND	SAMPLE CONC	MS SPIKE ADDED	MS CONC	MS % REC #	MSD SPIKE ADDED	MSD CONC	MSD % REC #	%RPD #	QC LIMITS	
									RPD	REC.
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine)	3.7832	7.90	10.586	87	7.89	13.0348	118	21	40	55-125
RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine)	3.1799	7.85	8.1204	63	7.83	8.2212	65	1	40	55-125
1,3,5-Trinitrobenzene	0	7.97	6.0126	75	7.95	5.2404	66	14	40	55-125
Nitrobenzene	0	7.94	7.0308	89	7.93	6.9006	87	2	40	55-125
Tetryl (Methyl-2,4,6-trinitrophyenylnitramine)	0	7.96	4.69	59	7.94	3.9341	50	17	40	10-125
2,4,6-Trinitrotoluene (TNT)	0.253	7.95	7.4804	91	7.94	7.0689	86	6	40	55-125
4-Amino-2,6-dinitrotoluene	0.2223	7.89	6.8506	84	7.87	6.6633	82	3	40	55-125
2-Amino-4,6-dinitrotoluene	0	7.97	6.2196	78	7.95	6.0057	76	3	40	55-125
2,6-Dinitrotoluene	0	7.96	7.0417	88	7.94	6.8052	86	3	40	55-125
2,4-Dinitrotoluene	0	7.98	6.6633	84	7.96	6.3989	80	4	40	55-125
2-Nitrotoluene	0	7.89	7.012	89	7.87	6.8986	88	1	40	55-125
4-Nitrotoluene	0	7.90	7.1157	90	7.88	6.9912	89	2	40	55-125
3-Nitrotoluene	0	7.86	6.9728	89	7.84	6.843	87	2	40	55-125

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
@ This RPD or percent recovery is not flagged as an exceedence because the Sample Found amount is five times or more than the Spike Added amount.

RPD: 0 out of 14 outside limits
Spike Recovery: 0 out of 28 outside limits

COMMENTS:

3

SOIL ORGANANCE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Pace Analytical Services, Inc. Contract: N/A

Run Sequence: R028606 MSD Run Sequence: R028606 SDG No.: TT51701

MS Client Sample No.: 13SD071MS MSD Client Sample No.: 13SD071MSD

MS Lab Sample ID: TT51701-002MS MSD Lab Sample ID: TT51701-002MSD

Matrix: Units: mg/Kg

Compound	SAMPLE CONC	MS SPIKE ADDED	MS CONC	MS % REC #	MSD SPIKE ADDED	MSD CONC	MSD % REC #	%RPD #	QC LIMITS RPD	QC LIMITS REC.
Perchlorate	0	7.98	6.8822	86	7.96	6.5091	82	5	40	55-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

\# This RPD or percent recovery is not flagged as an exceedence because the Sample amount is five times or more than the Spike Added amount.

RPD: 0 out of 14 outside limits

Spike Recovery: 0 out of 28 outside limits

COMMENTS:

ORDNANCE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.
B060308HORWLG

Lab Name: Pace Analytical Services, Inc. Contract: N/A

Lab Sample ID: B060308HORWLG SDG No.: TT51701

Matrix: (SOIL/WATER) Water Date Prepared: 06/03/2008

Lab File ID (1): O60408.b-O6040819.D Lab File ID (2): F60608.b-F6060803.D

Date Analyzed (1): 06/04/2008 Date Analyzed (2):

Time Analyzed (1): 22:47 Time Analyzed (2):

Instrument ID (1): HPLC5 (Oscar) Instrument ID (2): HPLC3 (Felix)

Column(1): Allure C18 ID: 4.60 (mm) Column(2): Synergi - EtPH ID: 4.60 (mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES AND QC SAMPLES:

CLIENT SAMPLE NO.	LAB SAMPLE ID	COL	LAB FILE ID	DATE/TIME ANALYZED	RUN SEQUENCE
13RB05290801	TT51701-012	1	O6040832.D	06/05/2008 07:27	R028606
		2	F6060805.D	06/06/2008 13:22	R028606
S060308HORWLG	S060308HORWLG	1	O6040820.D	06/04/2008 23:27	R028606
		2	F6060804.D	06/06/2008 12:42	R028606

COMMENTS:

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B060308HORWLG

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Water

Lab Sample ID: B060308HORWLG

Sample wt/vol: 1000.0 (g/mL) mL

Lab File ID: 06040819.D

% Moisture: _____ Decanted: (Y/N) N

Date Collected: _____

Extraction: (Type) SPE

Date Extracted: 06/03/2008

Concentrated Extract Volume: 5000.0 (uL)

Date Analyzed: 06/04/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: _____

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/L	Q
2691-41-0	HMX	0.25	U
121-82-4	RDX	0.25	U
99-35-4	1,3,5-TRINITROBENZENE	0.25	U
99-65-0	1,3-DINITROBENZENE	0.25	U
98-95-3	NITROBENZENE	0.25	U
479-45-8	TETRYL	0.25	U
118-96-7	2,4,6-TRINITROTOLUENE	0.25	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	0.25	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	0.25	U
606-20-2	2,6-DINITROTOLUENE	0.25	U
121-14-2	2,4-DINITROTOLUENE	0.25	U
88-72-2	2-NITROTOLUENE	0.25	U
99-99-0	4-NITROTOLUENE	0.25	U
99-08-1	3-NITROTOLUENE	0.25	U

Comments:

3B
WATER ORDNANCE BLANK SPIKE RECOVERY

Lab Name: Pace Analytical Services, Inc. Contract: N/A

BS Run Sequence: R028606 SDG No.: TT51701

BS Lab Sample ID: S060308HORWLG

Level: N/A Units: ug/L

Analyte	Spike Added	Found	% Rec #	Rec Limit
HMX	19.9	20.8749	105	60-120
RDX	19.7	20.4275	103	60-120
1,3,5-TRINITROBENZENE	20.0	17.456	87	60-120
1,3-DINITROBENZENE	20.1	17.0357	85	60-120
NITROBENZENE	20.0	17.1303	86	60-120
TETRYL	20.0	19.0698	95	60-120
2,4,6-TRINITROTOLUENE	20.0	19.0262	95	60-120
4-AMINO-2,6-DINITROTOLUENE	19.8	17.4952	88	60-120
2-AMINO-4,6-DINITROTOLUENE	20.0	16.363	82	60-120
2,6-DINITROTOLUENE	20.0	17.758	89	60-120
2,4-DINITROTOLUENE	20.1	15.7853	79	60-120
2-NITROTOLUENE	19.8	16.2095	82	60-120
4-NITROTOLUENE	19.9	16.4508	83	60-120
3-NITROTOLUENE	19.8	14.9164	75	60-120

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

Spike Recovery: 0 out of 14 outside limits

COMMENTS:

Date Printed: 6/13/2008 14:54

SOIL ORDNANCE SURROGATE RECOVERY

Lab Name: Pace Analytical Services, Inc. Contract: N/A

SDG No.: TT51701 Run Sequence: R028606

(LAB SAMPLE ID) CLIENT SAMPLE NUMBER	S1 (DNT) #	S2 () #	S3 () #	S4 () #	TOT OUT
(TT51701-011) 13SB1080506	102				0
(TT51701-010) 13SB1080304	113				0
(TT51701-009) 13SD070	110				0
(TT51701-008DL) 13SD076-DL	118				0
(TT51701-008) 13SD076	101				0
(TT51701-007) 13FD052908	104				0
(TT51701-006) 13SD075	97				0
(TT51701-005DL) 13SD074-DL	110				0
(TT51701-005) 13SD074	99				0
(TT51701-004) 13SD073	102				0
(TT51701-003) 13SD072	100				0
(TT51701-002) 13SD071	103				0
(TT51701-001) 13SD069	114				0
(S060208HORSLO) S060208HORSLO	98				0
(B060208HORSLO) B060208HORSLO	99				0
(TT51701-002MSD) 13SD071MSD	89				0
(TT51701-002MS) 13SD071MS	92				0

QC LIMITS

S1 (DNT) = 3,4-Dinitrotoluene 50-150

S2 () =

S3 () =

S4 () =

Column to be used to flag recovery values

* Values outside of contract required QC limits

Date Printed: 6/18/2008 11:59

FORM II ORD

SOIL ORDNANCE SURROGATE RECOVERY

Lab Name: Pace Analytical Services, Inc. Contract: N/A

SDG No.: TT51701 Run Sequence: R028606

(LAB SAMPLE ID) CLIENT SAMPLE NUMBER	S1 (DNT) #	S2 () #	S3 () #	S4 () #	TOT OUT
(TT51701-012) 13RB05290801	73				0
(S060308HORWLG) S060308HORWLG	94				0
(B060308HORWLG) B060308HORWLG	66				0

QC LIMITS
50-150

S1 (DNT) = 3,4-Dinitrotoluene
S2 () =
S3 () =
S4 () =

Column to be used to flag recovery values
* Values outside of contract required QC limits

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MP 5/23/08

Pace Analytical Services, Inc.
Initial Calibration Linearity Summary

Start Cal Date: 20-MAY-2008 11:33
End Cal Date : 20-MAY-2008 14:13
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : HP Genie
Method File : \\ceres\labdata\hplc\oscar\Oscar.i\052008.b\8330mnx52008.m
Method : Method 8330
Sublist : 8330mnx.sub
Column : C18
Column Size : 0m L - 4.60mm ID

Calibration Files:
Level 1: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200802.D
Level 2: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200803.D
Level 3: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200804.D
Level 4: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200805.D
Level 5: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200806.D

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave CF	%RSD
1 HMX	11.42000	11.32000	10.93600	10.04600	10.35020	10.81444	5.6
4 MNX	12.00000	12.04000	11.58600	11.06600	10.81660	11.50172	4.8
5 RDX	8.120000	8.240000	8.534000	7.793000	8.017800	8.140960	3.4
6 1,3,5-Trinitrobenzene	17.06000	16.96000	16.78800	15.30700	15.75780	16.37456	4.8
7 1,3-Dinitrobenzene	18.70000	18.79000	18.68000	17.09800	17.74980	18.20356	4.1
8 Tetryl	7.900000	7.970000	7.914000	7.212000	7.455400	7.690280	4.4
9 Nitrobenzene	10.92000	11.05000	10.91400	10.17600	10.52120	10.71624	3.4
11 2,4,6-Trinitrotoluene	9.500000	9.510000	9.448000	8.608000	8.904400	9.194080	4.5
12 4-Amino-2,6-Dinitrotoluene	6.500000	6.550000	6.596000	5.969000	6.142200	6.351440	4.4
13 2-Amino-4,6-Dinitrotoluene	8.860000	8.890000	8.896000	8.064000	8.308000	8.603600	4.5

Amount = Response divided by CF

CF - Calibration Factor (response divided by concentration).
RSD - Relative Standard Deviation.

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Pace Analytical Services, Inc.
Initial Calibration Linearity Summary

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave CF	%RSD
14 2,6-Dinitrotoluene	6.100000	6.290000	6.214000	5.669000	5.871200	6.028840	4.2
15 2,4-Dinitrotoluene	11.68000	11.77000	11.74400	10.66000	11.10060	11.39092	4.3
16 2-Nitrotoluene	4.480000	4.390000	4.416000	4.060000	4.199000	4.309000	4.0
17 4-Nitrotoluene	3.360000	3.410000	3.454000	3.172000	3.314400	3.342080	3.2
18 3-Nitrotoluene	4.200000	4.110000	4.072000	3.729000	3.907200	4.003640	4.7
19 3,4-Dinitrotoluene	6.800000	6.970000	6.844000	6.245000	6.468800	6.645560	4.2

Amount = Response divided by CF

CF = Calibration Factor (response divided by concentration).

[illegible] = Relative Standard Deviation

Pace Analytical Services, Inc.
Initial Calibration Retention Time Summary

Start Cal Date: 20-MAY-2008 11:33
End Cal Date : 20-MAY-2008 14:13
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : HP Genie
Method File : \\ceres\labdata\hplc\oscar\Oscar.i\052008.b\8330mnx52008.m
Method : Method 8330
Sublist : 8330mnx.sub
Column : C18
Column Size : 0m L - 4.60mm ID

Calibration Files:
Level 1: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200802.D
Level 2: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200803.D
Level 3: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200804.D
Level 4: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200805.D
Level 5: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200806.D

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave RT
1 HMX	4.64	4.63	4.64	4.64	4.65	4.641
4 MNX	6.96	6.95	6.97	6.97	6.98	6.969
5 RDX	8.18	8.16	8.19	8.18	8.20	8.183
6 1,3,5-Trinitrobenzene	11.87	11.87	11.87	11.88	11.91	11.880
7 1,3-Dinitrobenzene	14.69	14.68	14.68	14.70	14.73	14.699
8 Tetryl	16.58	16.57	16.56	16.61	16.65	16.594
9 Nitrobenzene	17.27	17.26	17.25	17.29	17.31	17.275
11 2,4,6-Trinitrotoluene	20.16	20.15	20.13	20.18	20.21	20.164
12 4-Amino-2,6-Dinitrotoluene	20.95	20.93	20.89	20.98	21.03	20.958
13 2-Amino-4,6-Dinitrotoluene	22.02	22.01	21.96	22.06	22.11	22.032

Retention times are expressed as minutes.

Pace Analytical Services, Inc.
Initial Calibration Retention Time Summary

Start Cal Date: 20-MAY-2008 11:33
End Cal Date : 20-MAY-2008 14:13
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : HP Genie
Method File : \\ceres\labdata\hplc\oscar\Oscar.i\052008.b\8330mnx52008.m
Method : Method 8330
Sublist : 8330mnx.sub
Column : C18
Column Size : 0m L - 4.60mm ID

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave RT
14 2,6-Dinitrotoluene	23.51	23.51	23.46	23.55	23.58	23.522
15 2,4-Dinitrotoluene	24.40	24.40	24.33	24.43	24.46	24.403
16 2-Nitrotoluene	29.65	29.68	29.59	29.71	29.71	29.667
17 4-Nitrotoluene	32.23	32.28	32.14	32.30	32.27	32.241
18 3-Nitrotoluene	34.66	34.73	34.59	34.76	34.72	34.693
10 3,4-Dinitrotoluene	17.93	17.91	17.90	17.95	17.98	17.932

Retention times are expressed as minutes.

Pace Analytical Services, Inc.
Initial Calibration Amounts Summary

Start Cal Date: 20-MAY-2008 11:33
End Cal Date : 20-MAY-2008 14:13
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : HP Genie
Method File : \\ceres\labdata\hplc\oscar\Oscar.i\052008.b\8330mnx52008.m
Method : Method 8330
Sublist : 8330mnx.sub
Column : C18
Column Size : 0m L - 4.60mm ID

Calibration Files:
Level 1: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200802.D
Level 2: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200803.D
Level 3: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200804.D
Level 4: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200805.D
Level 5: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200806.D

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
1 HMX	50.00	100.00	500.00	1000.00	5000.00
4 MNX	50.00	100.00	500.00	1000.00	5000.00
5 RDX	50.00	100.00	500.00	1000.00	5000.00
6 1,3,5-Trinitrobenzene	50.00	100.00	500.00	1000.00	5000.00
7 1,3-Dinitrobenzene	50.00	100.00	500.00	1000.00	5000.00
8 Tetryl	50.00	100.00	500.00	1000.00	5000.00
9 Nitrobenzene	50.00	100.00	500.00	1000.00	5000.00
11 2,4,6-Trinitrotoluene	50.00	100.00	500.00	1000.00	5000.00
12 4-Amino-2,6-Dinitrotoluene	50.00	100.00	500.00	1000.00	5000.00
13 2-Amino-4,6-Dinitrotoluene	50.00	100.00	500.00	1000.00	5000.00

Standard concentrations are expressed as ng/mL.

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Pace Analytical Services, Inc.
Initial Calibration Amounts Summary

Start Cal Date: 20-MAY-2008 11:33
End Cal Date : 20-MAY-2008 14:13
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : HP Genie
Method File : \\ceres\labdata\hplc\oscar\Oscar.i\052008.b\8330mnx52008.m
Method : Method 8330
Sublist : 8330mnx.sub
Column : C18
Column Size : 0m L - 4.60mm ID

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
14 2,6-Dinitrotoluene	50.00	100.00	500.00	1000.00	5000.00
15 2,4-Dinitrotoluene	50.00	100.00	500.00	1000.00	5000.00
16 2-Nitrotoluene	50.00	100.00	500.00	1000.00	5000.00
17 4-Nitrotoluene	50.00	100.00	500.00	1000.00	5000.00
18 3-Nitrotoluene	50.00	100.00	500.00	1000.00	5000.00
10 3,4-Dinitrotoluene	50.00	100.00	500.00	1000.00	5000.00

Standard concentrations are expressed as ng/mL.

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Pace Analytical Services, Inc.
Initial Calibration Response Summary

Start Cal Date: 20-MAY-2008 11:33
End Cal Date : 20-MAY-2008 14:13
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : HP Genie
Method File : \\ceres\labdata\hplc\oscar\Oscar.i\052008.b\8330mnx52008.m
Method : Method 8330
Sublist : 8330mnx.sub
Column : C18
Column Size : 0m L - 4.60mm ID

Calibration Files:
Level 1: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200802.D
Level 2: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200803.D
Level 3: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200804.D
Level 4: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200805.D
Level 5: //ceres/labdata/hplc/oscar/Oscar.i/052008.b/05200806.D

	Compound	Level 1	Level 2	Level 3	Level 4	Level 5
1	HMX	571.00000	1132.0000	5468.0000	10046.000	51751.000
4	MNX	600.00000	1204.0000	5793.0000	11066.000	54083.000
5	RDX	406.00000	824.00000	4267.0000	7793.0000	40089.000
6	1,3,5-Trinitrobenzene	853.00000	1696.0000	8394.0000	15307.000	78789.000
7	1,3-Dinitrobenzene	935.00000	1879.0000	9340.0000	17098.000	88749.000
8	Tetryl	395.00000	797.00000	3957.0000	7212.0000	37277.000
9	Nitrobenzene	546.00000	1105.0000	5457.0000	10176.000	52606.000
11	2,4,6-Trinitrotoluene	475.00000	951.00000	4724.0000	8608.0000	44522.000
12	4-Amino-2,6-Dinitrotoluene	325.00000	655.00000	3298.0000	5969.0000	30711.000
13	2-Amino-4,6-Dinitrotoluene	443.00000	889.00000	4448.0000	8064.0000	41540.000

Response is in Height units.

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Pace Analytical Services, Inc.
Initial Calibration Response Summary

Start Cal Date: 20-MAY-2008 11:33
End Cal Date : 20-MAY-2008 14:13
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : HP Genie
Method File : \\ceres\labdata\hplc\oscar\Oscar.i\052008.b\8330mnx52008.m
Method : Method 8330
Sublist : 8330mnx.sub
Column : C18
Column Size : 0m L - 4.60mm ID

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
14 2,6-Dinitrotoluene	305.00000	629.00000	3107.0000	5669.0000	29356.000
15 2,4-Dinitrotoluene	584.00000	1177.0000	5872.0000	10660.000	55503.000
16 2-Nitrotoluene	224.00000	439.00000	2208.0000	4060.0000	20995.000
17 4-Nitrotoluene	168.00000	341.00000	1727.0000	3172.0000	16572.000
18 3-Nitrotoluene	210.00000	411.00000	2036.0000	3729.0000	19536.000
10 3,4-Dinitrotoluene	340.00000	687.00000	3422.0000	6245.0000	32344.000

Response is in Height units.

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Pace Analytical Services, Inc.
Initial Calibration Linearity Summary

Start Cal Date: 02-JUN-2008 13:47
End Cal Date : 02-JUN-2008 16:27
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : HP Genie
Method File : \\ceres\labdata\hplc\felix\Felix.i\F60208syn.b\8330syn060208.m
Method : Method 8330
Sublist : 8330.sub
Column : EtPh
Column Size : 0m L - 4.60mm ID

Calibration Files:
Level 1: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020807.D
Level 2: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020808.D
Level 3: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020809.D
Level 4: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020810.D
Level 5: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020811.D

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Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave CF	%RSD
4 HMX	8.380000 *	6.730000	7.494000	7.308060	7.319400	7.846280	8.4
5 RDX	10.56000	10.95000	9.574000	9.411000	9.423000	9.983600	7.2
6 Nitrobenzene	17.74000	16.54000	16.98600	16.63500	16.80520	17.34124	4.6
7 4-Amino-2,6-Dinitrotoluene	10.48000	10.99000	9.366000	9.149000	9.171400	9.831280	8.6
8 2-Nitrotoluene	8.740000	9.300000	8.500000	8.364000	8.453200	8.671440	4.4
9 4-Nitrotoluene	7.580000	8.050000	7.336000	7.163000	7.279600	7.481720	4.7
10 2-Amino-4,6-Dinitrotoluene	14.40000	14.99000	12.86400	12.53700	12.61720	13.48164	8.4
11 1,3-Dinitrobenzene/INT	14.07000	14.65500	12.79600	12.55650	12.66210	13.34792	7.1
13 2,6-Dinitrotoluene	7.860000	8.100000	7.012000	6.860000	6.940200	7.354440	7.9
14 2,4-Dinitrotoluene	15.64000	16.10000	12.61600	12.24400	12.33420	13.78684	13.9

Amount = Response divided by CF

CF - Calibration Factor (response divided by concentration).
RSD - Relative Standard Deviation.

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Pace Analytical Services, Inc.
Initial Calibration Linearity Summary

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave CF	%RSD
15 1,3,5-Trinitrobenzene	9.560000	9.810000	8.420000	8.200000	8.256000	8.851400	8.7
16 Tetryl	5.220000	5.540000	4.702000	4.590000	4.623200	4.935040	8.6
17 2,4,6-TNT	6.320000	6.560000	5.524000	5.390000	5.423600	5.843520	9.5
12 3,4 Dinitrotoluene	7.700000	7.670000	6.655000	6.525000	6.595400	7.069880	9.3

Amount = Response divided by CF

CF - Calibration Factor (response divided by concentration).
RSD - Relative Standard Deviation.

Pace Analytical Services, Inc.
Initial Calibration Retention Time Summary

Start Cal Date: 02-JUN-2008 13:47
End Cal Date : 02-JUN-2008 16:27
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : HP Genie
Method File : \\ceres\labdata\hplc\felix\Felix.i\F60208syn.b\8330syn060208.m
Method : Method 8330
Sublist : 8330.sub
Column : EtPh
Column Size : 0m L - 4.60mm ID

Calibration Files:
Level 1: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020807.D
Level 2: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020808.D
Level 3: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020809.D
Level 4: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020810.D
Level 5: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020811.D

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave RT
4 HMX	8.46	8.47	8.45	8.45	8.44	8.454
5 RDX	9.06	9.07	9.06	9.05	9.05	9.059
6 Nitrobenzene	12.02	12.03	12.02	12.02	12.02	12.025
7 4-Amino-2,6-Dinitrotoluene	15.49	15.50	15.50	15.51	15.50	15.500
8 2-Nitrotoluene	15.89	15.91	15.91	15.91	15.91	15.906
9 4-Nitrotoluene	16.64	16.66	16.66	16.67	16.66	16.658
10 2-Amino-4,6-Dinitrotoluene	17.08	17.09	17.09	17.10	17.09	17.092
11 1,3-Dinitrobenzene/3NT	17.43	17.44	17.44	17.45	17.44	17.438
13 2,6-Dinitrotoluene	20.65	20.66	20.66	20.66	20.65	20.655
14 2,4-Dinitrotoluene	23.84	23.87	23.84	23.84	23.83	23.844

Retention times are expressed as minutes.

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Pace Analytical Services, Inc.
Initial Calibration Retention Time Summary

Start Cal Date: 02-JUN-2008 13:47
End Cal Date : 02-JUN-2008 16:27
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : HP Genie
Method File : \\ceres\labdata\hplc\felix\Felix.i\F60208syn.b\8330syn060208.m
Method : Method 8330
Sublist : 8330.sub
Column : EtPh
Column Size : 0m L - 4.60mm ID

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave RT
15 1,3,5-Trinitrobenzene	26.86	26.88	26.85	26.85	26.85	26.858
16 Tetryl	31.99	32.01	31.98	32.00	32.00	31.996
17 2,4,6-TNT	35.58	35.61	35.59	35.60	35.60	35.595
12 3,4-Dinitrotoluene	19.20	19.22	19.22	19.22	19.21	19.213

Retention times are expressed as minutes.

SUM - 158

Pace Analytical Services, Inc.
Initial Calibration Amounts Summary

Start Cal Date: 02-JUN-2008 13:47
End Cal Date : 02-JUN-2008 16:27
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : HP Genie
Method File : \\ceres\labdata\hplc\felix\Felix.i\F60208syn.b\8330syn060208.m
Method : Method 8330
Sublist : 8330.sub
Column : EtPh
Column Size : 0m L - 4.60mm ID

Calibration Files:
Level 1: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020807.D
Level 2: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020808.D
Level 3: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020809.D
Level 4: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020810.D
Level 5: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020811.D

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
4 HMX	50.00	100.00	500.00	1000.00	5000.00
5 RDX	50.00	100.00	500.00	1000.00	5000.00
6 Nitrobenzene	50.00	100.00	500.00	1000.00	5000.00
7 4-Amino-2,6-Dinitrotoluene	50.00	100.00	500.00	1000.00	5000.00
8 2-Nitrotoluene	50.00	100.00	500.00	1000.00	5000.00
9 4-Nitrotoluene	50.00	100.00	500.00	1000.00	5000.00
10 2-Amino-4,6-Dinitrotoluene	50.00	100.00	500.00	1000.00	5000.00
11 1,3-Dinitrobenzene/3NT	100.00	200.00	1000.00	2000.00	10000.00
13 2,6-Dinitrotoluene	50.00	100.00	500.00	1000.00	5000.00
14 2,4-Dinitrotoluene	50.00	100.00	500.00	1000.00	5000.00

Standard concentrations are expressed as ng/mL.

Pace Analytical Services, Inc.
Initial Calibration Amounts Summary

Start Cal Date: 02-JUN-2008 13:47
End Cal Date : 02-JUN-2008 16:27
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : HP Genie
Method File : \\ceres\labdata\hplc\felix\Felix.i\F60208syn.b\8330syn060208.m
Method : Method 8330
Sublist : 8330.sub
Column : EtPh
Column Size : 0m L - 4.60mm ID

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
15 1,3,5-Trinitrobenzene	50.00	100.00	500.00	1000.00	5000.00
16 Tetryl	50.00	100.00	500.00	1000.00	5000.00
17 2,4,6-TNT	50.00	100.00	500.00	1000.00	5000.00
12 3,4-Dinitrotoluene	50.00	100.00	500.00	1000.00	5000.00

Standard concentrations are expressed as ng/mL.

SUM - 160

Pace Analytical Services, Inc.
Initial Calibration Response Summary

Start Cal Date: 02-JUN-2008 13:47
End Cal Date : 02-JUN-2008 16:27
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : HP Genie
Method File : \\ceres\labdata\hplc\felix\Felix.i\F60208syn.b\8330syn060208.m
Method : Method 8330
Sublist : 8330.sub
Column : EtPh
Column Size : 0m L - 4.60mm ID

Calibration Files:
Level 1: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020807.D
Level 2: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020808.D
Level 3: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020809.D
Level 4: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020810.D
Level 5: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020811.D

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
4 HMX	419.00000	873.00000	3747.0000	7308.0000	36597.000
5 RDX	528.00000	1095.0000	4787.0000	9411.0000	47115.000
6 Nitrobenzene	887.00000	1854.0000	8493.0000	16635.000	84026.000
7 4-Amino-2,6-Dinitrotoluene	524.00000	1099.0000	4683.0000	9149.0000	45857.000
8 2-Nitrotoluene	437.00000	930.00000	4250.0000	8364.0000	42266.000
9 4-Nitrotoluene	379.00000	805.00000	3668.0000	7163.0000	36398.000
10 2-Amino-4,6-Dinitrotoluene	720.00000	1499.0000	6432.0000	12537.000	63086.000
11 1,3-Dinitrobenzene/3NT	1407.0000	2931.0000	12796.000	25113.000	126621.00
13 2,6-Dinitrotoluene	393.00000	810.00000	3506.0000	6860.0000	34701.000
14 2,4-Dinitrotoluene	782.00000	1610.0000	6308.0000	12244.000	61671.000

Response is in Height units.

Pace Analytical Services, Inc.
Initial Calibration Response Summary

Start Cal Date: 02-JUN-2008 13:47
End Cal Date : 02-JUN-2008 16:27
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : HP Genie
Method File : \\ceres\labdata\hplc\felix\Felix.i\F60208syn.b\8330syn060208.m
Method : Method 8330
Sublist : 8330.sub
Column : EtPh
Column Size : 0m L - 4.60mm ID

Compound	Level 1	Level 2	Level 3	Level 4	Level 5
15 1,3,5-Trinitrobenzene	478.00000	981.00000	4213.0000	8205.0000	41280.000
16 Tetryl	261.00000	554.00000	2351.0000	4590.0000	23116.000
17 2,4,6-TNT	316.00000	656.00000	2762.0000	5390.0000	27118.000
12 3,4-Dinitrotoluene	385.00000	787.00000	3329.0000	6525.0000	32982.000

Response is in Height units.

Pace Analytical Services, Inc.
Initial Calibration Verification Summary

Data File	: //ceres/labdata/hplc/oscar/Oscar.i/060408.b/06040802.D		
Injection Date	: 04-JUN-2008 11:08		
Sample Info	: STD04 1000PPB METHOD 8330		
Misc. Info	: ICV		
Laboratory ID	: STD04 1000PPB	Client ID	: HPLC1-17-18 20X
Instrument ID	: Oscar.i	Operator	: AH
Method	: 8330mnx52008.m	Sublist	: 8330
Quantitation	: ESTD	Integrator	: HP Genie
Dilution Factor	: 1.00	Sample Type	: CCALIB_4
Column	: C18	Column Size	: 0.25m L- 4.60mm ID

Compound	RT	RT Window	Average CF	ICV CF	%D	Flag
HMX	4.66 #	4.41 - 4.91	10.81444	10.53100	2.6	
RDX	8.22 #	7.97 - 8.47	8.140960	8.066000	0.9	
1,3,5-Trinitrobenzene	11.97 #	11.72 - 12.22	16.37456	15.91400	2.8	
1,3-Dinitrobenzene	14.77 #	14.52 - 15.02	18.20356	17.60700	3.3	
Tetryl	16.74 #	16.49 - 16.99	7.690280	7.204000	6.3	
Nitrobenzene	17.29 #	17.04 - 17.54	10.71624	10.47500	2.3	
3,4-Dinitrotoluene	18.02 #	17.77 - 18.27	6.645560	6.377000	4.0	
2,4,6-Trinitrotoluene	20.34 #	20.09 - 20.59	9.194080	8.722000	5.1	
4-Amino-2,6-Dinitrotoluene	21.08 #	20.78 - 21.38	6.351440	6.242000	1.7	
2-Amino-4,6-Dinitrotoluene	22.18 #	21.88 - 22.48	8.603600	8.297000	3.6	
2,6-Dinitrotoluene	23.63 #	23.34 - 23.92	6.028840	5.814000	3.6	
2,4-Dinitrotoluene	24.53 #	24.24 - 24.82	11.39092	10.98100	3.6	
2-Nitrotoluene	29.63 #	29.27 - 29.99	4.309000	4.185000	2.9	
4-Nitrotoluene	32.21 #	31.81 - 32.61	3.342080	3.279000	1.9	
3-Nitrotoluene	34.62 #	34.18 - 35.06	4.003640	3.874000	3.2	

Calibration Factor (CF) = Response divided by Concentration
Percent Difference (%D) = (Ave CF - ICV CF) divided by Ave CF times 100
* = Percent Difference is outside the acceptance limits of +/-15%
# = The compound retention time is the expected retention time in the method.

Pace Analytical Services, Inc.
Continuing Calibration Verification Summary

Data File : //ceres/labdata/hplc/oscar/Oscar.i/060408.b/06040813.D
Injection Date : 04-JUN-2008 18:47
Sample Info : STD04 1000PPB METHOD 8330
Misc. Info : Method 8330
Laboratory ID : STD04 1000PPB
Instrument ID : Oscar.i
Method : 8330mnx52008.m
Quantitation : ESTD
Dilution Factor : 1.00
Column : C18

Client ID : HPLC1-17-18 20X
Operator : AH
Sublist : 8330
Integrator : HP Genie
Sample Type: CCALIB_4
Column Size: 0.25m L- 4.60mm ID

Compound	RT	RT Window	Average CF	Continuing CF	%D	Flag
HMX	4.66	4.41 - 4.91	10.81444	10.66300	1.4	
RDX	8.23	7.97 - 8.47	8.140960	8.280000	-1.7	
1,3,5-Trinitrobenzene	11.97	11.72 - 12.22	16.37456	16.28200	0.6	
1,3-Dinitrobenzene	14.77	14.52 - 15.02	18.20356	17.98400	1.2	
Tetryl	16.75	16.49 - 16.99	7.690280	7.312000	4.9	
Nitrobenzene	17.29	17.04 - 17.54	10.71624	10.50700	2.0	
3,4-Dinitrotoluene	18.03	17.77 - 18.27	6.645560	6.491000	2.3	
2,4,6-Trinitrotoluene	20.34	20.09 - 20.59	9.194080	8.839000	3.9	
4-Amino-2,6-Dinitrotoluene	21.10	20.78 - 21.38	6.351440	6.338000	0.2	
2-Amino-4,6-Dinitrotoluene	22.21	21.88 - 22.48	8.603600	8.420000	2.1	
2,6-Dinitrotoluene	23.65	23.34 - 23.92	6.028840	5.886000	2.4	
2,4-Dinitrotoluene	24.55	24.24 - 24.82	11.39092	11.12400	2.3	
2-Nitrotoluene	29.67	29.27 - 29.99	4.309000	4.164000	3.4	
4-Nitrotoluene	32.25	31.81 - 32.61	3.342080	3.274000	2.0	
3-Nitrotoluene	34.67	34.18 - 35.06	4.003640	3.871000	3.3	

Calibration Factor (CF) = Response divided by Concentration
Percent Difference (%D) = (Ave CF - Cont CF) divided by AveCF times 100
* = Percent Difference is outside the acceptance limits of +/-15%
# = The compound retention time is the expected retention time in the method.

Pace Analytical Services, Inc.
Continuing Calibration Verification Summary

Data File	: //ceres/labdata/hplc/oscar/Oscar.i/060408.b/06040813.D		
Injection Date	: 04-JUN-2008 18:47		
Sample Info	: STD04 1000PPB METHOD 8330		
Misc. Info	: Method 8330		
Laboratory ID	: STD04 1000PPB	Client ID	: HPLC1-17-18 20X
Instrument ID	: Oscar.i	Operator	: AH
Method	: 8330mnx52008.m	Sublist	: 8330
Quantitation	: ESTD	Integrator	: HP Genie
Dilution Factor	: 1.00	Sample Type	: CCALIB_4
Column	: C18	Column Size	: 0.25m L- 4.60mm ID

Compound	RT	RT Window	Average CF	Continuing CF	%D	Flag
HMX	4.66	4.41 - 4.91	10.81444	10.66300	1.4	
RDX	8.23	7.97 - 8.47	8.140960	8.280000	-1.7	
1,3,5-Trinitrobenzene	11.97	11.72 - 12.22	16.37456	16.28200	0.6	
1,3-Dinitrobenzene	14.77	14.52 - 15.02	18.20356	17.98400	1.2	
Tetryl	16.75	16.49 - 16.99	7.690280	7.312000	4.9	
Nitrobenzene	17.29	17.04 - 17.54	10.71624	10.50700	2.0	
3,4-Dinitrotoluene	18.03	17.77 - 18.27	6.645560	6.491000	2.3	
2,4,6-Trinitrotoluene	20.34	20.09 - 20.59	9.194080	8.839000	3.9	
4-Amino-2,6-Dinitrotoluene	21.10	20.78 - 21.38	6.351440	6.338000	0.2	
2-Amino-4,6-Dinitrotoluene	22.21	21.88 - 22.48	8.603600	8.420000	2.1	
2,6-Dinitrotoluene	23.65	23.34 - 23.92	6.028840	5.886000	2.4	
2,4-Dinitrotoluene	24.55	24.24 - 24.82	11.39092	11.12400	2.3	
2-Nitrotoluene	29.67	29.27 - 29.99	4.309000	4.164000	3.4	
4-Nitrotoluene	32.25	31.81 - 32.61	3.342080	3.274000	2.0	
3-Nitrotoluene	34.67	34.18 - 35.06	4.003640	3.871000	3.3	

Calibration Factor (CF) = Response divided by Concentration
Percent Difference (%D) = (Ave CF - Cont CF) divided by AveCF times 100
* = Percent Difference is outside the acceptance limits of +/-15%
# = The compound retention time is the expected retention time in the method.

Pace Analytical Services, Inc.
Continuing Calibration Verification Summary

Data File	: //ceres/labdata/hplc/oscar/Oscar.i/060408.b/06040824.D		
Injection Date	: 05-JUN-2008 02:07		
Sample Info	: STD04 1000PPB METHOD 8330		
Misc. Info	: Method 8330		
Laboratory ID	: STD04 1000PPB	Client ID	: HPLC1-17-18 20X
Instrument ID	: Oscar.i	Operator	: AH
Method	: 8330mnx52008.m	Sublist	: 8330
Quantitation	: ESTD	Integrator	: HP Genie
Dilution Factor	: 1.00	Sample Type	: CCALIB_4
Column	: C18	Column Size	: 0.25m L- 4.60mm ID

Compound	RT	RT Window	Average CF	Continuing CF	%D	Flag
HMX	4.66	4.41 - 4.91	10.81444	10.93700	-1.1	
RDX	8.23	7.97 - 8.47	8.140960	8.475000	-4.1	
1,3,5-Trinitrobenzene	11.98	11.72 - 12.22	16.37456	16.58700	-1.3	
1,3-Dinitrobenzene	14.77	14.52 - 15.02	18.20356	18.37600	-0.9	
Tetryl	16.73	16.49 - 16.99	7.690280	7.210000	6.2	
Nitrobenzene	17.29	17.04 - 17.54	10.71624	10.59800	1.1	
3,4-Dinitrotoluene	18.01	17.77 - 18.27	6.645560	6.653000	-0.1	
2,4,6-Trinitrotoluene	20.32	20.09 - 20.59	9.194080	9.023000	1.9	
4-Amino-2,6-Dinitrotoluene	21.06	20.78 - 21.38	6.351440	6.543000	-3.0	
2-Amino-4,6-Dinitrotoluene	22.16	21.88 - 22.48	8.603600	8.665000	-0.7	
2,6-Dinitrotoluene	23.62	23.34 - 23.92	6.028840	6.026000	0.0	
2,4-Dinitrotoluene	24.52	24.24 - 24.82	11.39092	11.37700	0.1	
2-Nitrotoluene	29.65	29.27 - 29.99	4.309000	4.199000	2.6	
4-Nitrotoluene	32.23	31.81 - 32.61	3.342080	3.305000	1.1	
3-Nitrotoluene	34.66	34.18 - 35.06	4.003640	3.891000	2.8	

Calibration Factor (CF) = Response divided by Concentration
Percent Difference (%D) = (Ave CF - Cont CF) divided by AveCF times 100
* = Percent Difference is outside the acceptance limits of +/-15%
# = The compound retention time is the expected retention time in the method.

Pace Analytical Services, Inc.
Continuing Calibration Verification Summary

Data File	: //ceres/labdata/hplc/oscar/Oscar.i/060408.b/06040835.D		
Injection Date	: 05-JUN-2008 09:27		
Sample Info	: STD04 1000PPB METHOD 8330		
Misc. Info	: Method 8330		
Laboratory ID	: STD04 1000PPB	Client ID	: HPLC1-17-18 20X
Instrument ID	: Oscar.i	Operator	: AH
Method	: 8330mnx52008.m	Sublist	: 8330
Quantitation	: ESTD	Integrator	: HP Genie
Dilution Factor	: 1.00	Sample Type	: CCALIB_4
Column	: C18	Column Size	: 0.25m L- 4.60mm ID

Compound	RT	RT Window	Average CF	Continuing CF	%D	Flag
HMX	4.66	4.41 - 4.91	10.81444	11.18300	-3.4	
RDX	8.22	7.97 - 8.47	8.140960	8.633000	-6.0	
1,3,5-Trinitrobenzene	11.97	11.72 - 12.22	16.37456	16.89200	-3.2	
1,3-Dinitrobenzene	14.77	14.52 - 15.02	18.20356	18.61300	-2.2	
Tetryl	16.74	16.49 - 16.99	7.690280	7.244000	5.8	
Nitrobenzene	17.29	17.04 - 17.54	10.71624	10.40100	2.9	
3,4-Dinitrotoluene	18.02	17.77 - 18.27	6.645560	6.734000	-1.3	
2,4,6-Trinitrotoluene	20.32	20.09 - 20.59	9.194080	9.163000	0.3	
4-Amino-2,6-Dinitrotoluene	21.09	20.78 - 21.38	6.351440	6.620000	-4.2	
2-Amino-4,6-Dinitrotoluene	22.20	21.88 - 22.48	8.603600	8.821000	-2.5	
2,6-Dinitrotoluene	23.62	23.34 - 23.92	6.028840	6.128000	-1.6	
2,4-Dinitrotoluene	24.53	24.24 - 24.82	11.39092	11.56500	-1.5	
2-Nitrotoluene	29.65	29.27 - 29.99	4.309000	4.133000	4.1	
4-Nitrotoluene	32.24	31.81 - 32.61	3.342080	3.301000	1.2	
3-Nitrotoluene	34.66	34.18 - 35.06	4.003640	3.843000	4.0	

Calibration Factor (CF) = Response divided by Concentration
Percent Difference (%D) = (Ave CF - Cont CF) divided by AveCF times 100
* = Percent Difference is outside the acceptance limits of +/-20%
# = The compound retention time is the expected retention time in the method.

Pace Analytical Services, Inc.
Continuing Calibration Verification Summary

Data File : //ceres/labdata/hplc/oscar/Oscar.i/060408.b/06040841.D
Injection Date : 05-JUN-2008 14:05
Sample Info : STD04 1000PPB METHOD 8330
Misc. Info : Method 8330
Laboratory ID : STD04 1000PPB
Instrument ID : Oscar.i
Method : 8330mnx52008.m
Quantitation : ESTD
Dilution Factor : 1.00
Column : C18

Client ID : HPLC1-17-18 20X
Operator : AH
Sublist : 8330
Integrator : HP Genie
Sample Type: CCALIB_4
Column Size: 0.25m L- 4.60mm ID

Compound	RT	RT Window	Average CF	Continuing CF	%D	Flag
HMX	4.64	4.41 - 4.91	10.81444	10.31900	4.6	
RDX	8.19	7.97 - 8.47	8.140960	7.968000	2.1	
1,3,5-Trinitrobenzene	11.91	11.72 - 12.22	16.37456	15.41100	5.9	
1,3-Dinitrobenzene	14.68	14.52 - 15.02	18.20356	17.14500	5.8	
Tetryl	16.60	16.49 - 16.99	7.690280	7.194000	6.5	
Nitrobenzene	17.19	17.04 - 17.54	10.71624	10.09700	5.8	
3,4-Dinitrotoluene	17.89	17.77 - 18.27	6.645560	6.236000	6.2	
2,4,6-Trinitrotoluene	20.19	20.09 - 20.59	9.194080	8.525000	7.3	
4-Amino-2,6-Dinitrotoluene	20.87	20.78 - 21.38	6.351440	6.135000	3.4	
2-Amino-4,6-Dinitrotoluene	21.96	21.88 - 22.48	8.603600	8.162000	5.1	
2,6-Dinitrotoluene	23.45	23.34 - 23.92	6.028840	5.611000	6.9	
2,4-Dinitrotoluene	24.34	24.24 - 24.82	11.39092	10.67000	6.3	
2-Nitrotoluene	29.45	29.27 - 29.99	4.309000	4.014000	6.8	
4-Nitrotoluene	31.99	31.81 - 32.61	3.342080	3.141000	6.0	
3-Nitrotoluene	34.40	34.18 - 35.06	4.003640	3.726000	6.9	

Calibration Factor (CF) = Response divided by Concentration
Percent Difference (%D) = (Ave CF - Cont CF) divided by AveCF times 100
* = Percent Difference is outside the acceptance limits of +/-20%
# = The compound retention time is the expected retention time in the method.

Pace Analytical Services, Inc.
Initial Calibration Verification Summary

Data File	: //ceres/labdata/hplc/felix/Felix.i/F60608.b/F6060802.D		
Injection Date	: 06-JUN-2008 11:19		
Sample Info	: STD04 1000PPB METHOD8330		
Misc. Info	: ICV		
Laboratory ID	: STD04 1000PPB	Client ID	: HPLC1-17-18 20X
Instrument ID	: Felix.i	Operator	: AP
Method	: 8330syn060208.m	Sublist	: 8330
Quantitation	: ESTD	Integrator	: HP Genie
Dilution Factor	: 1.00	Sample Type	: CCALIB_4
Column	: EtPh	Column Size	: 0.25m L- 4.60mm ID

Compound	RT	RT Window	Average CF	ICV CF	%D	Flag
HMX	8.48 #	8.23 - 8.73	7.846280	7.453000	5.0	
RDX	9.08 #	8.83 - 9.33	9.983600	9.693000	2.9	
Nitrobenzene	12.06 #	11.80 - 12.30	17.34124	17.21900	0.7	
4-Amino-2,6-Dinitrotoluene	15.55 #	15.30 - 15.80	9.831280	9.349000	4.9	
2-Nitrotoluene	15.95 #	15.70 - 16.20	8.671440	8.579000	1.1	
4-Nitrotoluene	16.70 #	16.45 - 16.95	7.481720	7.297000	2.5	
2-Amino-4,6-Dinitrotoluene	17.15 #	16.90 - 17.40	13.48164	12.85300	4.7	
1,3-Dinitrobenzene/3NT .	17.48 #	17.24 - 17.74	13.34792	12.86100	3.6	
3,4-Dinitrotoluene	19.28 #	19.02 - 19.52	7.069880	6.639000	6.1	
2,6-Dinitrotoluene	20.72 #	20.47 - 20.97	7.354440	7.016000	4.6	
2,4-Dinitrotoluene	23.92 #	23.68 - 24.18	13.78684	12.42500	9.9	
1,3,5-Trinitrobenzene	26.94 #	26.67 - 27.21	8.851400	8.323000	6.0	
Tetryl	32.12 #	31.70 - 32.56	4.935040	4.649000	5.8	
2,4,6-TNT	35.73 #	35.29 - 36.17	5.843520	5.461000	6.5	

Calibration Factor (CF) = Response divided by Concentration
Percent Difference (%D) = (Ave CF - ICV CF) divided by Ave CF times 100
* = Percent Difference is outside the acceptance limits of +/-20%
# = The compound retention time is the expected retention time in the method.

Pace Analytical Services, Inc.
Continuing Calibration Verification Summary

Data File	: //ceres/labdata/hplc/felix/Felix.i/F60608.b/F6060813.D		
Injection Date	: 06-JUN-2008 18:43		
Sample Info	: STD04 1000PPB METHOD8330		
Misc. Info	: Method 8330		
Laboratory ID	: STD04 1000PPB	Client ID	: HPLC1-17-18 20X
Instrument ID	: Felix.i	Operator	: AP
Method	: 8330syn060208.m	Sublist	: 8330
Quantitation	: ESTD	Integrator	: HP Genie
Dilution Factor	: 1.00	Sample Type	: CCALIB_4
Column	: EtPh	Column Size	: 0.25m L- 4.60mm ID

Compound	RT	RT Window	Average CF	Continuing CF	%D	Flag
HMX	8.48	8.26 - 8.76	7.846280	7.605000	3.1	
RDX	9.08	8.87 - 9.37	9.983600	10.58600	-6.0	
Nitrobenzene	12.06	11.86 - 12.36	17.34124	17.46800	-0.7	
4-Amino-2,6-Dinitrotoluene	15.56	15.41 - 15.91	9.831280	9.624000	2.1	
2-Nitrotoluene	15.96	15.80 - 16.30	8.671440	8.810000	-1.6	
4-Nitrotoluene	16.71	16.56 - 17.06	7.481720	7.562000	-1.1	
2-Amino-4,6-Dinitrotoluene	17.16	16.82 - 17.32	13.48164	13.24000	1.8	
1,3-Dinitrobenzene/3NT	17.50	17.17 - 17.67	13.34792	13.30000	0.4	
3,4-Dinitrotoluene	19.28	19.17 - 19.67	7.069880	6.997000	1.0	
2,6-Dinitrotoluene	20.73	20.62 - 21.12	7.354440	7.217000	1.9	
2,4-Dinitrotoluene	23.94	23.55 - 24.05	13.78684	13.47200	2.3	
1,3,5-Trinitrobenzene	26.96	26.54 - 27.08	8.851400	8.564000	3.2	
Tetryl	32.14	31.49 - 32.35	4.935040	5.058000	-2.5	
2,4,6-TNT	35.76	35.08 - 35.96	5.843520	5.530000	5.4	

Calibration Factor (CF) = Response divided by Concentration
Percent Difference (%D) = (Ave CF - Cont CF) divided by AveCF times 100
* = Percent Difference is outside the acceptance limits of +/-15%
# = The compound retention time is the expected retention time in the method.

Pace Analytical Services, Inc.
Continuing Calibration Verification Summary

Data File : //ceres/labdata/hplc/felix/Felix.i/F60608.b/F6060822.D
Injection Date : 07-JUN-2008 00:43
Sample Info : STD04 1000PPB METHOD8330
Misc. Info : Method 8330
Laboratory ID : STD04 1000PPB
Instrument ID : Felix.i
Method : 8330syn060208.m
Quantitation : ESTD
Dilution Factor : 1.00
Column : EtPh

Client ID : HPLC1-17-18 20X
Operator : AP
Sublist : 8330
Integrator : HP Genie
Sample Type: CCALIB_4
Column Size: 0.25m L- 4.60mm ID

Compound	RT	RT Window	Average CF	Continuing CF	%D	Flag
HMX	8.46	8.26 - 8.76	7.846280	7.825000	0.3	
RDX	9.07	8.87 - 9.37	9.983600	10.10900	-1.3	
Nitrobenzene	12.04	11.86 - 12.36	17.34124	17.50000	-0.9	
4-Amino-2,6-Dinitrotoluene	15.53	15.41 - 15.91	9.831280	9.558000	2.8	
2-Nitrotoluene	15.93	15.80 - 16.30	8.671440	8.712000	-0.5	
4-Nitrotoluene	16.68	16.56 - 17.06	7.481720	7.456000	0.3	
2-Amino-4,6-Dinitrotoluene	17.12	16.82 - 17.32	13.48164	13.05400	3.2	
1,3-Dinitrobenzene/3NT	17.47	17.17 - 17.67	13.34792	13.12050	1.7	
3,4-Dinitrotoluene	19.25	19.17 - 19.67	7.069880	6.772000	4.2	
2,6-Dinitrotoluene	20.69	20.62 - 21.12	7.354440	7.139000	2.9	
2,4-Dinitrotoluene	23.88	23.55 - 24.05	13.78684	12.66900	8.1	
1,3,5-Trinitrobenzene	26.90	26.54 - 27.08	8.851400	8.549000	3.4	
Tetryl	32.06	31.49 - 32.35	4.935040	4.680000	5.2	
2,4,6-TNT	35.67	35.08 - 35.96	5.843520	5.522000	5.5	

Calibration Factor (CF) = Response divided by Concentration
Percent Difference (%D) = (Ave CF - Cont CF) divided by AveCF times 100
* = Percent Difference is outside the acceptance limits of +/-15%
# = The compound retention time is the expected retention time in the method.

CONFIRMATION SUMMARY WORKSHEET FOR SINGLE COMPONENT ANALYTES

Client Sample ID

13SD069

Lab Name: Pace Analytical Services, Inc.

Lab Sample ID: TT51701-001

Instrument ID: HPLC5 (Oscar)

Run Sequence ID: R028606

Column (1): Allure C18

Column (2): Synergi - EtPH

File (1): O60408.b-O6040805.D

File (2): F60608.b-F6060808.D

Date Analyzed (1): 6/4/2008 1:27:00 PM

Date Analyzed (2): 6/6/2008 3:22:00 PM

ANALYTE	COL	CONCENTRATION Final Units: mg/Kg		RPD	RT	RT Window
HMX (Octahydro-1,3,5,7-te	1	0.562167	X	5.2 %	4.65	4.41 - 4.91
	2	0.533614			8.46	8.23 - 8.73
RDX (Hexahydro-1,3,5-trin	1	0.836648	X	7.1 %	8.21	7.97 - 8.47
	2	0.779408			9.06	8.83 - 9.33

X = Concentration Reported

CONFIRMATION SUMMARY WORKSHEET FOR SINGLE COMPONENT ANALYTES

Client Sample ID

13SD071

Lab Name: Pace Analytical Services, Inc.

Lab Sample ID: TT51701-002

Instrument ID: HPLC5 (Oscar)

Run Sequence ID: R028606

Column (1): Allure C18

Column (2): Synergi - EtPH

File (1): O60408.b-O6040806.D

File (2): F60608.b-F6060809.D

Date Analyzed (1): 6/4/2008 2:07:00 PM

Date Analyzed (2): 6/6/2008 4:02:00 PM

ANALYTE	COL	CONCENTRATION Final Units: mg/Kg	RPD	RT	RT Window
HMX (Octahydro-1,3,5,7-te	1	3.7291	1.4 %	4.66	4.41 - 4.91
	2	3.78317 X		8.47	8.23 - 8.73
RDX (Hexahydro-1,3,5-trin	1	3.14712	1.0 %	8.23	7.97 - 8.47
	2	3.17992 X		9.08	8.83 - 9.33
2,4,6-Trinitrotoluene (TN	1	0.251064	0.8 %	20.28	20.09 - 20.59
	2	0.252974 X		35.69	35.29 - 36.17
4-Amino-2,6-dinitrotoluen	1	0.214697	3.5 %	21.00	20.78 - 21.38
	2	0.222328 X		15.55	15.30 - 15.80
2-Amino-4,6-dinitrotoluen	1	0.103367 X	6.0 %	22.09	21.88 - 22.48
	2	0.0973364		17.13	16.90 - 17.40

X = Concentration Reported

CONFIRMATION SUMMARY WORKSHEET FOR SINGLE COMPONENT ANALYTES

Client Sample ID

13SD072

Lab Name: Pace Analytical Services, Inc.

Lab Sample ID: TT51701-003

Instrument ID: HPLC5 (Oscar)

Run Sequence ID: R028606

Column (1): Allure C18

Column (2): Synergi - EtPH

File (1): O60408.b-O6040807.D

File (2): F60608.b-F6060810.D

Date Analyzed (1): 6/4/2008 2:47:00 PM

Date Analyzed (2): 6/6/2008 4:43:00 PM

ANALYTE	COL	CONCENTRATION Final Units: mg/Kg		RPD	RT	RT Window
HMX (Octahydro-1,3,5,7-te	1	4.75627		3.1 %	4.65	4.41 - 4.91
	2	4.90528	X		8.47	8.23 - 8.73
RDX (Hexahydro-1,3,5-trin	1	3.51837		4.0 %	8.21	7.97 - 8.47
	2	3.66037	X		9.08	8.83 - 9.33
2,4,6-Trinitrotoluene (TN	1	0.12862	X	1.8 %	20.32	20.09 - 20.59
	2	0.12631			35.64	35.29 - 36.17
4-Amino-2,6-dinitrotoluen	1	0.14245		6.9 %	21.07	20.78 - 21.38
	2	0.152574	X		15.54	15.30 - 15.80
2-Amino-4,6-dinitrotoluen	1	0.0631889		2.4 %	22.17	21.88 - 22.48
	2	0.064756	X <MDL		17.12	16.90 - 17.40

6/18/08
AP

X = Concentration Reported

CONFIRMATION SUMMARY WORKSHEET FOR SINGLE COMPONENT ANALYTES

Client Sample ID

13SD073

Lab Name: Pace Analytical Services, Inc.

Lab Sample ID: TT51701-004

Instrument ID: HPLC5 (Oscar)

Run Sequence ID: R028606

Column (1): Allure C18

Column (2): Synergi - EtPH

File (1): O60408.b-O6040836.D

File (2): F60608.b-F6060811.D

Date Analyzed (1): 6/5/2008 10:07:00 AM

Date Analyzed (2): 6/6/2008 5:23:00 PM

ANALYTE	COL	CONCENTRATION Final Units: mg/Kg		RPD	RT	RT Window
HMX (Octahydro-1,3,5,7-te	1	4.49439		1.7 %	4.66	4.41 - 4.91
	2	4.57296	X		8.47	8.23 - 8.73
RDX (Hexahydro-1,3,5-trin	1	2.43425		2.1 %	8.23	7.97 - 8.47
	2	2.48678	X		9.08	8.83 - 9.33
2,4,6-Trinitrotoluene (TN	1	1.48293		4.6 %	20.27	20.09 - 20.59
	2	1.55208	X		35.78	35.29 - 36.17
4-Amino-2,6-dinitrotoluen	1	0.194693	X	5.0 %	21.01	20.78 - 21.38
	2	0.185233			15.56	15.30 - 15.80
2-Amino-4,6-dinitrotoluen	1	0.146501	X	14.6 %	22.10	21.88 - 22.48
	2	0.126525			17.15	16.90 - 17.40

X = Concentration Reported

CONFIRMATION SUMMARY WORKSHEET FOR SINGLE COMPONENT ANALYTES

Client Sample ID

13SD074

Lab Name: Pace Analytical Services, Inc.

Lab Sample ID: TT51701-005

Instrument ID: HPLC5 (Oscar)

Run Sequence ID: R028606

Column (1): Allure C18

Column (2): Synergi - EtPH

File (1): O60408.b-O6040837.D

File (2): F60608.b-F6060812.D

Date Analyzed (1): 6/5/2008 10:47:00 AM

Date Analyzed (2): 6/6/2008 6:03:00 PM

ANALYTE	COL	CONCENTRATION Final Units: mg/Kg		RPD	RT	RT Window
HMX (Octahydro-1,3,5,7-te	1	26.1397		2.0 %	4.65	4.41 - 4.91
	2	26.6793	X		8.47	8.23 - 8.73
RDX (Hexahydro-1,3,5-trin	1	21.136		2.4 %	8.22	7.97 - 8.47
	2	21.6415	X		9.08	8.83 - 9.33
2,4,6-Trinitrotoluene (TN	1	5.16172		5.7 %	20.28	20.09 - 20.59
	2	5.46659	X		35.79	35.29 - 36.17
4-Amino-2,6-dinitrotoluen	1	0.819593	X	1.2 %	21.02	20.78 - 21.38
	2	0.810076			15.56	15.30 - 15.80
2-Amino-4,6-dinitrotoluen	1	0.399964		4.8 %	22.12	21.88 - 22.48
	2	0.419585	X		17.14	16.90 - 17.40

X = Concentration Reported

CONFIRMATION SUMMARY WORKSHEET FOR SINGLE COMPONENT ANALYTES

Client Sample ID

13SD074-DL

Lab Name: Pace Analytical Services, Inc.

Lab Sample ID: TT51701-005DL

Instrument ID: HPLC5 (Oscar)

Run Sequence ID: R028606

Column (1): Allure C18

Column (2): Synergi - EtPH

File (1): O60408.b-O6040816.D

File (2): F60608.b-F6060814.D

Date Analyzed (1): 6/4/2008 8:47:00 PM

Date Analyzed (2): 6/6/2008 7:23:00 PM

ANALYTE	COL	CONCENTRATION Final Units: mg/Kg		RPD	RT	RT Window
HMX (Octahydro-1,3,5,7-te	1	25.249		6.0 %	4.65	4.41 - 4.91
	2	26.8126	X		8.47	8.23 - 8.73
RDX (Hexahydro-1,3,5-trin	1	20.1244		6.9 %	8.20	7.97 - 8.47
	2	21.5603	X		9.08	8.83 - 9.33
2,4,6-Trinitrotoluene (TN	1	5.03665		5.8 %	20.27	20.09 - 20.59
	2	5.33541	X		35.71	35.29 - 36.17
4-Amino-2,6-dinitrotoluen	1	0.785653	X	1.3 %	20.98	20.78 - 21.38
	2	0.775561			15.56	15.30 - 15.80
2-Amino-4,6-dinitrotoluen	1	0.385115		24.9 %	22.09	21.88 - 22.48
	2	0.494499	X		17.18	16.90 - 17.40

<MDL
6/18/08
AP

X = Concentration Reported

CONFIRMATION SUMMARY WORKSHEET FOR SINGLE COMPONENT ANALYTES

Client Sample ID

13SD075

Lab Name: Pace Analytical Services, Inc.

Lab Sample ID: TT51701-006

Instrument ID: HPLC5 (Oscar)

Run Sequence ID: R028606

Column (1): Allure C18

Column (2): Synergi - FtPH

File (1): O60408.b-O6040808.D

File (2): F60608.b-F6060815.D

Date Analyzed (1): 6/4/2008 3:27:00 PM

Date Analyzed (2): 6/6/2008 8:03:00 PM

ANALYTE	COL	CONCENTRATION Final Units: mg/Kg		RPD	RT	RT Window
HMX (Octahydro-1,3,5,7-te	1	2.94582		0.9 %	4.65	4.41 - 4.91
	2	2.97196	X		8.46	8.23 - 8.73
RDX (Hexahydro-1,3,5-trin	1	8.38008		4.2 %	8.21	7.97 - 8.47
	2	8.73711	X		9.06	8.83 - 9.33
2,4,6-Trinitrotoluene (TN	1	0.482448	X	4.6 %	20.31	20.09 - 20.59
	2	0.460863			35.63	35.29 - 36.17
4-Amino-2,6-dinitrotoluen	1	0.307407		11.8 %	21.04	20.78 - 21.38
	2	0.346036	X		15.51	15.30 - 15.80
2-Amino-4,6-dinitrotoluen	1	0.139476	X	4.9 %	22.15	21.88 - 22.48
	2	0.132781			17.09	16.90 - 17.40

X = Concentration Reported

CONFIRMATION SUMMARY WORKSHEET FOR
SINGLE COMPONENT ANALYTES

Client Sample ID

13FD052908

Lab Name: Pace Analytical Services, Inc.

Lab Sample ID: TT51701-007

Instrument ID: HPLC5 (Oscar)

Run Sequence ID: R028606

Column (1): Allure C18

Column (2): Synergi - EtPH

File (1): O60408.b-O6040809.D

File (2): F60608.b-F6060816.D

Date Analyzed (1): 6/4/2008 4:07:00 PM

Date Analyzed (2): 6/6/2008 8:43:00 PM

ANALYTE	COL	CONCENTRATION Final Units: mg/Kg		RPD	RT	RT Window
HMX(Octahydro-1,3,5,7-te	1	0.288253	X	4.1 %	4.65	4.41 - 4.91
	2	0.276688			8.47	8.23 - 8.73
RDX (Hexahydro-1,3,5-trin	1	0.325771		1.8 %	8.23	7.97 - 8.47
	2	0.331757	X		9.07	8.83 - 9.33
2,4,6-Trinitrotoluene (TN	1	0.6487		3.4 %	20.34	20.09 - 20.59
	2	0.670911	X		35.66	35.29 - 36.17
4-Amino-2,6-dinitrotoluen	1	0.0788787		17.7 %	21.08	20.78 - 21.38
	2	0.0942342	X <MDL		15.53	15.30 - 15.80

6/18/08
AP

X = Concentration Reported

CONFIRMATION SUMMARY WORKSHEET FOR SINGLE COMPONENT ANALYTES

Client Sample ID

13SD076

Lab Name: Pace Analytical Services, Inc.

Lab Sample ID: TT51701-008

Instrument ID: HPLC5 (Oscar)

Run Sequence ID: R028606

Column (1): Allure C18

Column (2): Synergi - EtPH

File (1): O60408.b-O60408 10.D

File (2): F60608.b-F6060817.D

Date Analyzed (1): 6/4/2008 4:47:00 PM

Date Analyzed (2): 6/6/2008 9:23:00 PM

ANALYTE	COL	CONCENTRATION Final Units: mg/Kg		RPD	RT	RT Window
HMX (Octahydro-1,3,5,7-te	1	41.0714		3.4 %	4.65	4.41 - 4.91
	2	42.4909	X		8.46	8.23 - 8.73
RDX (Hexahydro-1,3,5-trin	1	217.251		3.5 %	8.21	7.97 - 8.47
	2	224.893	X		9.06	8.83 - 9.33
1,3,5-Trinitrobenzene	1	0.0467722		48.4 %	11.95	11.72 - 12.22
	2	0.0766627	X < MDL		26.90	26.68 - 27.22
2,4,6-Trinitrotoluene (TN	1	78.3361	6/18/08 AP	2.2 %	20.31	20.09 - 20.59
	2	80.0595	X		35.67	35.29 - 36.17
4-Amino-2,6-dinitrotoluen	1	2.5691	X	34.9 %	20.93	20.78 - 21.38
	2	1.80506			15.53	15.30 - 15.80
2-Amino-4,6-dinitrotoluen	1	1.10419	X	4.1 %	22.12	21.88 - 22.48
	2	1.06023			17.11	16.90 - 17.40

X = Concentration Reported

CONFIRMATION SUMMARY WORKSHEET FOR SINGLE COMPONENT ANALYTES

Client Sample ID

13SD076-DL

Lab Name: Pace Analytical Services, Inc.

Lab Sample ID: TT51701-008DL

Instrument ID: HPLC5 (Oscar)

Run Sequence ID: R028606

Column (1): Allure C18

Column (2): Synergi - EtPH

File (1): O60408.b-O6040840.D

File (2): F60608.b-F6060818.D

Date Analyzed (1): 6/5/2008 1:25:00 PM

Date Analyzed (2): 6/6/2008 10:03:00 PM

ANALYTE	COL	CONCENTRATION Final Units: mg/Kg		RPD	RT	RT Window
HMX (Octahydro-1,3,5,7-te	1	46.961		5.0 %	4.65	4.41 - 4.91
	2	49.351	X		8.47	8.23 - 8.73
RDX (Hexahydro-1,3,5-trin	1	250.39		6.9 %	8.20	7.97 - 8.47
	2	268.257	X		9.08	8.83 - 9.33
2,4,6-Trinitrotoluene (TN	1	87.85		4.4 %	20.22	20.09 - 20.59
	2	91.7849	X		35.69	35.29 - 36.17
4-Amino-2,6-dinitrotoluen	1	3.22387	X	43.7 %	20.80	20.78 - 21.38
	2	2.06661			15.56	15.30 - 15.80
2-Amino-4,6-dinitrotoluen	1	1.31912	X <CMPL	11.9 %	22.05	21.88 - 22.48
	2	1.17149			17.15	16.90 - 17.40

6/18/08
KP

X = Concentration Reported

CONFIRMATION SUMMARY WORKSHEET FOR
SINGLE COMPONENT ANALYTES

Client Sample ID

13SD070

Lab Name: Pace Analytical Services, Inc.

Lab Sample ID: TT51701-009

Instrument ID: HPLC5 (Oscar)

Run Sequence ID: R028606

Column (1): Allure C18

Column (2): Synergi - EtPH

File (1): O60408.b-O6040811.D

File (2): F60608.b-F6060819.D

Date Analyzed (1): 6/4/2008 5:27:00 PM

Date Analyzed (2): 6/6/2008 10:43:00 PM

ANALYTE	COL	CONCENTRATION Final Units: mg/Kg		RPD	RT	RT Window
HMX (Octahydro-1,3,5,7-te	1	1.74957		1.5 %	4.66	4.41 - 4.91
	2	1.77619	X		8.46	8.23 - 8.73
RDX (Hexahydro-1,3,5-trin	1	1.03387	X	0.3 %	8.23	7.97 - 8.47
	2	1.03066			9.07	8.83 - 9.33
2,4,6-Trinitrotoluene (TN	1	0.195951	X	0.9 %	20.32	20.09 - 20.59
	2	0.194219			35.63	35.29 - 36.17
4-Amino-2,6-dinitrotoluen	1	0.0562302		23.8 %	21.06	20.78 - 21.38
	2	0.0714437	X <MDL		15.53	15.30 - 15.80

6/18/08
AP

X = Concentration Reported

CONFIRMATION SUMMARY WORKSHEET FOR SINGLE COMPONENT ANALYTES

Client Sample ID

13SB1080304

Lab Name: Pace Analytical Services, Inc.

Lab Sample ID: TT51701-010

Instrument ID: HPLC5 (Oscar)

Run Sequence ID: R028606

Column (1): Allure C18

Column (2): Synergi - EtPH

File (1): O60408.b-O6040812.D

File (2): F60608.b-F6060820.D

Date Analyzed (1): 6/4/2008 6:07:00 PM

Date Analyzed (2): 6/6/2008 11:23:00 PM

ANALYTE	COL	CONCENTRATION Final Units: mg/Kg		RPD	RT	RT Window
HMX (Octahydro-1,3,5,7-te	1	0.188998		1.7 %	4.65	4.41 - 4.91
	2	0.192318	X		8.47	8.23 - 8.73
RDX (Hexahydro-1,3,5-trin	1	0.383463	X	5.4 %	8.22	7.97 - 8.47
	2	0.36347			9.07	8.83 - 9.33
1,3,5-Trinitrobenzene	1	0.0897162		8.7 %	11.95	11.72 - 12.22
	2	0.0978679	X ≤MDL 6/18/08 AP		26.94	26.68 - 27.22
2,4,6-Trinitrotoluene (TN	1	0.455034		4.4 %	20.31	20.09 - 20.59
	2	0.475473	X		35.70	35.29 - 36.17
4-Amino-2,6-dinitrotoluen	1	0.53487		0.2 %	21.06	20.78 - 21.38
	2	0.535988	X		15.55	15.30 - 15.80
2-Amino-4,6-dinitrotoluen	1	0.19163	X	11.1 %	22.15	21.88 - 22.48
	2	0.171446			17.13	16.90 - 17.40

X = Concentration Reported

CONFIRMATION SUMMARY WORKSHEET FOR
SINGLE COMPONENT ANALYTES

Client Sample ID

13SB1080506

Lab Name: Pace Analytical Services, Inc.

Lab Sample ID: TT51701-011

Instrument ID: HPLC5 (Oscar)

Run Sequence ID: R028606

Column (1): Allure C18

Column (2): Synergi - EtPH

File (1): O60408.b-O6040814.D

File (2): F60608.b-F6060821.D

Date Analyzed (1): 6/4/2008 7:27:00 PM

Date Analyzed (2): 6/7/2008 12:03:00 AM

ANALYTE	COL	CONCENTRATION Final Units: mg/Kg		RPD	RT	RT Window
HMX (Octahydro-1,3,5,7-te	1	0.273179	X	3.2 %	4.65	4.41 - 4.91
	2	0.264526			8.47	8.23 - 8.73
RDX (Hexahydro-1,3,5-trin	1	0.721384	X	3.8 %	8.22	7.97 - 8.47
	2	0.694577			9.07	8.83 - 9.33
1,3,5-Trinitrobenzene	1	0.135982		20.0 %	11.97	11.72 - 12.22
	2	0.166208	X		26.90	26.68 - 27.22
2,4,6-Trinitrotoluene (TN	1	0.915968	X	0.5 %	20.32	20.09 - 20.59
	2	0.911105			35.67	35.29 - 36.17
4-Amino-2,6-dinitrotoluen	1	1.32967		1.7 %	21.06	20.78 - 21.38
	2	1.35285	X		15.54	15.30 - 15.80
2-Amino-4,6-dinitrotoluen	1	0.426565	X	5.1 %	22.15	21.88 - 22.48
	2	0.405233			17.12	16.90 - 17.40

X = Concentration Reported

CONFIRMATION SUMMARY WORKSHEET FOR
SINGLE COMPONENT ANALYTES

Client Sample ID

13RB05290801

Lab Name: Pace Analytical Services, Inc.

Lab Sample ID: TT51701-012

Instrument ID: HPLC5 (Oscar)

Run Sequence ID: R028606

Column (1): Allure C18

Column (2): Synergi - EIPH

File (1): O60408.b-O6040832.D

File (2): F60608.b-F6060805.D

Date Analyzed (1): 6/5/2008 7:27:00 AM

Date Analyzed (2): 6/6/2008 1:22:00 PM

ANALYTE	COL	CONCENTRATION Final Units: ug/L	RPD	RT	RT Window
HMX	1	0.239495	65.8 %	4.67	4.41 - 4.91
	2	0.47411 X		8.55	8.23 - 8.73
RDX	1	0.402901	25.3 %	8.24	7.97 - 8.47
	2	0.519853 X		9.11	8.83 - 9.33

X = Concentration Reported

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC Crane		JOB NUMBER CT0048	
SUBJECT PCB			
BASED ON 8082		DRAWING NUMBER	
BY Ed Lodge	CHECKED BY	APPROVED BY	DATE

135D069.
Aroclor-1248 = 12,000 ug/Kg

Peak 1

$$\frac{2822694 \times 10{,}000 \times 10}{2{,}709540 \times 5.35 \times 0.5 \times 0.699} = 6953$$

4520
13800
24000
11800

61073/5 = 12214 ug/Kg

1

AROCLOR ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD069-DL

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028576

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-001DL

Sample wt/vol: 5.35 (g/mL) gm

Lab File ID: Q6040804.d

% Moisture: 30.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 10000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 0.5 (uL)

Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/kg	Q
12674-11-2	AROCLOR-1016	48	U
11104-28-2	AROCLOR-1221	48	U
11141-16-5	AROCLOR-1232	48	U
53469-21-9	AROCLOR-1242	48	U
12672-29-6	AROCLOR-1248	12000	
11097-69-1	AROCLOR-1254	48	U
11096-82-5	AROCLOR-1260	48	U

Comments:

Data File: \\diana\target\6890q.i\Q51908PCB-2.b\Q6040804.d
Report Date: 13-Jun-2008 13:03

Pace Analytical Services, Inc.

0.5ul RTX-CLP2 30m x 0.32mm x 0.25um

Data file : \\diana\target\6890q.i\Q51908PCB-2.b\Q6040804.d
Lab Smp Id: TT51701-001DL Client Smp ID: 13SD069
Inj Date : 04-JUN-2008 14:52
Operator : GR Inst ID: 6890Q.i
Smp Info : TT51701-001DL
Misc Info : Method 8082
Comment :
Method : \\diana\target\6890q.i\Q51908PCB-2.b\Q51908-2PCB.m
Meth Date : 13-Jun-2008 12:43 tarynn Quant Type: ESTD
Cal Date : 22-MAY-2008 18:29 Cal File: Q5220815.d
Als bottle: 1
Dil Factor: 10.00000 Sample Compound Amounts Loaded
Integrator: Falcon Compound Sublist: 8082.sub
Target Version: 4.03 Sample Matrix: SOIL
Processing Host: TARGET08

Concentration Formula: Amt * DF * Uf * Vt*GPC/(Vi * Ws * (100 - M)/100)

Name	Value	Description
DF	10.000	Dilution Factor
Uf	1.000	Correction factor
Vt	10000.000	Volume of final extract (uL)(1000 low, 2
GPC	1.000	GPC Factor
Vi	0.500	Volume injected (uL)
Ws	5.350	Weight of sample extracted (g)
M	30.100	% Moisture

RT	EXP RT	DLT RT	RESPONSE	CONCENTRATIONS ON-COL (ng)	FINAL (ug/Kg)	TARGET RANGE	RATIO
5 Aroclor-1248					CAS #: 12672-29-6		
10.618	10.633	-0.015	2822694	0.13002	6950	80.00- 120.00	100.00
11.208	11.223	-0.015	1941682	0.08450	4520	85.06- 125.06	68.79
11.278	11.293	-0.015	6173688	0.25879	13800	87.87- 127.87	218.72
11.621	11.639	-0.018	7938484	0.44896	24000	58.14- 98.14	281.24
12.248	12.266	-0.018	2815418	0.22009	11300	36.94- 76.94	99.74
Average of Peak Concentrations =					12200		
$ 1 Tetrachloro-m-xylene					CAS #:		
7.1611	7.1840	-0.023	691796	0.00105	56.2		

Pace Analytical Services, Inc.
Initial Calibration Linearity Summary

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave CF	%RSD
Aroclor-1242-1	+++++++	+++++++	13183900	+++++++	+++++++	13183900	0.0
Aroclor-1242-2	+++++++	+++++++	13217060	+++++++	+++++++	13217060	0.0
Aroclor-1242-3	+++++++	+++++++	12320370	+++++++	+++++++	12320370	0.0
Aroclor-1242-4	+++++++	+++++++	13095340	+++++++	+++++++	13095340	0.0
Aroclor-1242-5	+++++++	+++++++	11112780	+++++++	+++++++	11112780	0.0
Aroclor-1248-1	24373440	24223780	20979980	19597910	19372590	21709540 *	11.3
Aroclor-1248-2	26297840	24951023	22041450	20847240	20758970	22979300	10.9
Aroclor-1248-3	27078280	25476780	22630700	21849670	22244320	23855950	9.6
Aroclor-1248-4	19423840	19167980	16393820	16479720	16944670	17682010	8.4
Aroclor-1248-5	14996560	14071320	11946000	11475740	11471070	12792140	12.8
Aroclor-1254-1	27586320	26340460	23706870	22263500	22285850	24436600	9.9
Aroclor-1254-2	31068880	29943220	27239750	26211740	26665130	28225740	7.6
Aroclor-1254-3	41064720	39856260	38180250	38442850	39701470	39449110	3.0
Aroclor-1254-4	27042280	26523320	25414750	24870690	26516640	26073540	3.4
Aroclor-1254-5	33757680	31974840	31060530	30215610	31671520	31736040	4.1
Aroclor-1260-1	41393080	36440040	33158180	31569220	31309370	34773980	12.2
Aroclor-1260-2	49709280	44037760	40589200	39517900	39012060	42573240	10.4
Aroclor-1260-3	39783800	35981620	33287590	31561950	31083720	34340940	10.5
Aroclor-1260-4	40184200	35947580	33948070	32263910	31799830	34828720	9.8
Aroclor-1260-5	46798360	41895760	40335620	38913430	38351800	41258990	8.2

Amount = Response divided by CF

+++ - Standard Level not used in linearity determination.

CF - Calibration Factor (response divided by concentration).

RSD - Relative Standard Deviation.

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE ____ OF ____

CLIENT NSWC Crane		JOB NUMBER CTO 048	
SUBJECT Explosive			
BASED ON 8330		DRAWING NUMBER	
BY Sal Bracelli	CHECKED BY	APPROVED BY	DATE

1350074

HMX = 27 mg/Kg

$$\frac{5270 \times 20 \times 10 \times 0.001}{7.846280 \times 5.01} = 26.8 \text{ mg/Kg}$$

1

ORDNANCE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

13SD074-DL

Lab Name: Pace Analytical Services, In

Contract: N/A

SDG No.: TT51701

Run Sequence: R028606

Matrix: (SOIL/WATER) Soil

Lab Sample ID: TT51701-005DL

Sample wt/vol: 5.01 (g/mL) gm

Lab File ID: F6060814.D

% Moisture: 0.0 Decanted: (Y/N) N

Date Collected: 05/29/2008

Extraction: (Type) SONC

Date Extracted: 06/02/2008

Concentrated Extract Volume: 20000.0(uL)

Date Analyzed: 06/04/2008

Injection Volume: 50.0 (uL)

Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH:

Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: mg/Kg	Q
2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1	27	
121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5	22	
99-35-4	1,3,5-Trinitrobenzene	1.0	U
98-95-3	Nitrobenzene	1.0	U
479-45-8	Tetryl (Methyl-2,4,6-trinitrophyeny	1.0	U
118-96-7	2,4,6-Trinitrotoluene (TNT)	5.3	
19406-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U

Comments:

Pace Analytical Services, Inc.
Quantitation Report

Data File	: //ceres/labdata/hplc/felix/Felix.i/F60608.b/F6060814.D		
Injection Date	: 06-JUN-2008 19:23		
Sample Info	: TT51701-005DL METHOD8330		
Misc. Info	: Method 8330		
Laboratory ID	: TT51701-005DL	Client ID	: 13SD074 DL
Instrument ID	: Felix.i	Operator	: AP
Method	: 8330syn060208.m	Sublist	: 8330
Quantitation	: ESTD	Integrator	: HP Genie
Dilution Factor	: 10.0	Sample Type	: SAMPLE
Column	: EtPh	Column Size	: 0.25m L- 4.60mm ID

UnitFactor : 0.001000
FinalVolume : 20000 ul
SampleWeight: 5.010 g
Moisture : 0.0000 %
InjectionVol: 50.00 ul

Compound	RT	RT Window	Response	Concentrations Soln ng/mL	Concentrations Final mg/Kg
	3.57		6259		
HMX	8.47	8.23 - 8.73	5270	671.66	26.8
RDX	9.08	8.83 - 9.33	5392	540.08	21.6
	10.03		93		
	12.44		356		
	13.82		153		
4-Amino-2,6-Dinitrotoluene	15.56	15.30 - 15.80	191	19.428	0.776 } < MDL
2-Amino-4,6-Dinitrotoluene	17.18	16.90 - 17.40	167	12.387	0.494 }
	18.53		271		
3,4-Dinitrotoluene	19.28	19.02 - 19.52	1561	220.80	8.81
	23.05		106		
	23.27		100		
	23.46		81		
	23.65		43		
	30.37		102		
	31.05		100		
2,4,6-TNT	35.71	35.29 - 36.17	781	133.65	5.34

6/18/08 AP

Response is in height units.
M - The peak was manually integrated.
E - The quantitated amount exceeds the calibration range.

ORD - 125

Pace Analytical Services, Inc.
Initial Calibration Linearity Summary

Start Cal Date: 02-JUN-2008 13:47
End Cal Date : 02-JUN-2008 16:27
Quant Method : ESTD
Cal Curve Type: Average CF
Integrator : HP Genie
Method File : \\ceres\labdata\hplc\felix\Felix.i\F60208syn.b\8330syn060208.m
Method : Method 8330
Sublist : 8330.sub
Column : EtPh
Column Size : 0m L - 4.60mm ID

Calibration Files:
Level 1: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020807.D
Level 2: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020808.D
Level 3: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020809.D
Level 4: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020810.D
Level 5: //ceres/labdata/hplc/felix/Felix.i/F60208syn.b/F6020811.D

GR 6/5/08

Compound	Level 1	Level 2	Level 3	Level 4	Level 5	Ave CF	%RSD
4 HMX	8.300000 *	8.730000	7.494000	7.308000	7.319400	7.846280	8.4
5 RDX	10.56000	10.95000	9.574000	9.411000	9.423000	9.583600	7.2
6 Nitrobenzene	17.74000	18.54000	16.98600	16.63500	16.80520	17.34124	4.6
7 4-Amino 2,6-Dinitrotoluene	10.48000	10.99000	9.366000	9.149000	9.171400	9.831280	8.6
8 2-Nitrotoluene	8.740000	9.300000	8.500000	8.364000	8.453200	8.671440	4.4
9 4-Nitrotoluene	7.580000	8.050000	7.336000	7.163000	7.279600	7.481720	4.7
10 2-Amino-4,6 Dinitrotoluene	14.40000	14.99000	12.86400	12.53700	12.61720	13.46164	8.4
11 1,3-Dinitrobenzene/3NT	14.07000	14.65300	12.79600	12.55850	12.66210	13.34792	7.1
13 2,6-Dinitrotoluene	9.860000	8.100000	7.012000	6.860000	6.940200	7.354440	7.9
14 2,4-Dinitrotoluene	15.64000	16.10000	12.61600	12.24400	12.33420	13.78684	13.9

Amount = Response divided by CF

CF - Calibration Factor (response divided by concentration)
RSD - Relative Standard Deviation.

APPENDIX B

EXCAVATION VOLUME CALCULATIONS

CLIENT:	NAVAL SURFACE WARFARE CENTER, CRANE	JOB NUMBER:	112G00352-14.250A
SUBJECT:	SWMU 13 - MINE FILL B		
BASED ON:	Limits of Excavation Drawings	DRAWING NUMBER:	IMWP Figures 3-1, 3-2, 3-3, 3-4, and 3-5
BY: TWS Date: 7/29/08	CHECKED BY: TJR Date: 7/29	APPROVED BY:	DATE:

OBJECTIVE:

Estimate the volume and weight of PCB-contaminated soil and sediment to be excavated/removed from SWMU 13 to meet the 1 mg/kg cleanup goal and optional cleanup goals.

APPROACH:

1. Using the excavation areas identified on the referenced figures (Figures 3-1, 3-2, 3-2, 3-4, and 3-5, calculate the volume of soil to be removed based on vertical sidewalls and reported excavation depths.

2. Using a conversation factor of 1.485 tons per cubic yard of soil, calculate the weight of soil to be excavated.

3. Calculate the required backfill volume required for restoration.

REFERENCES:

TtNUS (Tetra Tech NUS, Inc.), 2008. Interim Measures Work Plan SWMU 13, NSWC Crane, Crane, Indiana.

CALCULATIONS

Volumes and Weights rounded to the nearest 10.

1) Base Excavation Volumes

1A) Building 166 Surface Soil

The area identified in Figure 3-1 southwest of Building 166 requires excavation to a depth of 2 feet. Based on in-place analytical data the concentrations of PCBs in this area do not exceed 50 mg/kg and therefore is not considered TSCA regulated soil.

Area of surface Excavation =	2,950 sf
Depth of Excavation =	2 ft
Volume of Excavation =	5,900 cf
Volume of Excavation =	**220 cy**

CLIENT:	NAVAL SURFACE WARFARE CENTER, CRANE	JOB NUMBER:	112G00352-14.250A
SUBJECT:	SWMU 13 - MINE FILL B		
BASED ON:	Limits of Excavation Drawings	DRAWING NUMBER:	IMWP Figures 3-1, 3-2, 3-3, 3-4, and 3-5
BY: TWS Date: 7/29/08	CHECKED BY: TSN Date: 7/29	APPROVED BY:	DATE:

1B) Building 171 Surface Soil

The area identified in Figure 3-1 southwest of Building 166 requires excavation to a depth of 2 feet. Based on in-place analytical data the concentrations of PCBs in a portion of this excavation area exceed 50 mg/kg and therefore must be handled separately and disposed of as TSCA regulated soil.

Total Area of Surface Soil Excavation =	17,320 sf
Depth of Excavation =	2 ft
Volume of Excavation =	34,640 cf
Volume of Excavation =	1,280 cy
Area Where PCB Concentrations Exceed 50 mg/kg =	5,230 sf
Depth of Excavation =	2 ft
Volume of TSCA regulated Soil =	10,460 cf
Volume of TSCA regulated Soil =	**390 cy**
Volume of Non-TSCA regulated Soil =	**890 cy**

1C) Drainage Channel Sediments

The drainage channels identified in Figure 3-1 requires excavation to a depth of 2 feet. Based on in-place analytical data the concentrations of PCBs in the drainage channels do not exceed 50 mg/kg and therefore are not considered TSCA regulated soils.

Based on field measurements the average area per foot of excavation within the drainage channels is 23 square feet per linear foot. Therefore, the area of excavation within the drainage channels equals the average area per foot times the length of channels to be excavated.

Average Area per foot of Excavation =	23 sf
Length of Channel Excavation =	470 ft
Area of surface Excavation =	10,810 sf
Depth of Excavation =	2 ft
Volume of Excavation =	21,620 cf
Volume of Excavation =	800 cy

In addition to the excavation within the channel itself, a 5 foot wide over-flow area on each side of the excavated channels will also be excavated to a depth of 1 foot.

Area of Over-Flow Excavation per foot of Channel Excavation =	10 sf
Length of Channel Excavation =	470 ft
Area of surface Excavation =	4,700 sf
Depth of Excavation =	1 ft
Volume of Excavation =	4,700 cf
Volume of Excavation =	170 cy

CLIENT:	NAVAL SURFACE WARFARE CENTER, CRANE	JOB NUMBER:	112G00352-14.250A
SUBJECT:	SWMU 13 - MINE FILL B		
BASED ON:	Limits of Excavation Drawings	DRAWING NUMBER:	IMWP Figures 3-1, 3-2, 3-3, 3-4, and 3-5
BY: TWS Date: 7/29/08	CHECKED BY: TJR Date: 7/29	APPROVED BY:	DATE:

Total Sediment Volume Removed from Channels = 970 cy

1D) Culvert Cleaning Sediment

During the removal of sediment from the channels sediment will also pressure washed from the culverts that are within the limits of the channel excavation. Based on field observations these channels are relatively clean and no measurement of sediment quantity was taken from the culverts. Based on PCB concentrations within the channel sediments it is assumed that the sediment within the culverts is also non-TSCA regulated.

Estimated Culvert Sediment Volume = 2.5 cy

1E) Sediment Piles Removal

Two piles of sediment are located within the conveyance tunnel located between buildings 171 and 169. Filed measurements indicate that there is approximately 8 cubic yards of sediment within these piles. Based on analytical data from these piles, the PCB concentrations do not exceed 50 mg/kg. Therefore, the sediment is not considered TSCA regulated soil.

Sediment Pile Volume = 8 cy

1F) Sump Sediment

The sump located northwest of Building 171 contains sediment that requires removal. Filed measurements were taken from the sump and the average depth of sediment was recorded. Based on analytical data from the sump sediment, PCB concentrations do not exceed 50 mg/kg. Therefore, the sediment is not considered TSCA regulated soil.

Approximate length of Sump =	20 ft
Approximate Width of Sump =	10 ft
Area of Sump Bottom =	200 sf
Depth of Sediment =	3 ft
Volume of Sediment in Sump =	600 cf
Volume of Sediment in Sump =	**20 cy**

1G) Trench Drain Sediments

The trench drains located around Building 171 will be cleaned and sediment will be removed from the trench drains. Based on field observations there is not a large amount of sediment within the trenches but the manhole located adjacent to the sump contains a substantial amount of sediment. Based on analytical data collected from the trench drains, PCB concentrations are less than 50 mg/kg. Therefore the sediment within the trench drains is not TSCA regulated soil.

Estimated Volume of Sediment in Trench Drain System = 5 cy

CLIENT:	NAVAL SURFACE WARFARE CENTER, CRANE	JOB NUMBER:	112G00352-14.250A
SUBJECT:	SWMU 13 - MINE FILL B		
BASED ON:	Limits of Excavation Drawings	DRAWING NUMBER:	IMWP Figures 3-1, 3-2, 3-3, 3-4, and 3-5
BY: TWS Date: 7/29/08	CHECKED BY: TSR Date: 7/29	APPROVED BY:	DATE:

SUMMARY OF IMWP SOIL AND SEDIMENT BASE EXCAVATION VOLUMES

Total Volume of Soil and Sediment Removed from SWMU 13 =	**2,510 cy**
Total Volume of TSCA Regulated Soil and Sediment =	**390 cy**
Total Weight of TSCA Regulated Soil and Sediment =	**580 ton**
Total Volume of Non-TSCA Regulated Soil and Sediment =	**2,120 cy**
Total Weight of Non-TSCA Regulated Soil and Sediment =	**3,150 ton**

2) Optional Excavations

2A) Option 1 Excavation Volumes

Option 1 includes the excavation of subsurface soils with PCB concentrations that exceed 25 mg/kg. If this option is executed the subsurface soil removed will be from a depth interval of 2 to 4 feet below ground surface (vertical sidewalls are assumed for this excavation). Based on in-place analytical data the subsurface soil near Building 171 contains PCBs at concentrations greater than 50 mg/kg and will be handled as TSCA regulated soil, the subsurface soil near building 166 contains PCB concentrations that are less than 50 mg/kg and is not considered TSCA regulated soil.

Area of Option 1 Excavation (Bldg 171) =	400 sf
Depth of Excavation (Bldg 171) =	2 ft
Additional Option 1 Volume (TASC Soil Bldg 171) =	800 cf
Additional Option 1 Volume (TASC Soil Bldg 171) =	**30 cy**
Additional Option 1 Weight (TASC Soil Bldg 171) =	**40 ton**
Area of Option 1 Excavation (Bldg 166) =	375 sf
Depth of Excavation (Bldg 166) =	2 ft
Additional Option 1 Volume (Non-TASC Soil Bldg 166) =	750 cf
Additional Option 1 Volume (Non-TASC Soil Bldg 166) =	**30 cy**
Additional Option 1 Weight (Non-TASC Soil Bldg 166) =	**40 ton**

2B) Option 2 Excavation Volumes

Option 2 includes the excavation of subsurface soils with PCB concentrations that exceed 1 mg/kg. If this option is executed the subsurface soil removed will be from a depth interval of 2 to 4 feet below ground surface (vertical sidewalls are assumed for this excavation). Based on in-place analytical data the subsurface soil near Building 171 contains PCBs at concentrations greater than 50 mg/kg and will be handled as TSCA regulated soil, the subsurface soil near building 166 contains PCB concentrations that are less than 50 mg/kg and is not considered TSCA regulated soil.

CLIENT:	NAVAL SURFACE WARFARE CENTER, CRANE	JOB NUMBER:	112G00352-14.250A
SUBJECT:	SWMU 13 - MINE FILL B		
BASED ON:	Limits of Excavation Drawings	DRAWING NUMBER:	IMWP Figures 3-1, 3-2, 3-3, 3-4, and 3-5
BY: TWS Date: 7/29/08	CHECKED BY: TJR Date: 7/29	APPROVED BY:	DATE:

Area of Option 2 Excavation (Bldg 171) =	900 sf
Depth of Excavation (Bldg 171) =	2 ft
Additional Option 2 Volume (TASC Soil Bldg 171) =	1800 cf
Additional Option 2 Volume (TASC Soil Bldg 171) =	**70 cy**
Additional Option 2 Weight (TASC Soil Bldg 171) =	**100 ton**
Area of Option 2 Excavation (Bldg 166) =	375 sf
Depth of Excavation (Bldg 166) =	2 ft
Additional Option 2 Volume (Non-TASC Soil Bldg 166) =	750 cf
Additional Option 2 Volume (Non-TASC Soil Bldg 166) =	**30 cy**
Additional Option 2 Weight (Non-TASC Soil Bldg 166) =	**40 ton**
Area of Option 2 Excavation (Channel) =	4320 sf
Depth of Excavation (Bldg 166) =	2 ft
Additional Option 2 Volume (Non-TASC Soil Channel) =	8640 cf
Additional Option 2 Volume (Non-TASC Soil Channel) =	**320 cy**
Additional Option 2 Weight (Non-TASC Soil Channel) =	**480 ton**

3) Restoration

Following the removal of contaminated soils from the SWMU 13 area the excavation areas will be backfilled to re-establish existing grades. Excavations will be backfilled with common fill and topsoil. Common fill will be used to backfill the excavations to a depth that is 6 inches below final grade and 6 inches of topsoil will be used to establish final grade.

3A) Base Line Restoration

Total Volume Excavated =	2,510 cy
Total Excavation Area =	35,780 sf
Thickness of Topsoil =	0.5 ft
Volume of Topsoil =	17,890 cf
Volume of Topsoil =	**660 cy**
Volume of Common Fill Needed =	**1,850 cy**

3B) Option 1 Restoration

Total Volume Excavated =	2,570 cy
Volume of Topsoil =	**660 cy**
Volume of Common Fill Needed =	**1,910 cy**

CLIENT:	NAVAL SURFACE WARFARE CENTER, CRANE	JOB NUMBER:	112G00352-14.250A
SUBJECT:	SWMU 13 - MINE FILL B		
BASED ON:	Limits of Excavation Drawings	DRAWING NUMBER:	IMWP Figures 3-1, 3-2, 3-3, 3-4, and 3-5
BY: TWS Date: 7/29/08	CHECKED BY: TJR Date: 7/29	APPROVED BY:	DATE:

3B) Option 2 Restoration

Total Volume Excavated = 2,930 cy

Volume of Topsoil = 660 cy

Volume of Common Fill Needed = 2,270 cy

APPENDIX C

SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SPECIFICATIONS
INTERIM MEASURES WORK PLAN
SWMU 13 – MINE FILL B
NSWC CRANE
CRANE, INDIANA

EMAC Contractor Requirements

The Environmental Multiple Award Contract (EMAC) contractor will be responsible for performing the following work:

1. Attend pre-IMWP implementation conference.
2. Submit documentation in accordance with the EMAC 'Basic Contract' 30 days prior to beginning work to allow the Navy sufficient time to review and comment. The EMAC contractor will then incorporate Navy comments into the documents. These documents include the following:
    - Work Plan
        - Excavation and Handling Plan
        - Hazardous/Waste Management Plan
        - Environmental Protection Plan
        - Erosion and Sediment Control Plan
        - Stormwater Pollution Prevention Plan
        - Transportation and Disposal Plan
    - Site Specific Health and Safety Plan (SSHSP) and Activity Hazard Analysis
    - Project Quality Control Plan (QCP)
3. Acquire Facility-specific permits, including but not limited to the following:
    - Safety & Building Availability Permit (ESO 8020/11)
    - Digging Permit (NWSCC 11000/3)
    - Flame Tool/Hot Work Permit (NWSCC 11320)
    - Hazards of Electromagnetic Radiation to Ordnance (HERO) (approval for portable radios)
4. Mobilize required equipment and personnel to excavate the indicated contaminated surface soil and sediments.
5. Construct and maintain the required erosion and sediment control devices for the duration of the project.
6. Construct required support facilities including, but not limited to, temporary gravel construction entrance, temporary access trails, dewatering pad, decontamination pad(s), and material storage areas.
7. Excavate, transport, and dispose PCB-contaminated surface soils and sediments.
8. Restore surface soil excavation area to meet surrounding grades.
9. Restore drainage channels and streams to pre-construction conditions and alignment.
10. Remove all temporary support facilities, leaving perimeter erosion and sediment controls in place until revegetation is complete and as instructed by the Navy.
11. Restore areas used for temporary support facilities (regrading and revegetation).
12. Demobilize equipment and personnel.

In addition to the QC submittals and Safety and Health submittals required by the NSWC Crane Contractor's Operations Manual and the Basic Contract, the EMAC contractor shall submit the following to the Navy:

- Field work reports in accordance with Part 6.4 Section C of the Basic Contract.
- Contractor 40 CFR 1910.120 Employee Training Certificates for all Contractor employees scheduled to be on-site.
- Erosion and Sediment Control installation and inspection logs.
- Copies of NSWC Crane specific permits.
- Certification and sampling results for backfill material and topsoil. A minimum of one sample per borrow source is required.
- Waste transportation subcontractor name, address, contact name, telephone number, and USDOT number.

- Hazardous waste disposal facility name, address, contact name, telephone number, and USEPA and State identification numbers, if required.
- Solid waste disposal facility name, address, contact name, telephone number, USEPA and State identification numbers.
- Copies of Treatment/Disposal Facility Permits.
- Waste profiles, complete waste characterization results, and any waste disposal facility pre-approval or approval documentation.
- Work Site Decontamination Certificates (verification that all vehicles equipment and containers were properly decontaminated prior to leaving the work site).
- Disposal Site Decontamination Certificates (verification that vehicles and containers were decontaminated prior to leaving the disposal facility).
- Shipment Manifests (manifests and other documents required to ship waste).
- Delivery Certificates (verification that waste was received at identified waste disposal facility).
- Treatment and Disposal Certificates (verification that waste was successfully received and disposed).
- Decontamination Log.

The EMAC contractor-provided information will be compiled in the Construction Completion Report and the project CTO Closure Report to be prepared by the Navy. The EMAC contractor shall provide the Navy, or their representative, all documentation within 30 days of Demobilization from the Site.

Supplemental Specifications

In addition to the performance specifications presented in the NSWC Crane Contractor's Operation Manual and in the Basic Contract, the EMAC contractor shall perform the activities in accordance with the supplemental specifications provided below.

General Requirements

The EMAC contractor is advised that this project is subject to Federal, State, and local regulatory agency inspections and review for compliance with environmental laws and regulations. The EMAC contractor shall fully cooperate with any representative from any Federal, State, or local regulatory agency who may visit the job site and shall provide immediate notification to the Officer in Charge of Construction (OICC), who shall accompany them on any subsequent site inspections. The EMAC contractor shall complete, maintain, and make available to the OICC, Facility, or regulatory agency personnel all documentation relating to environmental compliance under applicable Federal, State, and local laws and regulations. The EMAC contractor shall immediately notify the OICC if a Notice of Violation, Notice of Deficiency, or similar regulatory notice is issued to the EMAC contractor.

The EMAC contractor shall be responsible for all damages to persons or property resulting from EMAC contractor fault or negligence as well as for the payment of any civil fines or penalties which may be assessed by any Federal, State, or local regulatory agency as a result of the EMAC contractor's or any subcontractor's violation of an applicable Federal, State, or local environmental law or regulation. Should a Notice of Violation, Notice of Noncompliance, Notice of Deficiency, or similar regulatory agency notice be issued to the Government or Facility owner/operator on account of the actions or inactions of the EMAC contractor or one if its subcontractors in the performance of work under this contract, the EMAC contractor shall fully cooperate with the Government in defending against regulatory assessment of any civil fines or penalties arising out of such actions or inactions.

After approval of the EMAC contractor's Work Plan and before commencement of work the EMAC contractor shall submit to the OICC the required certifications. As requested by the OICC, the Navy Representative for this project may review and provide surveillance for the OICC to determine if EMAC contractor's submittals comply with the contract requirements.

The EMAC contractor shall be required to commence work on the approved EMAC contractor's Work Plan within 5 calendar days after receiving the notice to proceed and to prosecute the work diligently after receiving the notice to proceed.

NSWC Crane will remain in operation during the entire construction period. The EMAC contractor shall schedule the work as to cause the least amount of interference with the Facility. Work schedules shall be subject to the approval of the OICC. Permission to interrupt Facility road services shall be requested in writing a minimum of 15 calendar days prior to the desired date of interruption. The OICC shall be notified 48 hours prior to starting excavation activities.

Regular work hours shall consist of an 8-1/2 hour daily period established by the OICC, Monday through Friday, excluding Government holidays. The EMAC contractor should assume an 8-1/2 hour daily period. Working outside of the 8-1/2 hour daily period will require approval by the OICC. Work hours shall be established during the pre-IMWP implementation conference.

On-site storage, laydown, material handling, and decontamination activities shall be limited to areas approved by the OICC.

During the progress of construction activities, the work area and adjacent areas shall be kept clean and free of rubbish, surplus materials, and unneeded construction equipment. No material or debris shall be allowed to flow or wash into watercourses, ditches, gutters, drains, or pipes. Upon completion of the work, the EMAC contractor shall sweep paved areas and rake clean landscaped areas, and remove waste and surplus materials, rubbish, and construction facilities from the site.

Work Restrictions

EMAC contractor personnel employed at the Facility shall become familiar with and obey Facility regulations and keep within the limits of the work and avenues of ingress and egress as directed. Personnel shall not enter any restricted areas unless required to do so and until cleared for such entry. The EMAC contractor's equipment shall be clearly marked for identification.

The EMAC contractor shall indicate on the construction schedule any activity that could potentially interrupt Facility operations. The EMAC contractor shall notify the OICC in writing 15 calendar days prior to the required interruption.

Facilities and Services

Provide utility permits in accordance with Part 4.13 Section C of the Basic Contract.

NSWC Crane shall make all reasonably required amounts of utilities available to the EMAC Contractor from existing outlets and supplies, as indicated. The amount of each utility service consumed shall be charged to or paid for by the EMAC Contractor at the prevailing rates charged to NSWC Crane or shall be furnished at no charge as indicated. The EMAC Contractor shall carefully conserve any utilities furnished without charge.

The point at which NSWC Crane will deliver such utilities or services and the quantity available will be identified by NSWC Crane.

The EMAC Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the Government, the EMAC Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

Electric – Electrical power available, primary voltage is [2400 volt 3 phase, 3 wire, 60 cycle AC. Secondary voltages may be 120/208 or 120/240 volts.] Final taps and tie-ins to the NSWC Crane utility grid will be made by NSWC Crane electric shop.

Potable Water – Potable water is not available. EMAC Contractor shall provide potable water for use by all personnel.

Water – Reasonable quantities of water are available to the EMAC contractor at no charge. Provide backflow preventor devices on connections to potable water supplies. Under no circumstances will taps to NSWC Crane fire hydrants be allowed for obtaining water. Contactthe OICC for available potable water supply locations.

Telephone – Telephone service is not available.

Sanitary Facilities - Provide temporary sanitary facilities for use by all personnel in accordance with Part 3.10 Section C of the Basic Contract.

Municipal Waste – Municipal waste storage and disposal is not available.

Sewer – Water resulting from personnel and equipment decontamination, excavation dewatering, and water from materials handling pad may be discharged to the NSWC Crane sanitary sewer system, subject to approval of the NSWC Crane based on characterization samples of water to be discharged.

Site Personnel Qualifications

Site Superintendent - The EMAC contractor shall designate a Site Superintendent who shall have responsibility and authority to direct work performed. The Site Superintendent shall be responsible for the management and execution of all site activities in accordance with the IMWP, approved EMAC contractor's Work Plan, and all Federal, State, and local laws and regulations. The Site Superintendent may not act in the dual role as the Project Quality Control Manager or Site Health and Safety Specialist (SHSS). The Site Superintendent shall have, as a minimum, the following qualifications:

- A minimum of six years site superintendent experience.
- A minimum of three years experience on hazardous, toxic and radioactive waste (HTRW) projects.
- Familiar with the requirements of the U.S. Army Corps of Engineers Safety - Safety and Health Requirements (EM 385-1-1).
- Experience in the areas of hazard identification and safety compliance.

Project Quality Control Manager - The EMAC contractor shall designate a Project Quality Control (QC) Manager who shall assist and represent the QC Program Manager in continued implementation and enforcement of the approved Project QC Plan. The QC Program Manager or Project QC Manager shall be physically present at the project site whenever work is in progress. The Project QC Manager may be dual hatted with the SHSS if qualified. The Project QC Manager shall have, as a minimum, the following qualifications:

- A minimum two years experience as a Project QC Manager.
- A minimum of ten years combined experience in the following positions: project superintendent, QC manager, project manager, project engineer or construction manager on similar size and type of construction contracts which included the major trades that are part of this IM.
- Alternatively, the above ten year combined experience requirement may be satisfied by providing a professional engineer registered in the State of Indiana having at least two years experience as a Project QC Manager.
- Familiar with the requirements of the U.S. Army Corps of Engineers Safety - Safety and Health Requirements (EM 385-1-1).
- Experience in the areas of hazard identification and safety compliance.

Site Health and Safety Specialist - The EMAC contractor shall designate a Site Health and Safety Specialist (SHSS) who shall assist and represent the EMAC contractor's Health and Safety (H/S) Manager in continued implementation and enforcement of the approved Site Health and Safety Plan (SSHSP). The SHSS shall have the on-site responsibility and authority to modify and stop work, or remove personnel from the site if working conditions change which may affect on-site and off-site health and safety. The SHSS shall be physically present at the project site at all times. The SHSS may be dual hatted with the Project QC Manager. The SHSS shall have, as a minimum, the following qualifications:

- A minimum of five years safety work on similar projects.
- 30-hour OSHA construction safety class or equivalent within the last five years.
- An average of at least 24 hours of formal safety training each year for the last five years.

- Competent person status for at least the following:
    - excavation,
    - health hazard recognition, evaluation and control of chemical, physical and biological agents, and
    - personal protective equipment and clothing to include selection, use and maintenance.
- First aid and cardiopulmonary resuscitation (CPR) qualified.

Quality Control

Approval of the QC Plan is required prior to the start of construction. The OICC reserves the right to require changes in the QC Plan and operations as necessary to ensure the specified quality of work. The Contracting Officer reserves the right to interview the QC Manager at any time in order to verify his/her submitted qualifications.

The OICC shall be notified, in writing, of any proposed changes to the QC Plan, at a minimum of seven calendar days prior to the implementation of the proposed change. Proposed changes must be approved by the OICC.

Combined Contractor Production Report/Contractor Quality Control Report (CPR/CQCR) is required for each day that work is performed. CPR/CQCRs are to be prepared, signed, and dated by the Project QC Manager.

Safety and Occupational Health Requirements

The SHSS and EMAC contractor representatives who have a responsibility or significant role in accident prevention shall attend the pre-IMWP implementation conference. The purpose of the conference is for the EMAC contractor and the OICC to become acquainted and explain the functions and operating procedures of their respective organizations and to reach mutual understanding relative to the administration of the overall project before the initiation of work. The EMAC contractor shall discuss the details of the work identified in the approved EMAC contractor's Work Plan and discuss which construction phases will require significant or additional activity hazard analysis. In addition, a schedule for the preparation, submittal, review, and acceptance of additional hazard analysis shall be established to preclude project delays. Lastly, deficiencies in the submitted accident prevention report will be brought to the attention of the EMAC contractor at the conference. The EMAC contractor shall revise the plan to correct deficiencies and resubmit the plan for acceptance.

New employees (prime or subcontractor) will be informed of specific site hazards before they begin work. Documentation of this orientation shall be kept on file at the project site.

If unforeseen materials hazardous to human health are encountered during operations, that portion of the work shall be stopped and the OICC shall be notified immediately. Within 14 days, the Navy will determine if the material is hazardous. If the material is not hazardous or poses no danger, the OICC will direct the EMAC contractor to proceed without change. If the material is determined to be hazardous or to pose danger, and handling of the material is necessary to accomplish the work, the Contracting Officer will issue modifications to the proposed work.

Equipment shall be operated by designated qualified operators. Proof of qualifications shall be kept on the project site for review. Manufacturer's specifications or owner's manual for the equipment shall be on site and reviewed for additional safety precautions or requirements. Such additional safety precautions or requirements shall be incorporated into the activity hazard analysis. Mechanized equipment shall be inspected in accordance with manufacturer's recommendations for safe operations by a competent person prior to being placed into use. Daily checks or tests shall be conducted and documented on mechanized equipment by designated competent persons.

The competent person for excavations performed as a result of contract work shall be on-site when excavation work is being performed, and shall inspect and document the excavations daily prior to entry by workers. The competent person must evaluate all hazards, including atmospheric, that may be associated with the work, and shall have the resources necessary to correct hazards promptly.

Environmental Controls

An Erosion and Sediment Control Plan is included in the IMWP. The Erosion and Sediment Control Plan describes the location and description of all erosion and sediment control measures, a sequence of construction to be followed, graphic details of all erosion and sediment control measures to be used, and an approval sign-off block containing the names of the Facility and EMAC contractor contacts, whose signatures indicate plan acceptance/approval.

The EMAC contractor shall strictly follow the Erosion and Sediment Control Plan and maintain all measures used during construction. Modifications to the Erosion and Sediment Control Plan shall be submitted to the OICC and the Indiana Department of Environmental Management (IDEM) for approval. No modifications to the Erosion and Sediment Control Plan will be allowed until these changes have been approved by the OICC and IDEM and three copies of the approved modifications have been submitted to the OICC and one copy of the approved modifications have been submitted to IDEM.

Transportation and Disposal of Contaminated Material

The EMAC contractor shall be solely responsible for complying with all Federal, State, and local requirements for decontamination of vehicles, equipment, and containers and shall bear all responsibility and cost for any noncompliance. In addition to these requirements, the EMAC contractor shall perform the following:

- Visually inspect all vehicles, equipment, and containers leaving the work site for proper decontamination.
- Prepare and maintain a written decontamination log.

The EMAC contractor shall be solely responsible for complying with all Federal, State, and local requirements for transporting contaminated materials through the applicable jurisdictions and shall bear all responsibility and cost for any noncompliance. In addition to these requirements, the EMAC contractor shall perform the following:

- Inspect and document all vehicles and containers for proper operation and covering.
- Inspect all vehicles and containers for proper markings, manifest documents, and other requirements for waste shipment.

All contaminated materials removed from the site shall be disposed in a treatment/disposal facility permitted to accept such material.

The EMAC contractor shall properly dispose of investigation derived waste, personnel protective equipment, and miscellaneous wastes associated with implementation of the IMWP, including sampling and analysis that are generated by the Navy representatives.

APPENDIX D

IDEM STABILIZATION SPECIFICATIONS

Practice 3.11
Temporary Seeding

Purpose
(Exhibit 3.11-A)

* To reduce erosion and sedimentation damage by stabilizing disturbed areas where additional work (e.g., grading) is not scheduled for a period of 2 mo. to 1 yr.
* To reduce problems associated with mud or dust from bare soil surfaces during construction.
* To reduce sediment runoff to downstream areas.
* To improve visual aesthetics of the construction areas.

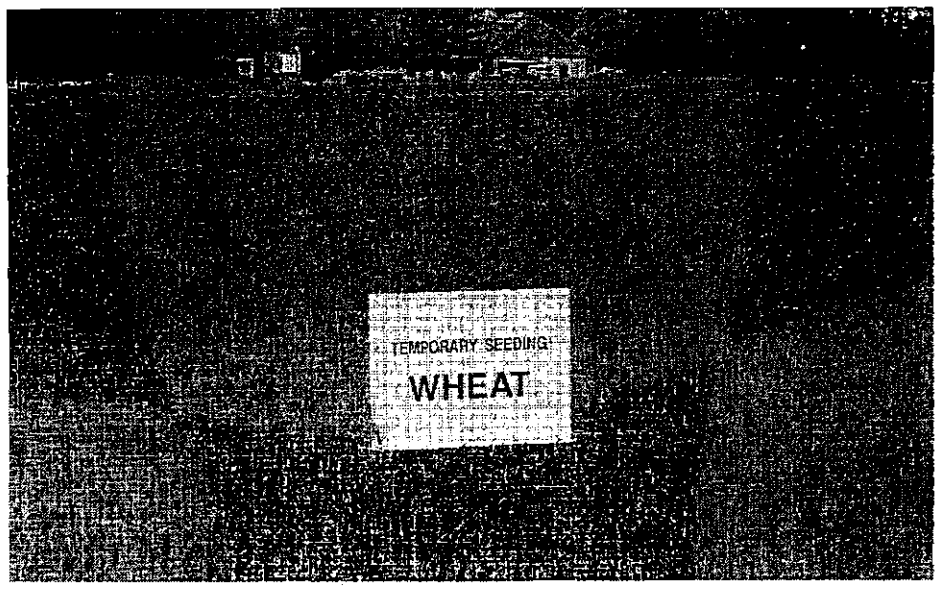

Exhibit 3.11-A. A temporary seeding of wheat to reduce erosion on a future home lot.

Requirements

Site and seedbed preparation: Graded and fertilizer applied.
Plant species: Selected on the basis of quick germination, growth, and time of year to be seeded (see *Exhibit 3.11-B*).
Mulch: Clean grain straw, hay, wood fibre, etc., to protect seedbed and encourage plant growth.
Seeding frequency: As often as possible following construction activity. Daily seeding of rough graded areas when the soil is loose and moist is usually most effective.

Application
(Exhibit 3.11-B)

SITE PREPARATION:

1. Install practices needed to control erosion, sedimentation, and water runoff, such as temporary and permanent diversions, sediment traps or basins, silt fences, and straw bale dams (Practices 3.21, 3.22, 3.72, 3.73, 3.74, and 3.75).
2. Grade the site as specified in the construction plan.

SEEDBED PREPARATION:

1. Test soil to determine its nutrient levels. (Contact your county SWCD or Cooperative Extension office for assistance and soils information, including available soil testing services.)
2. Fertilize as recommended by the soil test. If testing is not done, consider applying 400-600 lbs./acre of 12-12-12 analysis, or equivalent, fertilizer.
3. Work the fertilizer into the soil 2-4 in. deep with a disk or rake operated across the slope.

SEEDING:

1. Select a seeding mixture and rate from *Exhibit 3.11-B*, and plant at depth and on dates shown.
2. Apply seed uniformly with a drill or cultipacker-seeder or by broadcasting, and cover to the depth shown in *Exhibit 3.11-B*.

3. If drilling or broadcasting, firm the seedbed with a roller or cultipacker.
4. Mulch seeded areas to increase seeding success. Anchor all mulch by crimping or tackifying. Use of netting or erosion control blankets is possible, but may not be cost-effective for temporary seedings.

Exhibit 3.11-B. Temporary Seeding Recommendations.

Seed species*	Rate/acre	Planting depth	Optimum dates**
Wheat or rye	150 lbs.	1 to 1½ in.	9/15 to 10/30
Spring oats	100 lbs.	1 in.	3/1 to 4/15
Annual ryegrass	40 lbs.	1/4 in.	3/1 to 5/1 8/1 to 9/1
German millet	40 lbs.	1 to 2 in.	5/1 to 6/1
Sudangrass	35 lbs.	1 to 2 in.	5/1 to 7/30

* Perennial species may be used as a temporary cover, especially if the area to be seeded will remain idle for more than a year (Practice 3.12).

** Seeding done outside the optimum dates increases the chances of seeding failure.

Maintenance

* Inspect periodically after planting to see that vegetative stands are adequately established; re-seed if necessary.
* Check for erosion damage after storm events and repair; reseed and mulch if necessary.
* Topdress fall seeded wheat or rye seedings with 50 lbs./acre of nitrogen in February or March if nitrogen deficiency is apparent. (*Exhibit 3.11-B* shows only wheat/rye fall seeded.)

Common concern

Fertilizer not incorporated at least 2 in. deep—may be lost in runoff or remain concentrated near the surface to inhibit germination.

Mulch rate inadequate—results in poor germination and failure.

Seeding uneven or rate too low—results in patchy growth and erosion.

Practice 3.12
Permanent Seeding

Purposes
(Exhibit 3.12-A)

* To reduce erosion and sedimentation damage by stabilizing exposed areas where additional work (e.g., grading) is not scheduled for a period of more than a year or areas where final grading has been completed.
* To reduce problems associated with mud or dust from bare soil surfaces during construction.
* To reduce sediment runoff to downstream areas.
* To improve the visual aesthetics of the construction area.

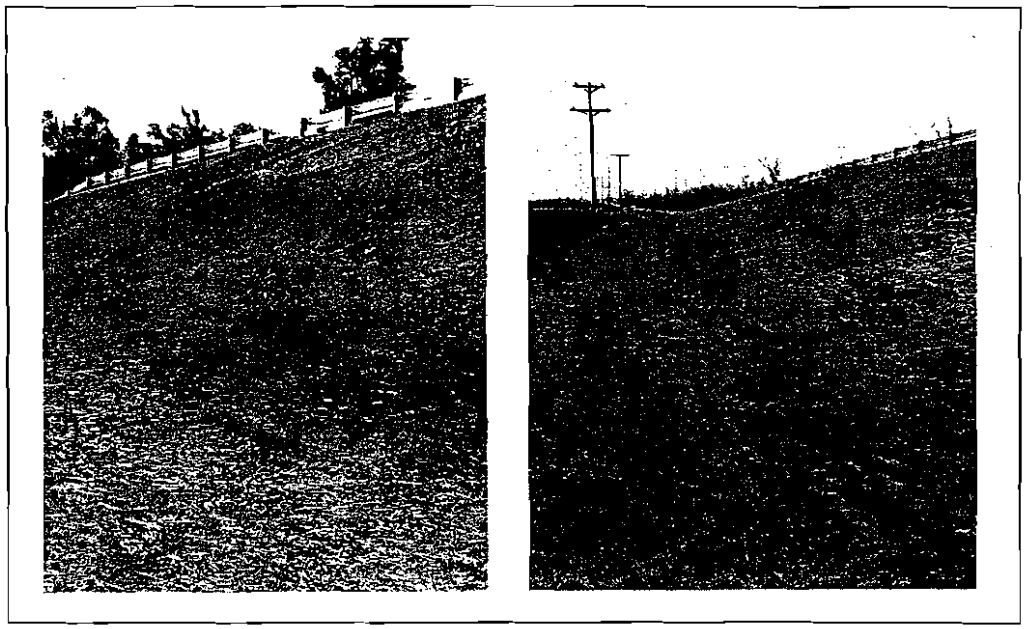

Exhibit 3.12-A. A road right-of-way (left) newly permanent seeded and mulched and (right) 6 mo. later.

Requirements

Site and seedbed preparation: Graded, and lime and fertilizer applied.

Plant species: Selected on the basis of soil type, soil pH, region of the state, time of year, and planned use of the area to be seeded *(see Exhibit 3.12-C)*.

Mulch: Clean grain straw, hay, wood fibre, etc., to protect seedbed and encourage plant growth. The mulch may need to be anchored to reduce removal by wind or water, or erosion control blankets may be considered.

Application
(Exhibits 3.12-B, C, and D)

Permanently seed all final grade areas (e.g., landscape berms, drainage swales, erosion control structures, etc.) as each is completed and all areas where additional work is not scheduled for a period of more than a year.

SITE PREPARATION:

1. Install practices needed to control erosion, sedimentation, and runoff prior to seeding. These include temporary and permanent diversions, sediment traps and basins, silt fences, and straw bale dams (Practices 3.21, 3.22, 3.72, 3.73, 3.74, and 3.75).
2. Grade the site and fill in depressions that can collect water.
3. Add topsoil to achieve needed depth for establishment of vegetation (Practice 3.02).

SEEDBED PREPARATION:

1. Test soil to determine pH and nutrient levels. (Contact your county SWCD or Cooperative Extension office for assistance and soils information, including available testing services.)
2. If soil pH is unsuitable for the species to be seeded, apply lime according to test recommendations.

3. Fertilize as recommended by the soil test. If testing was not done, consider applying 400-600 lbs./acre of 12-12-12 analysis, or equivalent, fertilizer.
4. Till the soil to obtain a uniform seedbed, working the fertilizer and lime into the soil 2-4 in. deep with a disk or rake operated across the slope *(Exhibit 3.12-B)*.

SEEDING:

Optimum seeding dates are Mar. 1-May 10 and Aug. 10-Sept. 30. Permanent seeding done between May 10 and Aug. 10 may need to be irrigated. As an alternative, use temporary seeding (Practice 3.11) until the preferred date for permanent seeding.

1. Select a seeding mixture and rate from *Exhibit 3.12-C*, based on site conditions, soil pH, intended land use, and expected level of maintenance.
2. Apply seed uniformly with a drill or cultipacker-seeder *(Exhibit 3.12-D)* or by broadcasting, and cover to a depth of 1/4-1/2 in.
3. If drilling or broadcasting, firm the seedbed with a roller or cultipacker.
4. Mulch all seeded areas (Practice 3.15). Consider using erosion control blankets on sloping areas (Practice 3.17). (NOTE: If seeding is done with a hydroseeder, fertilizer and mulch can be applied with the seed in a slurry mixture.)

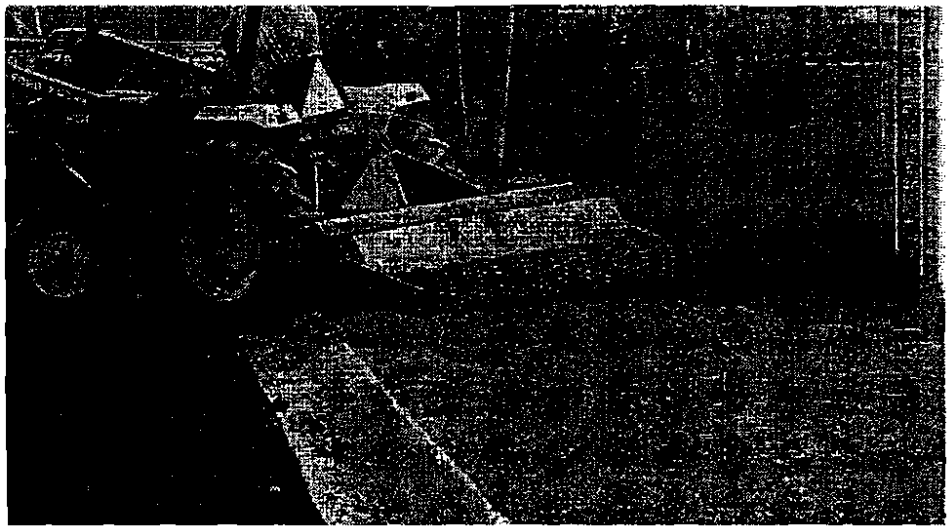

Exhibit 3.12-B. Preparing the seedbed with a combination roto-tiller and cultipacker.

Exhibit 3.12-C. Permanent Seeding Recommendations.

This table provides several seeding options. Additional seed species and mixtures are available commercially. When selecting a mixture, consider site conditions, including soil properties (e.g., soil pH and drainage), slope aspect and the tolerance of each species to shade and droughtiness.

Seed species and mixtures	Rate per acre	Optimum soil pH
OPEN AND DISTURBED AREAS (REMAINING IDLE MORE THAN 1 YR.)		
1. Perennial ryegrass	35 to 50 lbs.	5.6 to 7.0
+ white or ladino clover*	1 to 2 lbs.	
2. Kentucky bluegrass	20 lbs.	5.5 to 7.5
+ smooth bromegrass	10 lbs.	
+ switchgrass	3 lbs.	
+ timothy	4 lbs.	
+ perennial ryegrass	10 lbs.	
+ white or ladino clover*	1 to 2 lbs.	

Exhibit 3.12-C. Continued.

Seed species and mixtures	Rate per acre	Optimum soil pH
3. Perennial ryegrass	15 to 30 lbs.	5.6 to 7.0
+ tall fescue**	15 to 30 lbs.	
4. Tall fescue**	35 to 50 lbs.	5.5 to 7.5
+ ladino or white clover*	1 to 2 lbs.	
STEEP BANKS AND CUTS, LOW MAINTENANCE AREAS (NOT MOWED)		
1. Smooth bromegrass	25 to 35 lbs.	5.5 to 7.5
+ red clover*	10 to 20 lbs.	
2. Tall fescue**	35 to 50 lbs.	5.5 to 7.5
+ white or ladino clover*	1 to 2 lbs.	
3. Tall fescue**	35 to 50 lbs.	5.5 to 7.5
+ red clover*	10 to 20 lbs.	
(Recommended north of US 40)		
4. Orchardgrass	20 to 30 lbs.	5.6 to 7.0
+ red clover*	10 to 20 lbs.	
+ ladino clover*	1 to 2 lbs.	
5. Crownvetch*	10 to 12 lbs.	5.6 to 7.0
+ tall fescue**	20 to 30 lbs.	
(Recommended south of US 40)		
LAWNS AND HIGH MAINTENANCE AREAS		
1. Bluegrass	105 to 140 lbs.	5.5 to 7.0
2. Perennial ryegrass (turf-type)	45 to 60 lbs.	5.6 to 7.0
+ bluegrass	70 to 90 lbs.	
3. Tall fescue (turf-type)**	130 to 170 lbs.	5.6 to 7.5
+ bluegrass	20 to 30 lbs.	
CHANNELS AND AREAS OF CONCENTRATED FLOW		
1. Perennial ryegrass	100 to 150 lbs.	5.6 to 7.0
+ white or ladino clover*	1 to 2 lbs.	
2. Kentucky bluegrass	20 lbs.	5.5 to 7.5
+ smooth bromegrass	10 lbs.	
+ switchgrass	3 lbs.	
+ timothy	4 lbs.	
+ perennial ryegrass	10 lbs.	
+ white or ladino clover*	1 to 2 lbs.	
3. Tall fescue**	100 to 150 lbs.	5.5 to 7.5
+ ladino or white clover*	1 to 2 lbs.	
4. Tall fescue**	100 to 150 lbs.	5.5 to 7.5
+ Perennial ryegrass	15 to 20 lbs.	
+ Kentucky bluegrass	15 to 20 lbs.	

* For best results: (a) legume seed should be inoculated; (b) seeding mixtures containing legumes should preferably be spring-seeded, although the grass may be fall-seeded and the legume frost-seeded (Practice 3.13); and (c) if legumes are fall-seeded, do so in early fall.

** Tall fescue provides little cover for, and may be toxic to, some species of wildlife. The IDNR rec-ognizes the need for additional research on alternatives to tall fescue, such as buffalograss, orchard-grass, smooth bromegrass, and switch-grass. This research, in conjunction with demonstration areas, should focus on erosion control characteristics, wildlife toxicity, turf durability, and drought resistance.

NOTE: An oat or wheat companion or nurse crop may be used with any of the above permanent seeding mixtures. If so, it is best to seed during the fall seeding period, especially after Sept. 15, and at the following rates: spring oats--1/4 to 3/4 bu./acre; wheat--no more than 1/2 bu./acre.

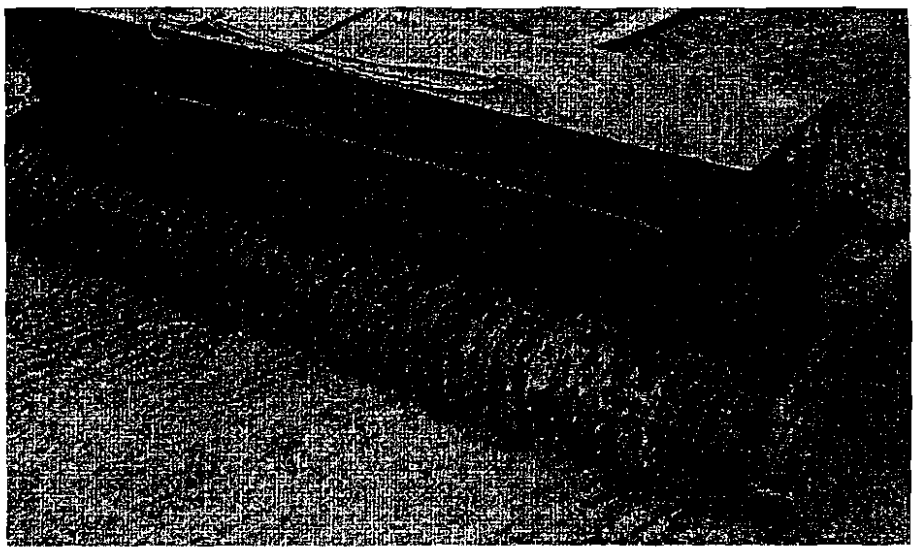

Exhibit 3.12-D. A cultipacker-seeder.

Maintenance

* Inspect periodically, especially after storm events, until the stand is successfully established. (Characteristics of a successful stand include: vigorous dark green or bluish-green seedlings; uniform density with nurse plants, legumes, and grasses well inter-mixed; green leaves; and the perennials remaining green throughout the summer, at least at the plant base.)
* Plan to add fertilizer the following growing season according to soil test recommendations.
* Repair damaged, bare, or sparse areas by filling any gullies, re-fertilizing, over- or re-seeding, and mulching.
* If plant cover is sparse or patchy, review the plant materials chosen, soil fertility, moisture condition, and mulching; then repair the affected area either by over-seeding or by re-seeding and mulching after re-preparing the seedbed.
* If vegetation fails to grow, consider soil testing to determine acidity or nutrient deficiency problems. (Contact your SWCD or Cooperative Extension office for assistance.)
* If additional fertilization is needed to get a satisfactory stand, do so according to soil test recommendations.

Common concerns

Insufficient topsoil or inadequately tilled, limed, and/or fertilized seedbed—results in poor establishment of vegetation.

Unsuitable species or seeding mixture—results in poor establishment of vegetation.

Nurse crop rate too high in the mixture—results in competition with the perennials.

Seeding done at the wrong time of year—results in poor establishment of vegetation, also plant hardiness is significantly decreased.

Mulch rate inadequate—results in poor germination and failure.

Practice 3.13
Dormant and Frost Seeding

Dormant seeding is a temporary or permanent seeding application at a time when soil temperatures are too low for germination to occur (less than 50°F). *Frost seeding* is a temporary or permanent seeding application in early spring when soils are in the freeze-thaw stage. (This practice can be used to repair or enhance areas having thin or declining cover or to re-vegetate an area.)

Purposes
(Exhibit 3.13-A)

* To provide early germination and soil stabilization in the spring.
* To reduce sediment runoff to downstream areas.
* To improve the visual aesthetics of the construction area.
* To repair previous seedings.

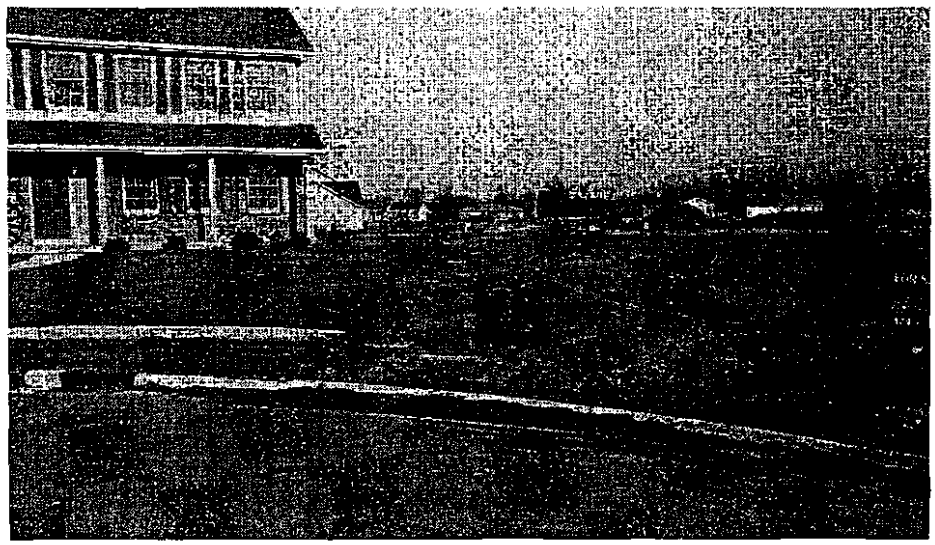

Exhibit 3.13-A. Use of dormant seeding could have reduced excessive early spring erosion on this site.

Requirements

Site and seedbed preparation: Graded as needed, and lime and fertilizer applied.

Plant species: Selected on the basis of soil type, adaptability to the region, and planned use of the area (see *Exhibits 3.13-B* and *3.13-C*).

Application
(Exhibits 3.13-B and C)

SITE PREPARATION:

1. Grade the area to be seeded.
2. Install needed erosion/water runoff control practices, such as temporary or permanent diversions, sediment basins, silt fences, or straw bale dams (Practices 3.21, 3.22, 3.72, 3.74, or 3.75).

FOR DORMANT SEEDING:

Site and seedbed preparation and mulching can be done months ahead of actual seeding; or if the existing ground cover is adequate, seeding can be done directly into it.

Seeding dates: Dec. 1-Feb. 28 (north of U.S. 40), Dec. 10-Jan. 15 (south of U.S. 40).

1. Broadcast fertilizer as recommended by a soil test; or if testing was not done, consider applying 400-600 lbs./acre of 12-12-12 analysis, or equivalent, fertilizer.
2. Apply mulch upon completion of grading (Practice 3.15).
3. Select an appropriate seed species or mixture from *Exhibit 3.13-B* for temporary seeding or *Exhibit 3.13-C* for permanent seeding, and broadcast on top of the mulch and/or into existing ground cover at the rate shown. (If site preparation occurs within the recommended dates, fertilize and lime, seed, and mulch at that time.)

FOR FROST SEEDING:

Seed is broadcast over the prepared seedbed and incorporated into the soil by natural freeze-thaw action.

Seeding dates: Feb. 28-Mar. 28 (north of U.S. 40), Feb. 15-Mar. 15 (south of U.S. 40).

1. Broadcast fertilizer as recommended by a soil test; or if testing was not done, consider applying 400-600 lbs./acre of 12-12-12 analysis, or equivalent, fertilizer.
2. Select an appropriate seed species or mixture from *Exhibit 3.13-B* for temporary seeding or *Exhibit 3.13-C* for permanent seeding, and broadcast on to the seedbed or into the existing ground cover at the rate shown. (Do not work the seed into the soil.)

Exhibit 3.13-B. Temporary Dormant or Frost Seeding Recommendations.

Seed species*	Rate per acre
Wheat or rye	150 lbs.
Spring oats	150 lbs.
Annual ryegrass	60 lbs.

* Perennial species may be used as a temporary cover, especially if the area to be seeded will remain idle for more than a year (Practice 3.12).

Exhibit 3.13-C. Permanent Dormant or Frost Seeding Recommendations.

This table provides several seeding options. Additional seed species and mixtures are available commercially. When selecting a mixture, consider site conditions, including soil properties (e.g., soil pH and drainage), slope aspect and the tolerance of each species to shade and droughtiness.

Seed species and mixtures	Rate per acre	Optimum soil pH
OPEN AND DISTURBED AREAS (REMAINING IDLE MORE THAN 1 YR.)		
1. Perennial ryegrass	50 to 75 lbs.	5.6 to 7.0
+ white or ladino clover*	1½ to 3 lbs.	
2. Kentucky bluegrass	30 lbs.	5.5 to 7.5
+ smooth bromegrass	15 lbs.	
+ switchgrass	5 lbs.	
+ timothy	6 lbs.	
+ perennial ryegrass	15 lbs.	
+ white or ladino clover*	1½ to 3 lbs.	
3. Perennial ryegrass	22 to 45 lbs.	5.6 to 7.0
+ tall fescue**	22 to 45 lbs.	
4. Tall fescue**	50 to 75 lbs.	5.5 to 7.5
+ ladino or white clover*	1½ to 3 lbs.	
STEEP BANKS AND CUTS, LOW MAINTENANCE AREAS (NOT MOWED)		
1. Smooth bromegrass	35 to 50 lbs.	5.5 to 7.5
+ red clover*	15 to 30 lbs.	
2. Tall fescue**	50 to 75 lbs.	5.5 to 7.5
+ white or ladine clover*	1½ to 3 lbs.	
3. Tall fescue**	50 to 75 lbs.	5.5 to 7.5
+ red clover*	15 to 30 lbs.	
(Recommended north of US 40)		
4. Orchardgrass	30 to 45 lbs.	5.6 to 7.0
+ red clover*	15 to 30 lbs.	
+ ladino clover*	1½ to 3 lbs.	
5. Crownvetch*	15 to 18 lbs.	5.6 to 7.0
+ tall fescue**	30 to 45 lbs.	
(Recommended south of US 40)		

Exhibit 3.13-C. Continued.

Seed species and mixtures	Rate per acre	Optimum soil pH
LAWNS AND HIGH MAINTENANCE AREAS		
1. Bluegrass	160 to 210 lbs.	5.5 to 7.0
2. Perennial ryegrass (turf-type)	70 to 90 lbs.	5.6 to 7.0
+ bluegrass	105 to 135 lbs.	
3. Tall fescue (turf-type)**	195 to 250 lbs.	5.6 to 7.5
+ bluegrass	30 to 45 lbs.	
CHANNELS AND AREAS OF CONCENTRATED FLOW		
1. Perennial ryegrass	150 to 225 lbs.	5.6 to 7.0
+ white or ladino clover*	1½ to 3 lbs.	
2. Kentucky bluegrass	30 lbs.	5.5 to 7.5
+ smooth bromegrass	15 lbs.	
+ switchgrass	5 lbs.	
+ timothy	6 lbs.	
+ perennial ryegrass	15 lbs.	
+ white or ladino clover*	1½ to 3 lbs.	
3. Tall fescue**	150 to 225 lbs.	5.5 to 7.5
+ ladino or white clover*	1½ to 3 lbs.	
4. Tall fescue**	150 to 225 lbs.	5.5 to 7.5
+ Perennial bluegrass	22 to 30 lbs.	
+ Kentucky bluegrass	22 to 30 lbs.	

* For best results: (a) legume seed should be inoculated; (b) seeding mixtures containing legumes should preferably be spring-seeded, although the grass may be fall-seeded and the legume frost-seeded; and (c) if legumes are fall-seeded, do so in early fall.

** Tall fescue provides little cover for, and may be toxic to, some species of wildlife. The IDNR recognizes the need for additional research on alternatives to tall fescue, such as buffalograss, orchardgrass, smooth bromegrass, and switch-grass. This research, in conjunction with demonstration areas, should focus on erosion control characteristics, wildlife toxicity, turf durability, and drought resistance.

NOTE: If using mixtures other than those listed here, increase the seeding rate by 50% over the conventional rate.

Maintenance

* Apply 200-300 lbs./acre of 12-12-12 or equivalent fertilizer between Apr. 15 and May 10 or during periods of vigorous growth.
* Re-seed and mulch any areas that have inadequate cover by mid- to late-April. For best results, re-seed within the recommended dates shown in Practices 3.11 for temporary seeding or 3.12 for permanent seeding.

Common concerns

Seeding done at wrong time of year--results in poor seed germination and vegetative stands.
Seeding on too steep a slope--results in seed loss and poor stands.
Seeding failure due to late freeze, killing germinated seedlings.
Mulch rate inadequate--results in poor germination and failure of dormant seeding.
Unsuitable choice of seed species or seeding mixture--results in poor vegetative stands or vegetation that does not serve the intended purpose.
Poor soil and seed contact--results in poor seed germination and vegetative stands.
Dormant seeding over mulch or frost seeding in concentrated flow areas--can result in seed being washed away before seed-soil contact and germination can occur.

Exhibit 3.13–C. Continued.

Seed species and mixtures	Rate per acre	Optimum soil pH
LAWNS AND HIGH MAINTENANCE AREAS		
1. Bluegrass	160 to 210 lbs.	5.5 to 7.0
2. Perennial ryegrass (turf-type)	70 to 90 lbs.	5.6 to 7.0
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+ bluegrass	30 to 45 lbs.	
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+ Kentucky bluegrass	22 to 30 lbs.	

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* Re-seed and mulch any areas that have inadequate cover by mid- to late-April. For best results, re-seed within the recommended dates shown in Practices 3.11 for temporary seeding or 3.12 for permanent seeding.

Common concerns

Seeding done at wrong time of year--results in poor seed germination and vegetative stands.
Seeding on too steep a slope--results in seed loss and poor stands.
Seeding failure due to late freeze, killing germinated seedlings.
Mulch rate inadequate--results in poor germination and failure of dormant seeding.
Unsuitable choice of seed species or seeding mixture--results in poor vegetative stands or vegetation that does not serve the intended purpose.
Poor soil and seed contact--results in poor seed germination and vegetative stands.
Dormant seeding over mulch or frost seeding in concentrated flow areas--can result in seed being washed away before seed-soil contact and germination can occur.

Practice 3.15
Mulching

Purposes
(Exhibit 3.15-A)

* To prevent erosion by protecting the soil from wind and water impact.
* To provide temporary surface stabilization.
* To prevent soil from crusting.
* To conserve moisture thereby promoting seed germination and seedling growth.

Exhibit 3.15-A. Applying straw mulch with a chopper-blower on freshly seeded soil adjacent to a road.

Requirements
(Exhibits 3.15-B and C)

Material: Straw, hay, wood fiber, cellulose, or excelsior (see *Exhibit 3.15-B*), or erosion control blankets or turf reinforcement mats (Practices 3.17 and 3.18), as specified in the erosion and sediment control plan.

Coverage: At least 75% of the soil surface.

Anchoring: Required for straw or hay mulch and sometimes excelsior to prevent displacement by wind and/or water (see *Exhibit 3.15-C*).

Exhibit 3.15-B. Mulch Materials, Rates, and Comments.

Material	Rate	Comments
Straw or hay	1½-2 tons/acre	Should be dry, unchopped, free of undesirable seeds. Spread by hand or machine. Must be crimped or anchored (see *Exhibit 3.15-D*).
Wood fiber or cellulose	1 ton /acre	Apply with a hydromulcher and use with tacking agent.
Long fiber wood (excelsior)	1/2-3/4 ton/acre	Anchor in areas subject to wind.

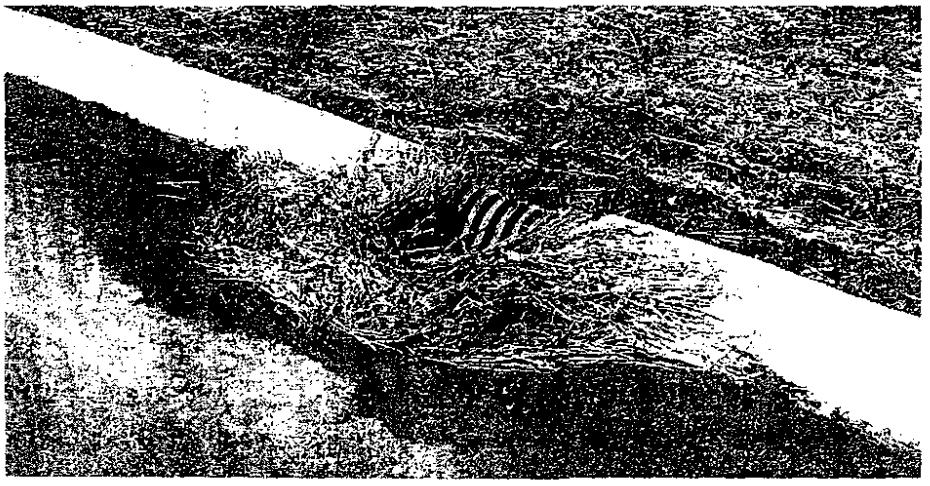

Exhibit 3.15-C. This unanchored straw mulch flowed with runoff to the storm drain. While acting somewhat as an inlet protection filter, it would have been more effective keeping soil from eroding off the site.

Application and anchoring

(Exhibits 3.15-D, E, and F)

1. Apply mulch at the recommended rate.
2. Spread uniformly by hand, hay fork, mulch blower, or hydromulcher. After spreading, no more than 25% of the ground surface should be visible.
3. If straw or hay is used, anchor it immediately one of the following ways (see *Exhibit 3.15-D*):
   - Crimp with a mulch anchoring tool, a weighted farm disk with dull serrated blades set straight (see *Exhibit 3.15-E*), or track cleats of a bulldozer; OR
   - Hydromulch with short cellulose fibers (see *Exhibit 3.15-F*); OR
   - Apply a liquid tackifier; OR
   - Cover with netting secured by metal staples.

Exhibit 3.15-D. Mulch Anchoring Methods.

Anchoring method	How to apply
Mulch anchoring tool OR Farm disk (dull, serrated, and set straight)	Crimp or punch the straw or hay into the soil 2-4 in. Operate machinery on the contour of the slope.
Cleating with dozer tracks	Operate dozer up and down slope, not across, or else the tracks will form rills.
Wood hydromulch fibers	Apply 1-2 tons/acre using a hydromulcher at a rate of 750 lbs./acre with a tacking agent (or according to contractor specifications). Do not use in areas of concentrated flow.
Asphalt emulsion	Emulsified asphalt should conform to the requirements of ASTM Spec. #977. Apply with suitable equipment at a rate of 0.05 gal./sq. yd. Do not use in areas of concentrated flow.
Synthetic tackifier, binder or soil stabilizer	Apply according to manufacturer's recommendation.
Biodegradable netting (polypropylene or similar material)*	Apply over mulch and staple with 6-8 in. wire staples. Follow manufacturer's recommendations for installation. Best suited to slope application.

* Install the netting immediately after applying the mulch. In areas of concentrated water flow, lay it parallel to the direction of flow; on other slopes, lay it either parallel or perpendicular to direction of flow. Edges of adjacent netting strips should overlap 4-6 in., with the strip on the upgrade side of any lateral water flow on top. Installation details are site specific, so follow manufacturer's directions.

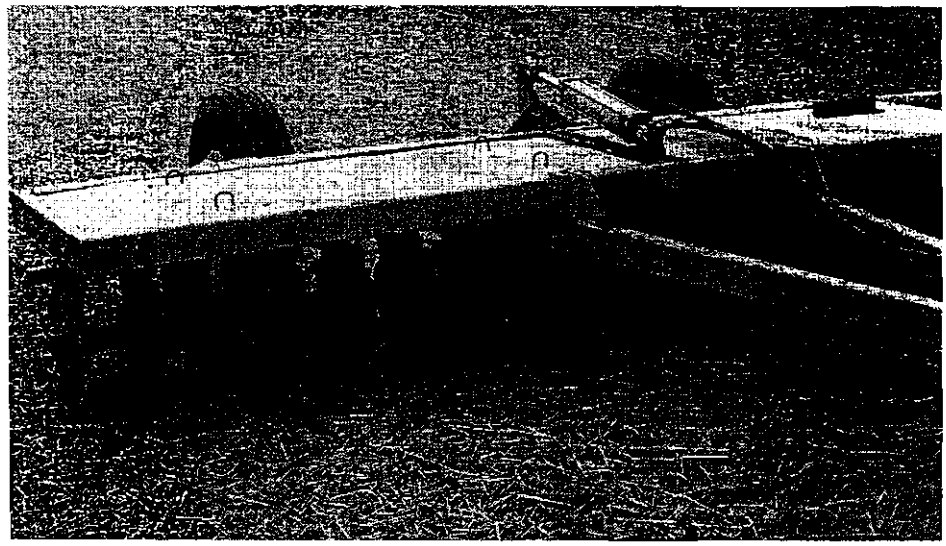

Exhibit 3.15-E. A crimper can be used to anchor mulch into the soil more securely.

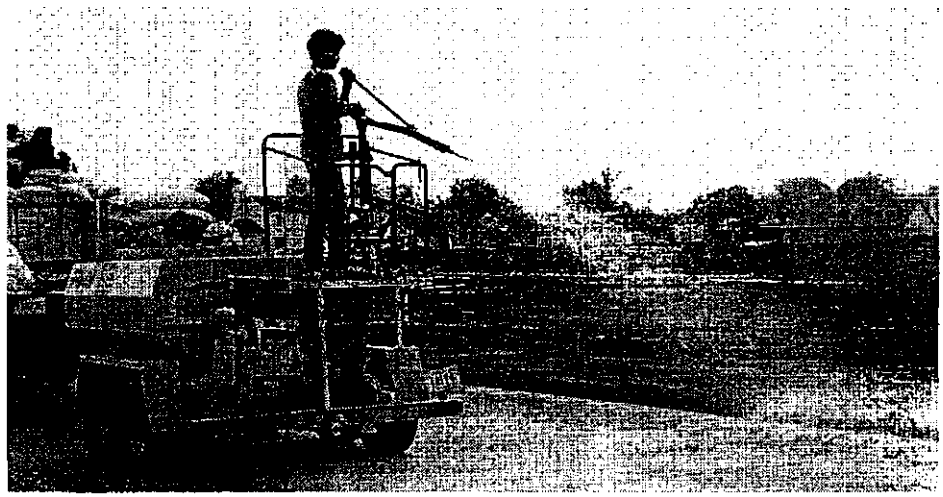

Exhibit 3.15-F. Hydroseeding the roadside in a new subdivision.

Maintenance

* Inspect after storm events to check for movement of mulch or for erosion.
* If washout, breakage, or erosion is present, repair the surface, then re-seed, re-mulch and, if applicable, install new netting.
* Continue inspections until vegetation is firmly established.

Common concerns

Inadequate coverage—results in erosion, washout, and poor plant establishment.

Appropriate tacking agent not applied or applied in insufficient amount—results in mulch being lost to wind and runoff.

Flow too concentrated to use straw mulch—results in erosion in channel; consider use of erosion control blankets and/or a diversion until vegetation is established.

Hydromulch applied in winter—results in deterioration of mulch before plants can become established.

Netting washed away—because insufficient number of staples used.