Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62467-04-D-005

N00164.AR.001166
NSWC CRANE
5090.3a

Rev. 0
08/08

PCB Source Determination
SWMU 13 – Building 171 Sump

Naval Surface Warfare Center Crane
Crane, Indiana

Contract Task Order 48

August 2008

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

TETRA TECH NUS, Inc.

TETRA TECH

PITT-08-8-008

August 8, 2008

Project No. 112G00517

Mr. Howard Hickey
NAVFAC MW
201 Decatur Avenue
Building 1A, Code EV
Great Lakes, Illinois 60088

Subject: CLEAN Contract N62467-04-D-0055
Contract Task Order No. 0048

RE: ***Final***
Report for Solid Waste Management Unit (SWMU) 13 (Mine Fill B) Building 171 Sump Polychlorinated Biphenyl (PCB) Source Determination

Dear Mr. Hickey:

Enclosed is the subject Report for SWMU 13.

Please contact the undersigned at (412) 921-8308 (e-mail Ralph.Basinski@Tetratech.com) or James Goerdt at (412) 921-8425 (e-mail James.Goerdt@Tetratech.com) regarding any questions you may have to the information provided.

Sincerely,

Ralph R. Basinski
Task Order Manager

RRB/mlg
Enclosures

cc: Mr. Tom Brent, NSWC Crane (letter and enclosure)
Mr. Jim Goerdt, Tetra Tech (letter and enclosure)
Ms. Bonnie Capito, NAVFAC Atlantic (PDF copy of letter via e-mail)
Mr. John Trepanowski, Tetra Tech (letter and enclosure)
Mr. Ralph Basinski, Tetra Tech (letter and enclosure)
Mr. Garth Glenn, Tetra Tech (letter only)
File copy – CTO 0048 (letter and enclosure)

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080802/P

SWMU 13 – BUILDING 171 SUMP
PCB SOURCE DETERMINATION REPORT

NAVAL SURFACE WARFARE CENTER CRANE
CRANE, INDIANA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

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

Submitted by:
Tetra Tech NUS, Inc.
234 Mall Boulevard, Suite 260
King of Prussia, Pennsylvania 19406

CONTRACT NO. N62467-04-D-0055
CONTRACT TASK ORDER 48

AUGUST 2008

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ACRONYMS

bgs	below ground surface
CLEAN	Comprehensive Long-term Environmental Action Navy
CTO	Contract Task Order
DI	deionized water
GPS	Global Positioning System
HMX	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
IAS	Initial Assessment Study
NAVFAC	Naval Facilities Engineering Command
NSWC	Naval Surface Warfare Center
PCB	polychlorinated biphenyl
QA	Quality Assurance
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
RFI	RCRA Facility Investigation
SWMU	Solid Waste Management Unit
TSCA	Toxic Substances Control Act
TtNUS	Tetra Tech NUS, Inc.
U.S. EPA	United States Environmental Protection Agency
VOCs	volatile organic compounds

EXECUTIVE SUMMARY

This Executive Summary provides a brief overview of the recent sampling event associated with the polychlorinated biphenyl (PCB) contamination at Solid Waste Management Unit (SWMU) 13 Building 171 Sump. All work was performed for the United States Navy, Naval Facilities Engineering Command (NAVFAC) Midwest by Tetra Tech NUS (TtNUS) under Contract Task Order (CTO) 0048 of the Comprehensive Long-Term Environmental Action Navy (CLEAN) IV Contract Number N62467-04-D-0055.

The major sources of contamination at SWMU 13 include 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. PCB oils were assumed to be heated in therminol boilers and then transferred to the SWMU 13 melt buildings (Buildings 166 and 171) where the oil was used as a heat transfer medium in the melting of explosive mixtures. Some of the oil was evidently spilled in the vicinity of the boilers because PCB contamination was detected at relatively high concentrations in soil, primarily in shallow soil (TtNUS, 2005). Previous investigations conducted at SWMU 13 are summarized in Section 2.2 of the SWMU 13 IMWP (TtNUS, 2008).

Upon review of the SWMU 13 IMWP, the United States Environmental Protection Agency (U.S. EPA) Region 5 requested that the source of PCB contamination documented in the sediment of a sump associated with Building 171 be determined. The purpose of this investigation; therefore, was to collect additional samples (soil and sediment) in the area of the suspected source (Building 171).

The focus of this field event was to collect sediment samples from the concrete drainage trenches and associated piping leading from Building 171 to the sump. The field activities were conducted on May 29, 2008. During the field investigation, eight sediment samples and two soil samples were collected and analyzed for explosives and PCBs.

Based on the findings in this investigation, it is believed that the source of PCB contamination within the SWMU 13 Building 171 sump was from the activities that occurred within Building 171 and was washed into the concrete trenches that surround the main boiler room and eventually lead to the sump. The analytical data from this field event is located in Section 3.0 of this report.

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this report is to describe the activities performed during the most recent field investigation of Solid Waste Management Unit (SWMU) 13, at the Naval Surface Warfare Center (NSWC) Crane located in Crane, Indiana. The activities associated with this investigation were completed in accordance with the Sampling Work Plan for SWMU 13 – Building 171 Sump PCB Source Determination (TtNUS, 2008). The activities included additional sediment and soil sampling to determine the source of polychlorinated biphenyl (PCB) contamination found in the Building 171 sump during the Resource Conservation and Recovery Act (RCRA) Field Investigations (RFI) conducted in 2003, 2004, and 2006. The focus of this field event was to collect sediment samples from the concrete drainage trenches and associated piping leading from Building 171 to the sump, as well as a soil sample between a catch basin and the sump. This work was performed for the United States Navy, Naval Facilities Engineering Command (NAVFAC) Midwest by Tetra Tech NUS, Inc. (TtNUS) under Contract Task Order (CTO) 48 of the Comprehensive Long-Term Environmental Action Navy (CLEAN) IV Contract Number N62467-04-D-0055. The samples were collected on May 29, 2008.

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 (see 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 SITE DESCRIPTION AND HISTORY

SWMU 13 is located in the central portion of NSWC Crane as shown on Figure 1-1. Figure 1-2 is an aerial photograph showing the location of Building 171 within SWMU 13.. SWMU 13 has been in use since 1941 when NSWC Crane was commissioned, and explosive ordnance was produced at SWMU 13

from 1941 until 1973. Since 1973, the facilities at SWMU 13 have been used to renovate ordnance and equipment. This Field Report focuses on the PCB-contaminated soils and sediments in the vicinity of Building 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 SWMU 13 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.

SWMU 13 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 SWMU 13. 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 PREVIOUS SAMPLING AND ANALYSIS

The major sources of contamination at SWMU 13 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 SWMU 13, 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.

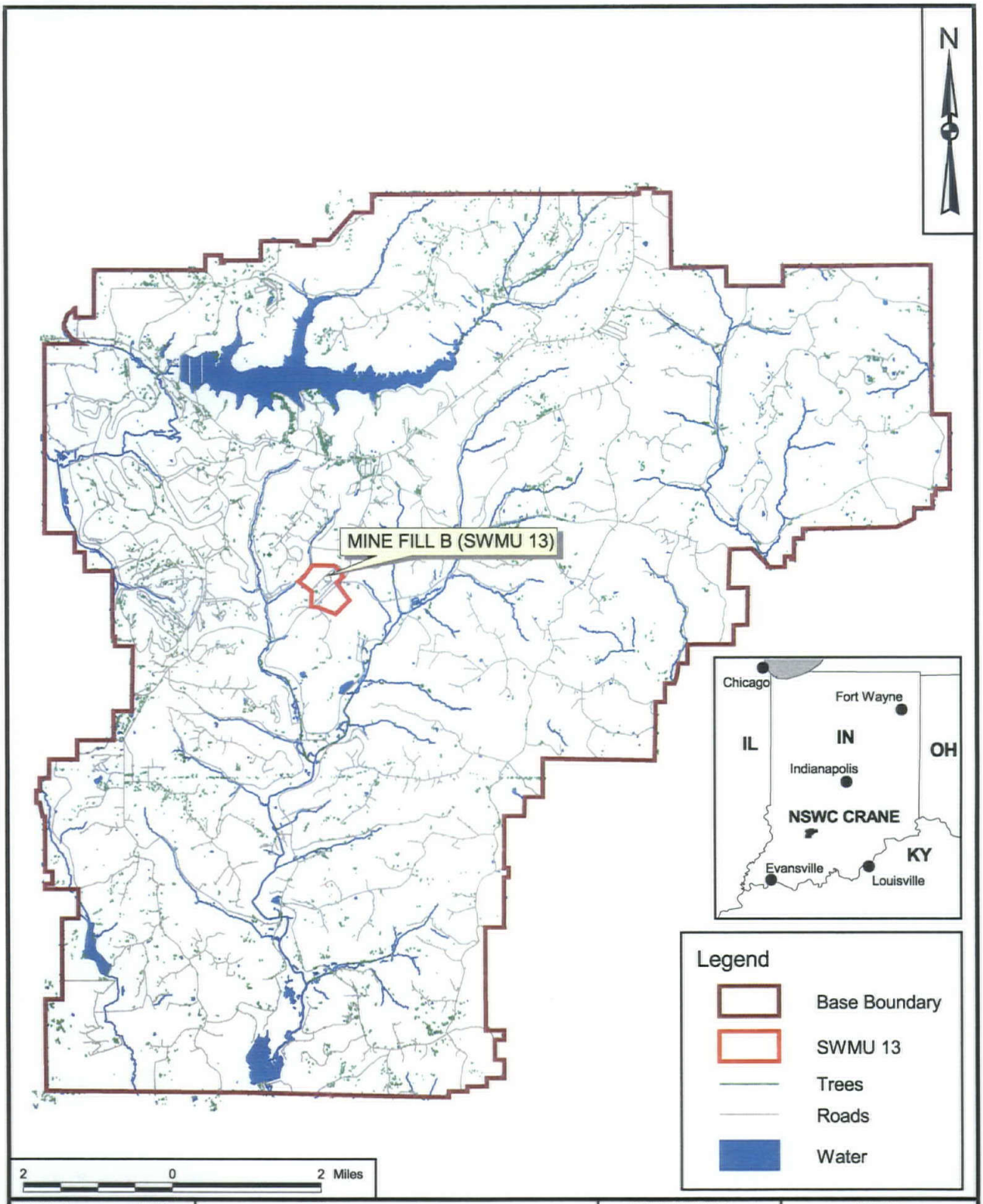
Interim Measures (1999 - 2002) – SWMU 13 was remediated between June 1999 to January 2002 as part of the bioremediation program that included sampling, excavation, on-site treatment through bioremediation (composting) of explosives-contaminated soil, and backfilling of the compost at SWMU 13. The types 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 SWMU 13, but PCBs were not the focus of the bioremediation (composting) of explosives-contaminated soil that occurred between 1999 and 2002.

1.5 REPORT ORGANIZATION

The following sections are contained in the remainder of this document:

- Section 2.0 presents the activities associated with this field investigation (May, 2008).
- Section 3.0 presents the data from the samples collected at SWMU 13 during this investigation.



DRAWN BY J. ENGLISH DATE 08/06/08	Tetra Tech NUS, Inc.	CONTRACT NUMBER 112G00352	OWNER NO. 0020
CHECKED BY J. GOERDT DATE 08/07/08	BASE AND SITE LOCATION MAP SWMU 13 - MINE FILL B FIELD REPORT NSWC CRANE CRANE, INDIANA	APPROVED BY — DATE —	
COST/SCHEDULE-AREA		APPROVED BY — DATE —	
SCALE AS NOTED		DRAWING NO. FIGURE 1 - 1	REV 0

P:\GIS\CRANE_NSWC\MAPDOCS\APR\NEWSMWU13.APR SITE LOCATION LAYOUT 08/07/08 JEE

P:\GIS\CRANE_NSWC\MAPDOCS\APR\NEWSWMU13.APR SWMU 13 AERIAL LAYOUT - VERTICAL 08/06/08 JEE

DRAWN BY J. ENGLISH	DATE 07/29/08	AERIAL PHOTOGRAPH - SWMU 13 BOUNDARY SWMU 13 - MINE FILL B FIELD REPORT NSWC CRANE CRANE, INDIANA	CONTRACT NUMBER 112G00352
CHECKED BY J. GOERDT	DATE 08/06/08		APPROVED BY — DATE —
COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 1-2 REV 0

NAVFAC

2.0 FIELD INVESTIGATION

This section presents sampling activities, procedures, and documentation utilized during the field investigation of the Building 171 sump (May 2008) at NSWC Crane SWMU 13.

2.1 OVERVIEW

Work performed during this field event was conducted in accordance with the procedures and methodologies described in the Sampling Work Plan for SWMU 13 – Building 171 Sump PCB Source Determination (TtNUS, 2008). Copies of all field forms, records, and field logbooks associated with this field investigation are provided in Appendices A and B of this document.

2.2 MOBILIZATION/DEMOBILIZATION

Tetra Tech personnel began mobilization activities on May 28, 2008. Field team members reviewed the Work Plan, associated appendices, and the Health and Safety Plan (HASP) prior to the start of project activities. In addition, the Field Operations Leader (FOL) held a field team orientation meeting prior to the field activities to ensure that personnel were familiar with the scope of the work. Field activities and demobilization from the site occurred over a one-day period (May 29, 2008).

2.3 SAMPLING ACTIVITIES

2.3.1 Sediment

A total of eight sediment samples were collected within the area of Building 171. Three of the samples were collected from the small concrete trenches located just outside the main walls of the boiler room. A single sample was collected from a sediment pile located approximately 25 feet down an enclosed tramway to confirm previous PCB contamination in this area. Two samples were collected from the larger concrete trenches leading away from Building 171 to the catch basin located approximately 30 feet from the boiler room. One sediment sample was collected from the catch basin, and one sample was collected from within the main sump located approximately 15 feet from the catch basin. The trenches were all constructed with concrete on the bottom and sides. The top of each trench was covered with steel grating. Sediment sample log sheets are included in Appendix A. Sample date, depth, and sample collection method are presented on each log sheet. Figure 2-1 shows the locations of all sediment sample locations completed as part of this field investigation at SWMU 13.

2.3.2 Soil

Two soil samples were collected from a single hand augered boring in the area between the catch basin and the sump. A transfer pipe is believed to be located between the two and the sample would determine if PCB contamination resulted from leakage of the pipe. The boring was initially placed 2 feet from the catch basin in the direction of the sump. Refusal was encountered at approximately 24 inches and was assumed to be due to the boring being located on top of the drain pipe between the catch basin and the sump. This boring was abandoned and a new boring was started approximately 12 inches away. A sample was collected at a depth of 3 to 4 feet bgs which was believed to be the approximate location of the bottom of the drain pipe. The second sample was collected at a depth of 5 to 6 feet bgs which would be just below the depth of the drain pipe. The boring log is included in Appendix A. The soil sample log, also contained in Appendix A, provides boring date, depth, drilling method, and depth interval for the soil sample. Figure 2-1 shows the location of the soil boring in relation to Building 171 and the catch basin and sump.

2.4 FIELD SAMPLE DOCUMENTATION

Sample documentation consisted of the completion of a boring log, soil sample log sheets, sample bottle tags, chain-of-custody record, and field logbook. Field documentation was completed as per SOP_CTO0048-03. The sample log sheets contain information such as sample location and ID, container requirements and analyses to be performed, sample type, time, date, and method of sample collection. Any unusual circumstances encountered during sample collection were noted on the forms. Sample log sheets are included in Appendix A of this document. The chain-of-custody record (Appendix A) was used to track each sample from collection to receipt and analysis at the laboratory.

2.5 SAMPLE HANDLING, PACKAGING, AND SHIPPING

Sample handling activities included field-related considerations concerning the selection of sample containers, preservatives, allowable holding times, sample custody, and maintaining samples at the appropriate storage temperature. All samples were containerized in 4-ounce clear glass jars and then sealed in Ziploc® plastic bags to minimize the possibility of breakage during transport. The sample containers were then placed in a cooler lined with a large plastic garbage bag. Samples were cooled immediately after collection with ice placed over the sample containers. A temperature blank was placed in each cooler prior to shipment. The plastic garbage bag was sealed with a knot, and the chain-of-custody form was sealed in a Ziploc® bag and taped to the inside of the cooler lid. A signed and dated custody seal was applied to each end of the cooler and then covered with strapping tape to provide a tamper-evident seal. A Federal Express airbill was applied to the shipping cooler. TtNUS maintained

custody of the samples until they were relinquished to Federal Express. The Federal Express tracking number (airbill number) was recorded on the chain-of-custody form, and the sender's copy of the airbill was maintained for shipment tracking, if needed. All samples were shipped to the laboratory for overnight delivery and were received within sample holding times.

2.6 QUALITY CONTROL SAMPLES

A quality assurance/quality control (QA/QC) samples were generated and collected during sampling activities to monitor both field and laboratory procedures. These procedures are detailed in the Work Plan. QA/QC samples included a field duplicate, rinsate blank, and temperature blank.

2.7 GPS

The northings and eastings of the samples located outside of Building 171 were determined using a Trimble GEO XT global positioning system (GPS). Samples under cover of Building 171, in which no GPS points could be collected, were photographed and measured from the other sample locations. Photos are contained in Appendix B of this document.

2.8 DECONTAMINATION

The nondedicated, nondisposable equipment (hand auger and stainless steel beaker) involved in field sampling activities was decontaminated before each sample was collected in accordance with SOP_CTO0048-04.

2.8.1 Sampling Equipment

Nondedicated (reusable) equipment used for collecting samples (i.e.: hand auger) was decontaminated before field sampling and at the end of the sampling event. The following decontamination steps were taken:

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

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

2.9 SITE MANAGEMENT AND FACILITY SUPPORT

The FOL was designated as the lead in coordinating the activities during the investigation. The FOL was responsible for ensuring that field team members were familiar with the Work Plan and the associated HASP. Additionally, the FOL was responsible for all sampling operations, QA/QC, and field documentation requirements.

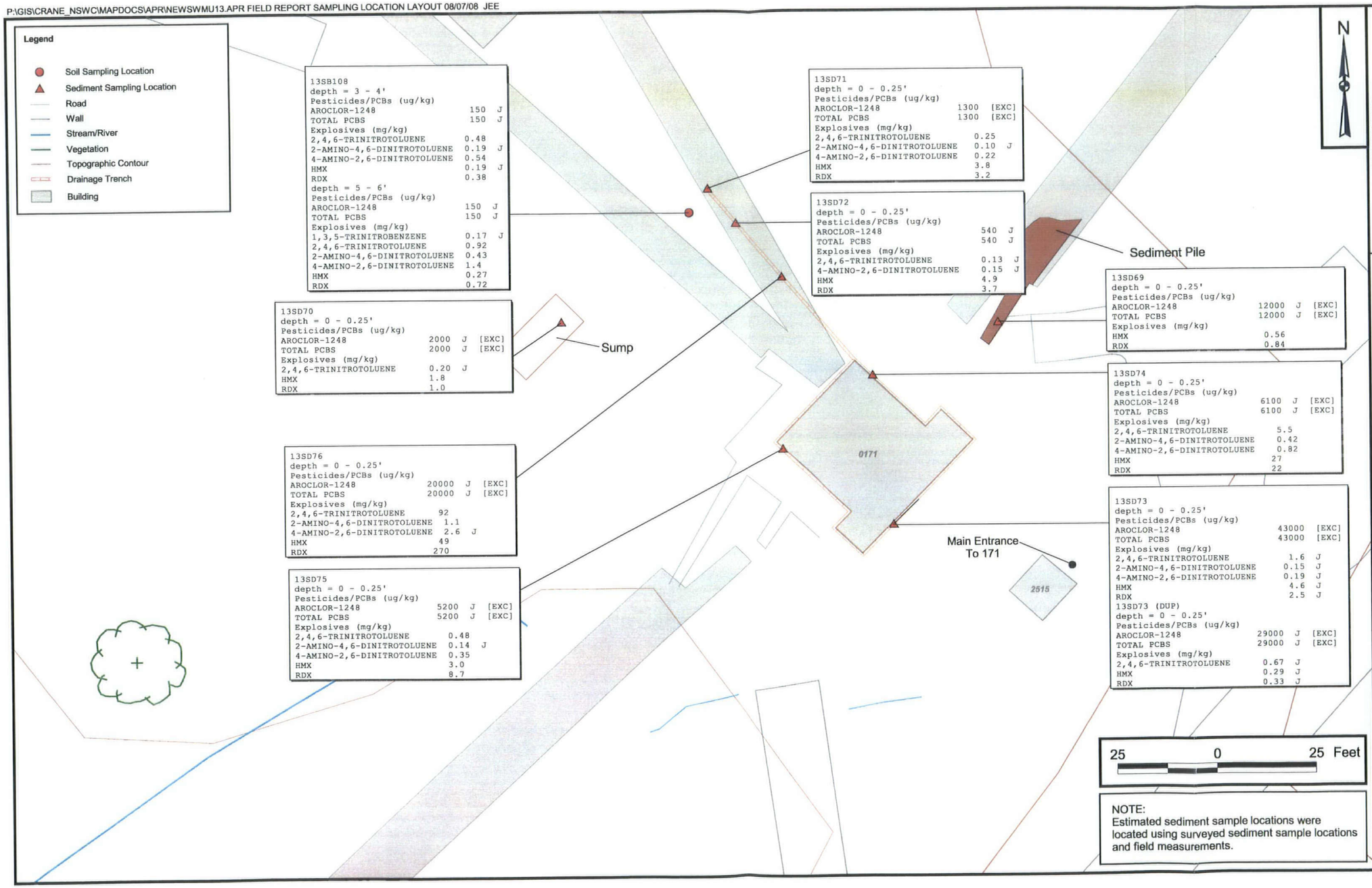
TABLE 2-1

SUMMARY OF MAY 2008 INVESTIGATION SAMPLING
SWMU 13 - FIELD REPORT
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 drains
ft bgs - Feet below ground surface
PCBs - Polychorinated biphenyls
X - Indicates Parameters were analyzed for this sample

P:\GIS\CRANE_NSWC\MAPDOCS\APR\NEWSWMU13.APR FIELD REPORT SAMPLING LOCATION LAYOUT 08/07/08 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 2-1

REV -

SAMPLING LOCATIONS
BUILDING 171
SWMU 13 - MINE FILL B
FIELD REPORT
NSWC CRANE
CRANE INDIANA

NAVFAC

DRAWN BY S. STROZ DATE 07/17/08

CHECKED BY J. GOERDT DATE 08/06/08

COST/SCHED-AREA

SCALE AS NOTED

3.0 DATA PRESENTATION

This section presents the analytical soil data for the additional sediment and soil samples collected at Building 171 – SWMU 13.

3.1 DATA PRESENTATION

Eight sediment samples and two soil samples were collected within the area of the SWMU 13 Building 171 on May 29, 2008 to try and determine the source of PCB contamination at the Building 171 sump. A list of samples collected is presented in Table 2-1. Pace Analytical Services, Inc. conducted the analyses, which are summarized by analytical fraction for each sample in Table 2-1. The results of this sampling event are presented in Table 3-1.

TABLE 3-1

SUMMARY OF MAY 2008 POSITIVE DETECTIONS
SWMU 13 - MINE FILL B
FIELD REPORT
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

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.

Tetra Tech NUS, Inc. (TtNUS), 2008. Sampling Work Plan for SWMU 13-Building 171 Sump PCB Source Determination, Naval Surface Warfare Center Crane, Crane, Indiana. May.

APPENDIX A

FIELD DOCUMENTATION

Pd-0113

CRANE NSWC
CTU 048
112600517

"Rite in the Rain"®
ALL-WEATHER
JOURNAL
No. 391

49342

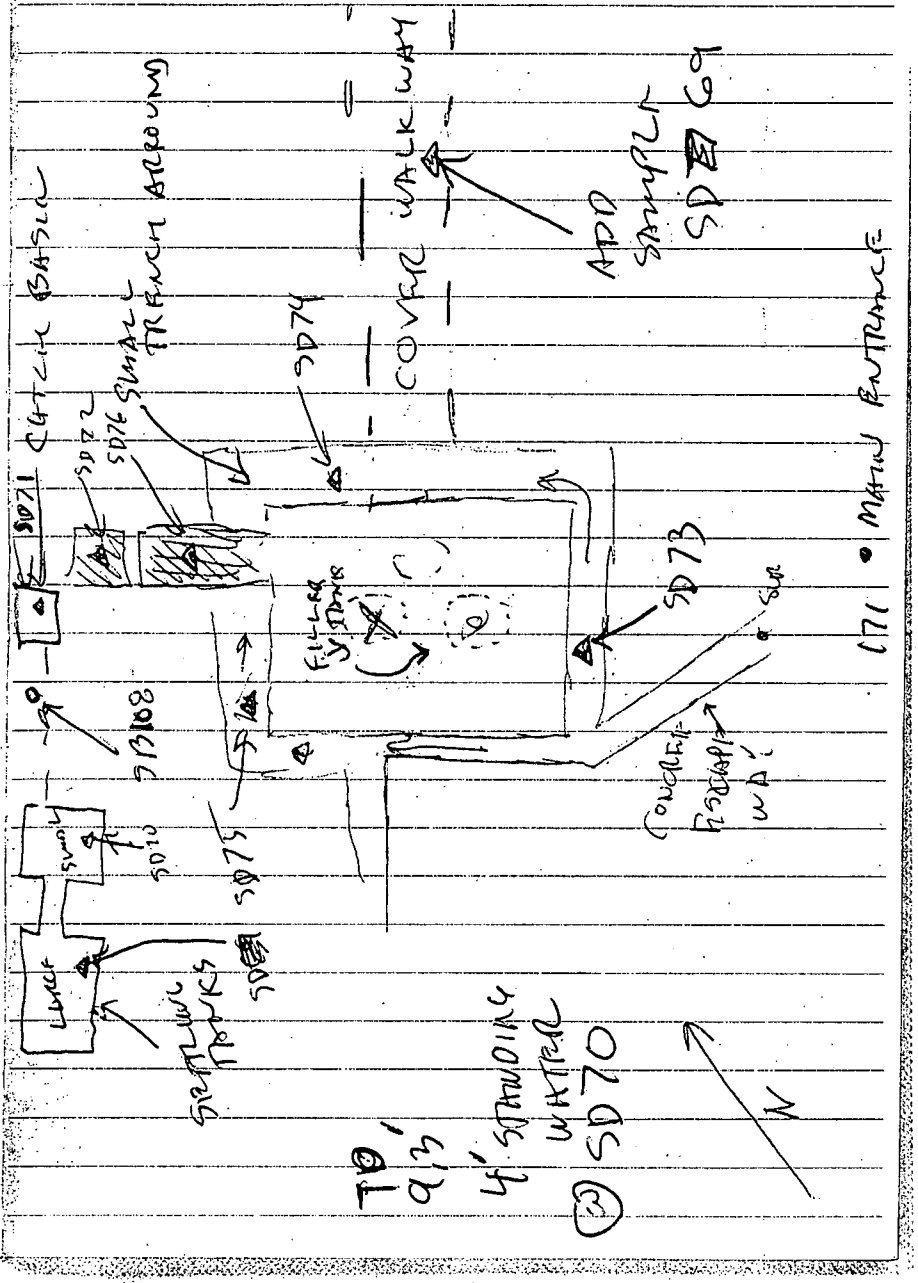
WEDNESDAY 5-28-08

FRED W RAMSER + JIM GEORDT EN ROUTE TO CRANE IN 0630 → 1300 HRS

1300 HRS - FWR + JG MEET w/ TOM BRENT

+ GO TO BLDG 171
+ DISCUSS SAMPLING LOCATIONS
- LIKE TO SAMPLE SOME SED IN THE NE COVERED WALK WAY AS SHOWN
- PROPOSED LOCATIONS SHOWN ON SKETCH → PG 3
- H+S TRAINING
+ DO INVENTORY
  - BUY DRINKING WATER
  - " PAPER TOWELS
- PLACE GPS ON CHG
- CALL VALERIE

1630 FWR + JG LV SITE FOR BLOOMINGTON



SUNNY 70's

THURSDAY 5-29-08

0700 FUR + JG LV HOTEL FOR SITE

0800 FUR + JG ON SITE
- LOAD EQ
- DECON EQ

SOW COLLECT SD AT BLDG 171
VALERRI: COORDINATES FROM SPL COLLECTED @ SETTLING TANK:
E: 3023361.2605
N: 1309056.9179

0900 DEPART FIELD OFFICE FOR SITE B

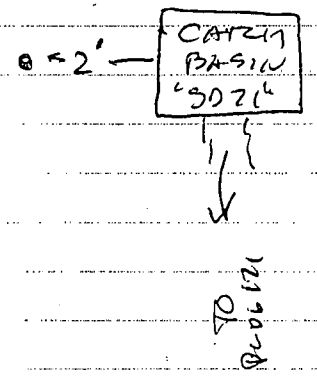
- Identified / MARKED LOCATIONS w/ SPRAY PAINT

- JG WILL FILL CONTAINER
- FUR WILL DO PAPERWORK LABELS ETC

SUNNY 70's

5-29-08

13SB08



AUGERED ~2' TOWARD SETTLING BASINS.
- MEASURED OUTLET FROM CATCH BASIN @ 3' BELOW G.S.
TARGET 4' BORING

0'-1' DK BRN LOAMY SAND
1'-2' BRN CLAY/SILT/TR GRV
HIT GRAVEL (PIPE?) @ 2.2'
REFUSAL MOVED ~1' TOWARD BLDG 171
- HIT REFUSAL @ 2nd HOLE,
- MOVED ~2' AWAY FROM BLDG 171 FROM "1st" HOLE
- WET @ 4.5' HIT water @ 5.8

COLLECTED SPL
13SB1080304 1045

13SB1080506 1055

5-29-08 SUNNY 70°

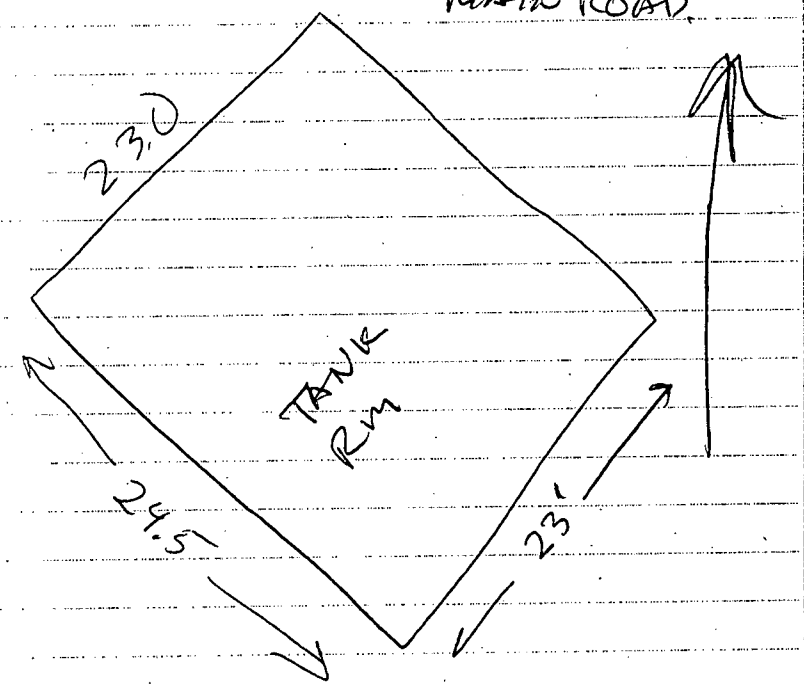
1115 COLLECTED 13SD070 FROM SMALL UP GRADIENT SETTLING TANK
~0.5' WATER,
~ DEPTH TO ~8'

1215 COMPLETED SAMPLE COLLECTION / PAPER WORK RETURN TO FIELD OFFICE

1340 GENERATED RINSATE BY POURING DI OVER HAND AUGER BUCKET INTO CONTAINERS USING:
NERL REAGENT GRADE DI H_2O
VWR International
LOT # 0817027
EXP 08-2008

13RB05290801

NOTE: GPS 13SD70, 13SD71
Center point of ESCAPE WALK WAY SE TOWARD MAIN ROAD.



- CLEAN FIELD OFFICE
- PACK SAMPLES FOR SHIPMENT

1500 LV SITE
1700 LV ARR AT FED EX

END

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: PWR
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):				

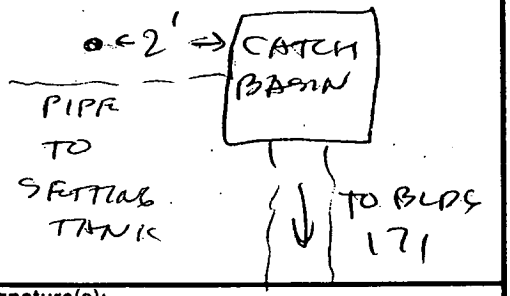
SAMPLE COLLECTION INFORMATION:

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):

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):				

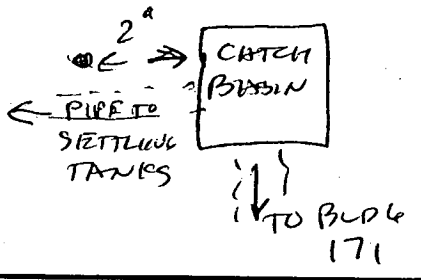
SAMPLE COLLECTION INFORMATION:

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

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

GRAB SAMPLE DATA:

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

COMPOSITE SAMPLE DATA:

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

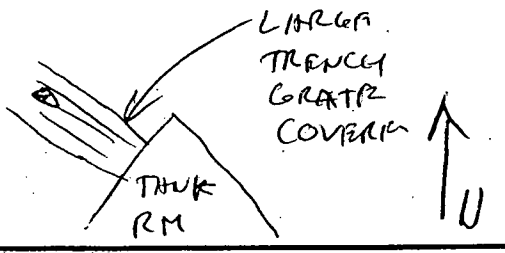
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCBs SW-846 8082	WMG ~~4oz jar~~ 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
[] 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 FIL 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):				

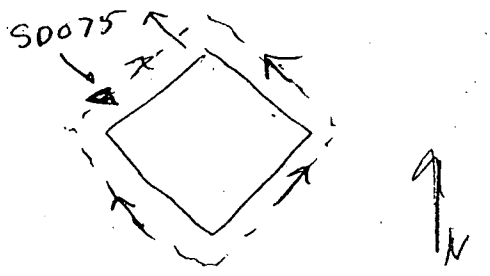
SAMPLE COLLECTION INFORMATION:

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

OBSERVATIONS / NOTES:

NO FLOW
DRT
SMALL TRENCH AROUND
TANK RM

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Fred W Ramse

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.: 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: 0942 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):				

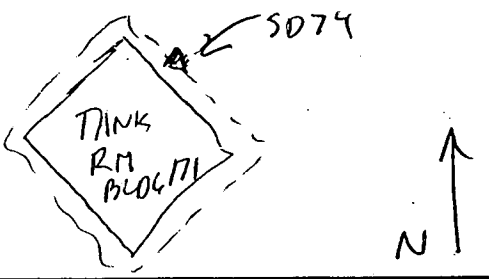
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCBs SW-846 8082	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):

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):				

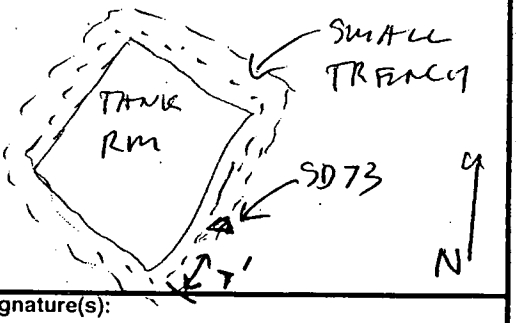
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCBs SW-846 8082	WMG ~~4oz jar~~ 2 8oz	✓	
Explosives SW-846 8330	WMG ~~4oz jar~~ 3		

OBSERVATIONS / NOTES:

- NO FLOW
- CRACKED CONCRETE WALLS DRAINING INTO SMALL ~~TRENCH~~ TRENCH AROUND BLDG 171 (FILL FOR TANK RM)

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	13FD052908

Signature(s): Fred W Ramer

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: FWR
C.O.C. No.: 4635

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

GRAB SAMPLE DATA:

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

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				

Monitor Readings (Range in ppm):				

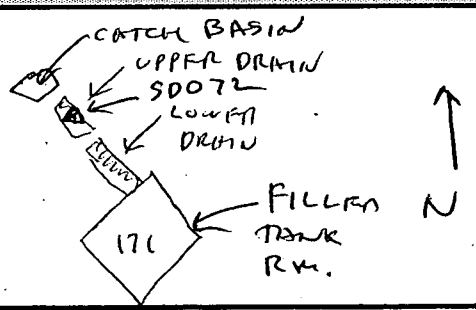
SAMPLE COLLECTION INFORMATION:

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

OBSERVATIONS / NOTES:

- 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): [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.: 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:

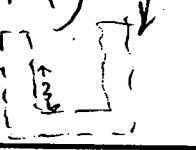
	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

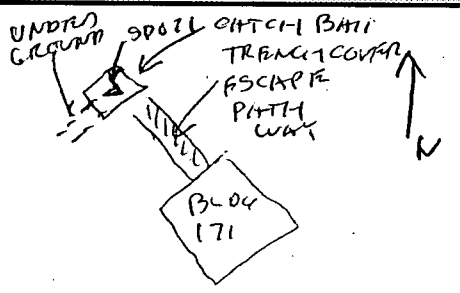
Analysis	Container Requirements	Collected	Other
PCBs SW-846 8082 3	WMG ~~4oz jar~~ 8oz dy	✓	
Explosives SW-846 8330 3	WMG ~~4oz jar~~		

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 Rans

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: RWR
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/BRASS 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):				

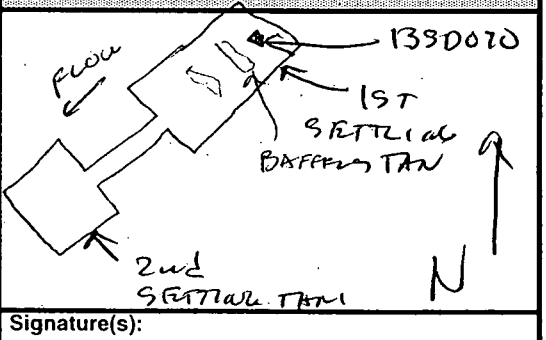
SAMPLE COLLECTION INFORMATION:

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

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

GRAB SAMPLE DATA:

Date: 5-29-08
Time: 0935
Method: DIRECT FILL
Monitor Reading (ppm):

Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
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):				

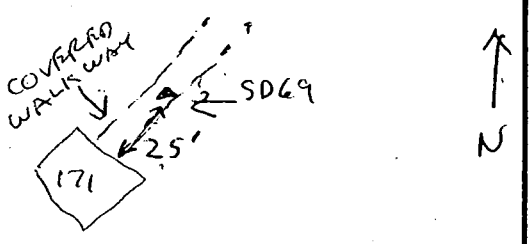
SAMPLE COLLECTION INFORMATION:

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): [signature]

BORING LOG

Tetra Tech NUS, Inc.

BLDG 171

PROJECT NAME: NSWC Crane SWMU 13
PROJECT NUMBER: 112G00517
DRILLING COMPANY: —
DRILLING RIG: HAND AUGER

BORING NUMBER: 13SB108
DATE: 5-29-08
GEOLOGIST: FRED W RAMSER
DRILLER: Jim Geordt

Sample No. and Type or RQD	Depth (FT.) or Run No.	Blows/ 6" or RQD (%)	Sample Recovery/ Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DECSRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0					DK	BRN LOAMY SAND	SM					
	1						CLAY + SILT	CL					
	2						↓ TR SAND		1ST TRY HIT				
	3						SAND + GRAVEL	SW	GRAVEL + REFUSAL				
S-1 1045	4						TR SILT		@ 2'				
	5						↓		- 2nd ATTEMP				
S-2 1055	6						↓		MOVED 1' TOWARD				
				TD @ 6'					BLDG 171. HAD				
									REFUSAL @ 2'				
									- 3rd ATTEMP				
							COLLECTED		MOVED 2'				
							SAMPLES:		AWAY FROM				
							13SB1080304		1ST HOLE ~~TOWARD~~				
									AWAY FROM				
							13SB1080506		BLDG 171.				

*When rock coring, enter rock brokeness.
**Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Drilling Area Background (ppm): NA

Remarks: _____

Converted to Well: Yes _____ No X Well I.D. #: —

ACAD:FORM_BORLOG.dwg 07/27/99 INL

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

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 / ICE

TYPE OF ANALYSIS: PCBs SW-846 8082 / Ex PCBs SW-846-8330

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	Ex PCBs SW-846-8330							COMMENTS
5/29	0935	13SD069	13 SD069	0	.25	SD	G	1	✓	✓							
	0954	13SD071	13 SD071	0	.25	SD	G	2	✓	✓							MS/MSD
	1002	13SD072	13 SD072	0	.25	SD	G	1	✓	✓							
	0945	13SD073	13 SD073	0	.25	SD	G	1	✓	✓							
	0942	13SD074	13 SD074	0	.25	SD	G	1	✓	✓							
	0950	13SD075	13 SD075	0	.25	SD	G	1	✓	✓							
	0000	13FD052908	—	0	.25	SD	G	1	✓	✓							COLLECTED @ SD073
	1012	13SD076	13 SD076	0	.25	SD	G	1	✓	✓							
	1115	13SD070	13SD070	0	.25	SD	G	1	✓	✓							
	1075	13SB1080304	13SB108	3'	4'	SO	G	1	✓	✓							
↓	1055	13SB1080506	13 SD106	5'	6'	SO	G	1	✓	✓							
5/29	1340	13RB05290801	13	—	—	QC	G	4	✓	✓							

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Fred W Ramsey	5-29-08	1600	1. RECEIVED BY: FEDEX		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

APPENDIX B

PHOTOGRAPHS

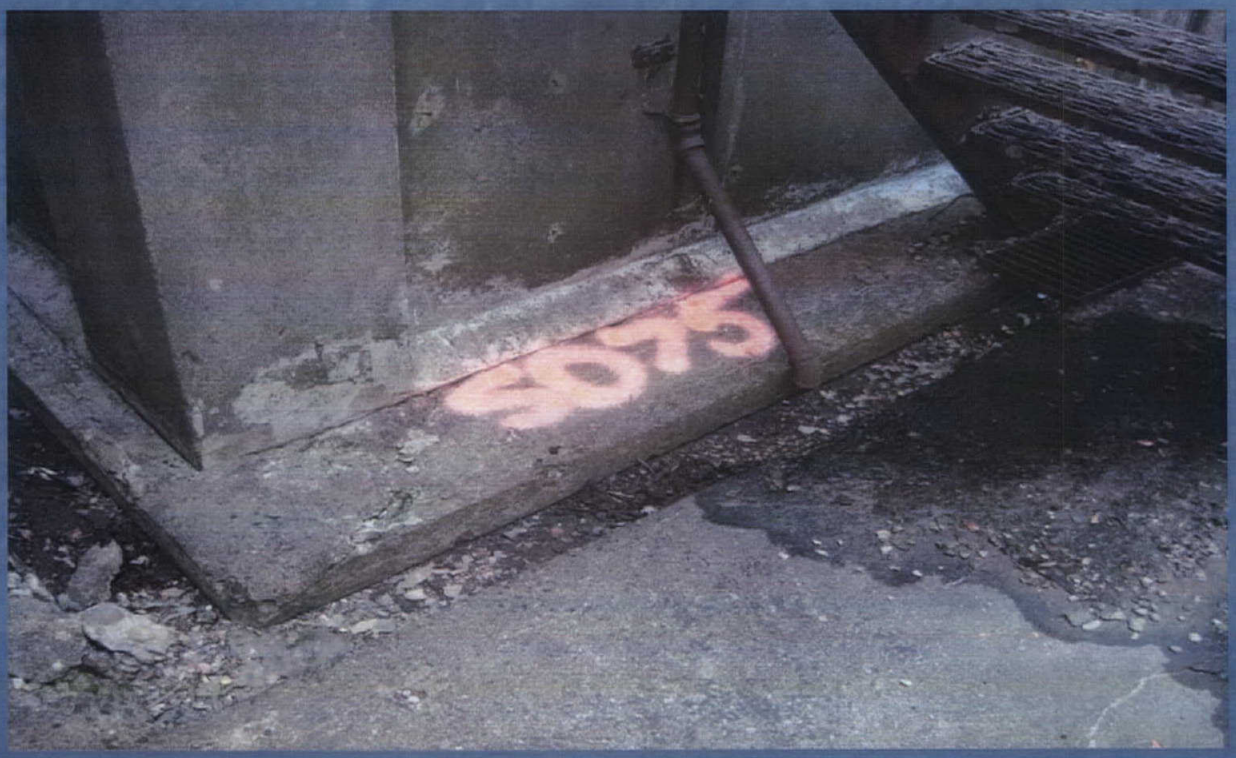
SWMU 13 – Building 171

Sediment sample location 13SD073

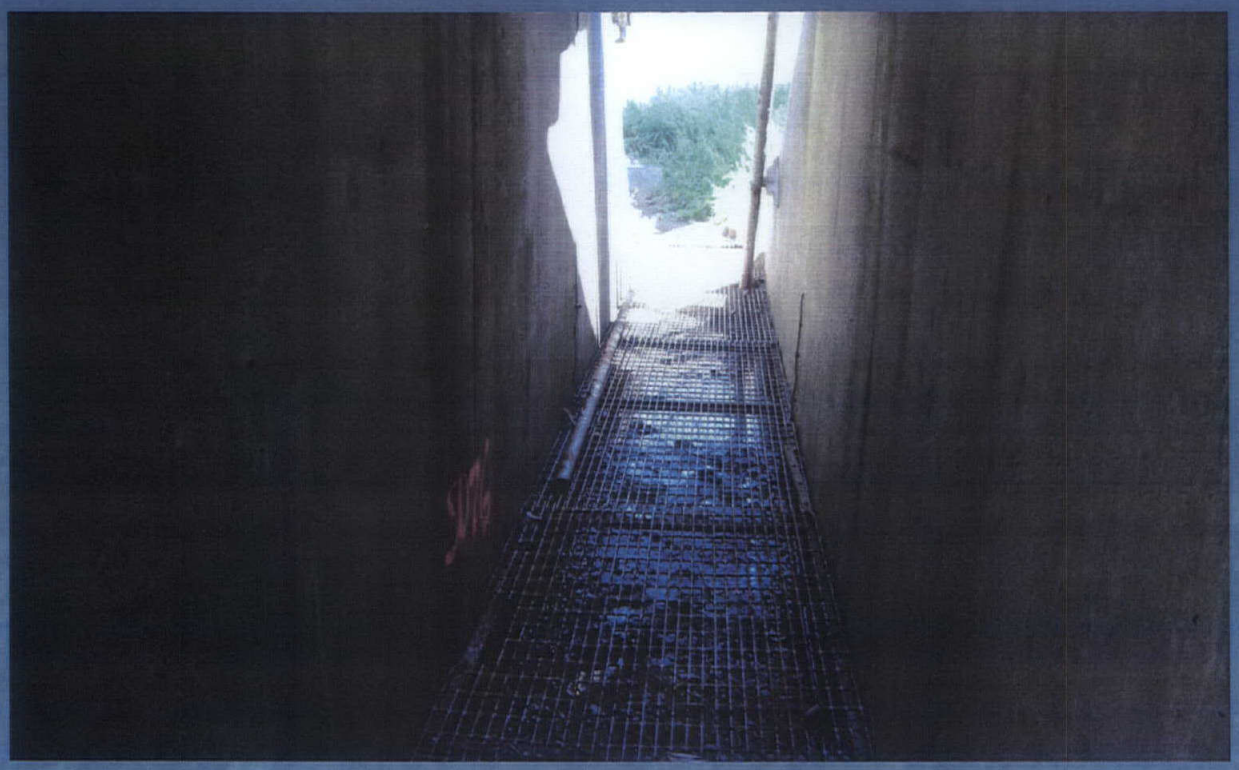
Sediment sample location 13SD069 at end of tramway

Close-up of sediment sample location 13SD069

Sediment sample location 13SD074



Sediment sample location 13SD075



Sediment sample location 13SD076

Leading out back side of building

Close up of sediment sample location 13SD071

Sediment sample location 13SD071 with soil sample 13SB108 at pin flag immediately to the left