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LETTER REPORT REGARDING SECOND QUARTER MONITORING REPORT FOR SOLID WASTE MANAGEMENT UNITS 6 AND 7 TREATABILITY STUDY NS MAYPORT FL
10/23/2003
TETRA TECH NUS

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Project Number N4259

Commander, Southern Division
Naval Facilities Engineering Command
ATTN: Adrienne Wilson (Code ES31)
2155 Eagle Drive
North Charleston, South Carolina 29406

Reference: CLEAN Contract Number N62467-94-D-0888
Contract Task Order Number 0253

Subject: Second Quarter Monitoring Report for Solid Waste Management Units (SWMUs) 6 and 7 Treatability Study
Naval Station (NAVSTA) Mayport, Mayport, Florida.

Dear Ms. Wilson:

Tetra Tech NUS, Inc. (TtNUS) is pleased to submit the Second Quarter Monitoring Letter Report for the subject site. This report was prepared for the United States Navy (Navy) Southern Division, Naval Facilities Engineering Command under Contract Task Order (CTO) 0253 for the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract Number N62467-94-D-0888. This letter report provides the results of the second quarter natural attenuation (NA) sampling event conducted in February 2003. Fieldwork and analytical sampling results for the second quarter event are presented herein.

Site Summary

NAVSTA Mayport is located near the town of Mayport within the city limits of Jacksonville, Florida, in northeastern Duval County on the south shore of the confluence of the St. Johns River and the Atlantic Ocean (Figure 1). NAVSTA Mayport, occupying 3,401 acres, has been in service since 1942. Current activities include support services for surface fleet and aircraft, including ship and aircraft repair and maintenance. The general locations of SWMUs 6 and 7 at NAVSTA Mayport are shown on Figure 1. SWMU 6, located directly east and adjacent to SWMU 7 (see Figure 2), served as a waste oil pit and sludge drying bed prior to the installation of SWMU 7 in 1979. SWMU 7 was the Oily Water Treatment Plant (OWTP) sludge drying beds, which were enclosed by earthen berms. The sludge drying beds received sludge from the OWTP clarifiers and bilge water from receiving tanks. Records indicate that approximately 1,500 gallons of sludge were transferred to the drying beds on the average of twice per week until late 1994. The easternmost drying bed was excavated in 1989, at which time a lined, diked enclosure and three bilge water receiving tanks were constructed.

Between 1992 and 2001, SWMU 7 has undergone two ex situ pilot studies, low-temperature thermal desorption (LTTD), and bioventing/bioslurping. Neither of these methods successfully remediated the site.

During previous investigations and studies, free product has been detected at the site on numerous occasions. The wells at the site that have historically exhibited a measurable presence of free product are as follows: MW01S, MW02S, MW03S, MW04S, MW06S, MW07S, MW11S, and MW15S. Of these wells, MW07S and MW11S were converted to extraction wells for the bioslurping system and MW15S was destroyed and replaced by MW15SR. Figure 3 shows the location of all monitoring wells associated with SWMUs 6 and 7.

Groundwater samples were collected on a semi-annual basis during 1999 and 2000. Four wells (MW04S, MW09S, MW15S, and MW16S) contained constituents detected in excess of Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTLs) (TtNUS, 2002; *Draft Treatability Study Work Plan for SWMUs 6 & 7*). Well MW04S was reported to have exceedances of 1-methylnaphthalene, 2-methylnaphthalene, and total recoverable petroleum hydrocarbons (TRPH). The only reported constituent in excess of GCTLs in MW09S was TRPH during the fourth quarter sampling event of 2000. 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene were detected in MW15S before it was destroyed. MW16S had reported concentrations of 1-methylnaphthalene and 2-methylnaphthalene exceeding GCTLs.

Soil contamination has been documented at the site during many of the above referenced assessment activities. However, the extent of soil contamination has yet to be completely defined. Most previous efforts focused on free-product recovery. Preliminary Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG) testing was completed in March 2002 and indicated exceedances of several individual petroleum hydrocarbon compounds and TRPH.

Purpose and Goals

This Treatability Study is being conducted in order to evaluate the applicability of remediation alternatives for free-product recovery, soil bioremediation, and groundwater NA. Groundwater is presently being sampled and analyzed for NA parameters to determine if NA is a viable groundwater treatment alternative. Passive free-product recovery will be tested at the site to determine if this technology will be a viable method for decreasing the free-product thickness on the groundwater surface. Ten soil samples will be collected and analyzed for TPHCWG to further characterize site soil. These samples will be used to determine if soil is deemed to be contaminated under the FDEP Chapter 62-777, Florida Administrative Code (FAC) Technical Report cleanup levels for TRPH. The analytical data from the 10 soil samples will also be used to determine the location from where soil will be collected for the soil bio-treatability tests. Soil will be collected and sent to two off-site in situ bio-treatability vendors for bench scale bioremediation tests to determine if nutrient injection will decrease soil contamination below FDEP Soil Cleanup Target Levels (SCTLs) and aid in the elimination of free product at the soil-water interface.

TtNUS Field Activities

Prior to this Second Quarter Groundwater Monitoring event, TtNUS personnel had conducted the first quarter of groundwater monitoring which consisted of three monthly sampling events in November 2002, December 2002, and January 2003. Field events for the first quarter began on November 13, 2002 with the installation of an up gradient (background) well for NA monitoring activities. On November 13, 2002, TtNUS personnel supervised the installation of shallow monitoring well MPT-8-MW19S, just south of SWMUs 6 and 7 (see Figure 3). The November sampling event was the baseline sampling event in which 10 wells were sampled for volatile organic compound (VOC), polynuclear aromatic hydrocarbon (PAH), TRPH, and NA parameters. Four additional wells were sampled during the baseline event for PAHs and VOCs only. During the December 2002 and January 2003 first quarter sampling events, ten wells were sampled for NA parameters only.

In February 2003, TtNUS conducted the Second Quarter Groundwater Monitoring event, which included the measurement of depth to groundwater and collection of groundwater samples from 10 site monitoring wells. The purpose of the sampling was to measure NA parameters. Groundwater samples were collected from monitoring wells MPT-8-MW01, MW04S, MW06S, MW09S, MW16S, MW17S, MW18S, MW19S, MPT-S-MW02S, and MPT-S-MW03S and analyzed for iron, manganese, alkalinity, select anions, ammonia, total organic carbon (TOC), biogenic gases, and field NA parameters.

Groundwater samples were collected from all wells in accordance with the current FDEP Standard Operating Procedures (SOPs). Depth-to-water was measured, and the wells were purged prior to sample collection. Purging was accomplished with a peristaltic pump using a low flow purge technique. During purging, field parameters [pH, conductivity, temperature, dissolved oxygen (DO), and oxidation-reduction

potential] were measured at approximately 5 to 10 minute intervals using either a YSI® Model 556 or Horiba U-22 water quality meter. The instrument was calibrated according to the manufacturer's specifications at the beginning of each day and at the end of the last sampling event day. A Field Calibration Log is provided in Attachment A. In addition, turbidity was monitored using a LaMotte 2020 Turbidimeter. Following well purging activities, groundwater samples were analyzed in the field for the following NA parameters: ferrous iron, carbon dioxide, DO, hydrogen sulfide, and sulfide. Groundwater Sample Log Sheets, Low Flow Purge Data Sheets, and Natural Attenuation Parameter Sheets compiled during purging and sampling at each location are also provided in Attachment A. Additional groundwater samples were collected for NA analysis at an off-site lab for alkalinity by United States Environmental Protection Agency (USEPA) Method E310.1, cations and anions by USEPA 300 series, TOC by USEPA Method 415.1, Dissolved Organic Carbon (DOC) by USEPA SW-846 Method 9060, Fractional Organic Carbon (FOC) by USEPA SW-846 Method 900, iron and manganese by USEPA Method SW-846 6010B, and ammonia by USEPA Method 350.1. The baseline event also included groundwater analysis of VOCs by USEPA Method SW-846 8260B, PAHs by USEPA Method SW-846 8310, and TRPH by Florida Petroleum Range Organics (FL-PRO). Groundwater samples were shipped on ice via Federal Express to GPL Laboratories in Gaithersburg, Maryland. In addition, biogenic gas samples were collected and shipped to Microseeps Inc., in Pittsburgh, Pennsylvania for analysis AMG20GAX. The validated groundwater analytical reports are included in Attachment B.

As part of the second quarter sampling, 10 soil samples were collected from previously documented contaminated areas by a stainless steel hand-auger and shipped to a fixed-based laboratory for analysis by (TPHCWG). The soil sampling locations were selected based on Historical Figure 4-9 (LNAPL Thickness Data, July 2000) in Attachment C, which shows free product plumes present on the groundwater table of SWMU 6 & 7. Soil sampling locations are depicted on Figure 4. The validated soil analytical reports are included in Attachment B.

On February 18, 2003, TtNUS supervised the installation of free-product recovery well MPT-8-RW01. The location of RW01 is presented on Figure 3. Its location was selected after free-product measurements of nearly one foot were measured in nearby bioslurping wells by TtNUS personnel. One month was given for recovery well RW01 to equilibrate. On March 24, 2003, a Keck PRC passive skimmer, purchased from Geotech, was installed in RW01. The passive skimmer operates by recovering light hydrocarbons from the groundwater via a floating intake screen. The largest sized screen available was recommended by the passive skimmer vendor based on the bunker C type fuel oil that is present at the soil-groundwater interface at this site. The vendor stated that if the free-product was too viscous, it would not flow through the skimmer screen. TtNUS personnel checked the passive skimmer weekly to empty it and ensure it was operating properly.

Groundwater Sampling Results

Baseline Event

No PAH, VOC, or TRPH detections were reported to exceed FDEP GCTLs during the baseline sampling. Iron was detected in exceedance of FDEP GCTLs in MPT-S-MW03S, MPT-8-MW01S, MW15SR, MW17S, and MW18S. Exceedance concentrations of iron ranged between 815 micrograms per liter (µg/L) and 14,000 µg/L, which exceed the iron GCTL of 300 µg/L. Manganese exceeded FDEP GCTLs in MPT-S-MW03S, MPT-8-MW15SR, MW17S, and MW18S. Manganese exceedance concentrations ranged from 59 µg/L to 556 µg/L, which exceeds its GCTL of 50 µg/L. Chloride was detected in exceedance of the FDEP GCTL of 250 mg/L in monitoring wells MPT-S-MW02S [420 milligrams per liter (mg/L)] and MPT-8-MW15SR (370 mg/L). Free-product measurements of 0.54 feet and 0.01 feet were measured in monitoring wells MPT-8-MW02S and MW03S, respectively.

Event 2 – First Quarter

Iron, manganese, chloride, and ammonia were detected above FDEP GCTLs in groundwater samples collected during the second sampling event. Iron exceedances were detected in MPT-8-MW01S, MW03S, MW04S, MW09S, MW16S, MW17S, and MW18S at concentrations ranging between 486 µg/L and 12,900 µg/L. Manganese exceedances were reported in MPT-8-MW03S, MW04S, MW09S, and

MW17S. Concentrations of manganese in exceedance of GCTLs ranged between 77.4 µg/L and 212 µg/L. A chloride exceedance of 420 mg/L was detected in monitoring well MPT-S-MW02S. Ammonia was detected at 5.3 mg/L in MPT-8-MW04S, which exceeds its FDEP GCTL of 2.8 mg/L. Free product was measured at 0.40 feet in monitoring well MPT-8-MW02S.

Event 3 – First Quarter

Iron, manganese, chloride, and ammonia were detected above FDEP GCTLs in groundwater samples collected during the third sampling event. Iron exceedances were detected in MPT-8-MW04S, MW09S, MW15SR, MW16S, MW17S, and MW18S at concentrations ranging between 1,410 µg/L and 13,600 µg/L. Manganese exceedances were reported in MPT-8-MW04S, MW09S, MW15SR, MW16S, MW17S and MW18S. Concentrations of manganese in exceedance of GCTLs ranged between 58.0 µg/L and 233 µg/L. A chloride exceedance of 400 mg/L was detected in monitoring well MPT-8-MW15SR. Ammonia was detected at 4.2 mg/L in MPT-8-MW04S, which exceeds its FDEP GCTL of 2.8 mg/L. Free-product measurements of 0.45 feet and 0.02 feet were encountered in monitoring wells MPT-8-MW02S and MW03S, respectively.

Second Quarter

Table 1 provides a summary of depth-to-water measurements from top of casing. Figure 5 provides a graphical representation of groundwater flow. Groundwater flow is generally north toward the St. Johns River. Table 2 is a summary of the groundwater NA parameters that were sent to a fixed-based laboratory during the second quarter sampling event. Groundwater NA parameters that were collected and analyzed in the field are summarized in Table 3. The monitoring well locations were presented on Figure 3.

Iron, manganese, and ammonia were detected above FDEP GCTLs in groundwater samples collected during the second sampling event. Iron exceedances were detected in MPT-8-MW03S, MW04S, MW09S, MW16S, MW17S, and MW18S at concentrations ranging between 1,300 µg/L and 14,800 µg/L. Manganese exceedances were reported in MPT-8-MW03S, MW04S, MW09S, MW16S, MW17S, MW18S and MW19S. Concentrations of manganese in exceedance of GCTLs ranged between 58.8 µg/L and 270 µg/L. Ammonia exceedances of GCTLs were detected in MPT-8-MW04S, MW09S, and MW16S at concentrations between 3.9 µg/L and 5.0 µg/L. Free-product measurements of 0.40 ft and 0.10 ft were recorded for monitoring wells MPT-8-MW02S and MW03S, respectively.

Soil Sampling and Free-Product Recovery Results

The TPHCWG analytical results for the ten soil samples are provided in Table 4. Locations of the 10 soil samples is presented on Figure 4. Soil sampling locations SB02 and SB03 had the highest TPHCWG concentrations and were located in the southern end of central pit. This was also the location where approximately one foot of free-product was measured and recovery well RW01 was installed.

Free-product recovery using the Keck passive skimmer proved to be ineffective at removing free-product from the soil-groundwater interface. Free-product measurements in the recovery well were approximately 0.02-foot each week. However, weekly inspection of the skimmer showed no free-product was recovered by the skimmer.

Summary/Conclusions

Iron, manganese, and ammonia were reported above FDEP GCTLs in several of the SWMU 6 and 7 monitoring wells, which is consistent with previous sampling events. A qualitative review of the field and laboratory NA sampling results does not reveal any significant deviations over the four sampling events to date. Any slight changes are most likely associated with seasonal changes in weather and temperature. A detailed analysis of each NA parameter will be provided in the Final Treatability Study Report following conclusion of all field work.

A split soil sample for two off-site in situ bio-treatability vendors that will perform bench scale bioremediation tests will be collected between soil sampling locations SB02 and SB03. This sample will be collected during the third quarter sampling event. These two soil sampling locations were selected because they exhibited the highest contaminant concentrations out of the 10 laboratory samples submitted for TPHCWG testing.

Free-product recovery using passive skimmers has been ineffective thus far. It is believed that the free-product (a bunker C type fuel oil) was too viscous to flow through the screen of the passive skimmer. Weekly maintenance of the passive skimmers will continue until the next groundwater NA sampling event. The next groundwater sampling event (Quarter Three) is schedule for May 2003.

If you have any questions with regard to this submittal, please contact me at (850) 385-9860 or via e-mail at hansent@ttnus.com.

Sincerely,

for

Terry Hansen P.G.
Task Order Manager

TH/cm

Attachments (5)

c: Mr. J. Cason P.G., FDEP (2 copies)
Ms. C. Mitchell, NAVSTA Mayport
Ms. D. Lancaster, NAVSTA Mayport
Mr. C. Benedikt, EPA
Mr. M. Halil P.E., JA Jones
Mr. M. Albert P.E., TtNUS
Ms. D. Wroblewski, TtNUS (cover letter only)
Mr. M. Perry, TtNUS (unbound copy)
Project File

TABLES

TABLE 1
GROUNDWATER ELEVATION SUMMARY

FEBRUARY 2003 SAMPLING EVENT (QUARTER 2)
SOLID WASTE MANAGEMENT UNITS 6 & 7
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

Well Number	Total Depth of Well (ft)	Top of Casing Elevation[1] (ft)	Depth to Water, ft (BTOC)				Groundwater Elevation[1]			
			11/19/02	12/17/02	01/13/03	02/13/03	11/19/02	12/17/02	01/13/03	02/13/03
MPT-8-MW01S	16.30	19.75	8.51	9.10	8.81	9.51	11.24	10.65	10.94	10.24
MPT-8-MW02S	15.22	NM	11.54	11.94	11.85	12.22	NA	NA	NA	NA
MPT-8-MW03S	15.40	NM	11.58	11.48	10.92	12.23	NA	NA	NA	NA
MPT-8-MW04S	15.50	11.90	10.04	10.33	10.14	10.39	1.86	1.57	1.76	1.51
MPT-8-MW06S	15.20	NM	7.06	7.53	7.42	8.18	NA	NA	NA	NA
MPT-8-MW08S	14.60	NM	9.02	9.64	NM	NA	NA	NA	NA	NA
MPT-8-MW09S	14.85	12.55	8.96	9.09	9.03	9.54	3.59	3.46	3.52	3.01
MPT-8-MW12S	18.10	NM	10.97	11.33	11.25	11.65	NA	NA	NA	NA
MPT-8-MW13S	15.25	NM	10.45	10.70	10.55	10.95	NA	NA	NA	NA
MPT-8-MW13I	39.45	NM	10.65	10.83	10.55	11.06	NA	NA	NA	NA
MPT-8-MW15SR	35.50	NM	10.15	10.61	10.47	10.91	NA	NA	NA	NA
MPT-8-MW16S	15.00	NM	8.55	8.77	8.67	9.00	NA	NA	NA	NA
MPT-8-MW17S	14.89	NM	9.22	9.46	9.26	9.40	NA	NA	NA	NA
MPT-8-MW18S	15.02	8.80	5.61	6.92	6.86	7.12	3.19	1.88	1.94	1.68
MPT-8-MW19S	16.30	NM	5.82	5.47	5.26	NA	NA	NA	NA	NA
MPT-S-MW02S	15.22	NM	7.85	8.58	8.83	9.98	NA	NA	NA	NA
MPT-S-MW03S	15.40	11.90	10.20	10.57	10.43	10.82	1.70	1.33	1.47	1.08

Notes:
[1] Based on benchmark elevation of southeast corner of concrete transformer slab assumed to be 30.00 ft.
ft = feet
BTOC = below top of casing
NM = not measured
NA = not available

TABLE 2
SUMMARY OF ANALYTES DETECTED IN GROUNDWATER

FEBRUARY 2003 SAMPLING EVENT (QUARTER 2)
SOLID WASTE MANAGEMENT UNITS 6 & 7
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

Sample No.		MPT-8-MW01S-03	MPT-S-MW02S-03	MPT-8-MW03S-03	MPT-8-MW04S-01
Sample Location		MW-01S	MW-02S	MW-03S	MW-04S
Collect Date		02/10/03	02/11/03	02/11/03	02/13/03
	GCTL[1]				
Metals[2] (µg/L)					
Iron	**300**	--	--	**4020**	**14100**
Manganese	**50**	26.4	8.4	**190**	**226**
Miscellaneous[2] (mg/L)					
Alkalinity	NC	170	380	370	500
Ammonia	**2.8**	0.39	0.78	0.48	**5**
Chloride	**250**	17	150	14	15
Dissolved Organic Carbon	NC	NA	NA	NA	NA
Fractional Organic Carbon	NC	NA	NA	NA	NA
Nitrate	10	--	0.80 J	--	--
Nitrite	10	--	--	--	--
Orthophosphate	NC	--	--	--	--
Sulfate	250	31	25	40	0.19
Total Organic Carbon	NC	3.1	13	2	34
Biogenic Gases[4] (mg/L)					
Carbon Dioxide	NC	6.6 J	52 J	56 J	140
Ethane	NC	0.000012 J	0.00024 J	0.00048 J	0.00001
Ethene	NC	--	--	--	--
Hydrogen [(nM)]	NC	2 J	1.3 J	1.8 J	3
Methane	NC	0.11 J	2.8 J	0.18	9.4
Nitrogen	NC	17 J	13 J	16 J	8.2
Oxygen	NC	3.4 J	4.6 J	2.8 J	1.5

See notes at end of table.

TABLE 2 (continued)
SUMMARY OF ANALYTES DETECTED IN GROUNDWATER

FEBRUARY 2003 SAMPLING EVENT (QUARTER 2)
SOLID WASTE MANAGEMENT UNITS 6 & 7
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

Sample No.		MPT-8-MW06S-01	MPT-8-MW09S-03	MPT-8-MW16S-03	MPT-8-MW16S-03-D
Sample Location		MW-06S	MW-09S	MW-16S	MW-16S(Duplicate)
Collect Date		02/13/03	02/10/03	02/11/03	02/11/03
	GCTL[1]				
Metals[2] (µg/L)					
Iron	**300**	--	**1650**	**14800**	**14600**
Manganese	**50**	40.9	**231**	**270**	**270**
Miscellaneous[2] (mg/L)					
Alkalinity	NC	180	330	570	570
Ammonia	2.8	0.24	**3.9**	**3.9**	**3.9**
Chloride	250	11	17	17	17
Dissolved Organic Carbon	NC	NA	NA	NA	NA
Fractional Organic Carbon	NC	NA	NA	NA	NA
Nitrate	10	--	--	--	--
Nitrite	10	--	--	--	--
Orthophosphate	NC	--	--	--	--
Sulfate	250	14	0.67	0.67	0.66
Total Organic Carbon	NC	2.9	35	35	34
Biogenic Gases[4] (mg/L)					
Carbon Dioxide	NC	9.5	55 J	200 J	120 J
Ethane	NC	--	--	0.000056 J	0.000031 J
Ethene	NC	--	--	--	--
Hydrogen [(nM)]	NC	0.5	2.9 J	1.9 J	1.7 J
Methane	NC	0.00006	0.87 J	8 J	5 J
Nitrogen	NC	16	16 J	7.8 J	9.9 J
Oxygen	NC	4.3	2.4 J	3.1 J	4.4 J

See notes at end of table.

TABLE 2 (continued)
SUMMARY OF ANALYTES DETECTED IN GROUNDWATER

FEBRUARY 2003 SAMPLING EVENT (QUARTER 2)
SOLID WASTE MANAGEMENT UNITS 6 & 7
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

Sample No.		MPT-8-MW-17S-01	MPT-8-MW-18S-01	MPT-8-MW-19S-01
Sample Location		MW-17S	MW-18S	MW-19S
Collect Date		02/13/03	02/13/03	02/11/03
	GCTL[1]			
Metals[2] (µg/L)				
Iron	**300**	**2390**	**1300**	--
Manganese	**50**	**78.8**	**58.8**	**94.4**
Miscellaneous[2] (mg/L)				
Alkalinity	NC	300	220	130
Ammonia	2.8	0.25		--
Chloride	250	11	6.6	23
Dissolved Organic Carbon	NC	NA	NA	4.2
Fractional Organic Carbon	NC	NA	NA	29
Nitrate	10	--	--	2.0 J
Nitrite	10	--	--	--
Orthophosphate	NC	--	--	--
Sulfate	250	14	15	36
Total Organic Carbon	NC	2.9	2.8	4.6
Biogenic Gases[4] (mg/L)				
Carbon Dioxide	NC	56	23	4 J
Ethane	NC	--	--	--
Ethene	NC	--	--	--
Hydrogen (nM)	NC	1.1	2	1.1 J
Methane	NC	0.51	0.18	0.0004 J
Nitrogen	NC	16	18	16 J
Oxygen	NC	1.1	1.7	7 J

[1] Groundwater Cleanup Target Levels from Chapter 62-777, F.A.C.
[2] SW-846 6010B (Metals)
[3] USEPA 310.1 (Alkalinity); USEPA 350.2 (Ammonia); USEPA 300.0 (Anions); SW-846 9060 (DOC, FOC, TOC)
[4] AMG20GAX (Biogenic Gases)

Notes: **Bold** indicates an exceedance of limits. **Bold** indicates which regulatory limit was exceeded.
µg/L = micrograms per liter
nM = Nanomoles
-- = Compound not detected
mg/L = milligrams per liter
NC = No criteria
NA = Not analyzed
J = Compound detected at an estimated concentration

TABLE 3
GROUNDWATER FIELD SAMPLING RESULTS SUMMARY

FEBRUARY 2003 SAMPLING EVENT (QUARTER 2)
SOLID WASTE MANAGEMENT UNITS 6 & 7
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

Sample ID	MPT-8-MW01S				MPT-8-MW04S				MPT-8-MW06S				MPT-8-MW09S			
Collect Date	11/19/02	12/19/02	01/13/03	02/10/03	11/22/02	12/19/02	01/15/03	02/13/03	11/21/02	12/18/02	01/14/03	02/13/03	11/19/02	12/18/02	01/14/03	02/10/03
Temperature (°C)	26.31	22.97	21.21	21.12	NM	24.99	22.88	23.25	25.11	22.42	19.86	19.91	25.15	23.45	21.45	20.70
pH (Standard Units)	7.51	11.13	7.54	8.02	NM	10.12	6.70	7.22	7.54	8.49	7.32	7.88	7.22	10.34	6.85	7.20
Conductivity (mS/cm)	0.495	0.349	0.342	0.404	NM	0.832	0.780	1.030	0.423	0.33	0.294	0.362	1.100	1.620	0.768	0.669
Turbidity (NTU)	2.8	2.6	0	0	NM	8.2	0	11.6	0	0	0	0.2	0	0	0	0.2
Redox Potential (Millivolts)	-149	-162	-227	-198	NM	-175	-181	-129	-47	87	74	7	-97	-97	-59	-74
Dissolved Oxygen (mg/L)	0.4	0.8	0.6	1.0	NM	0.2	0.6	0.3	4.0	5.0	6.0	5.0	2.0	1.0	1.0	0.8
Carbon Dioxide (mg/L)	13	10	<10	<10	NM	90	145	110	<10	<10	10	12	25	45	50	29
Sulfide (mg/L)	0.06	0.05	0.03	0.19	NM	0.23	0.32	0.15	0.03	0	0	0	0.01	0.01	0	0.01
Ferrous Iron (mg/L)	0.05	0.13	0.23	0.12	NM	4.3	6.4	6.0	0.01	0.01	0.01	0.05	0	0.98	1.27	1.49
Hydrogen Sulfide (mg/L)	0.1	0.1	0	0.5	NM	2	2.0	2.0	0	0	0	0	0.0	0.0	0.3	0.5

See notes at end of table.

TABLE 3
GROUNDWATER FIELD SAMPLING RESULTS SUMMARY

FEBRUARY 2003 SAMPLING EVENT (QUARTER 2)
SOLID WASTE MANAGEMENT UNITS 6 & 7
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

Sample ID	MPT-8-MW015SR				MPT-8-MW016S				MPT-8-MW017S				MPT-8-MW018S			
Collect Date	11/21/02	12/19/02	1/15/03	02/10/03	11/21/02	12/18/02	1/15/03	2/11/03	11/21/03	12/17/02	1/13/03	2/13/03	11/21/02	12/19/02	1/14/03	2/13/03
Temperature (°C)	24.48	NM	22.23	NM	25.90	24.41	22.45	22.50	25.90	24.09	21.81	22.08	26.12	24.10	22.47	21.70
pH (Standard Units)	7.4	NM	7.41	NM	6.84	10.39	6.70	7.30	6.84	10.41	6.99	7.59	7.16	11.26	7.05	7.63
Conductivity (mS/cm)	2.580	NM	2.670	NM	0.908	0.863	1.200	1.180	0.908	0.608	0.512	0.556	0.551	0.404	0.384	0.428
Turbidity (NTU)	>999	NM	277	NM	0	8.4	0	16.9	0	0	0	6.7	0	0	0	0
Redox Potential (Millivolts)	-394	NM	-368	NM	-169	-120	-215	-120	-169	-182	-132	-128	-157	-206	-133	-106
Dissolved Oxygen (mg/L)	0.3	NM	0.40	NM	0.20	0.8	0.4	1.0	0.0	0.4	0.4	1.0	0.3	1.0	1.0	1.0
Carbon Dioxide (mg/L)	35	NM	50	NM	50	160	70	160	50	30	25	30	20.00	28	17	16
Sulfide (mg/L)	>0.8	NM	>0.80	NM	0.09	0.06	0.09	0.07	0.09	0.09	0.04	0.08	0.01	0.01	0.03	0
Ferrous Iron (mg/L)	1.60	NM	0.1	NM	4.80	4	6	5.6	4.80	2.61	2.25	1.92	0.86	1.17	0.97	0.68
Hydrogen Sulfide (mg/L)	>5	NM	>5.0	NM	0.5	0.1	0.5	0.1	0.5	0.5	0	0	0	NM	0	0

See notes at end of table.

TABLE 3
GROUNDWATER FIELD SAMPLING RESULTS SUMMARY

FEBRUARY 2003 SAMPLING EVENT (QUARTER 2)
SOLID WASTE MANAGEMENT UNITS 6 & 7
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

Sample ID	MPT-8-MW019S				MPT-S-MW02S				MPT-S-MW03S			
Collect Date	11/20/02	12/18/03	1/14/03	2/11/03	11/20/02	12/17/03	1/15/03	2/11/03	11/21/03	12/19/02	1/14/03	2/11/03
Temperature (°C)	23.63	18.40	16.80	16.44	23.52	23.14	21.14	21.38	25.82	NM	NM	21.69
pH (Standard Units)	7.54	8.11	7.54	8.42	7.47	10.36	7.29	7.7	6.93	NM	NM	7.53
Conductivity (mS/cm)	0.491	0.345	0.334	0.429	2.78	2.78	1.39	1.39	0.928	NM	NM	0.740
Turbidity (NTU)	0	0	0	4.7	0	0	0	5.7	2.5	NM	NM	0
Redox Potential (Millivolts)	51	98	75	42	-73	-160	-150	-57	-253	NM	NM	-109
Dissolved Oxygen (mg/L)	3.0	4.0	6.0	6.0	1.0	1.0	2.0	3.0	0.3	NM	NM	1.0
Carbon Dioxide (mg/L)	<10	<10	<10	<10	25	25	18	20	34	NM	NM	35
Sulfide (mg/L)	0.00	0.01	0	0.03	0.03	0.04	0.01	0	0.25	NM	NM	0.01
Ferrous Iron (mg/L)	0.00	0.03	0.03	0.01	0.03	0.06	0	0	4.6	NM	NM	2.81
Hydrogen Sulfide (mg/L)	0	0	0	0	0	0	0	0	5	NM	NM	0

Notes:

Ft = Feet
°C = Degrees Celsius
mS/cm = Microsiemens per Centimeter
NTU = Nephelometric Turbidity Unit
Redox = Oxidation - Reduction
mg/L = Milligrams per Liter
NM=Not measured

TABLE 4
SUMMARY OF ANALYTES DETECTED IN SOIL - SWMUs 6 & 7

FEBRUARY 2003 SAMPLING EVENT (QUARTER 2)
SOLID WASTE MANAGEMENT UNITS 6 & 7
NAVAL STATION MAYPORT
MAYPORT, FLORIDA
PAGE 1 OF 2

Sample No.	MPT-8-SB01-3	MPT-8-SB02-3	MPT-8-SB03-3	MPT-8-SB04-2.5	MPT-8-SB05-8	MPT-8-SB06-8.5
Sample Depth	3 ft	3 ft	3 ft	2.5 ft	8 ft	8.5 ft
Collect Date	02/12/03	02/12/03	02/12/03	02/12/03	02/12/03	02/12/03
Parameter (mg/kg)						
C10-C12 Aliphatics	42 J	1900	730	--	500	--
C10-C12 Aromatics	--	600	--	--	100	--
C12-C16 Aliphatics	870	4200	3200	--	1900	--
C12-C16 Aromatics	17 J	2000	260	--	800	--
C16-C21 Aliphatics	840	2200	2300	--	1500	--
C16-C21 Aromatics	4.1 J	1500	320	--	670	--
C21-C35 Aliphatics	26 J	80	91	1.5 J	19 J	--
C21-C35 Aromatics	--	32 J	5.8 J	1.5 J	20 J	--
C5-C7 Aromatics	--	--	--	--	--	--
C6-C8 Aliphatics	--	--	--	--	--	--
C7-C8 Aromatics	--	--	--	--	--	--
C8-C10 Aliphatics	--	390	73	--	95	--
C8-C10 Aromatics	--	51	--	--	--	--

See notes at end of table.

TABLE 4 (continued)
SUMMARY OF ANALYTES DETECTED IN SOIL - SWMUs 6 & 7

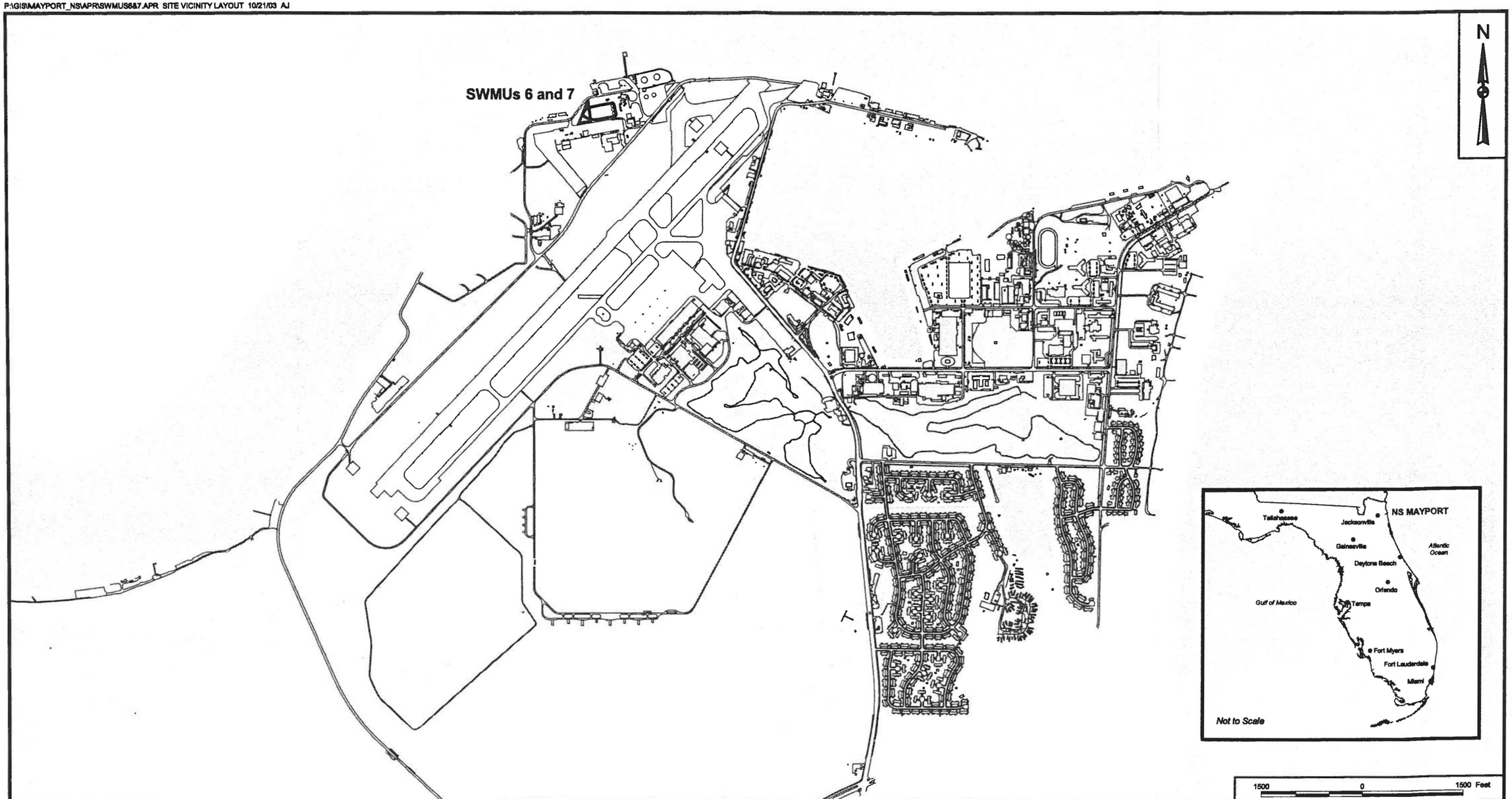
FEBRUARY 2003 SAMPLING EVENT (QUARTER 2)
SOLID WASTE MANAGEMENT UNITS 6 & 7
NAVAL STATION MAYPORT
MAYPORT, FLORIDA
PAGE 2 OF 2

Sample No.	MPT-8-SB07-7	MPT-8-SB08-7.5	MPT-8-SB09-6.5	MPT-8-SB010-3	MPT-8-SB010-3 (Duplicate)
Sample Depth	7 ft	7.5 ft	6.5 ft	3 ft	3 ft
Collect Date	02/12/03	02/12/03	02/12/03	02/12/03	02/12/03
Parameter (mg/kg)					
C10-C12 Aliphatics	--	150	780	13 J	23 J
C10-C12 Aromatics	--	--	23 J	--	--
C12-C16 Aliphatics	77	370	2700	290	260
C12-C16 Aromatics	14 J	15 J	270	16 J	16 J
C16-C21 Aliphatics	48 J	110	2000	62	48 J
C16-C21 Aromatics	4.9 J	3.2 J	190	4.6 J	3.4 J
C21-C35 Aliphatics	31 J	12 J	130	--	16 J
C21-C35 Aromatics	--	--	--	--	--
C5-C7 Aromatics	--	--	--	--	--
C6-C8 Aliphatics	--	--	--	--	--
C7-C8 Aromatics	--	--	--	--	--
C8-C10 Aliphatics	--	17 J	100	--	--
C8-C10 Aromatics	--	--	--	--	--

Notes: mg/kg = milligrams per kilograms
-- = Compound not detected
J = Compound detected at an estimated concentration

FIGURES

P:\GIS\MAYPORT_NS\APR\SWMUS6&7.APR SITE VICINITY LAYOUT 10/21/03 AJ



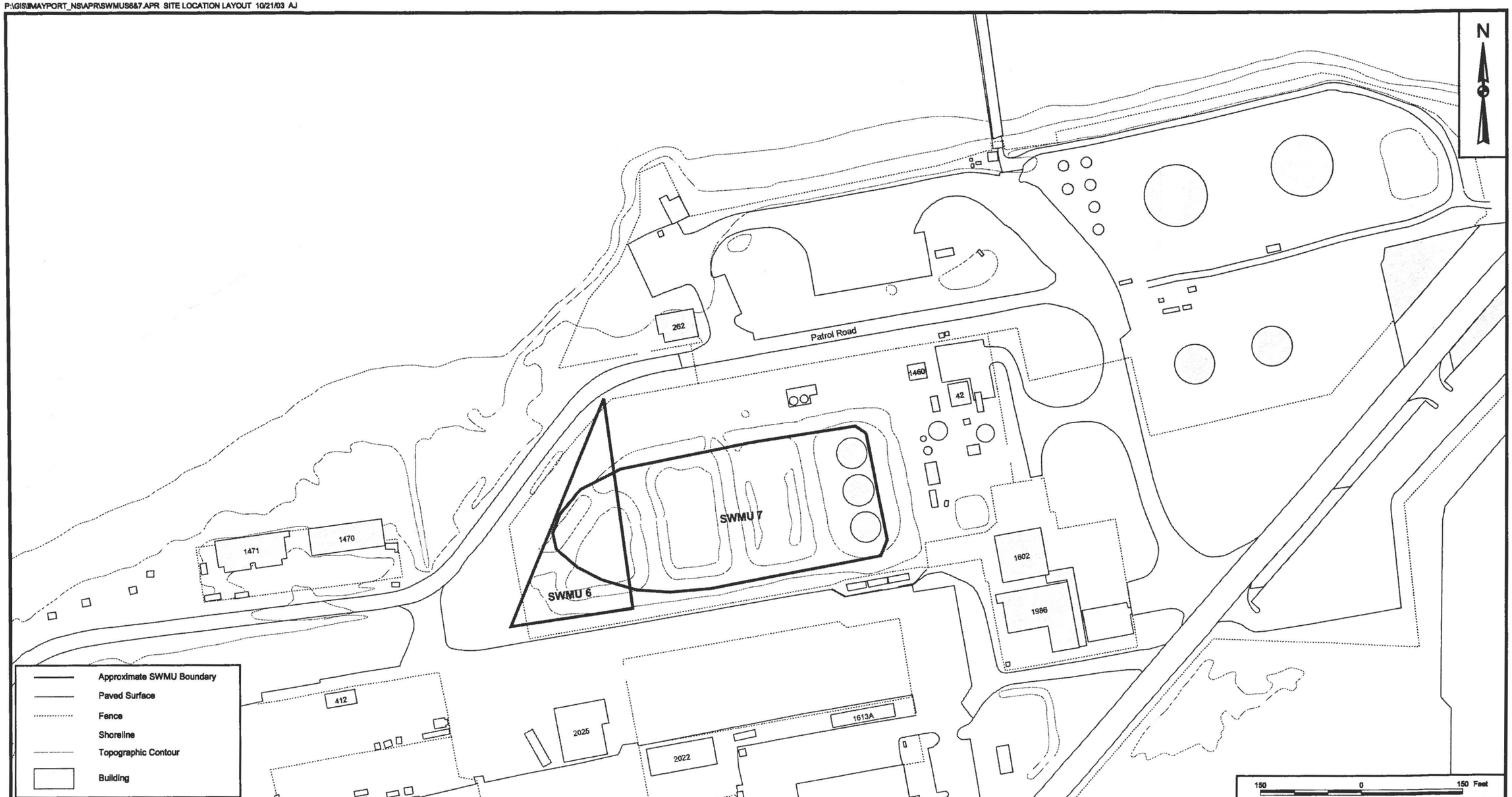
NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY A. JANOCHA	DATE 8/01/03
CHECKED BY C. METZ	DATE 10/21/03
COST/SCHED-AREA	
SCALE AS NOTED	

SITE VICINITY MAP
SECOND QUARTER GROUNDWATER MONITORING LETTER REPORT
SWMUs 6 AND 7
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

CONTRACT NO. 4259	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1	REV. 0

P:\GIS\MAYPORT_NS\APR\SWMUS6&7.APR SITE LOCATION LAYOUT 10/21/03 AJ



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY A. JANOCHA	DATE 8/01/03
CHECKED BY C. METZ	DATE 10/21/03
COST/SCHED-AREA	
SCALE AS NOTED	

SITE LOCATION MAP
SECOND QUARTER GROUNDWATER MONITORING LETTER REPORT
SWMUs 6 AND 7
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

CONTRACT NO. 4259

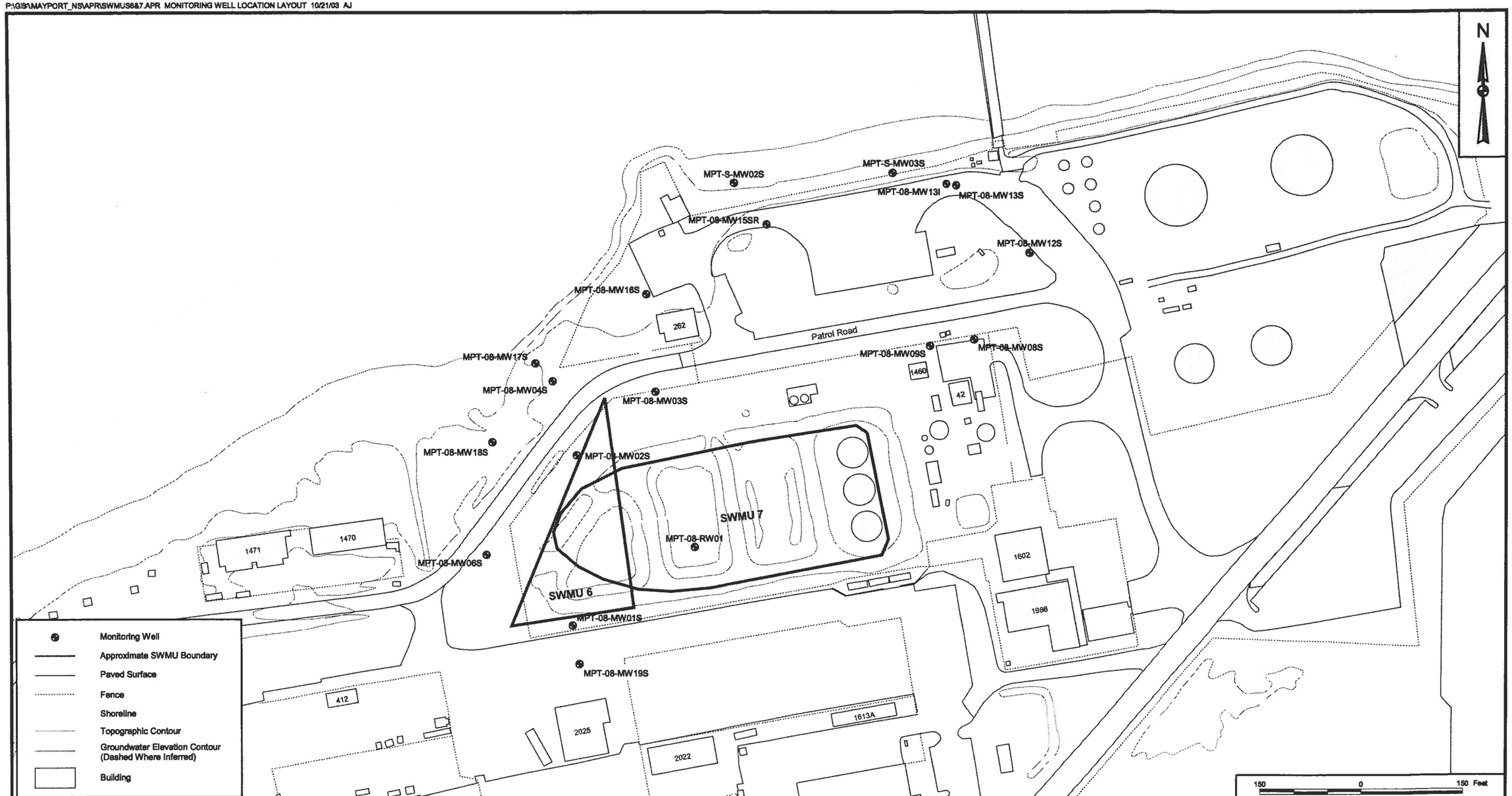
APPROVED BY ____ DATE ____

APPROVED BY ____ DATE ____

DRAWING NO. FIGURE 2

REV. 0

P:\GIS\MAYPORT_NS\APR\SWMUS6&7.APR MONITORING WELL LOCATION LAYOUT 10/21/03 AJ



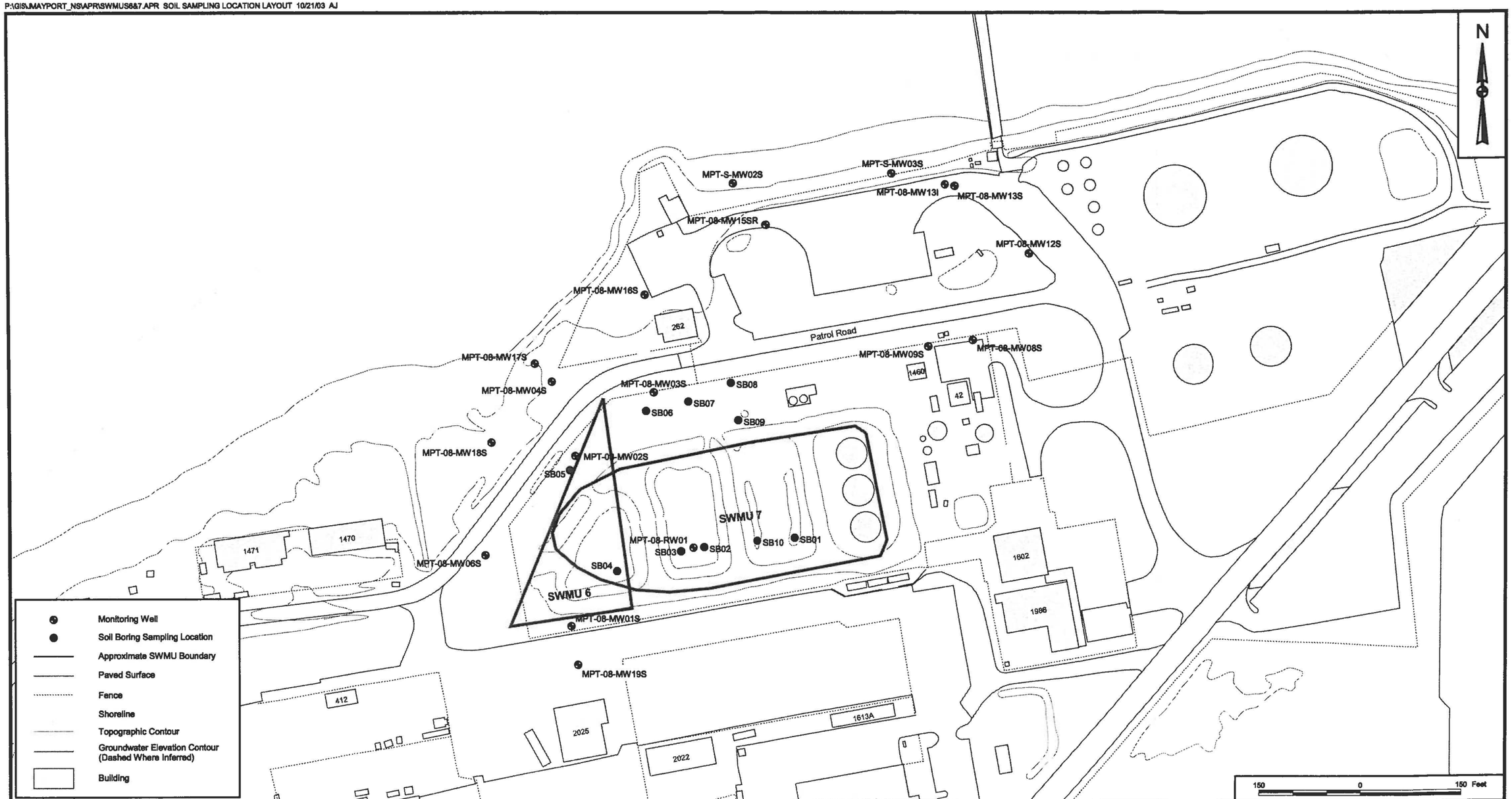
NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY A. JANOCHA	DATE 8/01/03
CHECKED BY C. METZ	DATE 10/21/03
COST/SCHED-AREA	
SCALE AS NOTED	

MONITORING WELL LOCATION MAP
SECOND QUARTER GROUNDWATER MONITORING LETTER REPORT
SWMUs 6 AND 7
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

CONTRACT NO. 4259	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 3	REV. 0

P:\GIS\MAYPORT_NS\APR\SWMUS6&7.APR SOIL SAMPLING LOCATION LAYOUT 10/21/03 AJ



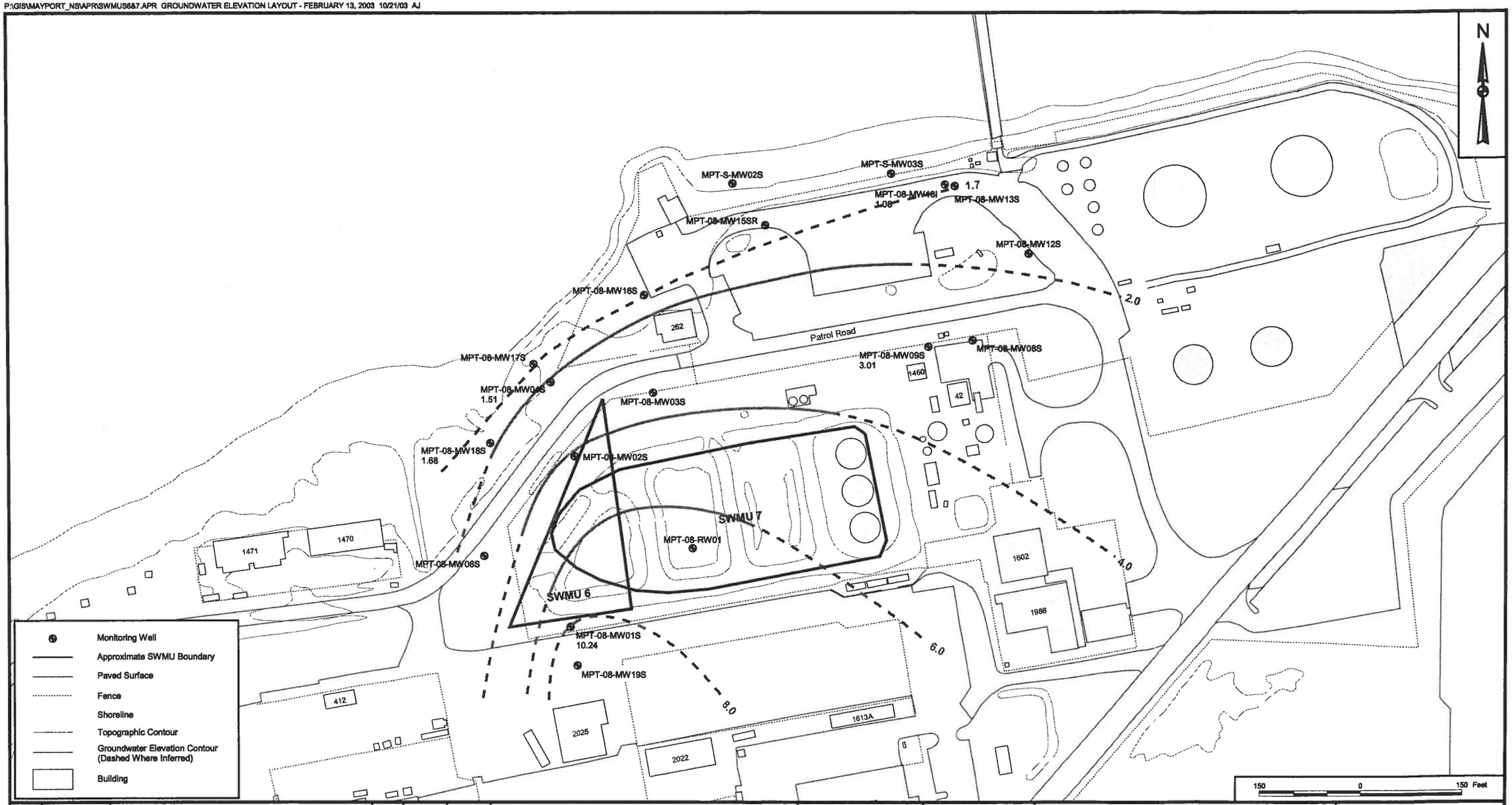
NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY A. JANOCHA	DATE 8/01/03
CHECKED BY C. METZ	DATE 10/21/03
COST/SCHED-AREA	
SCALE AS NOTED	

SOIL SAMPLING LOCATIONS
SECOND QUARTER GROUNDWATER MONITORING LETTER REPORT
SWMUs 6 AND 7
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

CONTRACT NO. 4259	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 4	REV. 0

P:\GIS\MAYPORT_NS\APR\SWMUS6&7.APR GROUNDWATER ELEVATION LAYOUT - FEBRUARY 13, 2003 10/21/03 AJ



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY A. JANOCHA	DATE 8/01/03
CHECKED BY C. METZ	DATE 10/21/03
COST/SCHED-AREA	
SCALE AS NOTED	

GROUNDWATER ELEVATION AND CONTOUR MAP
FEBRUARY 13, 2003
SECOND QUARTER GROUNDWATER MONITORING LETTER REPORT
SWMUs 6 AND 7
NAVAL STATION MAYPORT
MAYPORT, FLORIDA

CONTRACT NO. 4259	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 5	REV. 0

ATTACHMENT A

FIELD DATA FORMS

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: SWMU 7 **Project No.:** N4259
Location: Mayport **Personnel:** C.Metz, L. Knight
Weather Conditions: **Measuring Device:** Water interface probe
Tidally Influenced: Yes X No ___ **Remarks:**

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
MPT-8-MW01S	2/13/2003		19.75	16.3	9.51	—		
MPT-8-MW02S	1/13/2003			15.22	12.22-12.62	0.40		
MPT-8-MW03S	1/13/2003			15.4	12.23-12.33	0.10		
MPT-8-MW04S	1/13/2003		11.9	15.5	10.39	0.02		
MPT-8-MW06S	1/13/2003			15.2	8.18	—		
MPT-8-MW08S	1/13/2003			14.6	Didn't Take			
MPT-8-MW09S	1/13/2003		12.55	14.85	9.54	—		
MPT-8-MW12S	1/13/2003		12.93	18.1	11.65			
MPT-8-MW13S	1/13/2003		11.33	15.25	10.95			
MPT-8-MW13I	1/13/2003			39.45	11.06			
MPT-8-MW15SR	1/13/2003			35.5	10.91			
MPT-8-MW16S	1/13/2003			15	9.00			
MPT-8-MW17S	1/13/2003			14.89	9.40	—		
MPT-8-MW18S	1/13/2003		8.8	15.02	7.12	—		
MPT-8-MW19S	1/13/2003			16.3	Could Get (Truck parked on it)			
MPT-S-MW02S	1/13/2003		10.08	15.22	9.98	—		
MPT-S-MW03S	1/13/2003		11.9	15.4	10.82			
	2-13-03							
		X						
		All taken between 0930-10:30						

* All measurements to the nearest 0.01 foot

Page ____ of ____

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-MW01S-03
Sample Location: MW01S
Sampled By: C. Metz, L. Knight
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 2/10/2003	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Time: 1435								
Method: Low Flow Peristaltic	CLEAR	8.02	0.404	0	0.83	21.12	-198	

PURGE DATA

Date: 2/10/2003	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm):								
Well Casing Diameter: 2"								
Well Casing Material: PVC								
Total Well Depth (TD): 16.3'								
9.48								
One Casing Volume(gal/L):								
Start Purge (hrs): 1355								
End Purge (hrs): 1435								
Total Purge Time (min): 50								
Total Vol. Purged (gal/L): 14L								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
TOC, Ammonia	H2SO4	500ml glass	[illegible]
Alk,N,NO2, NO3, SO4, Cl, PO4,	none	1L Plastic	[illegible]
Iron + Manganese	HNO3	1L Plastic	[illegible]

OBSERVATIONS / NOTES

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Louis Knight

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: SWMU 7
PROJECT NUMBER: N4259 (CTO 253)

WELL ID: MPT-8-MW01S-03
DATE: 2·10·03

Time (Hrs.)	Water Level (Ft. below TOC)	Cumul. Volume (Liters)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (+/-mv)	Comments
1355	9.48									
1400	9.79		350	7.44	0.404	10.7	2.34	21.38	-52	
1405	9.79	3.5	350	7.61	0.402	0	0.95	21.18	-102	
1410	9.79		350	7.78	0.404	0	1.04	21.12	-152	
1415	9.79	7.0	350	7.91	0.404	0	0.97	21.10	-175	
1420	9.79		350	7.95	0.404	0	0.91	21.15	-181	
1425	9.79	10.5	350	7.98	0.403	0	0.89	21.03	-188	
1430	9.79		350	8.00	0.404	0	0.87	21.10	-194	
1435	9.79	14.0	350	8.02	0.404	0	0.83	21.12	-198	
1435	COLLECT	SAMPLE								

SIGNATURE(S): Travis Knight

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: SWMU 7

Project No.: N4259 (CTO 253)

Sampled By: C. Metz, L. Knight

Field Analyst: CM

Field Form Checked as per QA/QC Checklist (initials):

Sample ID No.: MPT-8-MW01S-03

Sample Location: MW01S

Duplicate: ☐

Blank: ☐

SAMPLING DATA:

	Color (Visual)	pH (SU)	S.C. (mS/cm)	Turbidity (NTU)	DO (Meter, mg/l)	Temp. (°C)	ORP (Eh) (+/- mv)
Date: 2-10-03							
Time: 1435							
Method: Prosta/Pr	clear	8.02	0.404	0	0.83	21.12	-198

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: CHEMetrics (Range: 0-1 mg/L)

Analysis Time: 1436

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	1-5 mg/L	200 ml	0.200 N	0.01
☐	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier		Concentration
_____	x 0.01	=	mg/L
_____	x 0.02	=	mg/L

CHEMetrics: _____ mg/L

Notes: was 1.0 on 1-10 range also

Hydrogen Sulfide (H_2S):

Equipment: HS-C

Analysis Time: 1437

Concentration: 0.5 mg/L

Exceeded 5.0 mg/L range on color chart: ☐

Notes:

Carbon Dioxide:

Equipment: CHEMetrics (Range: _____ mg/L)

Analysis Time: 1439

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	10-50 mg/L	200 ml	0.3636 N	0.1
☐	20-100 mg/L	100 ml	0.3636 N	0.2
☐	100-400 mg/L	200 ml	3.636 N	1.0
☐	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count			Concentration
_____	x 0.1	=	mg/L
_____	x 0.2	=	mg/L
_____	x 1.0	=	mg/L
_____	x 2.0	=	mg/L

CHEMetrics: _____ mg/L

Notes:

☐

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUATION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	SWMU 7	Sample ID No.:	MPT-8-MW01S-03
Project No.:	N4259 (CTO 253)	Sample Location:	MW01S
		Sampled By:	C. Metz, L. Knight

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide: 1443

Equipment: HACH DR-890 Colorimeter

Wave / Program: 93 / 610nm

TtNUS Serial No.: _____

Concentration: 0.19 mg/L

Ferrous Iron (Fe^{2+}):

Equipment: HACH DR-890 Colorimeter Other: _____ Analysis Time: 1441

Program/Module: 33 / 500nm

Concentration: 0.12 mg/L Filtered: ☐

Notes:

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-MW04S-03
Sample Location: MW04S
Sampled By: C. Metz, L. Knight
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 2/ /2003	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Time: 1255								
Method: Low Flow Peristaltic	CLEAR	7.22	1.03	11.6	0.75	23.25	-129	

PURGE DATA

Date: 2/13/2003	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0								
Well Casing Diameter: 2"								
Well Casing Material: PVC								
Total Well Depth (TD): 15.5'								
10.68								
One Casing Volume(gal/L):								
Start Purge (hrs): 1210								
End Purge (hrs): 1250								
Total Purge Time (min): 40								
Total Vol. Purged (gal/L): 10.4								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
TOC, Ammonia	H2SO4	500ml glass	[illegible]
Alk,N,NO2, NO3, SO4, Cl, PO4,	none	1L Plastic	[illegible]
Iron + Manganese	HNO3	1L Plastic	[illegible]

OBSERVATIONS / NOTES

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	Lucie Knight

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: SWMU 7
PROJECT NUMBER: N4259 (CTO 253)

WELL ID: MPT-8-MW04S-03
DATE: 2.13.03

Time (Hrs.)	Water Level (Ft. below TOC)	Cumul. Volume (Liters)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. Celsius	ORP (+/-mv)	Comments
1210	10.68		260							
1215	10.75		260	6.81	0.882	12.7	1.30	23.41	-101	
1220	10.76	2.6	260	6.92	0.883	9.8	0.90	23.41	-110	
1225	10.76		260	7.05	0.886	14.6	0.77	23.37	-120	
1230	10.76	5.2	260	7.11	0.886	14.6	0.77	23.32	-123	
1235	10.76		260	7.16	0.889	13.8	0.75	23.29	-124	
1240	10.76	7.8	260	7.19	1.03	12.9	0.75	23.17	-125	
1245	10.76		260	7.21	1.03	14.6	0.74	23.28	-129	
1250	10.76	10.4	260	7.22	1.03	11.6	0.75	23.25	-129	END PURGE
1255	COLLECT	SAMPLE								

SIGNATURE(S): [illegible]

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)
Sampled By: C. Metz, L. Knight
Field Analyst:
Field Form Checked as per QA/QC Checklist (initials):

Sample ID No.: MPT-8-MW04S-03
Sample Location: MW04S
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color (Visual)	pH (SU)	S.C. (mS/cm)	Turbidity (NTU)	DO (Meter, mg/l)	Temp. (°C)	ORP (Eh) (+/- mv)
Date: 2-13-03							
Time: 1255							
Method: Peristaltic	Clear	7.22	1.03	11.6	0.75	23.25	-129

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: CHEMetrics (Range: 0-1 mg/L)

Analysis Time: 1256

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	1-5 mg/L	200 ml	0.200 N	0.01
☐	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier	Concentration
_____	x 0.01 =	mg/L
_____	x 0.02 =	mg/L

CHEMetrics: 0.3 mg/L

Notes:

Hydrogen Sulfide (H_2S):

Equipment: HS-C

Analysis Time: 1258

Concentration: 2.0 mg/L

Exceeded 5.0 mg/L range on color chart: ☐

Notes:

Carbon Dioxide:

Equipment: CHEMetrics (Range: 100-1000 mg/L)

Analysis Time: 1259

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	10-50 mg/L	200 ml	0.3636 N	0.1
☐	20-100 mg/L	100 ml	0.3636 N	0.2
☐	100-400 mg/L	200 ml	3.636 N	1.0
☐	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count		Concentration
_____	x 0.1 =	mg/L
_____	x 0.2 =	mg/L
_____	x 1.0 =	mg/L
_____	x 2.0 =	mg/L

CHEMetrics: 110 mg/L

Notes: exceeded 10-100 mg/L range

☐

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUATION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	SWMU 7	Sample ID No.:	MPT-8-MW04S-03
Project No.:	N4259 (CTO 253)	Sample Location:	MW04S
		Sampled By:	C. Metz, L. Knight

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide: Time: 1304

Equipment: HACH DR-890 Colorimeter

Wave / Program: 93 / 610nm

TtNUS Serial No.: _____

Concentration: 0.15 mg/L

Ferrous Iron (Fe^{2+}):

Equipment: HACH DR-890 Colorimeter Other: _____ Analysis Time: 1302

Program/Module: 33 / 500nm

Concentration: 6.0 mg/L Filtered: ☐

Notes: exceed DR890 range of 3.30mg/L

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name:	SWMU 7	Sample ID No.:	MPT-8-MW06S-03
Project No.:	N4259 (CTO 253)	Sample Location:	MW06S
		Sampled By:	C. Metz, L. Knight
[ ] Domestic Well Data		C.O.C. No.:	
[X] Monitoring Well Data		Type of Sample:	
[ ] Other Well Type:		[X] Low Concentration	
[ ] QA Sample Type:		[ ] High Concentration	

SAMPLING DATA

Date: 2/13/2003	Color	pH	S.C.	Turbidity	DO	Temp.	ORP	Other
Time: 1045	Visual	Standard	mS/cm	NTU	mg/l	°C	mV	
Method: Low Flow Peristaltic	clear	7.88	0.362	0.2	4.08	19.91	7	

PURGE DATA

Date: 2/13/2003	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0								
Well Casing Diameter: 2"								
Well Casing Material: PVC								
Total Well Depth (TD): 15.2'								
8.11								
One Casing Volume(gal/L):								
Start Purge (hrs): 1005								
End Purge (hrs): 1040								
Total Purge Time (min): 35								
Total Vol. Purged (gal/L): 14L								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
TOC, Ammonia	H2SO4	500ml glass	[illegible]
Alk,N,NO2, NO3, SO4, Cl, PO4,	none	1L Plastic	[illegible]
Iron + Manganese	HNO3	1L Plastic	[illegible]

OBSERVATIONS / NOTES

Circle if Appticable:		Signature(s):
MS/MSD	Duplicate ID No.:	Lucas Knight

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: SWMU 7
PROJECT NUMBER: N4259 (CTO 253)

WELL ID: MPT-8-MW06S-03
DATE: 2-13-03

Time (Hrs.)	Water Level (Ft. below TOC)	Cumul. Volume (Liters)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. Celsius	ORP (+/-mv)	Comments
1005	8.11		400							
1010	8.32		400	7.69	0.349	6.0	5.48	19.91	49	
1015	8.31	4	400	7.62	0.356	6	4.49	19.91	38	
1020	8.31		400	7.70	0.356	4.7	4.15	19.88	28	
1025	8.37	8	400	7.83	0.355	2.8	4.20	19.87	21	
1030	8.40		400	7.87	0.358	1.6	4.19	19.88	16	
1035	8.41	12	400	7.88	0.360	1.0	4.05	19.91	4	
1040	8.41	14	400	7.88	0.362	0.2	4.08	19.91	7	END PURGE
1045	COLLECT	SAMPLE								

SIGNATURE(S): Travis Knight

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: SWMU 7

Project No.: N4259 (CTO 253)

Sampled By: C. Metz, L. Knight

Field Analyst: CM

Field Form Checked as per QA/QC Checklist (initials):

Sample ID No.: MPT-8-MW06S-03

Sample Location: MW06S

Duplicate: ☐

Blank: ☐

SAMPLING DATA:

	Color (Visual)	pH (SU)	S.C. (mS/cm)	Turbidity (NTU)	DO (Meter, mg/l)	Temp. (°C)	ORP (Eh) (+/- mv)
Date: 2-13-03							
Time: 1045							
Method: Peristaltic	Clear	7.88	.362	0.2	4.08	19.91	7

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: CHEMetrics (Range: 1-10 mg/L)

Analysis Time: 1047

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	1-5 mg/L	200 ml	0.200 N	0.01
☐	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier	Concentration
_____	x 0.01	= mg/L
_____	x 0.02	= mg/L

CHEMetrics: 5 mg/L

Notes: exceeded 0-1 mg/L range

Hydrogen Sulfide (H_2S):

Equipment: HS-C

Analysis Time: 1049

Concentration: 0 mg/L

Exceeded 5.0 mg/L range on color chart: ☐

Notes:

Carbon Dioxide:

Equipment: CHEMetrics (Range: 10-100 mg/L)

Analysis Time: 1052

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	10-50 mg/L	200 ml	0.3636 N	0.1
☐	20-100 mg/L	100 ml	0.3636 N	0.2
☐	100-400 mg/L	200 ml	3.636 N	1.0
☐	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count		Concentration
_____	x 0.1	= mg/L
_____	x 0.2	= mg/L
_____	x 1.0	= mg/L
_____	x 2.0	= mg/L

CHEMetrics: 12 mg/L

Notes:

☐

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUATION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	SWMU 7	Sample ID No.:	MPT-8-MW06S-03
Project No.:	N4259 (CTO 253)	Sample Location:	MW06S
		Sampled By:	C. Metz, L. Knight

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide: Time: 1055

Equipment: HACH DR-890 Colorimeter

Wave / Program: 93 / 610nm

TtNUS Serial No.: _____

Concentration: 0.00 mg/L

Ferrous Iron (Fe^{2+}):

Equipment: HACH DR-890 Colorimeter

Other: _____ Analysis Time: 1053

Program/Module: 33 / 500nm

Concentration: 0.05 mg/L

Filtered: ☐

Notes:

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-MW09S-03
Sample Location: MW09S
Sampled By: C. Metz, L. Knight
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 2/10/2003	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Time: 1235								
Method: Low Flow Peristaltic	CLEAR	7.20	0.669	0.2	1.10	20.70	-74	

PURGE DATA

Date: 2/ /2003	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0								
Well Casing Diameter: 2"								
Well Casing Material: PVC								
Total Well Depth (TD): 14.85'								
9.48								
One Casing Volume(gal/L):								
Start Purge (hrs): 1200								
End Purge (hrs): 1230								
Total Purge Time (min): 30								
Total Vol. Purged (gal/L): ~11.6								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
TOC, Ammonia	H2SO4	500ml glass	✓
Alk,N,NO2, NO3, SO4, Cl, PO4,	none	1L Plastic	✓
Iron + Manganese	HNO3	1L Plastic	✓

OBSERVATIONS / NOTES

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Louis Knight

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: SWMU 7
PROJECT NUMBER: N4259 (CTO 253)

WELL ID: MPT-8-MW09S-03
DATE: 2·10·03

Time (Hrs.)	Water Level (Ft. below TOC)	Cumul. Volume (Liters)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. Celsius	ORP (+/-mv)	Comments
1200	9.48		400							
1205	9.62		400							
1210	9.76	4	400	6.83	0.656	0.5	2.35	20.61	-13	
1215	9.75		380	6.82	0.662	1.6	1.41	20.65	-25	
1220	9.76	7.8	380	7.01	0.666	0.2	1.19	20.71	-55	
1225	9.76			7.08	0.668	0.2	1.16	20.72	-62	
1230	9.76	11.6		7.20	0.669	0.2	1.10	20.70	-74	
1235	COLLECT	SAMPLE								

SIGNATURE(S): [illegible]

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)
Sampled By: C. Metz, L. Knight
Field Analyst: CM
Field Form Checked as per QA/QC Checklist (initials):

Sample ID No.: MPT-8-MW09S-03
Sample Location: MW09S
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color (Visual)	pH (SU)	S.C. (mS/cm)	Turbidity (NTU)	DO (Meter, mg/l)	Temp. (°C)	ORP (Eh) (+/- mv)
Date: 2-10-03							
Time: 1235							
Method: Peristaltic	Clear	7.20	0.669	0.2	1.10	20.70	-74

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: CHEMetrics (Range: 0-1 mg/L)

Analysis Time: 1237

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	1-5 mg/L	200 ml	0.200 N	0.01
☐	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier	Concentration
_____	x 0.01	= mg/L
_____	x 0.02	= mg/L

CHEMetrics: 0.8 mg/L

Notes:

Hydrogen Sulfide (H_2S):

Equipment: HS-C

Analysis Time: 1239

Concentration: 0.5 mg/L

Exceeded 5.0 mg/L range on color chart: ☐

Notes:

Carbon Dioxide:

Equipment: CHEMetrics (Range: ~~[illegible]~~ 10-100 mg/L)

Analysis Time: 1240

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	10-50 mg/L	200 ml	0.3636 N	0.1
☐	20-100 mg/L	100 ml	0.3636 N	0.2
☐	100-400 mg/L	200 ml	3.636 N	1.0
☐	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count		Concentration
_____	x 0.1	= mg/L
_____	x 0.2	= mg/L
_____	x 1.0	= mg/L
_____	x 2.0	= mg/L

CHEMetrics: 29 mg/L

Notes:

☐

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: SWMU 7
PROJECT NUMBER: N4259 (CTO 253)

WELL ID: MPT-8-MW16S-03
DATE: 2.11.03

Time (Hrs.)	Water Level (Ft. below TOC)	Cumul. Volume (Liters)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (+/-mv)	Comments
0945	9.04		380							
0950	9.15		380	7.16	1.19	6.5	1.07	22.15	-114	
0955	9.15	3.8	380	7.25	1.19	9.1	0.73	22.23	-120	
1000	9.15		380	7.27	1.19	7.9	1.49	22.27	-115	
1005	9.15	7.6	380	7.28	1.19	12.9	0.75	22.34	-122	
1010	9.15		380	7.28	1.19	16.9	0.99	22.48	-125	
1015	9.15	11.4	380	7.30	1.19	13.8	1.29	22.46	-117	
1020	9.15	13.3	380	7.30	1.18	16.9	1.36	22.50	-120	
1025	COLLECT	SAMPLE								

SIGNATURE(S): Jessie Knight

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)
Sampled By: C. Metz, L. Knight
Field Analyst: CM
Field Form Checked as per QA/QC Checklist (initials):

Sample ID No.: MPT-8-MW16S-03
Sample Location: MW16S
Duplicate: [X] MPT-8-D001-03
Blank: [ ]

SAMPLING DATA:

	Color (Visual)	pH (SU)	S.C. (mS/cm)	Turbidity (NTU)	DO (Meter, mg/l)	Temp. (°C)	ORP (Eh) (+/- mv)	
Date: 2-11-03								
Time: 1025								
Method: Peristaltic								

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: CHEMetrics (Range: 1-10 mg/L) Analysis Time: 1026

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
[ ]	1-5 mg/L	200 ml	0.200 N	0.01
[ ]	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier	Concentration
_____	x 0.01	= mg/L
_____	x 0.02	= mg/L

CHEMetrics: 1 mg/L

Notes: exceed 0-1mg/L range

Hydrogen Sulfide (H_2S):

Equipment: HS-C Analysis Time: 1028

Concentration: 0.1 mg/L Exceeded 5.0 mg/L range on color chart: [ ]

Notes:

Carbon Dioxide:

Equipment: CHEMetrics (Range: 100-1000 mg/L) Analysis Time: 1029

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
[ ]	10-50 mg/L	200 ml	0.3636 N	0.1
[ ]	20-100 mg/L	100 ml	0.3636 N	0.2
[ ]	100-400 mg/L	200 ml	3.636 N	1.0
[ ]	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count		Concentration
_____	x 0.1	= mg/L
_____	x 0.2	= mg/L
_____	x 1.0	= mg/L
_____	x 2.0	= mg/L

CHEMetrics: 160 mg/L

Notes: exceed 10-100 range

[ ]

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUATION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	SWMU 7	Sample ID No.:	MPT-8-MW09S-03
Project No.:	N4259 (CTO 253)	Sample Location:	MW09S
		Sampled By:	C. Metz, L. Knight

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide: 1244

Equipment: HACH DR-890 Colorimeter

Wave / Program: 93 / 610nm

TtNUS Serial No.: _____

Concentration: 0.01 mg/L

Ferrous Iron (Fe^{2+}):

Equipment: HACH DR-890 Colorimeter Other: _____ Analysis Time: 1242

Program/Module: 33 / 500nm

Concentration: 1.49 mg/L Filtered: ☐

Notes:

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-MW16S-03
Sample Location: MW16S
Sampled By: C. Metz, L. Knight
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 2/ 11 /2003	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Time: 1025								
Method: Low Flow Peristaltic	Clear	7.30	1.18	16.9	1.36	22.50	-120	

PURGE DATA

Date: 2/ 11 /2003	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0								
Well Casing Diameter: 2"								
Well Casing Material: PVC								
Total Well Depth (TD): 15.0'								
9.04								
One Casing Volume(gal/L):								
Start Purge (hrs): 0945								
End Purge (hrs): 1020								
Total Purge Time (min): 35								
Total Vol. Purged (gal/L): 13.3								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
TOC, Ammonia	H2SO4	500ml glass	CM
Alk,N,NO2, NO3, SO4, Cl, PO4,	none	1L Plastic	CM
Iron + Manganese	HNO3	1L Plastic	CM

OBSERVATIONS / NOTES

Circle if Applicable:

MS/MSD

Duplicate ID No.: MPT-8-DU01-03

Signature(s): Lucas Knight

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUATION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	SWMU 7	Sample ID No.:	MPT-8-MW16S-03
Project No.:	N4259 (CTO 253)	Sample Location:	MW16S
		Sampled By:	C. Metz, L. Knight

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide: Time: 1036

Equipment: HACH DR-890 Colorimeter

Wave / Program: 93 / 610nm

TtNUS Serial No.: _____

Concentration: 0.07 mg/L

Ferrous Iron (Fe^{2+}):

Equipment: HACH DR-890 Colorimeter Other: _____ Analysis Time: 1034

Program/Module: 33 / 500nm

Concentration: 5.6 mg/L Filtered: ☐

Notes:

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name:	SWMU 7	Sample ID No.:	MPT-8-MW17S-03
Project No.:	N4259 (CTO 253)	Sample Location:	MW17S
		Sampled By:	C. Metz, L. Knight
[ ] Domestic Well Data		C.O.C. No.:	
[X] Monitoring Well Data		Type of Sample:	
[ ] Other Well Type:		[X] Low Concentration	
[ ] QA Sample Type:		[ ] High Concentration	

SAMPLING DATA

Date: 2/ 13 /2003	Color	pH	S.C.	Turbidity	DO	Temp.	ORP	Other
Time: 1405	Visual	Standard	mS/cm	NTU	mg/l	°C	mV	
Method: Low Flow Peristaltic	clear	7.59	0.556	6.7	1.96	22.08	-128	

PURGE DATA

Date: 2/ 13 /2003	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0								
Well Casing Diameter: 2"								
Well Casing Material: PVC								
Total Well Depth (TD): 14.89'								
9.76								
One Casing Volume(gal/L):								
Start Purge (hrs): 1320								
End Purge (hrs): 1400								
Total Purge Time (min): 40								
Total Vol. Purged (gal/L): 11.2								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
TOC, Ammonia	H2SO4	500ml glass	[illegible]
Alk,N,NO2, NO3, SO4, Cl, PO4,	none	1L Plastic	[illegible]
Iron + Manganese	HNO3	1L Plastic	[illegible]

OBSERVATIONS / NOTES

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	Lucas Knight

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: SWMU 7
PROJECT NUMBER: N4259 (CTO 253)
WELL ID: MPT-8-MW17S-03
DATE: 2·13·03

Time (Hrs.)	Water Level (Ft. below TOC)	Cumul. Volume (Liters)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. Celsius	ORP (+/-mv)	Comments
1320	9.76		280							
1325	9.83		280							
1330	9.83	2.8	280	7.68	0.575	48.0	7.29	23.10	-98	
1335	9.83		280	7.09	0.571	10.3	1.86	22.22	-88	
1340	9.82	5.6	280	7.44	0.544	9.9	1.84	22.04	-113	
1345	9.82		280	7.48	0.554	10.1	1.98	22.08	-117	
1350	9.82	8.4	280	7.53	0.552	8.2	2.14	22.04	-122	
1355	9.82		280	7.58	0.557	7.6	2.16	22.06	-126	
1400	9.82	11.2	280	7.59	0.556	6.7	1.96	22.08	-128	END PURGE
1405	COLLECT SAMPLE									

SIGNATURE(S): [illegible]

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: SWMU 7

Project No.: N4259 (CTO 253)

Sampled By: C. Metz, L. Knight

Field Analyst: CM

Field Form Checked as per QA/QC Checklist (initials):

Sample ID No.: MPT-8-MW17S-03

Sample Location: MW17S

Duplicate: ☐

Blank: ☐

SAMPLING DATA:

	Color (Visual)	pH (SU)	S.C. (mS/cm)	Turbidity (NTU)	DO (Meter, mg/l)	Temp. (°C)	ORP (Eh) (+/- mv)
Date: 2-13-03							
Time: 1405							
Method: Peristaltic	Clear	7.59	0.556	6.7	1.96	22.08	-128

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: CHEMetrics (Range: 1-10 mg/L)

Analysis Time: 1407

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	1-5 mg/L	200 ml	0.200 N	0.01
☐	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier	Concentration
	x 0.01 =	mg/L
	x 0.02 =	mg/L

CHEMetrics: 1 mg/L

Notes: exceeded 0-1 mg/L range

Hydrogen Sulfide (H_2S):

Equipment: HS-C

Analysis Time: 1409

Concentration: 0 mg/L

Exceeded 5.0 mg/L range on color chart: ☐

Notes:

Carbon Dioxide:

Equipment: CHEMetrics (Range: 10-100 mg/L)

Analysis Time: 1411

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	10-50 mg/L	200 ml	0.3636 N	0.1
☐	20-100 mg/L	100 ml	0.3636 N	0.2
☐	100-400 mg/L	200 ml	3.636 N	1.0
☐	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count		Concentration
	x 0.1 =	mg/L
	x 0.2 =	mg/L
	x 1.0 =	mg/L
	x 2.0 =	mg/L

CHEMetrics: 30 mg/L

Notes:

☐

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUATION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	SWMU 7	Sample ID No.:	MPT-8-MW17S-03
Project No.:	N4259 (CTO 253)	Sample Location:	MW17S
		Sampled By:	C. Metz, L. Knight

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide: Time: 1415

Equipment: HACH DR-890 Colorimeter

Wave / Program: 93 / 610nm

TtNUS Serial No.: _____

Concentration: 0.08 mg/L

Ferrous Iron (Fe^{2+}):

Equipment: HACH DR-890 Colorimeter Other: _____ Analysis Time: 1413

Program/Module: 33 / 500nm

Concentration: 1.92 mg/L Filtered: ☐

Notes:

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-MW18S-03
Sample Location: MW18S
Sampled By: C. Metz, L. Knight
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 2/ 13 /2003	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Time: 0925								
Method: Low Flow Peristaltic	CLEAR	7.63	0.428	0.0	0.52	21.70	-106	

PURGE DATA

Date: 2/ 13 /2003	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm):								
Well Casing Diameter: 2"								
Well Casing Material: PVC								
Total Well Depth (TD): 15.02'								
7.12								
One Casing Volume(gal/L):								
Start Purge (hrs): 0840								
End Purge (hrs): 0920								
Total Purge Time (min): 50								
Total Vol. Purged (gal/L): ~16L								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
TOC, Ammonia	H2SO4	500ml glass	[illegible]
Alk,N,NO2, NO3, SO4, Cl, PO4,	none	1L Plastic	[illegible]
Iron + Manganese	HNO3	1L Plastic	[illegible]

OBSERVATIONS / NOTES

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Louis Knight

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: SWMU 7
PROJECT NUMBER: N4259 (CTO 253)
WELL ID: MPT-8-MW18S-03
DATE: 2·13·03

Time (Hrs.)	Water Level (Ft. below TOC)	Cumul. Volume (Liters)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. Celsius	ORP (+/-mv)	Comments
0840	7.12		400							
0845	7.20		400	7.07	0.449	188	1.26	21.17	-36	
0850	7.17	4	400	7.50	0.438	25.6	0.59	21.55	-80	
0855	7.16		400	7.44	0.433	6.3	0.64	21.58	-87	
0900	7.17	8	400	7.55	0.431	1.9	0.52	21.68	-99	
0905	7.16		400	7.60	0.430	0.3	0.50	21.68	-103	
0910	7.18	12	400	7.60	0.428	0.6	0.49	21.68	-106	
0915	7.18		400	7.62	0.429	0.6	0.49	21.71	-106	
0920	7.18	16	400	7.63	0.428	0.0	0.52	21.70	-106	

SIGNATURE(S): Jones Knight

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	SWMU 7	Sample ID No.:	MPT-8-MW18S-03
Project No.:	N4259 (CTO 253)	Sample Location:	MW18S
Sampled By: C. Metz, L. Knight		Duplicate:	☐
Field Analyst: CM		Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):			

SAMPLING DATA:

Date: 2-13-03	Color	pH	S.C.	Turbidity	DO	Temp.	ORP (Eh)
Time: 0925	(Visual)	(SU)	(mS/cm)	(NTU)	(Meter, mg/l)	(°C)	(+/- mv)
Method: Peristaltic	Clear	7.63	0.428	0	0.52	21.70	-106

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: CHEMetrics (Range: 1-10 mg/L) Analysis Time: 0927

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	1-5 mg/L	200 ml	0.200 N	0.01
☐	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier	Concentration
_____	x 0.01 =	mg/L
_____	x 0.02 =	mg/L

CHEMetrics: ___ mg/L

Notes: exceeded 0-1 mg/L range

Hydrogen Sulfide (H_2S):

Equipment: HS-C Analysis Time: 0929

Concentration: 0 mg/L Exceeded 5.0 mg/L range on color chart: ☐

Notes:

Carbon Dioxide:

Equipment: CHEMetrics (Range: 10-100 mg/L) Analysis Time: 0932

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	10-50 mg/L	200 ml	0.3636 N	0.1
☐	20-100 mg/L	100 ml	0.3636 N	0.2
☐	100-400 mg/L	200 ml	3.636 N	1.0
☐	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count		Concentration
_____	x 0.1 =	mg/L
_____	x 0.2 =	mg/L
_____	x 1.0 =	mg/L
_____	x 2.0 =	mg/L

CHEMetrics: 16 mg/L

Notes:

☐

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUATION PARAMETERS

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

Sample ID No.: MPT-8-MW18S-03
Sample Location: MW18S
Sampled By: C. Metz, L. Knight

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide: 0937

Equipment: HACH DR-890 Colorimeter
Wave / Program: 93 / 610nm
TtNUS Serial No.: _____

Concentration: 0.0 mg/L

Ferrous Iron (Fe^{2+}):

Equipment: HACH DR-890 Colorimeter
Other: _____
Analysis Time: 0934
Program/Module: 33 / 500nm
Concentration: 0.68 mg/L
Filtered: ☐
Notes:

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-MW19S-03
Sample Location: MW19S
Sampled By: C. Metz, L. Knight
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 2/ 11 /2003	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Time: 1530								
Method: Low Flow Peristaltic	clear	8.42	0.429	4.7	6.15	16.44	42	

PURGE DATA

Date: 2/ 11 /2003	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm):								
Well Casing Diameter: 2"								
Well Casing Material: PVC								
Total Well Depth (TD): 16.3'								
5.90								
One Casing Volume(gal/L):								
Start Purge (hrs): 1440								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
TOC, Ammonia	H2SO4	500ml glass	✓
Alk, N, NO2, NO3, SO4, Cl, PO4, DOC, FOC	none	1L Plastic	✓
Iron + Manganese	HNO3	1L Plastic	✓

OBSERVATIONS / NOTES

Circle if Applicable:

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

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: SWMU 7
PROJECT NUMBER: N4259 (CTO 253)

WELL ID: MPT-8-MW19S-03
DATE: 2.11.03

Time (Hrs.)	Water Level (Ft. below TOC)	Cumul. Volume (Liters)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. Celsius	ORP (+/-mv)	Comments
1440	9.90		400							
1445	6.08		400	7.92	0.450	7.2	6.64	16.91	46	
1450	6.08	4	400	8.22	0.437	4.5	6.31	16.62	36	
1455	6.08		400	8.28	0.444	5.5	6.39	16.66	37	
1500	6.08	8	400	8.31	0.437	5.5	6.31	16.62	38	
1505	6.08		400	8.35	0.425	6.5	6.29	16.51	39	
1510	6.09	12	400	8.36	0.431	6.3	6.23	16.55	39	
1515	6.09		400	8.38	0.431	6.0	6.24	16.48	39	
1520	6.09	16	400	8.41	0.434	4.9	6.17	16.46	40	
1525	6.09	18	400	8.41	0.425	4.7	6.13	16.42	41	
1530	6.09	20	400	8.42	0.429	4.7	6.15	16.44	42	
1530	COLLECT SAMPLE									

SIGNATURE(S): Jessie Knight

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	SWMU 7	Sample ID No.:	MPT-8-MW19S-03
Project No.:	N4259 (CTO 253)	Sample Location:	MW19S
Sampled By: C. Metz, L. Knight		Duplicate:	☐
Field Analyst:		Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):			

SAMPLING DATA:

	Color (Visual)	pH (SU)	S.C. (mS/cm)	Turbidity (NTU)	DO (Meter, mg/l)	Temp. (°C)	ORP (Eh) (+/- mv)
Date: 2-11-03							
Time: 1530							
Method: Peristaltic	Clear	8.42	0.429	4.7	6.15	16.44	42

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: CHEMetrics (Range: 1-10 mg/L) Analysis Time: 1532

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	1-5 mg/L	200 ml	0.200 N	0.01
☐	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier	Concentration
_____	x 0.01 =	mg/L
_____	x 0.02 =	mg/L

CHEMetrics: 6 mg/L

Notes: exceeded 0-1mg/L range

Hydrogen Sulfide (H_2S):

Equipment: HS-C Analysis Time: 1533

Concentration: 0 mg/L Exceeded 5.0 mg/L range on color chart: ☐

Notes:

Carbon Dioxide:

Equipment: CHEMetrics (Range: 10-100 mg/L) Analysis Time: 1535

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	10-50 mg/L	200 ml	0.3636 N	0.1
☐	20-100 mg/L	100 ml	0.3636 N	0.2
☐	100-400 mg/L	200 ml	3.636 N	1.0
☐	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count		Concentration
_____	x 0.1 =	mg/L
_____	x 0.2 =	mg/L
_____	x 1.0 =	mg/L
_____	x 2.0 =	mg/L

CHEMetrics: <10 mg/L

Notes: Was below minimum detection of 10mg/L

☐

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUATION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	SWMU 7	Sample ID No.:	MPT-8-MW19S-03
Project No.:	N4259 (CTO 253)	Sample Location:	MW19S
		Sampled By:	C. Metz, L. Knight

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide: Time: 1540

Equipment: HACH DR-890 Colorimeter

Wave / Program: 93 / 610nm

TtNUS Serial No.: _____

Concentration: 0.03 mg/L

Ferrous Iron (Fe^{2+}):

Equipment: HACH DR-890 Colorimeter Other: _____ Analysis Time: 1537

Program/Module: 33 / 500nm

Concentration: 0.01 mg/L Filtered: ☐

Notes:

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name:	SWMU 7	Sample ID No.:	MPT-S-MW02S-03
Project No.:	N4259 (CTO 253)	Sample Location:	S-MW02S
		Sampled By:	C. Metz, L. Knight
[ ] Domestic Well Data		C.O.C. No.:	
[X] Monitoring Well Data		Type of Sample:	
[ ] Other Well Type:		[X] Low Concentration	
[ ] QA Sample Type:		[ ] High Concentration	

SAMPLING DATA

Date: 2/ 4 /2003	Color	pH	S.C.	Turbidity	DO	Temp.	ORP	Other
Time: 1350	Visual	Standard	mS/cm	NTU	mg/l	°C	mV	
Method: Low Flow Peristaltic	CLEAR	7.70	1.39	5.7	2.10	21.38	-57	

PURGE DATA

Date: 2/ 4 /2003	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm):								
Well Casing Diameter: 2"								
Well Casing Material: PVC								
Total Well Depth (TD): 15.22'								
9.09								
One Casing Volume(gal/L):								
Start Purge (hrs): 1250								
End Purge (hrs): 1345								
Total Purge Time (min): 55								
Total Vol. Purged (gal/L): ~13 L								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
TOC, Ammonia	H2SO4	500ml glass	✓
Alk, N, NO2, NO3, SO4, Cl, PO4,	none	1L Plastic	✓
Iron + Manganese	HNO3	1L Plastic	✓

OBSERVATIONS / NOTES

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	Louis Knight

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: SWMU 7
PROJECT NUMBER: N4259 (CTO 253)

WELL ID: MPT-S-MW02S-03
DATE: 2·11·03

Time (Hrs.)	Water Level (Ft. below TOC)	Cumul. Volume (Liters)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. Celsius	ORP (+/-mv)	Comments
1250	9.09		220							
1253	9.90		220							
1255	9.85		220							
1300	9.81	2.2	220	7.81	1.73	5.2	4.10	21.89	1	
1310	9.81	4.4	220	7.93	1.73	11.6	2.99	21.85	-32	
1320	9.81	6.6	220	7.81	1.61	0	2.56	21.65	-47	
1330	9.81	8.8	220	7.75	1.49	6.5	2.20	21.59	-51	
1340	9.81	11.0	220	7.71	1.42	8.2	2.17	21.51	-55	
1345	END PURGE 9.81	12.1	220	7.70	1.39	5.7	2.10	21.38	-57	
1350	COLLECT SAMPLE									

SIGNATURE(S): [illegible]

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: SWMU 7

Project No.: N4259 (CTO 253)

Sampled By: C. Metz, L. Knight

Field Analyst: CM

Field Form Checked as per QA/QC Checklist (initials):

Sample ID No.: MPT-S-MW02S-03

Sample Location: S-MW02S

Duplicate: ☐

Blank: ☐

SAMPLING DATA:

	Color (Visual)	pH (SU)	S.C. (mS/cm)	Turbidity (NTU)	DO (Meter, mg/l)	Temp. (°C)	ORP (Eh) (+/- mv)
Date: 2-11-03							
Time: 1350							
Method: Peristaltic	Clear	7.70	1.39	5.7	2.10	21.38	-57

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: CHEMetrics (Range: 1-10 mg/L)

Analysis Time: 1351

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	1-5 mg/L	200 ml	0.200 N	0.01
☐	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier	Concentration
_____	x 0.01	= mg/L
_____	x 0.02	= mg/L

CHEMetrics: 3 mg/L

Notes: exceeded 0-1mg/L range

Hydrogen Sulfide (H_2S):

Equipment: HS-C

Analysis Time: 1353

Concentration: 0 mg/L

Exceeded 5.0 mg/L range on color chart: ☐

Notes:

Carbon Dioxide:

Equipment: CHEMetrics (Range: 10-100 mg/L)

Analysis Time: 1356

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	10-50 mg/L	200 ml	0.3636 N	0.1
☐	20-100 mg/L	100 ml	0.3636 N	0.2
☐	100-400 mg/L	200 ml	3.636 N	1.0
☐	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count		Concentration
_____	x 0.1	= mg/L
_____	x 0.2	= mg/L
_____	x 1.0	= mg/L
_____	x 2.0	= mg/L

CHEMetrics: 20 mg/L

Notes:

☐

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUATION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	SWMU 7	Sample ID No.:	MPT-S-MW02S-03
Project No.:	N4259 (CTO 253)	Sample Location:	S-MW02S
		Sampled By:	C. Metz, L. Knight

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide: Time: 1400

Equipment: HACH DR-890 Colorimeter

Wave / Program: 93 / 610nm

TtNUS Serial No.: _____

Concentration: 0.00 mg/L

Ferrous Iron (Fe^{2+}):

Equipment: HACH DR-890 Colorimeter Other: _____ Analysis Time: 1358

Program/Module: 33 / 500nm

Concentration: 0.00 mg/L Filtered: ☐

Notes:

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name:	SWMU 7	Sample ID No.:	MPT-S-MW03S-03
Project No.:	N4259 (CTO 253)	Sample Location:	S-MW03S
		Sampled By:	C. Metz, L. Knight
[ ] Domestic Well Data		C.O.C. No.:	
[X] Monitoring Well Data		Type of Sample:	
[ ] Other Well Type:		[X] Low Concentration	
[ ] QA Sample Type:		[ ] High Concentration	

SAMPLING DATA

Date: 2/ 11 /2003	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Time: 0910								
Method: Low Flow Peristaltic	Clear	7.53	0.740	0	1.16	21.69	-109	

PURGE DATA

Date: 2/ 11 /2003	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP
Method: Low Flow Peristaltic							
Monitor Reading (ppm): 0							
Well Casing Diameter: 2"							
Well Casing Material: PVC							
Total Well Depth (TD): 15.4'							
10.75							
One Casing Volume(gal/L):							
Start Purge (hrs): 0835							
End Purge (hrs): 0910							
Total Purge Time (min): 45							
Total Vol. Purged (gal/L): 10.5							

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
TOC, Ammonia	H2SO4	500ml glass	✓
Alk, N, NO2, NO3, SO4, Cl, PO4,	none	1L Plastic	✓
Iron + Manganese	HNO3	1L Plastic	✓

OBSERVATIONS / NOTES

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	Louis Knight

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: SWMU 7
PROJECT NUMBER: N4259 (CTO 253)
WELL ID: MPT-S-MW03S-03
DATE: 2.11.03

Time (Hrs.)	Water Level (Ft. below TOC)	Cumul. Volume (Liters)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. Celsius	ORP (+/-mv)	Comments
0835	10.75		350							
0838	10.96		350							
0840	10.95		300	6.93	0.707	21.1	2.35	21.38	-50	
0845	10.95	3.0	300	6.99	0.715	17.4	1.19	21.44	-80	
0850	10.97		300	7.41	0.721	17.4	1.10	21.49	-106	
0855	10.97	6.0	300	7.54	0.723	0	1.08	21.51	-119	
0900	10.99		300	7.50	0.737	0	1.32	21.50	-105	
0905	11.00	9.0	300	7.53	0.737	0	1.14	21.63	-109	
0910	11.00	10.5	300	7.53	0.740	0	1.16	21.69	-109	

SIGNATURE(S): Jason Knight

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: SWMU 7

Project No.: N4259 (CTO 253)

Sampled By: C. Metz, L. Knight

Field Analyst: CM

Field Form Checked as per QA/QC Checklist (initials):

Sample ID No.: MPT-S-MW03S-03

Sample Location: S-MW03S

Duplicate: ☐

Blank: ☐

SAMPLING DATA:

	Color (Visual)	pH (SU)	S.C. (mS/cm)	Turbidity (NTU)	DO (Meter, mg/l)	Temp. (°C)	ORP (Eh) (+/- mv)	
Date: 2-11-03								
Time: 0910								
Method: Peristaltic	Clear							

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:

Equipment: CHEMetrics (Range: 1-10 mg/L)

Analysis Time: 0912

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	1-5 mg/L	200 ml	0.200 N	0.01
☐	2-10 mg/L	100 ml	0.200 N	0.02

Titration Count	Multiplier		Concentration
_____	x 0.01	=	mg/L
_____	x 0.02	=	mg/L

CHEMetrics: 1 mg/L

Notes: Exceeded 0-1 range

Hydrogen Sulfide (H_2S):

Equipment: HS-C

Analysis Time: 0915

Concentration: 0 mg/L

Exceeded 5.0 mg/L range on color chart: ☐

Notes:

Carbon Dioxide:

Equipment: CHEMetrics (Range: _____ mg/L)

Analysis Time: 0914

Range Used:	Range	Sample Vol.	Cartridge	Multiplier
☐	10-50 mg/L	200 ml	0.3636 N	0.1
☐	20-100 mg/L	100 ml	0.3636 N	0.2
☐	100-400 mg/L	200 ml	3.636 N	1.0
☐	200-1000 mg/L	100 ml	3.636 N	2.0

Titration Count			Concentration
_____	x 0.1	=	mg/L
_____	x 0.2	=	mg/L
_____	x 1.0	=	mg/L
_____	x 2.0	=	mg/L

CHEMetrics: 3.5 mg/L

Notes:

☐

GROUNDWATER SAMPLE LOG SHEET
NATURAL ATTENUATION PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	SWMU 7	Sample ID No.:	MPT-S-MW03S-03
Project No.:	N4259 (CTO 253)	Sample Location:	S-MW03S
		Sampled By:	C. Metz, L. Knight

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Sulfide: Time: 0922

Equipment: HACH DR-890 Colorimeter

Wave / Program: 93 / 610nm

TtNUS Serial No.: _____

Concentration: 0.01 mg/L

Ferrous Iron (Fe^{2+}):

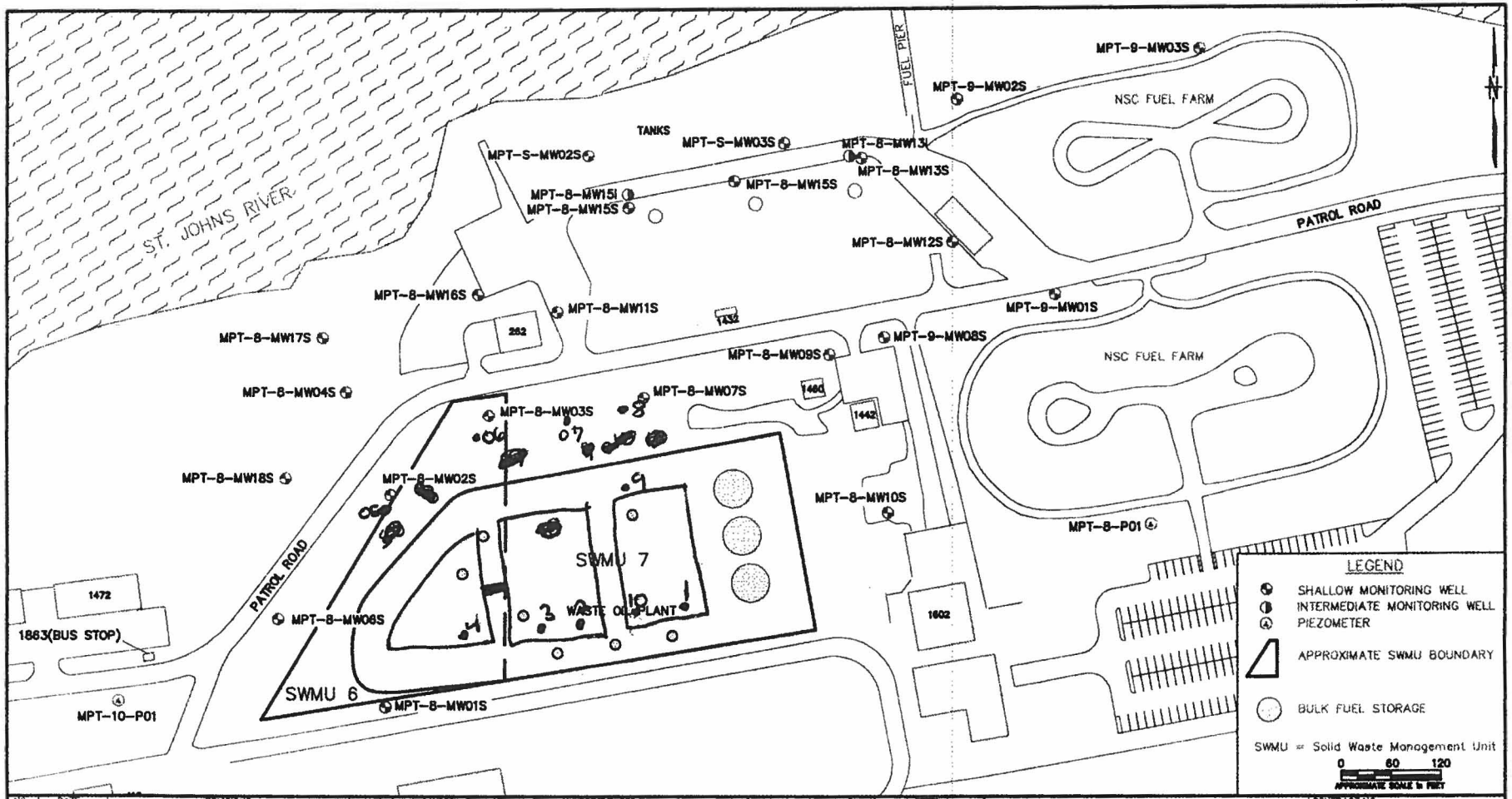
Equipment: HACH DR-890 Colorimeter Other: _____ Analysis Time: 0918

Program/Module: 33 / 500nm

Concentration: 2.81 mg/L Filtered: ☐

Notes:

Soil Borings!!!



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY LLK DATE 4/28/00
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

MONITORING WELL LOCATION MAP
SWMUs 6 AND 7
U.S. NAVAL STATION
MAYPORT, FLORIDA

CONTRACT NO. 0482
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 1-1 REV. 0

FORM CADD NO. SDIV_BN.DWG – REV 0 – 1/20/98

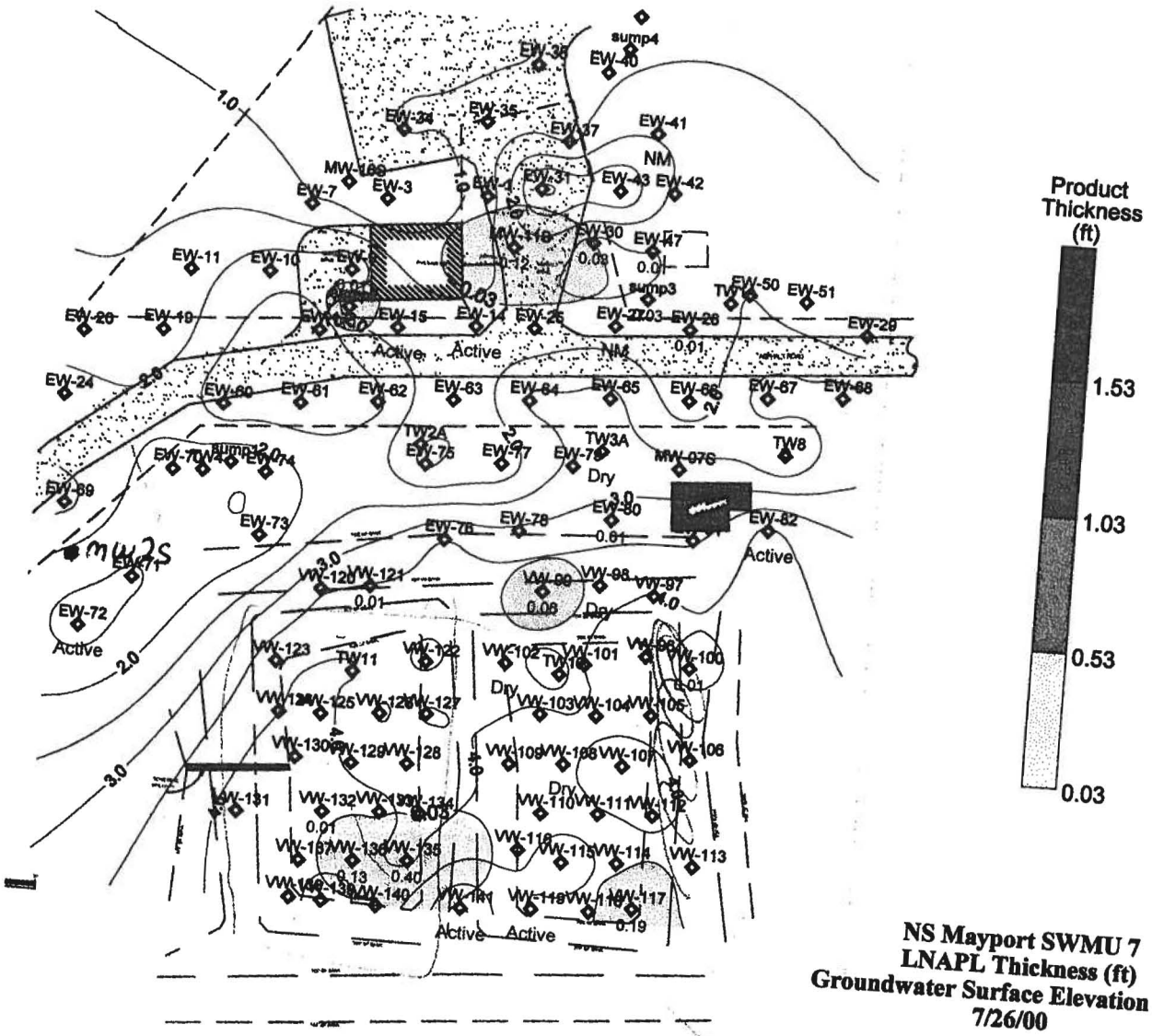


Figure 4-9. LNAPL Thickness Data, July 2000

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-SB10-3
Sample Location: SB10
Sampled By: C.Metz, L. Knight
C.O.C. No.:

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

GRAB SAMPLE DATA:

Date: 2-12-03	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1610	2.5-3	gray	F-M Sand w shells
Method: hand Auger			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

Date: 2-12-03	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
NA		0-1	Yellow/brwn	F-M Sand w/shell
Method:		1-2	Yellow brwn	F-M Sand w/shell, some clay
NA		2-3	gray	Same
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Preservation	Collected
TPH (Florida TPHCWG)	(1) - 4oz Clear wide mouth jar.	none	CRM

OBSERVATIONS / NOTES:

MAP:

See pg 15 of field Log Book

Circle if Applicable:

MS/MSD

Duplicate ID No.: MPT-SB-DU01

Signature(s): Charles Metz

Dup

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-SB01-3
Sample Location: SB01
Sampled By: C.Metz, L. Knight
C.O.C. No.:

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

GRAB SAMPLE DATA:

Date: 2-12-03	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1000	3.0'	dk gray To black	coarse Sand/shells
Method: Hand Auger			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 2-12-03	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
NA		0-1.5	dk yellow brn	Fine sand
Method:		1.5-2.5	dk gray/black	coarse shelly
NA		2.5-3.0	see above	
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Preservation	Collected
TPH (Florida TPHCWG)	(1) - ~~6~~ 8oz Clear wide mouth jar.	none	CMA

OBSERVATIONS / NOTES:

Petroleum odor strong in sample. Very black, almost ~~sample~~ appeared to be free-product

MAP:

See log book, pg 15

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Charla Metz

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-SB02 – 3.
Sample Location: SB02
Sampled By: C.Metz, L. Knight
C.O.C. No.:

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 2-12-03 Time: 1030 Method: Hand Auger Monitor Reading (ppm): 0	2.5 - 3.0	dk gray to black	Fine Sand with shells

COMPOSITE SAMPLE DATA:

Date: 2-12-03	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
NA		0-1.5	light yellow/brn	Fine sand
Method:		1.5-		as above with shell
NA				
Monitor Readings				
(Range in ppm):				
0				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Preservation	Collected
TPH (Florida TPHCWG)	(1) ~~402~~ 802 Clear wide mouth jar.	none	CMM

OBSERVATIONS / NOTES:

Very strong petroleum odor
Well stick-up beside boring had 0.3' of free-product.

MAP:

See pg 15 of Log Book

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Charles Metz

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-SB03 - 3
Sample Location: SB03
Sampled By: C.Metz, L. Knight
C.O.C. No.:

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

GRAB SAMPLE DATA:

Date: 2-12-03	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1045	2.5-3.0	dk gray to black	Shelly fine to med. Sand
Method: Hand			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
NA		0-1	orang/brun	Shelly sand fine/medium
Method:		1-2	yellow/brun	Same as above
NA		2-3	dk gray to blk	Same as above
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Preservation	Collected
TPH (Florida TPHCWG)	(1) - 4oz Clear wide mouth jar.	none	

OBSERVATIONS / NOTES:

Strong petroleum odor
Sample collected just above water Table in saturated zone.
* Well stick up 6ft from boring location had approx. 1.0' of free-product

MAP:

See pg 15 of field log book

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Charles Metz

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-SB04-2.5
Sample Location: SB04
Sampled By: C.Metz, L. Knight
C.O.C. No.:

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

GRAB SAMPLE DATA:

Date: 2·12·03	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1205	2.5-3.0	DK. GRAY	SAND, fine & med w/ shell hash
Method: SS HAND AUGER			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
NA	1200	0 - 2.5	BROWN·GRAY	SAND (v-f) w/ shell hash
Method:			GRAY @ 1.5'bls	
NA				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Preservation	Collected
TPH (Florida TPHCWG)	(1) ~~4oz~~ 8oz. Clear wide mouth jar.	none	[illegible]

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): [illegible]

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-SB05 - 8
Sample Location: SB05
Sampled By: C.Metz, L. Knight
C.O.C. No.:

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

GRAB SAMPLE DATA:

Date: 2·12·03	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1320	8.0	GRAY/lt. brown	SAND w/ abundant shell
Method: SS HAND AUGER			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

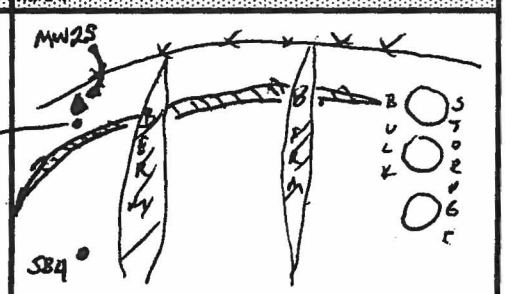
Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
NA	1240	0 - 1	dk gray. brown	SAND of shell
Method:		1 - 4	light brown /	SAND w/ abundant shell, very fine
NA			very light brown	fine medium
Monitor Readings		4 - 4.5	v.l. brown/gn. gray	AA w/ some clay
(Range in ppm):		4.5 - 7.5	LIKE "1 - 4"	
		7.5 - 8.0	GRAY	AA
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Preservation	Collected
TPH (Florida TPHCWG)	(1) - 4oz Clear wide mouth jar.	none	

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-SB06-8.5
Sample Location: SB06
Sampled By: C.Metz, L. Knight
C.O.C. No.:

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

GRAB SAMPLE DATA:

Date: 2-12-03	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1420	8-8.5	LT Brown/Yellow	Medium sand w/shells
Method: Hand Auger			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
NA		0-8	dary gray/brn	fine sand/some shells
Method:		8.0-8.5	LT Brwn/Yellow	med Sand/w/shells
NA				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Preservation	Collected
TPH (Florida TPHCWG)	(1) - 4oz Clear wide mouth jar.	none	cm

OBSERVATIONS / NOTES:

MAP:

See pg 15 of Field Log Book

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Charles Metz

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-SB07-7
Sample Location: SB07
Sampled By: C.Metz, L. Knight
C.O.C. No.:

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 2-12-03 Time: 1450 Method: hand Auger Monitor Reading (ppm): 0	7.0	med. brown	SAND (fine & medium)

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
NA		0-1.5	dk Gray/Black	fine sand / some shells
Method:		1.5-6.0	Light Gray/Brwn	fine-med Sand / LoTs of shells
NA		6.0-6.5	v. pale yellow brown	SAND w/ trace shell
Monitor Readings		6.5-7.0	med. brown	SAND (fine & medium)
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Preservation	Collected
TPH (Florida TPHCWG)	(1) - 4oz Clear wide mouth jar.	none	

OBSERVATIONS / NOTES:

MAP:

See pg 15, field Log Book

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Charles Metz

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-SB08-7.5
Sample Location: SB08
Sampled By: C.Metz, L. Knight
C.O.C. No.:

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 2·12·03 Time: 1510 Method: SS HAND AUGER Monitor Reading (ppm):	7.5	GRAY	SAND, fine, w/ abundant shell

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
NA	1455	0 - 1.5	dk. gray-brown	SAND (fine) w/ some shell
Method:		1.5 - 7.0	lt. yellow-brown	SAND (fine & med) w/ abundant shell
NA		7.0 - 7.5	gray	AA
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Preservation	Collected
TPH (Florida TPHCWG)	(1) ~~4oz~~ Clear wide mouth jar.	none	LAK
	8 oz.		

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Louis Knight

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: SWMU 7
Project No.: N4259 (CTO 253)

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

Sample ID No.: MPT-8-SB09-6.5
Sample Location: SB09
Sampled By: C.Metz, L. Knight
C.O.C. No.:

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

GRAB SAMPLE DATA:

Date: 2.12.03	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1545	6.0-6.5	gray To Light Black	f-m/ Sand lots of shell
Method: SS HAND AUGER			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
NA		0 - 1	yellow-Brown	SAND (fine)
Method:		1.0-1.5	dk gray	AA
NA		1.5-5.5	lt. yellow-brown	SAND (fine & med) w/ abundant shelly
Monitor Readings		5.5-6.5	gray	AA
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Preservation	Collected
TPH (Florida TPHCWG)	(1) ~~4oz~~ 8oz Clear wide mouth jar.	none	✓

OBSERVATIONS / NOTES:

MAP:

See pg 15 of Field Log Book

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Lance Knight

ATTACHMENT B

LABORATORY ANALYTICAL REPORTS

LABORATORY DATA WILL BE INCLUDED ON THE LIVING CD IN ELECTRONIC FORMAT

ATTACHMENT C

HISTORICAL FIGURES

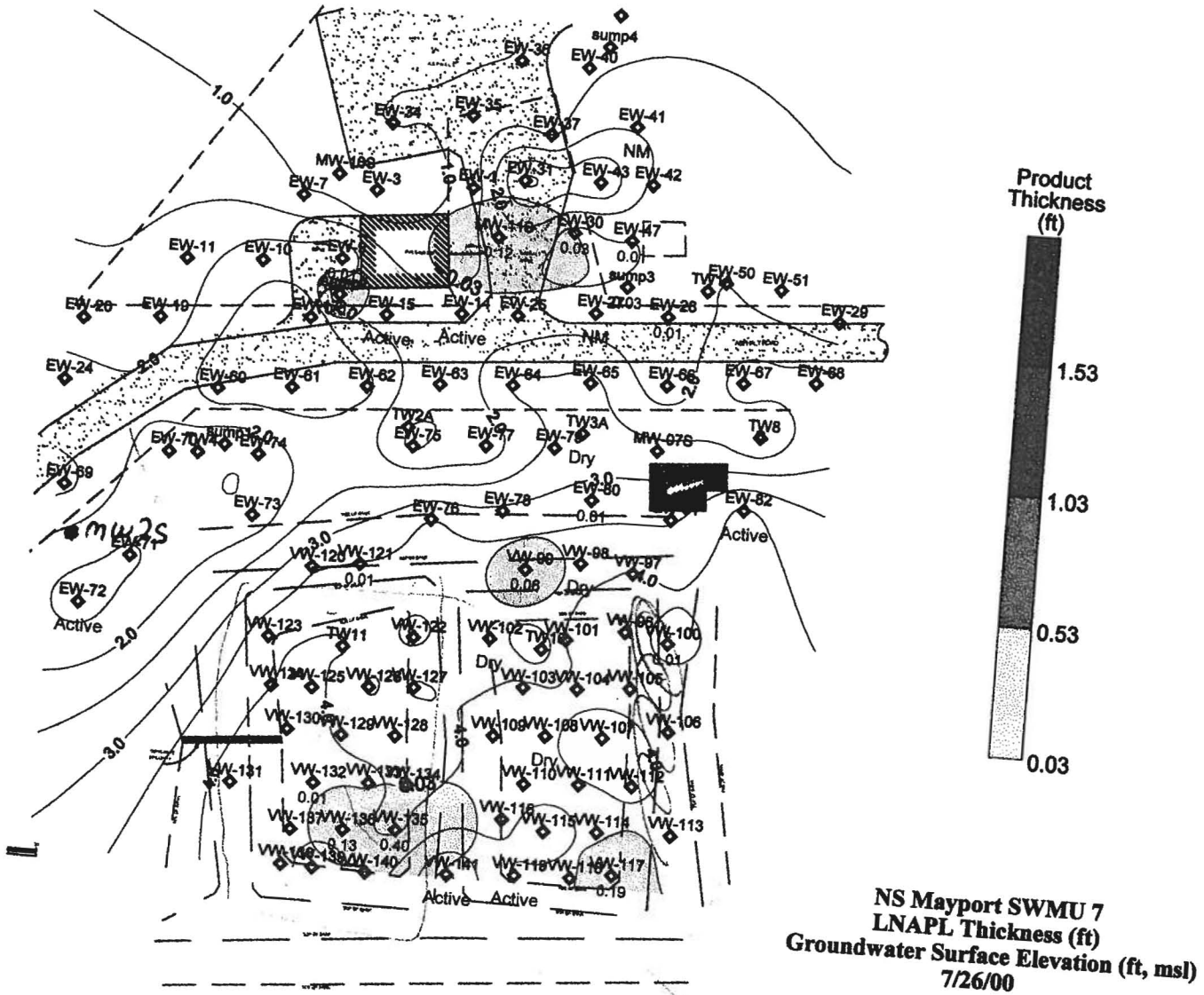


Figure 4-9. LNAPL Thickness Data, July 2000