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Monitored Natural Attenuation Report
for
Mine Fill A (SWMU 12)

Round No. 6

Naval Surface Warfare Center Crane
Crane, Indiana

Contract Task Order 0377

February 2007

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PITT-02-7-038

February 28, 2007

Project No. 112G00041

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Reference: CLEAN Contract No. N62467-94-D-0888
Contract Task Order No. 0377

Subject: NSWC Crane
Mine Fill A (SWMU 12)
Monitored Natural Attenuation Report for Round 6

Dear Mr. Hickey:

Enclosed you will find one copy of the Round 6 Monitored Natural Attenuation Report at Mine Fill A (SWMU 12) for your review and comment.

Please contact me at (412) 921-8308 (email: Ralph.Basinski@ttnus.com) or Joe Lucas at (412) 921-8882 (email: Joe.Lucas@ttnus.com) regarding any questions or comments.

Sincerely,

Joseph H. Lucas for

Ralph R. Basinski
Task Order Manager

RRB/mlg
Enclosure

cc: Mr. Tom Brent, NSWC Crane (1 copy of enclosure)
Ms. Debra Humbert, TtNUS (Letter only)
Mr. Mark Perry, TtNUS (1 copy of enclosure unbound)
Mr. Ralph Basinski, TtNUS (1 copy of enclosure)
Project File – CTO 0377

REVISION 0
FEBRUARY 2007

MONITORED NATURAL ATTENUATION REPORT FOR MINE FILL A (SWMU 12)

ROUND NO. 6

NAVAL SURFACE WARFARE CENTER, CRANE
CRANE, INDIANA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
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CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0377

FEBRUARY 2007

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LIST OF ACRONYMS

µg/L	micrograms per liter
asml	above mean sea level
CMS	Corrective Measures Study
DNX	hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine
DO	Dissolved Oxygen
IRA	Interim Removal Action
MFA	Mine Fill A
mL	milliliters
Mgd	Mississippi Glen Dean Water Bearing Zone
MNA	Monitored natural attenuation
MNX	hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine
NSWC	Naval Surface Warfare Center
ORP	Oxidation-reduction potential
Puz	Pennsylvanian Upper Water Bearing Zone
Pmz	Pennsylvanian Middle Water Bearing Zone
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
RFI	RCRA Facility Investigation
SOPs	Standard operating procedures
SVOC	Semivolatile organic compound
SWMU	Solid waste management unit
TNX	hexahydro-1,3,5-trinitroso-1,3,5-triazine
TtNUS	Tetra Tech NUS
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile organic compound

1.0 INTRODUCTION

A Phase III Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) has been conducted at the Naval Surface Warfare Center (NSWC) Crane Mine Fill A (MFA), also known as solid waste management unit (SWMU) 12. The purpose of the RFI was to determine whether explosives in groundwater, surface water, or sediment present unacceptable risk, or if any residual explosives in soil present unacceptable levels of risk to human health and the environment. The RFI was conducted at SWMU 12 in accordance with applicable RCRA corrective action requirements and provides data on the nature and extent of select explosive, metals, miscellaneous semivolatile organic compound (SVOC), and volatile organic compound (VOC) concentrations in surface soils, subsurface soils, sediment, surface water and groundwater. The RFI indicates that explosives contamination remains in soil around buildings and that explosives have migrated to groundwater and unacceptable levels of risk remain for various combinations of human and ecological receptors, with the majority of risk attributable to the use of groundwater by select human receptors.

MFA was used for the production of large mines, depth charges, rocket heads, aerial bombs, and projectiles in buildings. MFA also includes battery and soil disposal areas that are located at the extreme south end of the SWMU. In the past, explosives powders discharged from production building roof vents that accumulated on the roofs were washed down to the ground by precipitation, resulting in the contamination of soils. In addition, wastewaters containing explosives were discharged into nearby ditches. The battery area was used to dispose of AA household type batteries on the ground surface. The soil disposal area was used to dump soil and construction debris on the ground surface. During the period 1997 to 2000, an interim removal action (IRA) was conducted in which explosive-contaminated soils were removed for treatment via bioremediation. Treated soils were then placed into the excavations from which the contaminated soils were removed. Just prior to the MFA battery area IRA, the batteries were all but unrecognizable, and only their inner cores were visible on the ground surface. MFA is currently used as a renovation facility for explosives-loaded bombs, demilitarized gas generators, and paint bombs.

A corrective measures study (CMS) will be conducted at SWMU 12. Among the remedial alternatives expected to be evaluated will be the potential for natural attenuation to reduce concentrations of explosives in the groundwater. The United States Environmental Protection Agency (U.S. EPA) Region 5 has established a framework entitled "Region 5 Framework for Monitored Natural Attenuation Decisions for Groundwater" (U.S. EPA, 2000). This framework provides technical direction for the collection of adequate monitoring data to support evaluations of the effectiveness of monitored natural attenuation

(MNA). In order to determine whether residual explosives are naturally degrading at SWMU 12, a long-term groundwater monitoring plan for explosives and explosives degradation products is being conducted. The long-term monitoring program, as planned, consists of nine rounds of sampling to provide information on trends in groundwater concentrations of explosives and explosives degradation by-productions. Recently, six rounds of quarterly groundwater, soils, sediments, seeps, and surface water sampling and analyses were completed at SWMU 12. Information regarding the results of Rounds 1 and 2 is presented in the SWMU 12 RFI (Tetra Tech NUS, Inc. [TtNUS], 2005a). The results for Rounds 3 through 5 were reported in the prior SWMU 12 MNA reports (TtNUS, 2005b; TtNUS, 2006a; and TtNUS, 2006b).

The purpose of this report is to present the results of groundwater and surface water monitoring activities in Round 6, including field documentation, and to provide the framework for evaluation of data once all nine rounds have been completed. Field documentation associated with Round 6 is provided in Appendices A, B, and C of this report. Appendices D and E present analytical results for Round 6 and potentiometric surface maps for groundwater elevations obtained in Round 5, respectively. The final monitoring report (after Round 9) will contain an evaluation as to whether residual explosives may be naturally degrading and whether MNA is a viable remedial option for contaminated groundwater and surface water at SWMU 12. Information obtained from the long term monitoring program will be used in the CMS to evaluate the effectiveness of MNA. The MNA program being conducted at SWMU 12 meets the U.S. EPA Region V MNA requirements.

2.0 FIELD INVESTIGATION

This section presents a discussion of sampling activities, procedures, and documentation utilized during Round 6 field operations performed in 2006 for NSWC Crane SWMU 12.

2.1 OVERVIEW

Field activities for Round 6 were conducted in May 2006. All work performed for Round 6 was conducted in accordance with the procedures and methodologies described in the U.S. EPA-approved QAPP Addendum No. 2 (TtNUS, 2004) to the approved QAPP. Standard operating procedures (SOPs) that governed the field work are included in Appendix C of Addendum No. 2 to the approved QAPP. All field activities were electronically recorded and copies of all field forms, records, daily activities, and health and safety documentation associated with the Round 6 field investigation are provided in Appendices A through C of this document.

2.2 SAMPLING OPERATIONS

This section discusses the methodology for groundwater and surface water sampling activities performed at SWMU 12 during Round 6. Table 2-1 contains a summary of water level/elevation data for Rounds 1 through 6. Instruments used in the field were calibrated daily prior to use according to the manufacturer's requirements and in accordance with all applicable standard operating procedures (SOPs). Table 2-2 provides a summary of all proposed versus actual samples collected, the analyses performed, and if necessary, the reasoning why a sample was not collected.

2.2.1 Groundwater Purging and Sampling

During Round 6, the groundwater wells were sampled using dedicated bladder pumps. Groundwater quality parameters including pH, specific conductance, temperature, dissolved oxygen (DO), and oxidation reduction potential (ORP) were measured during purging at 5- to 10-minute intervals using a multi-parameter water quality meter and flow-through cell. Longer intervals were used for slower pumping wells. Water levels and pumping rates were also measured during purging at 5- to 10-minute intervals. Purging continued until a minimum of one well volume was removed and the above parameters stabilized, or until the well had been purged for 4 hours, in accordance with SOPs CTO166-15 and CTO166-16. To the extent possible, the pumping rates were adjusted to prevent drawdown from exceeding 0.3 foot during purging. Immediately following the purging process and before sampling, the temperature, pH, specific

conductance, DO, ORP, and turbidity were measured and recorded on the groundwater sample log sheets.

Sample containers were filled by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence. All pertinent field data, including sampling methods, purge information, pump intake depths, and locations were recorded electronically on low-flow purge data forms and groundwater sample log forms (see Appendix A.1). See Figure 2-1 for all groundwater sampling locations.

Twenty of the proposed 21 groundwater samples were collected at SWMU 12 during Round 6 (See Table 2-2). Monitoring well 12MWT30 was dry during this sampling period.

2.2.2 Surface Water Sampling

Surface water samples were collected from intermittent streams, drainage ditches, and surface runoff locations throughout SWMU 12. All samples were collected at previously sampled locations which had been marked with a labeled, wooden survey stake. Fluorescent flagging had been tied to the stake and to a nearby tree (if available) to facilitate relocation of the sample location for future sampling. Round 6 surface water samples were collected in accordance with Addendum No. 2 to the approved QAPP. All pertinent field data, including water quality parameters, sampling methods, and locations were recorded electronically on a surface water sample log sheet (see Appendix A.2). See Figure 2-2 for all surface water sampling locations.

All eight proposed surface water samples were collected at SWMU 12 during Round 6. (See Table 2-2).

2.3 QUALITY CONTROL SAMPLES

Quality assurance (QA)/quality control (QC) samples were generated and collected during sampling activities to monitor both field and laboratory procedures. These procedures are detailed in the approved QAPP Addendum No 2. QA/QC samples included field duplicates, equipment rinsate blanks, source water blanks, and temperature blanks.

2.4 WATER LEVEL MEASUREMENTS AND AQUIFER TESTING

2.4.1 Groundwater Level Measurements

A complete synoptic round of water levels including all the wells was taken prior to any groundwater monitoring well sampling activity. The synoptic water level measurements were obtained within a 24 hour time period. Measurements were taken with an electrical water level indicator (M-scope), using the top of the riser pipe as the reference point to determine water depth for monitoring wells and using a surveyed mark for staff gauge measurements. All measurements were taken in accordance with the specific SOP contained in QAPP Addendum No 2. A mark was placed at the top of the riser pipe to ensure that measurements were taken from a consistent reference point. Water level measurements and staff gauge measurements were recorded to the nearest 0.01 foot on groundwater level measurement forms. Table 2-1 contains water level/elevation data for Rounds 1 through 6.

TABLE 2-1

MONITORING WELL CONSTRUCTION INFORMATION AND WATER LEVEL MEASUREMENTS
SWMU 12 - MINE FILL A
ROUND 6
NSWC CRANE
CRANE, INDIANA

Well or Gauge Number	Installation Date	Northing (feet) NAVD	Easting (feet) NAVD	Ground Elevation (feet amsl)	Top of Riser or Reference Point Elevation (feet amsl)	Total Depth (feet bgs)(1)	Screened Interval				Water-Bearing Zone	October 17, 2004		December 15, 2004		January 18, 2005		May 18, 2005		August 10, 2005		November 29, 2005		May 5, 2006	
							Top (feet bgs)	Bottom (feet bgs)	Top (feet amsl)	Bottom (feet amsl)		Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)
MONITORING WELLS																									
12MWT01	7/24/04	1312852.79	3026150.48	724.06	726.87	35.0	24.00	34.00	700.06	690.06	Puz	11.10	715.77	9.68	717.19	9.34	717.53	9.27	717.60	11.15	715.72	10.91	715.96	9.54	717.33
12MWT02	7/25/04	1312701.31	3026218.56	723.57	725.64	29.0	18.00	28.00	705.57	695.57	Puz	10.02	715.62	8.63	717.01	8.32	717.32	8.25	717.39	10.19	715.45	9.85	715.79	8.53	717.11
12MWT03	8/31/04	1312747.34	3026026.90	732.39	734.44	26.0	15.00	25.00	717.39	707.39	Puz	16.91	717.53	16.21	718.23	16.00	718.44	15.29	719.15	15.82	718.62	16.06	718.38	15.13	719.31
12MWT04	9/10/04	1312647.57	3026082.64	728.62	730.74	25.0	14.00	24.00	714.62	704.62	Puz	14.94	715.80	13.67	717.07	13.35	717.39	13.29	717.45	15.14	715.60	14.91	715.83	13.56	717.18
12MWT05	9/8/04	1312511.09	3026137.13	722.90	725.36	25.0	14.00	24.00	708.90	698.90	Puz	10.12	715.24	8.72	716.64	8.41	716.95	8.41	716.95	10.39	714.97	9.91	715.45	8.70	716.66
12MWT06	8/15/04	1311833.50	3026562.65	724.59	726.70	24.0	13.00	23.00	711.59	701.59	Puz	9.54	717.16	10.51	716.19	10.75	715.95	10.18	716.52	9.50	717.20	9.92	716.78	9.94	716.76
12MWT07	8/27/04	1311707.13	3026615.62	726.03	728.40	25.0	14.00	24.00	712.03	702.03	Puz	11.80	716.60	13.05	715.35	13.42	714.98	12.62	715.78	11.86	716.54	12.16	716.24	12.37	716.03
12MWT08	7/25/04	1311609.35	3026660.10	726.73	728.83	24.0	13.00	23.00	713.73	703.73	Puz	12.03	716.80	13.05	715.78	13.19	715.64	12.71	716.12	12.05	716.78	12.36	716.47	12.72	716.11
12MWT09	8/29/04	1311595.76	3026580.09	725.78	728.00	25.0	14.00	24.00	711.78	701.78	Puz	13.44	714.56	13.60	714.40	13.40	714.60	12.37	715.63	12.43	715.57	13.17	714.83	12.26	715.74
12MWT10	8/11/04	1311456.81	3026649.95	723.84	726.68	25.0	14.00	24.00	709.84	699.84	Puz	15.17	711.51	14.67	712.01	14.19	712.49	13.17	713.51	14.08	712.60	15.07	711.61	13.19	713.49
12MWT11	8/14/04	1313014.33	3026776.15	738.45	740.79	25.0	14.00	24.00	724.45	714.45	Puz	15.55	725.24	12.96	727.83	12.88	727.91	13.01	727.78	15.25	725.54	14.23	726.56	12.39	728.40
12MWT12	8/14/04	1312972.30	3026791.19	739.51	741.66	25.0	14.00	24.00	725.51	715.51	Puz	13.03	728.63	10.61	731.05	9.95	731.71	10.18	731.48	12.47	729.19	11.48	730.18	10.09	731.57
12MWT13	7/31/04	1313060.01	3026835.37	733.55	735.81	21.0	10.00	20.00	723.55	713.55	Puz	8.21	727.60	5.30	730.51	4.63	731.18	4.83	730.98	7.33	728.48	5.85	729.96	4.93	730.88
12MWT14	8/31/04	1312965.79	3026875.34	734.54	736.67	26.0	15.00	25.00	719.54	709.54	Puz	19.51	717.16	20.05	716.62	20.75	715.92	21.28	715.39	20.30	716.37	19.42	717.25	21.22	715.45
12MWT15	8/31/04	1312876.08	3026906.85	734.40	736.74	25.0	14.00	24.00	720.40	710.40	Puz	16.32	720.42	18.52	718.22	19.17	717.57	18.24	718.50	16.63	720.11	16.39	720.35	18.37	718.37
12MWT16	8/14/04	1312096.13	3027182.94	743.63	745.97	25.0	14.00	24.00	729.63	719.63	Puz	20.97	725.00	21.95	724.02	22.13	723.84	21.62	724.35	21.37	724.60	22.10	723.87	21.63	724.34
12MWT17	8/15/04	1312047.38	3027205.14	744.84	747.23	26.0	15.00	25.00	729.84	719.84	Puz	22.79	724.44	24.11	723.12	24.63	722.60	23.73	723.50	23.05	724.18	23.02	724.21	23.78	723.45
12MWT18	8/27/04	1312114.82	3027253.63	743.93	745.94	26.0	15.00	25.00	728.93	718.93	Puz	21.55	724.39	22.61	723.33	23.06	722.88	22.68	723.26	21.80	724.14	21.80	724.14	22.52	723.42
12MWT19	8/28/04	1312026.45	3027292.38	744.55	746.89	27.0	16.00	26.00	728.55	718.55	Puz	25.83	721.06	27.06	719.83	27.77	719.12	27.68	719.21	26.66	720.23	25.66	721.23	27.68	719.21
12MWT20	9/1/04	1311919.40	3027337.61	744.40	746.56	26.0	15.00	25.00	729.40	719.40	Puz	23.86	722.70	24.97	721.59	25.35	721.21	25.45	721.11	24.47	722.09	23.89	722.67	25.35	721.21
12MWT21	9/12/04	1312878.00	3026436.50	735.16	737.72	25.0	14.00	24.00	721.16	711.16	Puz	21.42	716.30	19.92	717.80	19.54	718.18	19.46	718.26	21.49	716.23	22.30	715.42	19.74	717.98
12MWT22	9/11/04	1311937.84	3026901.94	737.50	739.74	25.0	14.00	24.00	723.50	713.50	Puz	16.56	723.18	17.40	722.34	17.71	722.03	17.10	722.64	16.60	723.14	16.61	723.13	17.13	722.61
12MWT23	8/10/04	1311150.87	3027466.57	737.29	739.75	31.0	20.00	30.00	717.29	707.29	Puz	27.20	712.55	28.22	711.53	28.65	711.10	21.89	717.86	27.52	712.23	27.00	712.75	28.09	711.66
12MWT24	8/10/04	1310974.75	3027184.02	738.28	740.60	31.0	20.00	30.00	718.28	708.28	Puz	32.07	708.53	32.38	708.22	32.34	708.26	32.35	708.25	32.36	708.24	31.98	708.62	32.33	708.27
12MWT24A	8/16/04	1310968.91	3027192.97	737.99	740.53	54.0	44.00	54.00	693.99	683.99	Puz	34.68	705.85	35.00	705.53	35.23	705.30	34.93	705.60	35.13	705.40	34.07	706.46	34.87	705.66
12MWT25	9/12/04	1313924.59	3026269.42	746.55	748.66	26.0	15.00	25.00	731.55	721.55	Puz	17.80	730.86	17.35	731.31	17.35	731.31	16.55	732.11	16.81	731.85	16.87	731.79	16.59	732.07

TABLE 2-1

MONITORING WELL CONSTRUCTION INFORMATION AND WATER LEVEL MEASUREMENTS
SWMU 12 - MINE FILL A
ROUND 6
NSWC CRANE
CRANE, INDIANA

Well or Gauge Number	Installation Date	Northing (feet) NAVD	Easting (feet) NAVD	Ground Elevation (feet amsl)	Top of Riser or Reference Point Elevation (feet amsl)	Total Depth (feet bgs)[1]	Screened Interval				Water-Bearing Zone	October 17, 2004		December 15, 2004		January 18, 2005		May 18, 2005		August 10, 2005		November 29, 2005		May 5, 2006	
							Top (feet bgs)	Bottom (feet bgs)	Top (feet amsl)	Bottom (feet amsl)		Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)
12MWT26	9/12/04	1313638.57	3025981.12	741.64	743.72	25.0	14.00	24.00	727.64	717.64	Puz	10.56	733.16	10.91	732.81	11.01	732.71	10.02	733.70	9.79	733.93	10.31	733.41	10.10	733.62
12MWT27	9/2/04	1313736.63	3026477.23	738.42	740.52	26.0	15.00	25.00	723.42	713.42	Puz	10.96	729.56	9.35	731.17	9.24	731.28	9.18	731.34	10.02	730.50	9.81	730.71	9.15	731.37
12MWT28	8/30/04	1313506.96	3026352.09	743.27	745.53	26.0	15.00	25.00	728.27	718.27	Puz	12.96	732.57	12.78	732.75	12.78	732.75	11.8	733.73	12.10	733.43	12.61	732.92	12.04	733.49
12MWT29	9/10/04	1312653.54	3026079.78	729.13	731.23	89.0	70.00	88.00	659.13	641.13	Pmz	59.97	671.26	61.20	670.03	61.34	669.89	59.83	671.40	58.83	672.40	59.00	672.23	58.98	672.25
12MWT30	8/29/04	1311604.34	3026576.32	725.67	727.59	90.5	70.00	90.00	655.67	635.67	Pmz	92.71	634.88	92.74	634.85	92.69	634.90	92.56	635.03	92.59	635.00	92.76	634.83	92.67	634.92
12MWT31	8/30/04	1312970.99	3026872.87	734.55	736.75	89.0	68.00	88.00	666.55	646.55	Pmz	85.17	651.58	68.86	667.89	68.72	668.03	67.87	668.88	61.18	675.57	68.40	668.35	67.80	668.95
12MWT32	9/1/04	1312015.49	3027297.24	744.51	747.44	100.0	79.00	99.00	665.51	645.51	Pmz	68.55	678.89	85.93	661.51	86.11	661.33	84.75	662.69	84.99	662.45	85.31	662.13	84.60	662.84
12MWT33	9/2/04	1313725.86	3026481.26	738.32	740.49	95.0	74.00	94.00	664.32	644.32	Pmz	44.99	695.50	42.44	698.05	41.80	698.69	41.34	699.15	43.30	697.19	43.31	697.18	41.26	699.23
12MWT34	8/13/04	1310967.35	3027183.73	738.02	740.52	87.0	76.00	86.00	662.02	652.02	Pmz	88.42	652.10	88.32	652.20	88.12	652.40	87.98	652.54	87.95	652.57	88.09	652.43	88.00	652.52
12MWT35	8/27/04	1312711.38	3027111.95	732.17	734.64	27.0	16.00	26.00	716.17	706.17	Puz	12.33	722.31	12.53	722.11	12.70	721.94	12.11	722.53	11.90	722.74	11.85	722.79	12.36	722.28
12MWT36	8/27/04	1312466.54	3027186.16	736.51	738.63	26.0	15.00	25.00	721.51	711.51	Puz	13.15	725.48	14.19	724.44	14.58	724.05	14.12	724.51	13.17	725.46	13.39	725.24	14.19	724.44
12MWT37	7/29/04	1311630.57	3027496.41	736.35	738.77	25.0	14.00	24.00	722.35	712.35	Puz	22.20	716.57	25.74	713.03	26.24	712.53	25.98	712.79	23.51	715.26	25.16	713.61	26.26	712.51
12MWT38	9/11/04	1312353.89	3026531.17	726.05	728.03	25.0	14.00	24.00	712.05	702.05	Puz	10.03	718.00	10.64	717.39	10.63	717.40	9.69	718.34	9.46	718.57	9.95	718.08	9.62	718.41
12MWT39	7/30/04	1311015.63	3027662.97	735.33	737.64	35.0	24.00	34.00	711.33	701.33	Puz	35.83	701.81	36.05	701.59	35.82	701.82	35.56	702.08	35.50	702.14	35.51	702.13	35.39	702.25
12MWT40	8/12/04	1310616.56	3027037.67	725.37	727.50	29.0	18.00	28.00	707.37	697.37	Puz	22.23	705.27	23.11	704.39	23.18	704.32	23.04	704.46	23.83	703.67	24.50	703.00	24.00	703.50
12MWT41	10/27/04	1310642.00	3026376.75	621.30	622.97	35.0	24.00	34.00	597.30	587.30	Mgd	NA	NA	20.33	602.64	20.42	602.55	19.75	603.22	20.10	602.87	20.07	602.90	19.55	603.42
12MWT42	9/1/04	1312364.70	3026127.28	717.93	720.22	29.0	13.00	28.00	704.93	689.93	Puz	15.03	705.19	13.02	707.20	12.13	708.09	11.69	708.53	13.67	706.55	14.07	706.15	11.88	708.34
12MWT43	11/12/04	1310955.52	3026125.55	677.03	679.01	81.0	65.00	80.00	612.03	597.03	Plz	NA	NA	78.15	600.86	78.56	600.45	78.19	600.82	---	NA	78.12	600.89	78.28	600.73
12MWT44	10/27/04	1310276.64	3026617.87	624.81	626.69	35.5	25.00	35.00	599.81	589.81	Mgd	NA	NA	26.25	600.44	26.58	600.11	26.14	600.55	26.60	600.09	26.45	600.24	26.22	600.47
12MWT45	10/29/04	1313384.30	3027614.01	688.37	691.07	25.0	14.00	24.00	674.37	664.37	Pmz	NA	NA	17.07	674.00	16.03	675.04	15.62	675.45	19.97	671.10	20.31	670.76	14.79	676.28
12MWT46	10/30/04	1312828.63	3027864.12	673.31	675.67	24.5	14.00	24.00	659.31	649.31	Pmz	NA	NA	16.07	659.60	16.02	659.65	15.80	659.87	21.66	654.01	18.51	657.16	17.19	658.48
12MWT47	10/31/04	1312455.99	3028025.00	660.79	663.12	25.0	14.00	24.00	646.79	636.79	Pmz	NA	NA	12.85	650.27	12.67	650.45	14.00	649.12	16.02	647.10	15.68	647.44	12.97	650.15
12MWT48	11/9/04	1312052.61	3028122.50	647.84	650.05	30.0	19.00	29.00	628.84	618.84	Pmz	NA	NA	30.50	619.55	30.41	619.64	30.36	619.69	30.34	619.71	30.27	619.78	30.34	619.71
12MWT49	11/10/04	1310956.27	3028138.17	616.96	619.25	30.0	19.00	29.00	597.96	587.96	Mgd	NA	NA	30.03	589.22	25.66	593.59	26.24	593.01	27.92	591.33	27.04	592.21	26.24	593.01
12MWT50	10/29/04	1310582.27	3028100.87	606.85	609.01	35.0	24.00	34.00	582.85	572.85	Mgd	NA	NA	DRY	NA	35.34	573.67	34.76	574.25	34.60	574.41	35.30	573.71	35.15	573.86
WES-7-1-81	__	1309481.87	3026477.49	628.95	631.95	41.5	27.02	36.20	601.93	592.75	Plz	NA	NA	NA	NA	20.41	611.54	19.86	612.09	23.70	608.25	NA	NA	NA	NA
WES-7-2-81	__	1309501.85	3026589.93	601.72	604.72	35.0	20.27	29.62	581.45	572.10	Mgd	NA	NA	NA	NA	34.26	570.46	33.93	570.79	35.99	568.73	NA	NA	NA	NA
WES-7-3-81	__	1309677.40	3026457.16	596.22	599.22	38.0	23.40	32.72	572.82	563.50	Mgd	NA	NA	NA	NA	28.82	570.40	27.11	572.11	29.15	570.07	NA	NA	NA	NA

TABLE 2-1

MONITORING WELL CONSTRUCTION INFORMATION AND WATER LEVEL MEASUREMENTS
SWMU 12 - MINE FILL A
ROUND 6
NSWC CRANE
CRANE, INDIANA

Well or Gauge Number	Installation Date	Northing (feet) NAVD	Easting (feet) NAVD	Ground Elevation (feet amsl)	Top of Riser or Reference Point Elevation (feet amsl)	Total Depth (feet bgs)(1)	Screened Interval				Water-Bearing Zone	October 17, 2004		December 15, 2004		January 18, 2005		May 18, 2005		August 10, 2005		November 29, 2005		May 5, 2006	
							Top (feet bgs)	Bottom (feet bgs)	Top (feet amsl)	Bottom (feet amsl)		Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)	Depth to Water (feet btor)	Water Elevation (feet amsl)
WES-7-4-81	—	1309586.54	3026531.10	595.22	598.22	39.0	24.31	33.64	570.91	561.58	Mgd	NA	NA	NA	NA	26.53	571.69	26.23	571.99	NA	NA	NA	NA	NA	NA
WES-7-5-81	—	1309640.94	3026503.16	593.50	596.50	39.0	24.30	33.65	569.20	559.85	Mgd	NA	NA	NA	NA	24.25	572.25	23.98	572.52	26.14	570.36	NA	NA	NA	NA
STAFF GAUGES																									
12SG01	10/14/04	1313149.25	3026817.59	NA	730.97	NA	NA	NA	NA	NA	NA	NA	NA	3.19	NA	Dry	NA	Dry	NA	Dry	NA	3.20	727.77	Dry	NA
12SG02	10/14/04	1312731.07	3027125.37	NA	731.64	NA	NA	NA	NA	NA	NA	NA	NA	Dry	NA	Dry	NA	Dry	NA	Dry	NA	Dry	NA	Dry	NA
12SG03	10/14/04	1312335.43	3027317.19	NA	735.03	NA	NA	NA	NA	NA	NA	NA	NA	1.87	NA	Dry	NA	1.92	733.11	Dry	NA	1.85	733.18	1.10	733.93
12SG04	10/14/04	1311657.15	3027481.28	NA	736.72	NA	NA	NA	NA	NA	NA	NA	NA	4.50	NA	Dry	NA	4.11	732.61	Dry	NA	4.11	732.61	4.12	732.60
12SG05	10/14/04	1310844.41	3026971.44	NA	724.28	NA	NA	NA	NA	NA	NA	NA	NA	Dry	NA	Dry	NA	Dry	NA	Dry	NA	2.50	721.78	Dry	NA
12SG06	10/14/04	1312141.14	3026445.52	NA	713.38	NA	NA	NA	NA	NA	NA	NA	NA	3.75	NA	3.95	NA	Dry	NA	Dry	NA	3.50	709.88	Dry	NA
12SG07	10/14/04	1312447.98	3026302.90	NA	713.45	NA	NA	NA	NA	NA	NA	NA	NA	4.28	NA	4.26	NA	4.27	709.18	Dry	NA	4.24	709.21	3.87	709.58
12SG08	10/14/04	1316378.17	3028951.05	NA	668.56	NA	NA	NA	NA	NA	NA	NA	NA	5.05	NA	5.23	NA	5.74	662.82	Dry	NA	6.45	662.11	5.86	662.70
12SG09	10/14/04	1308584.68	3028722.93	NA	529.35	NA	NA	NA	NA	NA	NA	NA	NA	17.24	NA	17.40	NA	17.40	511.95	17.55	511.80	17.48	511.87	17.43	511.92
12SG10	10/14/04	1307698.34	3029600.29	NA	517.21	NA	NA	NA	NA	NA	NA	NA	NA	14.58	NA	14.69	NA	14.69	502.52	15.05	502.16	14.25	502.96	14.52	502.69
12SG11	10/14/04	1305640.98	3027744.30	NA	513.47	NA	NA	NA	NA	NA	NA	NA	NA	20.00	NA	19.94	NA	19.90	493.57	20.05	493.42	19.71	493.76	19.95	493.52
12SG12	10/14/04	1308475.83	3027438.49	NA	538.45	NA	NA	NA	NA	NA	NA	NA	NA	6.02	NA	6.05	NA	6.06	532.39	Dry	NA	6.05	532.40	6.05	532.40

Notes:
1 = Total depth of boring, total depth of well may be less.
2 = Staff gauge measured surface water level that appears to be perched above groundwater in the Pennsylvanian geologic unit immediately adjacent to or underlying the drainageway.
bgs = Below ground surface.
btor = Below top of riser/reference point.
amsl = Above mean sea level (NAVD88).
NA = Not applicable.
NAVD = North American Vertical Datum
Puz = Pennsylvanian upper water bearing zone
Pmz = Pennsylvania middle water bearing zone
Mgd = Mississippi glen dean water bearing zone
Plz = Lower Pennsylvanian water-bearing zone

TABLE 2-2

SUMMARY OF ENVIRONMENTAL SAMPLES AND LABORATORY ANALYSES
SWMU 12 - MINE FILL A
ROUND 6
NSWC CRANE
CRANE, INDIANA

Sample Number	Analytical Fraction				Reasoning Why Sample Was Not Collected
	Explosives		Miscellaneous		
	Nitroaromatics and Nitramines SW-846 8330	RDX Degradation Products SW-846 8330, Modified	Nitrate + Nitrite (as N) EPA 353.2	Total Organic Carbon SW-846 9060	
Groundwater (Round 6)					
12GWT0306	X		X		
12GWT0606	X		X		
12GWT0906	X	X	X		
12GWT1006	X		X		
12GWT1106	X		X		
12GWT1206	X		X		
12GWT1606	X		X		
12GWT1706	X		X		
12GWT1806	X	X	X		
12GWT2006	X	X	X		
12GWT2206	X		X		
12GWT2306	X		X		
12GWT2806	X	X	X		
12GWT30	O		O		Dry Well
12GWT3106	X		X		
12GWT3206	X	X	X		
12GWT3606	X	X	X		
12GWT3806	X		X		
12GWT4106	X		X		
12GWT4206	X		X		
12GWT4706	X		X		
GW TOTALS	**20**	**6**	**20**	**0**	
Surface Water (Round 6)					
12SW0906	X		X		
12SW1106	X		X		
12SW1405	X		X		
12SW2406	X		X		
12SW2506	X		X		

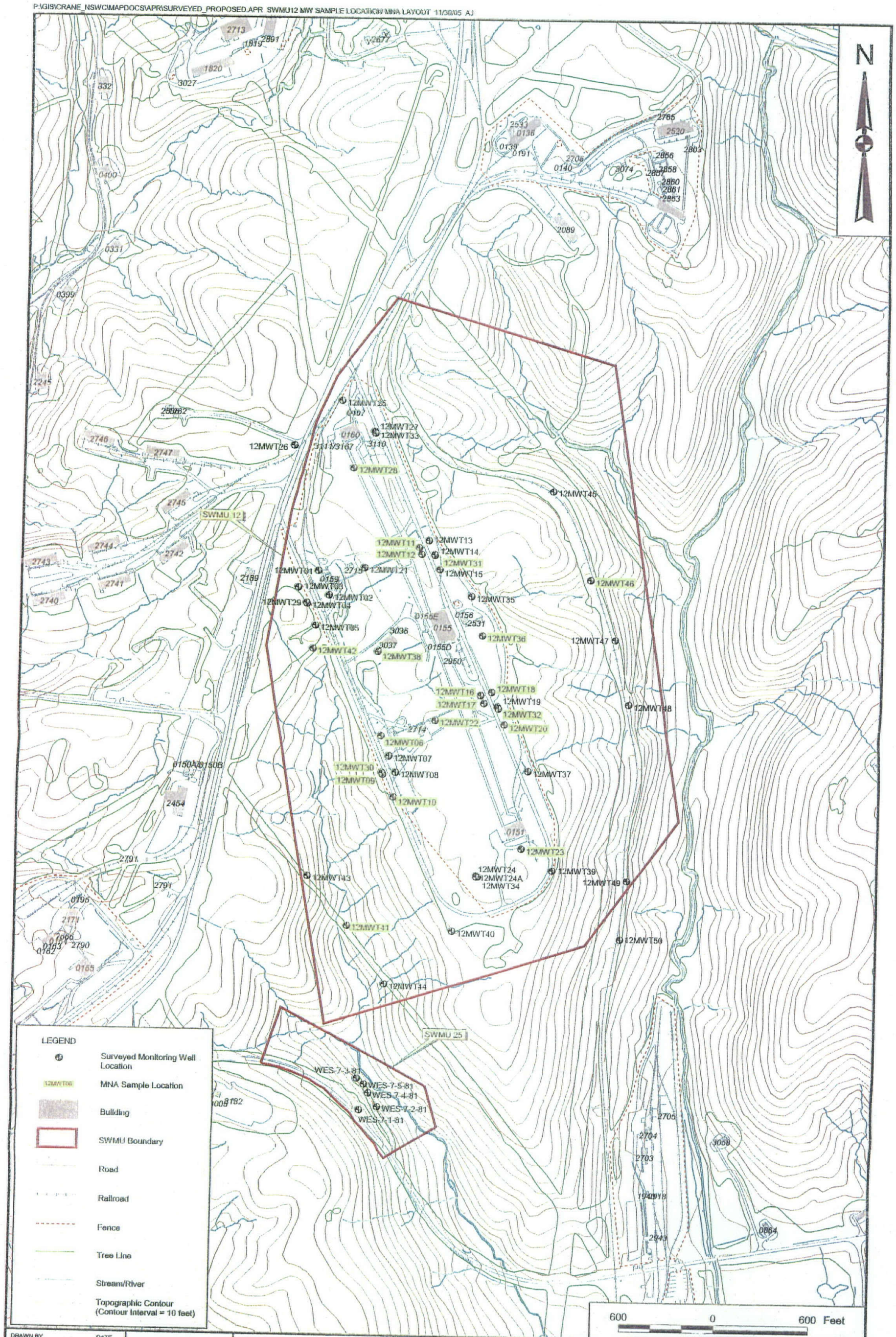
TABLE 2-2

SUMMARY OF ENVIRONMENTAL SAMPLES AND LABORATORY ANALYSES
SWMU 12 - MINE FILL A
ROUND 6
NSWC CRANE
CRANE, INDIANA

Sample Number	Analytical Fraction				Reasoning Why Sample Was Not Collected
	Explosives		Miscellaneous		
	Nitroaromatics and Nitramines SW-846 8330	RDX Degradation Products SW-846 8330, Modified	Nitrate + Nitrite (as N) EPA 353.2	Total Organic Carbon SW-846 9060	
12SW2706	X		X		
12SW3104	X		X		
12SW3405	X		X		
SW TOTALS	**8**	**0**	**8**	**0**	

X = Sample was collected as proposed.
O = Sample not collected.

P:\GIS\CRANE_NSWC\MAPDOCS\APR\SURVEYED_PROPOSED.APR SWMU12 MW SAMPLE LOCATION MNA LAYOUT 11/30/05 AJ



DRAWN BY	DATE
A. JANOCHA	11/17/05
CHECKED BY	DATE
J. LUCAS	11/30/05
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

SURVEYED MONITORING WELL LOCATIONS

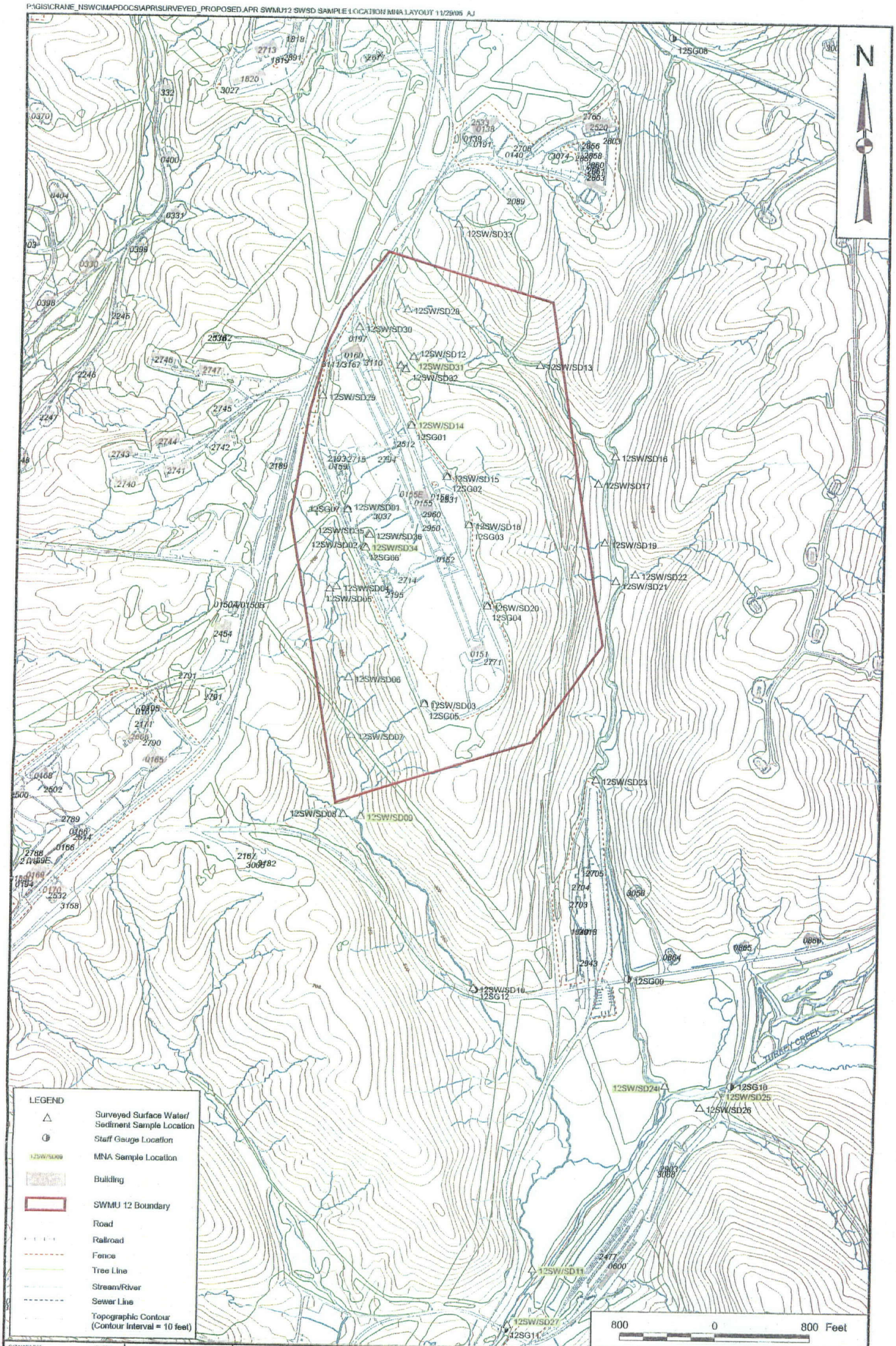
SWMU 12 - MINE FILL A AND SWMU 25 - HIGHWAY 58 DUMP SITE A

NSWC CRANE

CRANE, INDIANA

CONTRACT NUMBER	
CTO 0343	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 2 - 1	REV 0

P:\GIS\CRANE_NSWC\MAPDOCS\APR\SURVEYED_PROPOSED.APR SWMU12 SWSD SAMPLE LOCATION MNA LAYOUT 11/29/05 AJ



DRAWN BY	DATE
A. JANOCHA	11/17/05
CHECKED BY	DATE
J. LUCAS	11/30/05
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

SURVEYED SURFACE WATER/SEDIMENT SAMPLE
AND STAFF GAUGE LOCATIONS
SWMU 12 - MINE FILL A
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

CONTRACT NUMBER	
CTO 0343	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 2 - 2	REV 0

3.0 DATA PRESENTATION

This section presents the analytical results for groundwater and surface water sampling conducted in Round 6 at SMWU 12 (see Tables 3-1 to 3-7). Analytical results for Rounds 1 through 5 are also provided to support data evaluation which is discussed in Section 4. Appendix D contains a summary of analytical results for groundwater and surface water samples collected in Round 6.

The SWMU 12 RFI determined that explosives contamination remains in soil around SWMU 12 buildings and explosives have migrated to groundwater and surface water. RDX was identified as the most frequently detected explosive in groundwater and surface water. As a result, RDX is being considered as a parent compound for evaluating the effectiveness of natural attenuation at SWMU 12. Over time, natural attenuation will reduce the mass or concentration of the parent compound in soil and groundwater. During the natural attenuation process, the parent compound will decompose in stages to other well-defined intermediate products. In the case of RDX, degradation by-products are expected to include nitroso derivatives hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine (MNX), hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine (DNX), and hexahydro-1,3,5-trinitroso-1,3,5-triazine (TNX). As a result, the presentation and interpretation of analytical results in Sections 3 and 4 for SWMU 12 monitoring will focus on RDX and its associated degradation by-products.

3.1 GROUNDWATER DATA

Groundwater analytical results for Rounds 1 through 6 at SWMU 12 are presented in Tables 3-1, 3-3, and 3-5 for select monitoring well locations in the Upper and Middle Pennsylvania, and the Mississippi Glen Dean Water Bearing Zones, respectively. These tables show a listing of concentrations for explosives, explosive degradation products, and miscellaneous field parameters. Groundwater samples were not analyzed for degradation by-products in Round 6. Descriptive statistics for Round 6 samples are presented in Tables 3-2 and 3-4. Concentrations are presented in micrograms per liter (µg/L), along with data validation qualifiers, as applicable. Due to the staggered nature of the groundwater sampling, not all wells were sampled in each of the 6 rounds of sampling.

3.1.1 Pennsylvania Upper Water Bearing Zone (Puz)

Monitoring results for Round 6 groundwater sampling at the Pennsylvania Upper Water Bearing Zone (Puz) monitoring wells are presented in Table 3-1. As shown in Table 3-1, explosives were detected at wells 12MWT06, 12MWT09, 12MWT10, 12MWT11, 12MWT12, 12MWT16, 12MWT17, 12MWT18,

12MWT20, 12MWT22, 12MWT38, and 12MWT42. No explosives were detected at wells 12MWT03, 12MWT23, and 12MWT28. Well location 12MWT28 is considered to be upgradient of SWMU 12.

The most frequently detected explosives in Round 6 were RDX and HMX. Groundwater concentrations were highest for RDX and ranged from 4.1µg/L in sample 12MWT2006 to 8,100 µg/L in sample 12MWT1606. Very high concentrations of RDX were also found in samples 12MWT0606 (4,800 µg/L), 12MWT1106 (4,600 µg/L), and 12MWT1706 (2,600 µg/L). HMX concentrations ranged from 0.78 µg/L in sample 12MWT3806 to 600 ug/L in sample 12MWT1606. HMX concentrations were high in samples 12MWT1106 (520 µg/L), 121MWT0606 (390 µg/L), and 12MWT16 (110 µg/L). In addition to RDX and HMX, several additional explosives were detected at monitoring wells 12MWT11, 12MWT12, 12MWT16, and 12MWT17, including 1,3,5-trinitrobenzene, 2,4,6-trinitrotoluene, 2-amino-4,6-dinitrotoluene, and 4-amino-2,6-dinitrotoluene. Table 3-2 presents descriptive statistics for Puz monitoring results in Round 6.

3.1.2 Pennsylvania Middle Water Bearing Zone (Pmz)

Monitoring results for sampling at the Pennsylvania Middle Water Bearing Zone (Pmz) wells are presented in Table 3-3. The descriptive statistics for Round 6 detections and field parameters are shown in Table 3-4. There were no detections of explosives in Round 6.

3.1.3 Mississippi Glen Dean Water Bearing Zone (Mgd)

Round 6 monitoring results for sampling conducted in the Mississippi Glen Dean (Mgd) water bearing zone are presented in Table 3-5. There were no detections of explosives or field parameter results in Round 6. As a result, there is no statistical summary for Round 6 in the Mgd.

3.2 SURFACE WATER DATA

Surface water analytical results for Round 6 are presented in Table 3-6, along with a statistical summary in Table 3-7. In Round 6, explosives were detected in samples 12SW0906, 12SW1106, 12SW1405, 12SW3104, and 12SW3405. RDX and HMX were the most frequently detected explosives. Surface water samples were not analyzed for degradation by-products.

RDX concentrations ranged from 2.5 µg/L in sample 12SW1106 to 200 µg/L in sample 12SW3405. HMX concentrations ranged from 2.1 µg/L in sample 12SW1106 to 55 µg/L in sample 12SW3405. In addition to RDX and HMX, other detections in surface water included 2,4,6-trinitrotoluene (12SW3104), 4-amino-

2,6-dinitrotoluene (12MWT1405, 12MWT3104, AND 12SW3405), and 2-amino-4,6-dinitrotoluene (12MWT3104).

TABLE 3-1

SUMMARY OF CHEMICALS DETECTED, FIELD PARAMETERS, AND MISCELLANEOUS PARAMETERS FOR SWMU 12 GROUNDWATER
ROUNDS 1 THROUGH 6 IN THE PENNSYLVANIA UPPER WATER BEARING ZONE
NSWC CRANE
CRANE, INDIANA

	Location	12MWT03						12MWT06					
	Sampling Round	1	2	3	4	5	6	1	2	3	4	5	6
	Date	09/27/2004	03/03/2005	05/22/2005	08/29/2005	12/06/2005	05/18/2006	09/14/2004	02/21/2005	05/21/2005	08/26/2005	11/29/2005	05/18/2006
Explosives	**Units**												
1,3,5-TRINITROBENZENE	UG/L	0.27 U	0.284 U	0.264 U	0.27 U	0.26 U	0.25 U	16	19	15	23 J	26	12
1,3-DINITROBENZENE		0.27 U	0.284 U	0.264 U	0.27 U	0.26 U	0.25 U	8	8.9	7.4	10 J	12	7.2
2,4,6-TRINITROTOLUENE		0.27 U	0.284 U	0.264 U	0.27 UJ	0.26 U	0.25 U	160	170	140	210 J	200	120
2,4-DIAMINO-6-NITROTOLUENE		0.27 U	0.284 U		0.27 U			4.9 J	7.8 J		7.5 J		
2,4-DINITROTOLUENE		0.27 U	0.284 U	0.264 U	0.27 U	0.26 U	0.25 U	2.4 J	0.24 U	0.269 U	5.4 J	5.3 J	0.25 U
2,6-DIAMINO-4-NITROTOLUENE		0.27 U	0.284 U		0.27 U			0.255 U	0.24 U		0.26 U		
2,6-DINITROTOLUENE		0.27 U	0.284 U	0.264 U	0.27 U	0.26 U	0.25 U	9.8 J	0.24 U	12	15 J	0.25 U	25 U
2-AMINO-4,6-DINITROTOLUENE		0.27 U	0.284 U	0.264 U	0.27 U	0.26 U	0.25 U	32 J	40 J	68	82 J	110 J	28 J
2-NITROTOLUENE		0.27 U	0.284 U	0.264 U	0.27 U	0.26 U	0.25 U	0.255 U	0.24 U	0.269 U	0.26 U	0.25 U	0.25 U
3,5-DINITROANILINE		0.27 U	0.284 U		0.27 U			4.6	9.4		9.7 J		
3-NITROTOLUENE		0.27 U	0.284 U	0.264 U	0.27 U	0.26 U	0.25 U	0.255 U	0.24 U	0.269 U	0.26 U	0.25 U	0.25 U
4,4'-TN-AZOXY		0.532 U	0.568 U		0.53 U			0.51 U	0.48 U		0.52 U		
4-AMINO-2,6-DINITROTOLUENE		0.27 U	0.284 U	0.264 U	0.27 U	0.26 U	0.25 U	34	53	62 J	71 J	64	35 J
4-NITROTOLUENE		0.27 U	0.284 U	0.264 U	0.27 U	0.26 U	0.25 U	0.255 U	5.8 J	0.269 U	6.7 J	0.25 U	0.25 U
RDX		0.27 U	0.284 U	0.264 U	0.27 U	0.26 U	0.25 U	6300 J	7200	5000	5400 J	6100	4800
DNX		0.27 U	0.284 U		0.27 U			1.6 J	1.9 J		1.7 J		
HMX		0.27 U	0.284 U	0.264 U	0.27 U	0.26 U	0.25 U	400	530	420	520 J	580 J	390
MNX		0.27 U	0.284 U		0.27 U			23	30		21 J		
NITROBENZENE		0.27 U	0.284 U	0.264 U	0.27 U	0.26 U	0.25 U	0.255 U	0.24 U	0.269 U	0.26 U	0.25 U	0.25 U
TETRYL		0.27 U	0.284 U	0.264 U	0.27 U	0.26 U	0.25 U	0.255 U	0.24 U	0.269 U	17 R	0.25 U	0.25 U
TNX		0.27 U	0.284 U		0.27 U			0.255 U	0.74 J		0.26 U		
Field Parameters													
TEMPERATURE	C	14.58	12.55	16.3	19.34			17.35	11.39	13.69	16.66		
DISSOLVED OXYGEN	MG/L	2.66	12.29				1.05	5.67	3.51				1.01
DISSOLVED OXYGEN - METER				3.32	0.98					1.27	0.63		
SPECIFIC CONDUCTANCE	MS/CM	1.638	1.425	1.205	1.151		1.97	0.282	0.265	0.317	0.303		0.582
OXIDATION REDUCTION POTENTIAL	MV	13.9	26	66	553.6		43	65	91	253.7	435.5		313
TURBIDITY	NTU	303	7.71	290	18		2.5	0.75	0.28	0.1	0.6		0
PH	S.U.	7.25	6.32	6.07	5.42		6.46	5.85	5.2	4.17	4.91		4.63
TEMPERATURE	C						14.5						13.78
Miscellaneous Parameters													
AMMONIA-N	MG/L	0.11 J	0.15					0.005 U	0.01 UJ				
NITRITE/NITRATE-N		0.05 U	0.05 U		0.025 U		0.025 U	3.3 J	1.8		0.025 U		1.1
TOTAL ORGANIC CARBON					1.9						5.9		

TABLE 3-1

SUMMARY OF CHEMICALS DETECTED, FIELD PARAMETERS, AND MISCELLANEOUS PARAMETERS FOR SWMU 12 GROUNDWATER
ROUNDS 1 THROUGH 6 IN THE PENNSYLVANIA UPPER WATER BEARING ZONE
NSWC CRANE
CRANE, INDIANA

Location		12MWT09						12MWT10					
Sampling Round		1	2	3	4	5	6	1	2	3	4	5	6
Date		09/10/2004	03/02/2005	05/21/2005	08/26/2005	12/03/2005	05/09/2006	09/25/2004	02/07/2005	05/19/2005	08/26/2005	12/03/2005	05/20/2006
Explosives	**Units**												
1,3,5-TRINITROBENZENE	UG/L	0.264 U	0.271 U	0.25 U	0.25 U	0.271 U	0.25 U	0.27 U	0.264 U	0.248 U	0.26 U	0.26 U	0.25 U
1,3-DINITROBENZENE		0.264 U	0.271 U	0.25 U	0.25 U	0.271 U	0.25 U	0.27 U	0.264 U	0.248 U	0.26 U	0.26 U	0.25 U
2,4,6-TRINITROTOLUENE		0.264 U	0.271 U	0.25 U	0.31 R	0.271 U	0.25 U	0.27 U	0.264 U	0.248 U	0.26 U	0.26 U	0.25 U
2,4-DIAMINO-6-NITROTOLUENE		0.264 U	0.271 U		0.25 U			0.27 U	0.264 U		0.26 U		
2,4-DINITROTOLUENE		0.264 U	0.271 U	0.25 U	0.25 U	0.271 U	0.25 U	0.27 U	0.264 U	0.248 U	0.26 U	0.26 U	0.25 U
2,6-DIAMINO-4-NITROTOLUENE		0.264 U	0.271 U		0.25 U			0.27 U	0.264 U		0.26 U		
2,6-DINITROTOLUENE		0.264 U	0.34 J	0.25 U	0.29 J	0.271 U	0.25 U	0.27 U	0.264 U	0.248 U	0.26 U	0.26 U	0.25 U
2-AMINO-4,6-DINITROTOLUENE		5.4 J	4 J	4 J	5.2 J	4.5 J	6.3 J	0.27 U	0.264 U	0.248 U	0.26 U	0.26 U	0.25 U
2-NITROTOLUENE		0.264 U	0.271 U	0.25 U	0.25 U	0.271 U	0.25 U	0.27 U	0.264 U	0.248 U	0.26 U	0.26 U	0.25 U
3,5-DINITROANILINE		0.264 U	0.271 U		0.25 U			0.27 U	0.264 U		0.26 U		
3-NITROTOLUENE		0.264 U	0.271 U	0.25 U	0.25 U	0.271 U	0.25 U	0.27 U	0.264 U	0.248 U	0.26 U	0.26 U	0.25 U
4,4'-TN-AZOXY		0.528 U	0.542 U		0.5 U			0.538 U	0.528 U		0.52 U		
4-AMINO-2,6-DINITROTOLUENE		7.3	5.2	4.6	5.8	5.3	5.4	0.27 U	0.264 U	0.248 U	0.26 U	0.26 U	0.25 U
4-NITROTOLUENE		0.264 U	0.271 U	0.25 U	0.25 U	0.271 U	0.25 U	0.27 U	0.264 U	0.248 U	0.26 U	0.26 U	0.25 U
RDX		480 J	510	370	460	390	390	22	30	33	37	56	35
DNX		0.264 U	0.271 U		0.25 UJ			0.27 U	0.264 U		0.26 U		
HMX		65	64	52	61	54	54	6.6	7.6 J	5.8	6.8	8.3	6.7
MNX		0.264 U	0.33 J		0.82 J			0.39 J	0.33 J		0.35 J		
NITROBENZENE		0.264 U	0.271 U	0.25 U	0.25 U	0.271 U	0.25 U	0.27 U	0.264 U	0.248 U	0.26 U	0.26 U	0.25 U
TETRYL		0.264 U	0.271 U	0.25 U	0.25 U	0.271 U	0.25 U	0.27 U	0.264 U	0.248 U	0.26 U	0.26 U	0.25 U
TNX		0.264 U	0.271 U		0.25 U			0.27 U	0.264 U		0.26 U		
Field Parameters													
TEMPERATURE	C	18.78	10.31	14.69	18.97			17.5	12.1	15.02	16.87		
DISSOLVED OXYGEN	MG/L	4.61	5.57				2.26	4.78	5.26				0.52
DISSOLVED OXYGEN - METER				0.99	2.38					0.58	0.81		
SPECIFIC CONDUCTANCE	MS/CM	0.403	0.313	0.257	0.264		0.403	0.724	0.57	0.587	550		0.97
OXIDATION REDUCTION POTENTIAL	MV	140	370.2	375	163		427	149	387	354	488.7		339
TURBIDITY	NTU	6.99	2.31	3.3	9.7		3.9	4.1	2	0.35	36		194
PH	S.U.	5.04	4.25	4.26	4.5		4.43	4.64	4.5	3.83	3.29		3.17
TEMPERATURE	C						13.5						12.81
Miscellaneous Parameters													
AMMONIA-N	MG/L	0.005 U	0.01 U					0.06 U	0.13				
NITRITE/NITRATE-N		1.8 J	0.3		0.025 U		0.75	0.05	0.05 U		0.025 U		0.025 U
TOTAL ORGANIC CARBON					2.1						5.2		

TABLE 3-1

SUMMARY OF CHEMICALS DETECTED, FIELD PARAMETERS, AND MISCELLANEOUS PARAMETERS FOR SWMU 12 GROUNDWATER
ROUNDS 1 THROUGH 6 IN THE PENNSYLVANIA UPPER WATER BEARING ZONE
NSWC CRANE
CRANE, INDIANA

Location		12MWT11						12MWT12					
Sampling Round		1	2	3	4	5	6	1	2	3	4	5	6
Date		09/13/2004	02/22/2005	05/19/2005	08/23/2005	12/15/2005	05/20/2006	09/14/2004	02/22/2005	05/19/2005	08/23/2005	12/14/2005	05/19/2006
Explosives	**Units**												
1,3,5-TRINITROBENZENE	UG/L	110	110	99	130	100	95	0.26 U	0.24 U	0.269 U	0.27 U	0.36 J	0.25 U
1,3-DINITROBENZENE		4	6.3	7.5	9.4	10	10	0.26 U	0.24 U	0.269 U	0.27 U	0.26 U	0.25 U
2,4,6-TRINITROTOLUENE		110	110	110	160	120	140	1.4	2.9	0.32 J	6.1	11	0.25 U
2,4-DIAMINO-6-NITROTOLUENE		69 J	75 J		77 R			0.67 J	0.24 U		0.27 U		
2,4-DINITROTOLUENE		2.8 J	0.24 U	0.264 U	4.4 R	3.8 J	0.25 U	0.26 U	0.24 U	0.269 U	0.27 U	0.26 U	0.25 U
2,6-DIAMINO-4-NITROTOLUENE		0.266 U	0.24 U		0.26 U			0.26 U	0.24 U		0.27 U		
2,6-DINITROTOLUENE		8.1 J	0.24 U	11	0.26 U	18 J	25 U	0.29 J	0.24 U	0.269 U	0.27 U	0.26 U	0.25 U
2-AMINO-4,6-DINITROTOLUENE		39 J	31 J	52 J	34 J	36 J	21 J	6.1 J	5.3 J	4.2 J	7.7 J	8.4 J	3.7 J
2-NITROTOLUENE		0.45 J	0.24 U	0.264 U	0.26 U	0.271 U	0.25 U	0.26 U	0.24 U	0.269 U	0.27 U	0.26 U	0.25 U
3,5-DINITROANILINE		11	12 J		13			0.91 J	0.92 J		1.7		
3-NITROTOLUENE		0.266 U	0.24 U	0.264 U	0.26 U	0.271 U	0.25 U	0.26 U	1.6 J	0.269 U	0.27 U	0.26 U	0.25 U
4,4'-TN-AZOXY		0.532 U	0.48 U		0.53 U			0.52 U	0.48 U		0.53 U		
4-AMINO-2,6-DINITROTOLUENE		78 J	43	41	50 J	47	38 J	6.9	6.4	4.2	11	10	4.5
4-NITROTOLUENE		0.266 U	0.24 U	4.1 R	0.26 U	0.271 U	0.25 U	0.26 U	0.24 U	0.269 U	0.27 U	0.26 U	0.25 U
RDX		3900 J	4900	4100	5000	4700	4600	480 J	380	390	270	280	340
DNX		0.266 U	1.9 J		0.26 U			1.3 J	0.36 J		0.39 R		
HMX		490	530	430	560	550	520	120	89 J	98	74	70	110
MNX		10 J	2.4 J		14 J			7.8	4.8		4.2		
NITROBENZENE		0.266 U	0.24 U	0.264 U	0.26 U	0.271 U	0.25 U	0.26 U	0.24 U	0.269 U	0.27 U	0.26 U	0.25 U
TETRYL		0.266 U	0.24 U	0.264 U	0.26 U	0.271 U	0.25 U	0.26 U	0.24 U	0.269 U	0.27 U	0.26 U	0.25 U
TNX		0.266 U	11 J		0.26 U			0.26 U	0.54 J		0.27 U		
Field Parameters													
TEMPERATURE	C	20.89	10.33	17.1	18.73			18.58	10.82	22.38	16.98		
DISSOLVED OXYGEN	MG/L	1.63	1.71				-9999	0.97	1.76				0.68
DISSOLVED OXYGEN - METER				1.4	1.15					1.47	0.52		
SPECIFIC CONDUCTANCE	MS/CM	0.299	0.197	0.249	0.27		0.574	0.683	0.607	0.79	0.63		0.95
OXIDATION REDUCTION POTENTIAL	MV	190	243.7	343.5	696.7		443	72	56	189.7	624.5		223
TURBIDITY	NTU	0.5	0.21	2.4	0		1.16	0.35	0.71	6.8	0		0.25
PH	S.U.	3.08	3.89	3.96	2.93		2.67	6.12	6.08	6.05	5.35		5.33
TEMPERATURE	C						13.46						12.91
Miscellaneous Parameters													
AMMONIA-N	MG/L	0.04	0.11					0.03	0.1				
NITRITE/NITRATE-N		10 J	4.8		2.4		5.3	2.9 J	4.7		1.4		2.2
TOTAL ORGANIC CARBON					3.1						11		

TABLE 3-1

SUMMARY OF CHEMICALS DETECTED, FIELD PARAMETERS, AND MISCELLANEOUS PARAMETERS FOR SWMU 12 GROUNDWATER
ROUNDS 1 THROUGH 6 IN THE PENNSYLVANIA UPPER WATER BEARING ZONE
NSWC CRANE
CRANE, INDIANA

	Location	12MWT16						12MWT17					
	Sampling Round	1	2	3	4	5	6	1	2	3	4	5	6
	Date	09/12/2004	02/16/2005	05/22/2005	08/23/2005	12/01/2005	05/18/2006	09/11/2004	02/17/2005	05/22/2005	08/23/2005	12/01/2005	05/18/2006
Explosives	**Units**												
1,3,5-TRINITROBENZENE	UG/L	1.1 J	1.3 J	2.4 J	3.1 J	3.3	5.2	0.66 J	0.82 J	0.74 J	0.92 J	1 J	2
1,3-DINITROBENZENE		0.271 U	0.245 U	0.25 U	0.27 U	0.24 U	0.25 U	0.43 J	0.34 J	0.266 U	0.27 U	0.27 J	0.25 U
2,4,6-TRINITROTOLUENE		0.271 U	8.2	10	0.27 U	0.24 U	9.9	0.255 UJ	2.3	2.2	0.27 U	2.3	2.2
2,4-DIAMINO-6-NITROTOLUENE		1.6 J	1.8 J		2.1 R			0.57 J	1.4 J		1.2 R		
2,4-DINITROTOLUENE		0.271 U	0.3 J	0.32 J	0.27 U	0.24 U	0.25 U	0.255 UJ	0.258 U	0.3 J	0.27 U	0.4 J	0.25 U
2,6-DIAMINO-4-NITROTOLUENE		0.271 U	0.245 U		0.27 U			0.255 UJ	0.258 U		0.27 U		
2,6-DINITROTOLUENE		1.8	1.7 J	1.9	2	1.5	2.5 J	0.82 J	1.6	1.2	1.1	1.1	1.5
2-AMINO-4,6-DINITROTOLUENE		76	100 J	120 J	160 J	96	120 J	14 J	30 J	27 J	32 J	29 J	32 J
2-NITROTOLUENE		0.271 U	0.245 U	0.25 U	0.27 U	0.24 U	0.25 U	0.255 UJ	0.258 U	0.266 U	0.27 U	0.252 U	0.25 U
3,5-DINITROANILINE		0.271 U	5.8		0.27 U			0.78 J	1.6		0.27 U		
3-NITROTOLUENE		0.68 J	0.245 U	0.25 U	0.34 R	0.24 U	0.25 U	0.255 UJ	0.258 U	0.266 U	0.27 U	0.252 U	0.25 U
4,4'-TN-AZOXY		0.542 U	0.49 U		0.53 U			0.51 UJ	0.515 U		0.54 U		
4-AMINO-2,6-DINITROTOLUENE		160	190	210	260	160	210	25 J	43	41	47	41	46
4-NITROTOLUENE		0.271 U	0.245 U	0.25 U	0.27 U	0.24 U	0.25 U	0.255 UJ	0.258 U	0.266 U	0.27 U	0.252 U	0.25 U
RDX		6300 J	7400	6500	8500	6500	8100	1600 J	2600	2000	2600	2500	2600
DNX		22	18		21 J			3.7 J	6.1		5.1		
HMX		370	400	450	650	480 J	600	76 J	130	110 J	150	150 J	150
MNX		250	200		260			44 J	79		67		
NITROBENZENE		0.271 U	0.245 U	0.25 U	0.27 U	0.24 U	0.25 U	0.255 UJ	0.258 U	0.266 U	0.27 U	0.252 U	0.25 U
TETRYL		0.271 U	0.245 U	0.25 U	0.27 U	0.24 U	0.25 U	0.255 UJ	0.258 U	0.266 U	0.27 U	0.252 U	0.25 U
TNX		7.8	6.2		8.9			1.3 J	2		2.3		
Field Parameters													
TEMPERATURE	C	15.52	15.02	19.18	18.34			19.24	13.02	15.88	18.94		
DISSOLVED OXYGEN	MG/L	4.79	4.49				3.56	6.05	8.3				2.95
DISSOLVED OXYGEN - METER				0						8.54			
SPECIFIC CONDUCTANCE	MS/CM	0.616	0.336	1.324	0.374		0.634	1.212	0.592	0.621	0.702		0.97
OXIDATION REDUCTION POTENTIAL	MV	54	101.4	41	186		489	144	131	249.9	170		370
TURBIDITY	NTU	512	144	50	280		106.8	226	131	29	130		55.4
PH	S.U.	6.05	6.25	6.2	1.49		4.95	5.43	5.88	4.72	1.52		5.08
TEMPERATURE	C						14.77						17.58
Miscellaneous Parameters													
AMMONIA-N	MG/L	0.07	0.11					0.04	0.18 J				
NITRITE/NITRATE-N		5.7 J	4.2		0.23		2.1	4.6 J	1.7		0.06		1.6
TOTAL ORGANIC CARBON					5.2						3.7		

TABLE 3-1

SUMMARY OF CHEMICALS DETECTED, FIELD PARAMETERS, AND MISCELLANEOUS PARAMETERS FOR SWMU 12 GROUNDWATER
ROUNDS 1 THROUGH 6 IN THE PENNSYLVANIA UPPER WATER BEARING ZONE
NSWC CRANE
CRANE, INDIANA

	Location	12MWT18						12MWT20					
	Sampling Round	1	2	3	4	5	6	1	2	3	4	5	6
	Date	09/26/2004	03/03/2005	05/22/2005	08/24/2005	12/01/2005	05/07/2006	09/27/2004	02/07/2005	05/22/2005	08/28/2005	12/05/2005	05/09/2006
Explosives	**Units**												
1,3,5-TRINITROBENZENE	UG/L	0.27 U	0.25 U	0.252 U	0.27 U	0.24 U	0.25 U	0.245 U	0.238 U	0.258 U	0.26 U	0.26 U	0.25 U
1,3-DINITROBENZENE		0.27 U	0.28 J	0.252 U	0.27 U	0.24 U	0.25 U	0.245 U	0.238 U	0.258 U	0.26 U	0.26 U	0.25 U
2,4,6-TRINITROTOLUENE		0.27 U	0.25 U	0.252 U	0.27 U	0.24 U	0.25 U	0.245 U	0.238 U	0.258 U	0.26 U	0.26 U	0.25 U
2,4-DIAMINO-6-NITROTOLUENE		0.27 U	0.25 U		0.27 U			0.245 U	0.238 U		0.26 U		
2,4-DINITROTOLUENE		0.27 U	0.25 U	0.252 U	0.27 U	0.24 U	0.25 U	0.245 U	0.238 U	0.258 U	0.26 U	0.26 U	0.25 U
2,6-DIAMINO-4-NITROTOLUENE		0.27 U	0.25 U		0.27 U			0.245 U	0.238 U		0.26 U		
2,6-DINITROTOLUENE		0.27 U	0.25 U	0.252 U	0.27 U	0.24 U	0.25 U	0.245 U	0.238 U	0.258 U	0.26 U	0.26 U	0.25 U
2-AMINO-4,6-DINITROTOLUENE		0.27 U	0.25 U	0.252 U	0.27 U	0.24 U	0.25 U	0.245 U	0.238 U	0.258 U	0.26 U	0.26 U	0.25 U
2-NITROTOLUENE		0.27 U	0.25 U	0.252 U	0.27 U	0.24 U	0.25 U	0.245 U	0.238 U	0.258 U	0.26 U	0.26 U	0.25 U
3,5-DINITROANILINE		0.27 U	0.25 U		0.27 U			0.245 U	0.238 U		0.26 U		
3-NITROTOLUENE		0.27 U	0.25 U	0.252 U	0.27 U	0.24 U	0.25 U	0.245 U	0.238 U	0.258 U	0.26 U	0.26 U	0.25 U
4,4'-TN-AZOXY		0.538 U	0.5 U		0.54 U			0.49 U	0.475 U		0.52 U		
4-AMINO-2,6-DINITROTOLUENE		0.27 U	0.25 U	0.252 U	0.27 U	0.24 U	0.25 U	0.245 U	0.238 U	0.258 U	0.26 U	0.26 U	0.25 U
4-NITROTOLUENE		0.27 U	0.25 U	0.252 U	0.27 U	0.24 U	0.25 U	0.245 U	0.238 U	0.258 U	0.26 U	0.26 U	0.25 U
RDX		20	32	24	14	26	20	1.4	3.1	4.2	1.2	1.3	4.1
DNX		0.27 U	0.25 U		0.27 U			0.245 U	0.238 U		0.26 U		
HMX		0.48 J	1 J	0.92	0.67	0.94 J	1.9 J	0.245 U	0.238 U	0.258 U	0.26 U	0.26 U	0.25 U
MNX		0.27 U	0.25 U		0.27 U			0.245 U	0.238 U		0.26 U		
NITROBENZENE		0.27 U	0.25 U	0.252 U	0.27 U	0.24 U	0.25 U	0.245 U	0.238 U	0.258 U	0.26 U	0.26 U	0.25 U
TETRYL		0.27 U	0.25 U	0.252 U	0.27 U	0.24 U	0.25 U	0.245 U	0.238 U	0.258 U	0.26 U	0.26 U	0.25 U
TNX		0.27 U	0.25 U		0.27 U			0.245 U	0.238 U		0.26 U		
Field Parameters													
TEMPERATURE	C	17	12.75	14.9	20.02			18.4	12.07	17.33	21.32		
DISSOLVED OXYGEN	MG/L	2.38	19.36				-9999	2.5	4.26				1.42
DISSOLVED OXYGEN - METER				0.38	5.11					0.47	5.18		
SPECIFIC CONDUCTANCE	MS/CM	2.472	2.132	1.457	1.384		-9999	2.095	1.696	1.783	1.327		2.84
OXIDATION REDUCTION POTENTIAL	MV	41	376.6	14.9	408		-9999	89.5	45.4	365	185		363
TURBIDITY	NTU	15	26.4	40	70		-9999	1	0.8	3.8	5.2		7.29
PH	S.U.	4.95	4.13	4.58	5.5		-9999	5.35	5.25	4.84	5.5		5.18
TEMPERATURE	C						-9999						16.51
Miscellaneous Parameters													
AMMONIA-N	MG/L	0.18 J	0.34					0.18	0.2				
NITRITE/NITRATE-N		0.71	0.05 U		0.025 U		0.56	0.67	0.97		0.025 U		0.41
TOTAL ORGANIC CARBON					3.1						4.2		

TABLE 3-1

SUMMARY OF CHEMICALS DETECTED, FIELD PARAMETERS, AND MISCELLANEOUS PARAMETERS FOR SWMU 12 GROUNDWATER
ROUNDS 1 THROUGH 6 IN THE PENNSYLVANIA UPPER WATER BEARING ZONE
NSWC CRANE
CRANE, INDIANA

	Location	12MWT22						12MWT23					
	Sampling Round	1	2	3	4	5	6	1	2	3	4	5	6
	Date	10/10/2004	02/21/2005	05/21/2005	08/25/2005	12/05/2005	05/17/2006	09/10/2004	02/20/2005	05/21/2005	08/26/2005	12/06/2005	05/19/2006
Explosives	**Units**												
1,3,5-TRINITROBENZENE	UG/L	2.6	0.24 U	0.255 U	0.27 U	0.26 U	0.25 U	0.258 U	0.24 U	0.275 U	0.26 U	0.24 U	0.25 U
1,3-DINITROBENZENE		0.49 J	0.24 U	0.255 U	0.27 U	0.26 U	0.25 U	0.258 U	0.24 U	0.275 U	0.26 U	0.24 U	0.25 U
2,4,6-TRINITROTOLUENE		96	0.26 J	0.255 U	0.54 R	0.31 J	0.86	0.258 U	0.24 U	0.275 U	0.26 U	0.24 U	0.25 U
2,4-DIAMINO-6-NITROTOLUENE		2.3 J	0.48 J		0.27 U			0.258 U	0.24 U		0.26 U		
2,4-DINITROTOLUENE		0.73	0.24 U	0.255 U	0.27 U	0.26 U	0.25 U	0.258 U	0.24 U	0.275 U	0.26 U	0.24 U	0.25 U
2,6-DIAMINO-4-NITROTOLUENE		0.266 U	0.24 U		0.27 U			0.258 U	0.24 U		0.26 U		
2,6-DINITROTOLUENE		2	0.24 U	0.255 U	0.27 U	0.26 U	0.25 U	0.258 U	0.24 U	0.275 U	0.26 U	0.24 U	0.25 U
2-AMINO-4,6-DINITROTOLUENE		5.9	0.24 U	0.255 U	0.27 U	0.43 J	0.25 U	0.258 U	0.24 U	0.275 U	0.26 U	0.24 U	0.25 U
2-NITROTOLUENE		0.266 U	0.24 U	0.255 U	0.27 U	0.26 U	0.25 U	0.258 U	0.24 U	0.275 U	0.26 U	0.24 U	0.25 U
3,5-DINITROANILINE		0.63 J	0.24 U		0.27 U			0.258 U	0.24 U		0.26 U		
3-NITROTOLUENE		0.266 U	0.24 U	0.255 U	0.27 U	2.5 J	0.25 U	0.258 U	0.24 U	0.275 U	0.26 U	0.24 U	0.25 U
4,4'-TN-AZOXY		0.532 U	0.48 U		0.53 U			0.515 U	0.48 U		0.51 U		
4-AMINO-2,6-DINITROTOLUENE		9.6	0.62	0.255 U	0.74	0.83	0.25 U	0.258 U	0.24 U	0.275 U	0.26 U	0.24 U	0.25 U
4-NITROTOLUENE		0.266 U	0.24 U	0.255 U	0.27 U	0.26 U	0.25 U	0.258 U	0.24 U	0.275 U	0.26 U	0.24 U	0.25 U
RDX		590	34	26	61	76	46	0.258 U	0.24 U	0.275 U	0.26 U	0.24 U	0.25 U
DNX		0.266 U	0.24 U		0.27 U			0.258 U	0.24 U		0.26 U		
HMX		32	5	3.7	5.2	6.3 J	5	0.258 U	0.24 U	0.275 U	0.26 U	0.24 U	0.25 U
MNX		0.81	0.43 J		0.35 J			0.258 U	0.24 U		0.26 U		
NITROBENZENE		0.266 U	0.24 U	0.255 U	0.27 U	0.26 U	0.25 U	0.258 U	0.24 U	0.275 U	0.26 U	0.24 U	0.25 U
TETRYL		0.266 U	0.24 U	0.255 U	0.27 U	0.26 U	0.25 U	0.258 U	0.24 U	0.275 U	0.26 U	0.24 U	0.25 U
TNX		0.266 U	0.24 U		0.27 U			0.258 U	0.24 U		0.26 U		
Field Parameters													
TEMPERATURE	C	15.13	12.51	13.54	17.49			18.14	12.66	17.46	20.57		
DISSOLVED OXYGEN	MG/L	6.02	6.1				5.05	5.08	1.79				2.01
DISSOLVED OXYGEN - METER				5.84	4.54					1.73	2.82		
SPECIFIC CONDUCTANCE	MS/CM	0.448	0.186	0.172	0.175		0.301	6.359	4.644	5.05	4.549		8.09
OXIDATION REDUCTION POTENTIAL	MV	365.3	182.1	290.6	159		244	301	504.6	498.5	493		426
TURBIDITY	NTU	7.79	9.66	73	50		33	218	6.8	12	150		127
PH	S.U.	5.27	5.61	5.65	5.5		6.01	2.94	3.33	2.93	4		3.02
TEMPERATURE	C						15.3						13.84
Miscellaneous Parameters													
AMMONIA-N	MG/L	0.005 UJ	0.01 UJ					8.9 J	4 J				
NITRITE/NITRATE-N		0.63	0.19		0.025 U		0.081	2.3 J	0.22		0.025 U		0.13
TOTAL ORGANIC CARBON					2.4						12		

TABLE 3-1

SUMMARY OF CHEMICALS DETECTED, FIELD PARAMETERS, AND MISCELLANEOUS PARAMETERS FOR SWMU 12 GROUNDWATER
ROUNDS 1 THROUGH 6 IN THE PENNSYLVANIA UPPER WATER BEARING ZONE
NSWC CRANE
CRANE, INDIANA

Location		12MWT28						12MWT36					
Sampling Round		1	2	3	4	5	6	1	2	3	4	5	6
Date		09/13/2004	02/15/2005	05/23/2005	08/28/2005	12/16/2005	05/07/2006	09/24/2004	03/04/2005	05/22/2005	08/24/2005	12/02/2005	05/07/2006
Explosives	**Units**												
1,3,5-TRINITROBENZENE	UG/L	0.269 U	0.242 U	0.271 U	0.26 U	0.27 U	0.25 UJ	0.252 U	0.24 U	0.271 U	0.24 U	0.27 U	0.29 U
1,3-DINITROBENZENE		0.269 U	0.242 U	0.271 U	0.26 U	0.27 U	0.25 UJ	0.252 U	0.24 U	0.271 U	0.24 U	0.27 U	0.29 U
2,4,6-TRINITROTOLUENE		0.269 U	0.242 U	0.271 U	0.26 UJ	0.27 U	0.25 UJ	0.252 U	0.24 U	0.271 U	0.24 U	0.27 U	0.29 U
2,4-DIAMINO-6-NITROTOLUENE		0.269 U	0.242 U		0.26 U			0.252 U	0.24 U		0.24 U		
2,4-DINITROTOLUENE		0.269 U	0.242 U	0.271 U	0.26 U	0.27 U	0.25 UJ	0.252 U	0.24 U	0.271 U	0.24 U	0.27 U	0.29 U
2,6-DIAMINO-4-NITROTOLUENE		0.269 U	0.242 U		0.26 U			0.252 U	0.24 U		0.24 U		
2,6-DINITROTOLUENE		0.269 U	0.242 U	0.271 U	0.26 U	0.27 U	0.25 UJ	0.252 U	0.24 U	0.271 U	0.24 U	0.27 U	0.29 U
2-AMINO-4,6-DINITROTOLUENE		0.269 U	0.242 U	0.271 U	0.26 U	0.27 U	0.25 UJ	0.252 U	0.24 U	0.271 U	0.24 U	0.27 U	0.29 U
2-NITROTOLUENE		0.269 U	0.242 U	0.271 U	0.26 U	0.27 U	0.25 UJ	0.252 U	0.24 U	0.271 U	0.24 U	0.27 U	0.29 U
3,5-DINITROANILINE		0.269 U	0.242 U		0.26 U			0.252 U	0.24 U		0.24 U		
3-NITROTOLUENE		0.269 U	0.242 U	0.271 U	0.26 U	0.27 U	0.25 UJ	0.252 U	0.24 U	0.271 U	0.24 U	0.27 U	0.29 U
4,4'-TN-AZOXY		0.538 U	0.485 U		0.52 U			0.505 U	0.48 U		0.49 U		
4-AMINO-2,6-DINITROTOLUENE		0.269 U	0.242 U	0.271 U	0.26 U	0.27 U	0.25 UJ	0.252 U	0.26 J	0.271 U	0.24 U	0.29 J	0.29 U
4-NITROTOLUENE		0.269 U	0.242 U	0.271 U	0.26 U	0.27 U	0.25 UJ	0.252 U	0.24 U	0.271 U	0.24 U	0.27 U	0.29 U
RDX		0.269 U	0.242 U	0.271 U	0.29 J	0.43 J	0.25 UJ	41	42	35	42	41	43
DNX		0.269 U	0.242 U		0.26 U			0.39 J	0.24 U		0.34 R		
HMX		0.269 U	0.242 U	0.271 U	0.26 U	0.27 U	0.25 UJ	6.1	6.9	5.7	7.2	7.3 J	7.5
MNX		0.269 U	0.242 U		0.26 U			1.1	1.1		1.1		
NITROBENZENE		0.269 U	0.242 U	0.271 U	0.26 U	0.27 U	0.25 UJ	0.252 U	0.24 U	0.271 U	0.24 U	0.27 U	0.29 U
TETRYL		0.269 U	0.242 U	0.271 U	0.26 U	0.27 U	0.25 UJ	0.252 U	0.24 U	0.271 U	0.24 U	0.27 U	0.29 U
TNX		0.269 U	0.242 U		0.26 U			0.252 U	0.24 U		0.24 U		
Field Parameters													
TEMPERATURE	C	16.31	16.17	14.49	19.73			19.94	13.02	16.67	26.34		
DISSOLVED OXYGEN	MG/L	7.29	4.17				0.68	3.69	2.63				0.45
DISSOLVED OXYGEN - METER				1.63	1.83					2.98	2.54		
SPECIFIC CONDUCTANCE	MS/CM	1.937	1.208	1.05	1.021		1.46	0.65	0.55	0.464	0.494		0.859
OXIDATION REDUCTION POTENTIAL	MV	75	82.7	237.4	704.3		241	332.5	222.7	232.6	636.8		299
TURBIDITY	NTU	10.83	9.03	4.72	60		145	0.82	0.22	0	0		0
PH	S.U.	6.33	6.41	6	1.32		5.92	6.02	6.29	6	5.9		5.57
TEMPERATURE	C						15.27						14.25
Miscellaneous Parameters													
AMMONIA-N	MG/L	0.005 U	0.01 U					0.1 J	0.01 U				
NITRITE/NITRATE-N		0.81 J	0.25		0.025 U		0.025 U	5.4	6.1		0.025 U		5.9
TOTAL ORGANIC CARBON					1.1						2.5		

TABLE 3-1

SUMMARY OF CHEMICALS DETECTED, FIELD PARAMETERS, AND MISCELLANEOUS PARAMETERS FOR SWMU 12 GROUNDWATER
ROUNDS 1 THROUGH 6 IN THE PENNSYLVANIA UPPER WATER BEARING ZONE
NSWC CRANE
CRANE, INDIANA

Location		12MWT38						12MWT42					
Sampling Round		1	2	3	4	5	6	1	2	3	4	5	6
Date		10/09/2004	02/20/2005	05/19/2005	08/28/2005	12/01/2005	05/17/2006	09/28/2004	02/19/2005	05/22/2005	08/25/2005	12/02/2005	05/18/2006
Explosives	**Units**												
1,3,5-TRINITROBENZENE	UG/L	0.25 U	0.242 U	0.252 U	0.26 U	0.25 U	0.25 U	0.266 U	0.245 U	0.26 U	0.26 U	0.264 U	0.25 U
1,3-DINITROBENZENE		0.25 U	0.242 U	0.252 U	0.26 U	0.25 U	0.25 U	0.266 U	0.245 U	0.26 U	0.26 U	0.264 U	0.25 U
2,4,6-TRINITROTOLUENE		0.25 U	0.242 U	0.252 U	0.26 UJ	0.25 U	0.25 U	0.266 U	0.245 U	0.26 U	0.26 U	0.264 U	0.25 U
2,4-DIAMINO-6-NITROTOLUENE		0.25 U	0.242 U		0.26 U			0.266 U	0.245 U		0.26 U		
2,4-DINITROTOLUENE		0.25 U	0.242 U	0.252 U	0.26 U	0.25 U	0.25 U	0.266 U	0.245 U	0.26 U	0.26 U	0.264 U	0.25 U
2,6-DIAMINO-4-NITROTOLUENE		0.25 U	0.242 U		0.26 U			0.266 U	0.245 U		0.26 U		
2,6-DINITROTOLUENE		0.25 U	0.242 U	0.252 U	0.26 U	0.25 U	0.25 U	0.266 U	0.245 U	0.26 U	0.26 U	0.264 U	0.25 U
2-AMINO-4,6-DINITROTOLUENE		0.25 U	0.242 U	0.252 U	0.26 U	0.25 U	0.25 U	0.266 U	0.245 U	0.26 U	0.26 U	0.264 U	0.25 U
2-NITROTOLUENE		0.25 U	0.242 U	0.252 U	0.26 U	0.25 U	0.25 U	0.266 U	0.245 U	0.26 U	0.26 U	0.264 U	0.25 U
3,5-DINITROANILINE		0.25 U	0.242 U		0.26 U			0.266 U	0.245 U		0.26 U		
3-NITROTOLUENE		0.25 U	0.242 U	0.252 U	0.26 U	0.25 U	0.25 U	0.266 U	0.245 U	0.26 U	0.26 U	0.264 U	0.25 U
4,4'-TN-AZOXY		0.5 U	0.485 U		0.52 U			0.532 U	0.49 U		0.52 U		
4-AMINO-2,6-DINITROTOLUENE		0.25 U	0.242 U	0.252 U	0.26 U	0.25 U	0.25 U	0.266 U	0.245 U	0.26 U	0.26 U	0.264 U	0.25 U
4-NITROTOLUENE		0.25 U	0.242 U	0.252 U	0.26 U	0.25 U	0.25 U	0.266 U	0.245 U	0.26 U	0.26 U	0.264 U	0.25 U
RDX		42	52 J	59	57	26	61	11	19	17	17	21	15
DNX		0.25 U	0.242 U		0.26 U			0.266 U	0.245 U		0.26 U		
HMX		0.35 J	0.71 J	0.64 J	0.79	0.29 J	0.78	18	27	25	29	37 J	30
MNX		0.25 U	0.36 J		0.28 J			0.266 U	0.245 U		0.26 U		
NITROBENZENE		0.25 U	0.242 U	0.252 U	0.26 U	0.25 U	0.25 U	0.266 U	0.245 U	0.26 U	0.26 U	0.264 U	0.25 U
TETRYL		0.25 U	0.242 U	0.252 U	0.26 U	0.25 U	0.25 U	0.266 U	0.245 U	0.26 U	0.26 U	0.264 U	0.25 U
TNX		0.25 U	0.242 U		0.26 U			0.266 U	0.245 U		0.26 U		
Field Parameters													
TEMPERATURE	C	17.61	10.48	15.02	22.36			17.5	11.27	15.26	14.86		
DISSOLVED OXYGEN	MG/L	6.88	3.67				2.22	0.18	1.25				1.43
DISSOLVED OXYGEN - METER				2.87	3.46					2.47	0.82		
SPECIFIC CONDUCTANCE	MS/CM	0.607	0.33	0.297	0.321		0.568	0.625	0.303	0.346	0.299		0.414
OXIDATION REDUCTION POTENTIAL	MV	171.3	399.7	420	688.6		472	523	279.9	398.2	806.6		398
TURBIDITY	NTU	5	1.21	1.4	0.4		1.81	1.01	0.55	5	7.8		3.5
PH	S.U.	4.2	3.6	3.7	2.97		3.07	4	4.24	5	3.43		4.31
TEMPERATURE	C						15.04						12.6
Miscellaneous Parameters													
AMMONIA-N	MG/L	0.005 UJ	0.08 J					0.005 U	0.01 UJ				
NITRITE/NITRATE-N		0.07	0.05 U		0.025 U		0.025 U	0.4	0.21		0.025 U		0.19
TOTAL ORGANIC CARBON					2.6						2.4		

A blank cell indicates that no sample was collected or analysis was conducted for the parameter.

J – Indicates that the chemical was detected; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported cc considered to be an estimate of the true concentration.

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

UJ – Indicates that the chemical was not detected; however, the detection limit (sample-specific detection limit) is considered to be estimated based on problems encountered during laboratory analysis. T numerical detection limit is regarded as inaccurate or imprecise.

R – Indicates that the chemical may or may not be present. The positive analytical result reported by the laboratory is considered to be unreliable and unusable. This qualifier is applied in cases of gross technical deficiencies.

UG/L - micrograms per liter
C - degrees centigrade
MG/L - milligrams per liter
MS/CM - millisiemens per centimeter
MV - millivolts
NTU - nephelometric turbidity units
S.U. - standard units

TABLE 3-2

DESCRIPTIVE STATISTICS FOR
SWMU 12 (MINE FILL A) ROUND 6 GROUNDWATER IN THE PENNSYLVANIA UPPER ZONE
NSWC CRANE
CRANE, INDIANA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive Detects	Sample of Maximum Detect
Energetics (ug/L)							
1,3,5-TRINITROBENZENE	4/16	2	95	0.25 - 0.29	7.2	29	12GWT1106
1,3-DINITROBENZENE	2/16	7	10	0.25 - 0.29	1.2	8.6	12GWT1106
2,4,6-TRINITROTOLUENE	5/16	0.86	140	0.25 - 0.29	17	55	12GWT1106
2,6-DINITROTOLUENE	2/16	1.5	2.5 J	0.25 - 25	1.9	2.0	12GWT1606
2-AMINO-4,6-DINITROTOLUENE	6/16	3.7 J	120 J	0.25 - 0.29	13	35	12GWT1606
4-AMINO-2,6-DINITROTOLUENE	6/16	4.5	210	0.25 - 0.29	21	56	12GWT1606
HMX	12/16	0.78	600	0.25 - 0.25	117	156	12GWT1606
RDX	13/16	4.1	8100	0.25 - 0.25	1316	1620	12GWT1606
Miscellaneous Parameters							
NITRITE/NITRATE-N	12/16	0.081	5.9	0.025 - 0.025	1.3	1.7	12GWT3606

TABLE 3-3

SUMMARY OF CHEMICALS DETECTED, FIELD PARAMETERS, AND MISCELLANEOUS PARAMETERS FOR SWMU 12 GROUNDWATER
ROUNDS 1 THROUGH 6 IN THE PENNYSLVANIA MIDDLE WATER BEARING ZONE
NSWC CRANE
CRANE, INDIANA

	Location	12MWT30						12MWT31					
	Sampling Round	1	2	3	4	5	6	1	2	3	4	5	6
	Date	No Sample	No Sample	05/21/2005	No Sample	No Sample	No Sample	09/27/2004	02/07/2005	05/23/2005	08/24/2005	12/14/2005	05/19/2006
Explosives	**Units**												
1,3,5-TRINITROBENZENE	UG/L			2.78 U				0.27 U	0.275 U	0.258 U	0.27 U	0.27 U	0.25 U
1,3-DINITROBENZENE				2.78 U				0.27 U	0.275 U	0.258 U	0.27 U	0.27 U	0.25 U
2,4,6-TRINITROTOLUENE				2.78 U				0.27 U	0.275 U	0.258 U	0.27 U	0.27 U	0.25 U
2,4-DIAMINO-6-NITROTOLUENE								0.27 U	0.275 U		0.27 U		
2,4-DINITROTOLUENE				2.78 U				0.27 U	0.275 U	0.258 U	0.27 U	0.27 U	0.25 U
2,6-DIAMINO-4-NITROTOLUENE								0.27 U	0.275 U		0.27 U		
2,6-DINITROTOLUENE				2.78 U				0.27 U	0.275 U	0.258 U	0.27 U	0.27 U	0.25 U
2-AMINO-4,6-DINITROTOLUENE				2.78 U				0.27 U	0.275 U	0.258 U	0.27 U	0.27 U	0.25 U
2-NITROTOLUENE				3.2 J				0.27 U	0.275 U	0.258 U	0.27 U	0.27 U	0.25 U
3,5-DINITROANILINE								0.27 U	0.275 U		0.27 U		
3-NITROTOLUENE				2.78 U				0.27 U	0.275 U	0.258 U	0.27 U	0.27 U	0.25 U
4,4'-TN-AZOXY								0.532 U	0.55 U		0.54 U		
4-AMINO-2,6-DINITROTOLUENE				2.78 U				0.27 U	0.275 U	0.258 U	0.27 U	0.27 U	0.25 U
4-NITROTOLUENE				2.78 U				0.27 U	0.275 U	0.258 U	0.27 U	0.27 U	0.25 U
RDX				2.78 U				0.27 U	0.275 U	0.258 U	0.27 U	0.27 U	0.25 U
DNX								0.27 U	0.275 U		0.27 U		
HMX				2.78 U				0.27 U	0.275 U	0.258 U	0.27 U	0.27 U	0.25 U
MNX								0.27 U	0.275 U		0.27 U		
NITROBENZENE				2.78 U				0.27 U	0.275 U	0.258 U	0.27 U	0.27 U	0.25 U
TETRYL				2.78 U				0.27 U	0.275 U	0.258 U	0.27 U	0.27 U	0.25 U
TNX								0.27 U	0.275 U		0.27 U		
Field Parameters													
TEMPERATURE	C							16.87	10.99	18.04	16.95		
DISSOLVED OXYGEN	MG/L							6.45	1.16				1.42
DISSOLVED OXYGEN - METER										3.77	0.54		
SPECIFIC CONDUCTANCE	MS/CM							0.507	0.431	0.374	337		0.615
OXIDATION REDUCTION POTENTIAL	MV							301.9	70.7	335	576		72
TURBIDITY	NTU							25	75	25	9.8		13
PH	S.U.							7.05	8.09	7.58	6.93		8.06
Miscellaneous Parameters													
AMMONIA-N	MG/L							0.37 J	0.45				
NITRITE/NITRATE-N								0.05 U	0.05 U		1		0.089
TOTAL ORGANIC CARBON											1 U		

TABLE 3-3

SUMMARY OF CHEMICALS DETECTED, FIELD PARAMETERS, AND MISCELLANEOUS PARAMETERS FOR SWMU 12 GROUNDWATER
ROUNDS 1 THROUGH 6 IN THE PENNYSLVANIA MIDDLE WATER BEARING ZONE
NSWC CRANE
CRANE, INDIANA

	Location	12MWT32						12MWT46					
	Sampling Round	1	2	3	4	5	6	1	2	3	4	5	6
	Date	09/28/2004	02/08/2005	05/22/2005	08/25/2005	12/15/2005	05/07/2006	11/13/2004	03/03/2005	12/04/2005	No Sample	No Sample	No Sample
Explosives	**Units**												
1,3,5-TRINITROBENZENE	UG/L	0.248 U	0.242 U	0.245 U	0.27 U	0.264 U	0.25 U	0.255 U	0.26 U	0.26 U			
1,3-DINITROBENZENE		0.248 U	0.242 U	0.245 U	0.27 U	0.264 U	0.25 U	0.255 U	0.26 U	0.26 U			
2,4,6-TRINITROTOLUENE		0.248 U	0.242 U	0.245 U	0.27 U	0.264 U	0.25 U	0.255 U	0.26 U	0.26 U			
2,4-DIAMINO-6-NITROTOLUENE		0.248 U	0.242 U		0.27 U			0.255 U	0.26 U				
2,4-DINITROTOLUENE		0.248 U	0.242 U	0.245 U	0.27 U	0.264 U	0.25 U	0.255 U	0.26 U	0.26 U			
2,6-DIAMINO-4-NITROTOLUENE		0.248 U	0.242 U		0.27 U			0.255 U	0.26 U				
2,6-DINITROTOLUENE		0.248 U	0.242 U	0.245 U	0.27 U	0.264 U	0.25 U	0.255 U	0.26 U	0.26 U			
2-AMINO-4,6-DINITROTOLUENE		0.248 U	0.242 U	0.245 U	0.27 U	0.264 U	0.25 U	0.255 U	0.26 U	0.26 U			
2-NITROTOLUENE		0.248 U	0.242 U	0.245 U	0.27 U	0.31 J	0.25 U	0.255 U	0.26 U	0.26 U			
3,5-DINITROANILINE		0.248 U	0.242 U		0.27 U			0.255 U	0.26 U				
3-NITROTOLUENE		0.248 U	0.242 U	0.245 U	0.27 U	0.264 U	0.25 U	0.255 U	0.26 U	0.26 U			
4,4'-TN-AZOXY		0.495 U	0.485 U		0.53 U			0.51 U	0.52 U				
4-AMINO-2,6-DINITROTOLUENE		0.248 U	0.242 U	0.245 U	0.27 U	0.264 U	0.25 U	0.255 U	0.26 U	0.26 U			
4-NITROTOLUENE		0.248 U	0.242 U	0.245 U	0.27 U	0.264 U	0.25 U	0.255 U	0.26 U	0.26 U			
RDX		0.248 U	0.242 U	0.245 U	0.27 U	0.264 U	0.25 U	0.255 U	0.26 U	0.26 U			
DNX		0.248 U	0.242 U		0.27 U			0.255 U	0.26 U				
HMX		0.248 U	0.242 U	0.245 U	0.27 U	0.264 U	0.25 U	0.255 U	0.26 U	0.26 U			
MNX		0.248 U	0.242 U		0.27 U			0.255 U	0.26 U				
NITROBENZENE		0.248 U	0.242 U	0.245 U	0.27 U	0.264 U	0.25 U	0.255 U	0.26 U	0.26 U			
TETRYL		0.248 U	0.242 U	0.245 U	0.27 U	0.264 U	0.25 U	0.255 U	0.26 U	0.26 U			
TNX		0.248 U	0.242 U		0.27 U			0.255 U	0.26 U				
Field Parameters													
TEMPERATURE	C	14.28	11.67	16.89	19.49			14.99	12.99				
DISSOLVED OXYGEN	MG/L	11.72	1.06					5.42	0.64				
DISSOLVED OXYGEN - METER				4.27	0.64								
SPECIFIC CONDUCTANCE	MS/CM	1.257	1.355	0.337	1.23			0.382	0.296				
OXIDATION REDUCTION POTENTIAL	MV	121.2	-7.1	246.5	150			101	-10				
TURBIDITY	NTU	315	360	31	9.4			23	4.61				
PH	S.U.	6.57	6.7	4.27	6.2			5.68	6.02				
Miscellaneous Parameters													
AMMONIA-N	MG/L	1	1.7					1.8 J	0.82				
NITRITE/NITRATE-N		0.025 U	0.05 U		0.025 U		0.12	0.025 U	0.05 U				
TOTAL ORGANIC CARBON					1 U								

A blank cell indicates that no sample was collected or analysis was conducted for the parameter.
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
J – Indicates that the chemical was detected; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is considered to be an estimate of the true concentration.
UG/L - micrograms per liter
C - degrees centigrade
MG/L - milligrams per liter
MS/CM - millisiemens per centimeter
MV - millivolts
NTU - nephelometric turbidity units
S.U. - standard units

TABLE 3-4

DESCRIPTIVE STATISTICS FOR
SWMU 12 (MINE FILL A) ROUND 6 GROUNDWATER IN THE PENNSYLVANIA MIDDLE ZONE
NSWC CRANE
CRANE, INDIANA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive Detects	Sample of Maximum Detect
Miscellaneous Parameters (mg/L)							
NITRITE/NITRATE-N	2/2	0.089	0.12	- -	0.105	0.105	12GWT3206

TABLE 3-5

SUMMARY OF CHEMICALS DETECTED, FIELD PARAMETERS, AND MISCELLANEOUS PARAMETERS FOR SWMU 12
GROUNDWATER ROUNDS 1 THROUGH 6 IN THE MISSISSIPPI GLEN DEAN WATER BEARING ZONE
NSWC CRANE
CRANE, INDIANA

Location		12MWT41											
Sampling Round		1		2		3		4		5		6	
Date		11/10/2004		02/19/2005		05/23/2005		08/25/2005		12/01/2005		05/20/2006	
Explosives	Units												
1,3,5-TRINITROBENZENE	UG/L	0.266	U	0.255	U	0.26	U	0.26	U	0.25	U	0.25	U
1,3-DINITROBENZENE		0.266	U	0.255	U	0.26	U	0.26	U	0.25	U	0.25	U
2,4,6-TRINITROTOLUENE		0.266	U	0.255	U	0.26	U	0.26	U	0.25	U	0.25	U
2,4-DIAMINO-6-NITROTOLUENE		0.266	U	0.255	U			0.26	U				
2,4-DINITROTOLUENE		0.266	U	0.255	U	0.26	U	0.26	U	0.25	U	0.25	U
2,6-DIAMINO-4-NITROTOLUENE		0.266	U	0.255	U			0.26	U				
2,6-DINITROTOLUENE		0.266	U	0.255	U	0.26	U	0.26	U	0.25	U	0.25	U
2-AMINO-4,6-DINITROTOLUENE		0.266	U	0.255	U	0.26	U	0.26	U	0.25	U	0.25	U
2-NITROTOLUENE		0.266	U	0.255	U	0.26	U	0.26	U	0.25	U	0.25	U
3,5-DINITROANILINE		0.266	U	0.255	U			0.26	U				
3-NITROTOLUENE		0.266	U	0.255	U	0.26	U	0.26	U	0.25	U	0.25	U
4,4'-TN-AZOXY		0.532	U	0.51	U			0.53	U				
4-AMINO-2,6-DINITROTOLUENE		0.266	U	0.255	U	0.26	U	0.26	U	0.25	U	0.25	U
4-NITROTOLUENE		0.266	U	0.255	U	0.26	U	0.26	U	0.25	U	0.25	U
RDX		0.266	U	0.255	U	0.26	U	0.26	U	0.33	J	0.25	U
DNX		0.266	U	0.255	U			0.26	U				
HMX		0.266	U	0.255	U	0.26	U	0.26	U	0.25	U	0.25	U
MNX		0.266	U	0.255	U			0.26	U				
NITROBENZENE		0.266	U	0.255	U	0.26	U	0.26	U	0.25	U	0.25	U
TETRYL		0.266	U	0.255	U	0.26	U	0.26	U	0.25	U	0.25	U
TNX		0.266	U	0.255	U			0.26	U				
Field Parameters													
TEMPERATURE	C	14.12		10.02		13.77		15.5					
DISSOLVED OXYGEN	MG/L	2.8		1.26									
DISSOLVED OXYGEN - METER						0.59		0.54					
SPECIFIC CONDUCTANCE	MS/CM	0.922		0.754		0.579		0.544					
OXIDATION REDUCTION POTENTIAL	MV	71		-39		23.8		767.6					
TURBIDITY	NTU	4		3.6		7.6		34					
PH	S.U.	6.85		6.78		6		2.81					
TEMPERATURE	C												
Miscellaneous Parameters													
AMMONIA-N	MG/L	0.16	J	0.46	J								
NITRITE/NITRATE-N		0.025	U	0.05	U			0.025	U			0.025	U
TOTAL ORGANIC CARBON								1	U				

A blank cell indicates that no sample was collected or analysis was conducted for the parameter.
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
J – Indicates that the chemical was detected; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is considered to be an estimate of the true concentration.
UG/L - micrograms per liter
C - degrees centigrade
MG/L - milligrams per liter
MS/CM - millisiemens per centimeter
MV - millivolts
NTU - nephelometric turbidity units
S.U. - standard units

TABLE 3-6

SUMMARY OF CHEMICALS DETECTED, FIELD PARAMETERS,
AND MISCELLANEOUS PARAMETERS FOR SWMU 12 SURFACE WATER
ROUNDS 1 THROUGH 6
NSWC CRANE
CRANE, INDIANA

Location		12SW/SD09						12SW/SD11					
Sampling Round		1	2	3	4	5	6	1	2	3	4	5	6
Date		10/27/2004	03/06/2005	05/20/2005	08/27/2005	11/29/2005	05/16/2006	10/12/2004	03/05/2005	05/20/2005	08/27/2005	11/29/2005	05/16/2006
Explosives	units												
RDX		19	8.3	12	9.2	19	10	5.6 J	1.9	4.5	0.25 U	5.3	2.5
DNX		0.264 U	0.258 U		0.26 U			0.24 UJ	0.24 U		0.25 U		
MNX		0.52 J	0.258 U		0.72			0.24 UJ	0.24 U		0.25 U		
TNX		0.264 U	0.258 U		0.26 U			0.24 UJ	0.24 U		0.25 U		
Field Parameters													
TEMPERATURE	C	15.72	2.86	15.3	21.78			12.13	4.89	14.57	20.43		
DISSOLVED OXYGEN	MG/L	10.28	4.64				12.93	1.19	2.45				11.59
DISSOLVED OXYGEN - METER				9.65	6.77					9.21	7.02		
SPECIFIC CONDUCTANCE	MS/CM	0.299	0.095	0.117	0.184		0.192	0.427	0.107	0.116	0.11		0.211
OXIDATION REDUCTION POTENTIAL	MV	67.7	189	193	157			169.6	76	109	209		
TURBIDITY	NTU	17.1	2.7	21	21		5.13	82.6	5.56	19	27		4.01
PH	S.U.	7.41	6.59	7.01	7.27		7.58	6.98	6.63	6.63	6.83		7.23
TEMPERATURE	C						12						12.1
Miscellaneous Parameters													
AMMONIA-N	MG/L	0.03 J	0.005 U					4.2 J	0.005 U				
DISSOLVED OXYGEN													
NITRITE/NITRATE-N		1.9	0.37 J		0.2		0.19	0.025 U	0.025 UJ		0.025 U		0.077

TABLE 3-6

SUMMARY OF CHEMICALS DETECTED, FIELD PARAMETERS,
AND MISCELLANEOUS PARAMETERS FOR SWMU 12 SURFACE WATER
ROUNDS 1 THROUGH 6
NSWC CRANE
CRANE, INDIANA

Location		12SW/SD14					12SW/SD24					
Sampling Round		1	2	3	5	6	1	2	3	4	5	6
Date		11/01/2004	03/07/2005	05/20/2005	11/29/2005	05/16/2006	10/27/2004	03/05/2005	05/20/2005	08/27/2005	11/29/2005	05/16/2006
Explosives	units											
RDX		12	55	25	52	20	0.8	0.39 J	0.46 J	0.24 U	0.58	0.25 U
DNX		0.24 U	0.248 U				0.248 U	0.252 U		0.24 U		
MNX		0.24 U	0.41 J				0.248 U	0.252 U		0.24 U		
TNX		0.24 U	0.248 U				0.248 U	0.252 U		0.24 U		
Field Parameters												
TEMPERATURE	C	15.07	8.6	17.33			15.66	5.59	15.08	18.33		
DISSOLVED OXYGEN	MG/L	10.26	4.33			10.01	11.74	2.79				12.89
DISSOLVED OXYGEN - METER				7.98					9.88	2.6		
SPECIFIC CONDUCTANCE	MS/CM	0.86	0.301	0.32		0.43	0.2706	0.14	0.144	0.218		0.266
OXIDATION REDUCTION POTENTIAL	MV	52.3	241	187			61.8	126	187	390		
TURBIDITY	NTU	137	59	800		18	18.3	3.1	17	0		1.81
PH	S.U.	7.69	5.99	7.36		7.77	7.55	7.1	7.16	6.16		7.51
TEMPERATURE	C					14.6						12.2
Miscellaneous Parameters												
AMMONIA-N	MG/L	0.24 J	0.07				0.021 J	0.005 U				
DISSOLVED OXYGEN												
NITRITE/NITRATE-N		3.8	1.2			1.3	0.1	0.025 UJ		0.025 U		0.12

TABLE 3-6

SUMMARY OF CHEMICALS DETECTED, FIELD PARAMETERS,
AND MISCELLANEOUS PARAMETERS FOR SWMU 12 SURFACE WATER
ROUNDS 1 THROUGH 6
NSWC CRANE
CRANE, INDIANA

	Location	12SW/SD25						12SW/SD27					
	Sampling Round	1	2	3	4	5	6	1	2	3	4	5	6
	Date	10/11/2004	03/05/2005	05/20/2005	08/27/2005	11/29/2005	05/16/2006	10/12/2004	03/05/2005	05/20/2005	08/27/2005	11/29/2005	05/16/2006
Explosives	units												
RDX		0.258 U	0.26 U	0.248 U	0.26 U	0.242 U	0.25 U	0.242 U	0.25 U	0.28 J	0.25 U	0.24 U	0.25 U
DNX		0.258 U	0.26 U		0.26 U			0.242 U	0.25 U		0.25 U		
MNX		0.258 U	0.26 U		0.26 U			0.242 U	0.25 U		0.25 U		
TNX		0.258 U	0.26 U		0.26 U			0.242 U	0.25 U		0.25 U		
Field Parameters													
TEMPERATURE	C	12.58	5.25	14.17	21.75			13.55	5.21	14.18	22.74		
DISSOLVED OXYGEN	MG/L	8.89	2.97				11.8	7.44	1.95				13.31
DISSOLVED OXYGEN - METER				10.27	7.15					10.02	7.27		
SPECIFIC CONDUCTANCE	MS/CM	0.282	0.078	0.082	0.224		0.16	0.267	0.092	0.087	0.221		0.179
OXIDATION REDUCTION POTENTIAL	MV	260.5	116	173	246			266.2	113	172	242		
TURBIDITY	NTU	2.4	3.76	16	0		3.89		9.15	30	14		2.04
PH	S.U.	6.92	7.13	6.88	7.4		7.47	6.81	6.76	6.77	7.47		7.14
TEMPERATURE	C						12						11.8
Miscellaneous Parameters													
AMMONIA-N	MG/L	0.005 UJ	0.005 U					0.18 J	0.005 U				
DISSOLVED OXYGEN													
NITRITE/NITRATE-N		0.025 U	0.025 UJ		0.025 U		0.025 U	0.025 U	0.025 UJ		0.025 U		0.063 J

TABLE 3-6

SUMMARY OF CHEMICALS DETECTED, FIELD PARAMETERS,
AND MISCELLANEOUS PARAMETERS FOR SWMU 12 SURFACE WATER
ROUNDS 1 THROUGH 6
NSWC CRANE
CRANE, INDIANA

Location		12SW/SD31						12SW/SD34					
Sampling Round		1	2	3	4	5	6	1	2	3	4	5	6
Date		No Sample	03/05/2005	05/20/2005	No Sample	11/29/2005	05/16/2006	No Sample	03/06/2005	05/20/2005	08/27/2005	11/29/2005	05/16/2006
Explosives	units												
RDX			20	34		47	23		140	99	3.1	83	200
DNX			0.258 U						0.271 U		0.29 U		
MNX			0.258 U						1.9		0.29 U		
TNX			0.258 U						0.271 U		0.29 U		
Field Parameters													
TEMPERATURE	C		7.35	15.8					10.04	16.28	20.56		
DISSOLVED OXYGEN	MG/L		3.55				11.65		3.52				11.08
DISSOLVED OXYGEN - METER				9.63						8.61	2.75		
SPECIFIC CONDUCTANCE	MS/CM		0.081	0.184			0.242		0.404	0.462	0.456		0.442
OXIDATION REDUCTION POTENTIAL	MV		98	138					141	177	116		
TURBIDITY	NTU		40	40			17		130	130	8.7		45
PH	S.U.		7.46	7.42			7.61		7.18	7.58	7.46		7.72
TEMPERATURE	C						15.4						14
Miscellaneous Parameters													
AMMONIA-N	MG/L		0.14						0.08				
DISSOLVED OXYGEN													
NITRITE/NITRATE-N			0.51 J				0.4		0.81		0.025 U		1.2

A blank cell indicates that no sample was collected or analysis was conducted for the parameter.
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported
J – Indicates that the chemical was detected; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is considered to be an estimate of t
UG/L - micrograms per liter
C - degrees centigrade
MG/L - milligrams per liter
MS/CM - millisiemens per centimeter
MV - millivolts
NTU - nephelometric turbidity units
S.U. - standard units

TABLE 3-7

DESCRIPTIVE STATISTICS FOR
SWMU 12 (MINE FILL A) ROUND 6 SURFACE WATER
NSWC CRANE
CRANE, INDIANA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive Detects	Sample of Maximum Detect
Explosives (ug/L)							
2,4,6-TRINITROTOLUENE	1/8	180	180	0.25	23	180	12SW3104
2-AMINO-4,6-DINITROTOLUENE	1/8	5.9 J	5.9 J	0.25	0.85	5.9	12SW3104
4-AMINO-2,6-DINITROTOLUENE	3/8	0.71	32	0.25	4.3	11	12SW3104
HMX	5/8	2.1	55	0.25	9.7	16	12SW3405
RDX	5/8	2.5	200	0.25	32	51	12SW3405
Miscellaneous Parameters (mg/L)							
NITRITE/NITRATE-N	7/8	0.063 J	1.3	0.025	0.42	0.48	12SW1405

4.0 DATA EVALUATION

Section 4 presents groundwater and surface water monitoring data for Rounds 1 through 6. The information presented includes potentiometric surface contours and temporal plots for each groundwater and surface water sampling location included in the SWMU 12 long term monitoring program. The objective of the long term monitoring program at SWMU 12 is to collect enough monitoring data (up to nine rounds) to determine the nature and extent of contamination, whether residual explosives are naturally degrading, and provide data for making remedy decisions for residual explosives contamination to complete the CMS.

The information being provided in this monitoring program fulfills the requirements established by the U.S. EPA Region 5 as described in the document entitled "Region 5 Framework for Monitored Natural Attenuation Decisions for Groundwater" (U.S. EPA 2000). The framework summarizes the current state-of-the-science and U.S. EPA policy on the use of MNA. The framework also provides technical direction for the collection of specific primary and secondary monitoring information to demonstrate a net loss of contaminants and processes responsible for the loss.

The primary MNA monitoring information requirements are identified below in bold type along with supporting information being provided by the SWMU 12 long term monitoring program.

- **Monitoring data should include analytical results for the contaminants of concern and their degradation products from nine or more rounds of samples collected under non-pumping conditions over a period of three to five years.** The SWMU 12 long term monitoring program is providing analytical results for select explosives and degradation by-products. As indicated in the SWMU 12 RFI, RDX is considered to be the principal chemical of concern because is it a site-related contaminant and has been detected more frequently and at higher concentrations than any other explosive. The degradation by-products for RDX are DNX, MNX, and TNX. The long-term monitoring program is scheduled to include nine rounds of sampling, under non-pumping conditions, to provide information on trends in groundwater and surface water concentrations of explosives and explosives degradation by-productions. To date, six rounds of groundwater sampling events have been conducted in September 2004, March, 2005, May, 2005, August, 2005, November and December, 2005, and May 2006. The remaining three rounds of sampling are expected to be completed in 2007 if monitoring continues on a quarterly basis.

- **There should be at least two years of quarterly sampling to evaluate seasonal effects on the contaminant concentrations.** At the completion of the ninth round of sampling at SWMU 12, quarterly monitoring will have been conducted for at least 3 years.

- **The data should be collected from appropriately located sampling points, including within the source area, within the center of the plume and at the leading edges of the plume.** The SWMU 12 long term monitoring program includes 21 wells. The location of each well relative to the contamination plume is discussed in Section 4.1.

- **Samples should be collected from points located vertically (above and below) and horizontally (upgradient and downgradient) outside the area of groundwater contamination.** The SMWU 12 long term monitoring program includes wells located in the Puz, Pmz, and Mgd water bearing zones to evaluate if contamination is migrating vertically to the lower aquifer (Mgd). Through Round 4, explosives contamination has been detected in the Puz and Pmz aquifers, but not in the Mgd aquifer. In Round 5, RDX was detected at a low concentration in the Mgd indicating that explosives have migrated to the lower aquifer. However, there were no detections of explosives in the Mgd in Round 6. In addition, the monitoring program includes monitoring wells positioned upgradient and downgradient of the source area, within the source plume and along the outside area of the groundwater contamination.

- **The most recent analytical data on groundwater should be no more than two years old at the time of evaluation.** The ninth round of sampling is expected to be completed in 2007. A final report evaluating the MNA program through nine rounds of sampling is expected to be issued in late 2007 or early 2008. As a result, the most recent analytical data will be no more than two years old.

- **Demonstration of a trend of decreasing contamination concentration must be clear and meaningful and be based on statistical tests which indicate a high degree of confidence in the apparent trend line.** The SWMU 12 MNA report summarizing nine rounds of sampling will include temporal plots of RDX and degradation by-product concentrations, along with a detailed statistical evaluation.

- **Additional rounds of samples, beyond nine rounds, may be required to demonstrate the decreasing trend.** SWMU 12 MNA monitoring data will be evaluated after nine rounds and a decision will be made if additional data is needed.

The secondary MNA monitoring information requirements are identified below in bold type along with supporting information being provided by the SWMU 12 long term monitoring program.

- **The monitoring data should be collected from appropriate locations that are distributed both vertically and horizontally throughout the plume.** The SWMU 12 long term monitoring program includes monitoring wells located in the Puz, Pmz, and Mgd water bearing zones to evaluate if contamination is migrating vertically to the lower aquifers. In addition, the monitoring program includes monitoring wells positioned upgradient and downgradient of the source area, within the source plume and along the outside area of the groundwater contamination. The location of each well relative to the contamination plume is discussed in Section 4.1 below.

- **Sample locations should consider heterogeneities in geologic structures and in the spatial distribution of contaminants. Groundwater flow paths and rates should be fully and accurately defined.** Groundwater elevations are being measured during each sampling round to develop potentiometric analyses of groundwater direction and flow rates and the results will be presented in the final MNA report.

- **Locations should be sampled under non-pumping conditions and should include the following information:**

  - **Contaminants of concern and potential degradation by-products.** All sampling is being conducted under non-pumping conditions. The SWMU 12 monitoring program is providing analytical results for RDX and the degradation by-products DNX, MNX, and TNX.

  - **Routine and Other Indicator Parameters.** The monitoring data also includes the routine indicator parameters DO, ORP, pH, specific conductance, temperature, turbidity, ammonia, and nitrite/nitrate concentrations.

  - **Vertical and horizontal characterization of the distribution of hydraulic conductivity and its affect on contaminant concentrations.** Information collected in nine rounds of sampling will be evaluated and used to characterize vertical and horizontal hydraulic conductivity.

  - **Water levels should be measured to determine groundwater flow direction.** Groundwater elevations are being measured at each well during each of the nine sampling rounds and the results will be presented in the final MNA report in the form of potentiometric surface figures.

- **Seasonal variations and trends should be evaluated by obtaining data from different times of the year to determine if changes in contaminant concentrations, indicator parameters, or water types are caused by natural attenuation or may be attributed to seasonal variability.** The SWMU 12 monitoring program includes monitoring which will measure RDX and degradation by-product concentrations and routine indicator parameters by season. The final MNA report will include the presentation of temporal plots to discern trends of RDX and degradation by-product concentrations, as well as routine indicator parameters.

4.1 GROUNDWATER MONITORING PROGRAM

MNA groundwater sampling is being conducted at 21 select well locations across SWMU 12 (see Figure 2-1). Sixteen wells are located in the Puz aquifer; four wells are located in the Pmz aquifer; and the remaining well is in the Mgd aquifer. These wells have been established in accordance with U.S. EPA Region 5 MNA guidance. The monitoring wells have a specific role in the monitoring program and represent locations within the plume source area, within the center and leading edges of the plume, and from points located vertically (above and below) and horizontally (upgradient and downgradient) outside the area of groundwater contamination. The selected wells are distributed as follows in the Puz, Pmz, and Mgd water bearing zones:

Puz Aquifer Wells

- Three source area wells (12MWT06, 12MWT11, and 12MWT16)
- Three wells located within the center of the plume (12MWT09, 12MWT12, and 12MWT17)
- Seven wells at the leading edge of the plume (12MWT10, 12MWT18, 12MWT20, 12MWT22, 12MWT36, 12MWT38, and 12MWT42)
- One well upgradient of the plume (12MWT28)
- Two wells laterally downgradient of the plume (12MWT03 and 12MWT23)

Pmz Aquifer Wells

- Three wells vertically below the plume (12MWT30, 12MWT31, and 12MWT32)
- One well laterally downgradient of the plume (12MWT46)

Mgd Aquifer Well

- One well laterally downgradient of the plume (12MWT41)

In Rounds 3 through 9, all groundwater samples are being analyzed for explosives and well stabilization parameters with occasional analyses for routine indicator MNA parameters and periodically for RDX degradation by-products. Groundwater elevations are also being collected during each sampling round.

4.2 SURFACE WATER MONITORING PROGRAM

In support of the MNA demonstration, surface water samples are also being collected at eight select locations (see Figure 2-2). These locations include 12SW/SD09, 12SW/SD11, 12SW/SD14, 12SW/SD24, 12SW/SD25, 12SW/SD27, 12SW/SD31, and 12SW/SD34. The location 12SW/SD25 is considered to be upgradient of SWMU 12. In Rounds 3 through 9, samples from these locations are being analyzed for explosives and the routine indicator parameters DO, ORP, pH, specific conductance, temperature, turbidity, ammonia and nitrite/nitrate concentrations.

4.3 ROUND 6 POTENTIOMETRIC SURFACES

Figures 4-1, 4-2, and 4-3 show the Round 6 (May 5, 2006) potentiometric surface elevation maps for the Puz, Pmz, and Mgd water bearing zones, respectively. The groundwater elevations collected in Round 6 were compared to groundwater elevations reported in Round 5 (see Appendix E). In general, groundwater flow for Round 6 in all three water bearing zones are similar to flow directions reported in Round 5. An overview of the groundwater elevations in Round 6, as compared to Round 5, is presented below for each water bearing zone.

The potentiometric surface for the Puz in Round 6 is presented in Figure 4-1. As in previous rounds, the highest groundwater elevations were measured at the far northwest end of SWMU 12 at wells 12MWT25 to 12MWT28 (731.37 feet asml to 733.62 feet asml). In general, the changes in most well elevations were ± 1.5 feet as compared to Round 5. As shown in Figure 4-1, there are two ridges of higher groundwater elevations that extend from the groundwater high at the north end of SWMU 12. The larger more pronounced ridge runs southeast along the centerline of the SWMU 12 ridgetop through wells 12MWT16, 12MWT17, and 12MWT23. The groundwater elevations decrease from 733 to 712 feet amsl along this groundwater ridge. To the northeast and southwest of this groundwater ridge, the elevations decrease rapidly to the sides of the ridge. Shallow groundwater on the northeastern side of this groundwater ridge flows to the east and northeast, while shallow groundwater on the southwestern side of the ridge flows southwest. A second ridge extends from the northern high area toward the southwest. Along this ridge, the elevations decrease gradually along the crest of the groundwater ridge at wells 12MWT26 and 12MWT28 (733 feet amsl) down to well 12MWT42 (708 feet amsl). Groundwater is flowing toward the cropline on the sides of both ridges.

Groundwater elevations measured in the Pmz in Round 6 are shown in Figure 4-2. With the exception of 12MWT45, most Pmz wells in Round 6 changed by ± 2.0 feet in elevation as compared to Round 5. The largest increase in elevation occurred at well 12MWT45, which increased by 5.52 feet. The highest groundwater elevation was at well 12MWT33 (696.23 feet amsl) in the northwestern end of SWMU 12. A groundwater ridge in the Pmz extends from the northwest end of the SWMU toward the southeast. Groundwater elevations decrease toward the southeast and toward the southwest from the groundwater ridge. The lowest groundwater elevations were measured in wells 12MWT30 (634.92 feet amsl) on the southwest side of SWMU 12 and 12MWT48 (619.71 feet amsl) on the southeast side of SWMU 12.

Round 6 groundwater levels for the Mgd zone are presented in Figure 4-3. In Round 6, groundwater elevations ranged from 573.86 feet amsl at 12MWT50 to 603.42 feet amsl at 12MWT41. The general groundwater flow direction in the Mgd in Round 6 was to the south and southeast toward Turkey Creek.

4.4 GROUNDWATER TEMPORAL PLOT TREND ANALYSIS

The temporal plots shown in Figures 4-4, 4-5, and 4-6 for each water bearing zone are arranged in columns by monitoring well location showing concentration trends for RDX followed by the trend for each degradation by-product. The analytical results for each round are shown as a data point and include the validation qualifier if applicable and correspond to the datum presented in Tables 3-1, 3-3, and 3-5, respectively, for the Puz, Pmz, and Mgd. The absence of a data point for a Round indicates no sample was collected or a particular parameter was not a target analyte.

Puz Aquifer

Figure 4-4 shows temporal plots of RDX and degradation by-product groundwater concentrations for Rounds 1 through 6 in the Puz. Through Round 6, RDX has been detected all at MNA monitoring locations with the exception of 12MWT03 and 12MWT23, which are laterally downgradient of the contamination plume at SWMU 12. At the present time, RDX concentrations at monitoring wells 12MWT10, 12MWT11, and 12MWT16 are showing a potential upward trend in RDX concentrations through 6 rounds of sampling. Monitoring wells 12MWT09 and 12MWT12 are showing a potential downward trend in RDX concentrations. Otherwise, all other Puz wells display no trend in RDX concentrations. Degradation by-products have been detected at all monitoring locations with the exception of 12MWT03, 12MWT18, 12MWT20, 12MWT23, 12MWT28, and 12MWT42. At the present time, there is insufficient data to discern any trend in degradation by-product concentrations.

Pmz Aquifer

Figure 4-5 shows temporal plots of RDX and degradation by-product concentrations for Round 1 through 6 in Pmz wells. Through Round 6, there have been no positive detections of RDX or degradation by-products in the Pmz monitoring wells 12MWT30, 12MWT31, 12MWT32, and 12MWT46.

Mgd Aquifer

Figure 4-6 shows temporal plots of RDX and degradation by-product concentrations for Round 1 through 6 in the single Mgd well 12MWT41. Through Round 5, there has been only one minor detection of RDX (0.33µg/L), which occurred in Round 5. There have been no positive detections of RDX degradation by-products at well 12MWT41.

4.5 SURFACE WATER TEMPORAL PLOT TREND ANALYSIS

Figure 4-7 shows temporal plots of explosives and degradation by-product surface water concentrations for Rounds 1 through 6. Through Round 6, RDX has been detected at all surface water sampling locations with the exception of 12SW/SD25, which is considered to be an upgradient location. RDX has been most frequently detected at surface water locations 12SW/SD11, 12SW/SD14, 12SW/SD24, 12SW/SD31, and 12SW/SD34. However, RDX concentrations exhibit no clear trends. The only RDX degradation by-product detected through Round 6 is MNX at locations 12SW/SD09, 12SW/SD14, and 12SW/SD34. At the present time, there is insufficient data to conduct an evaluation regarding trends for MNX concentrations.

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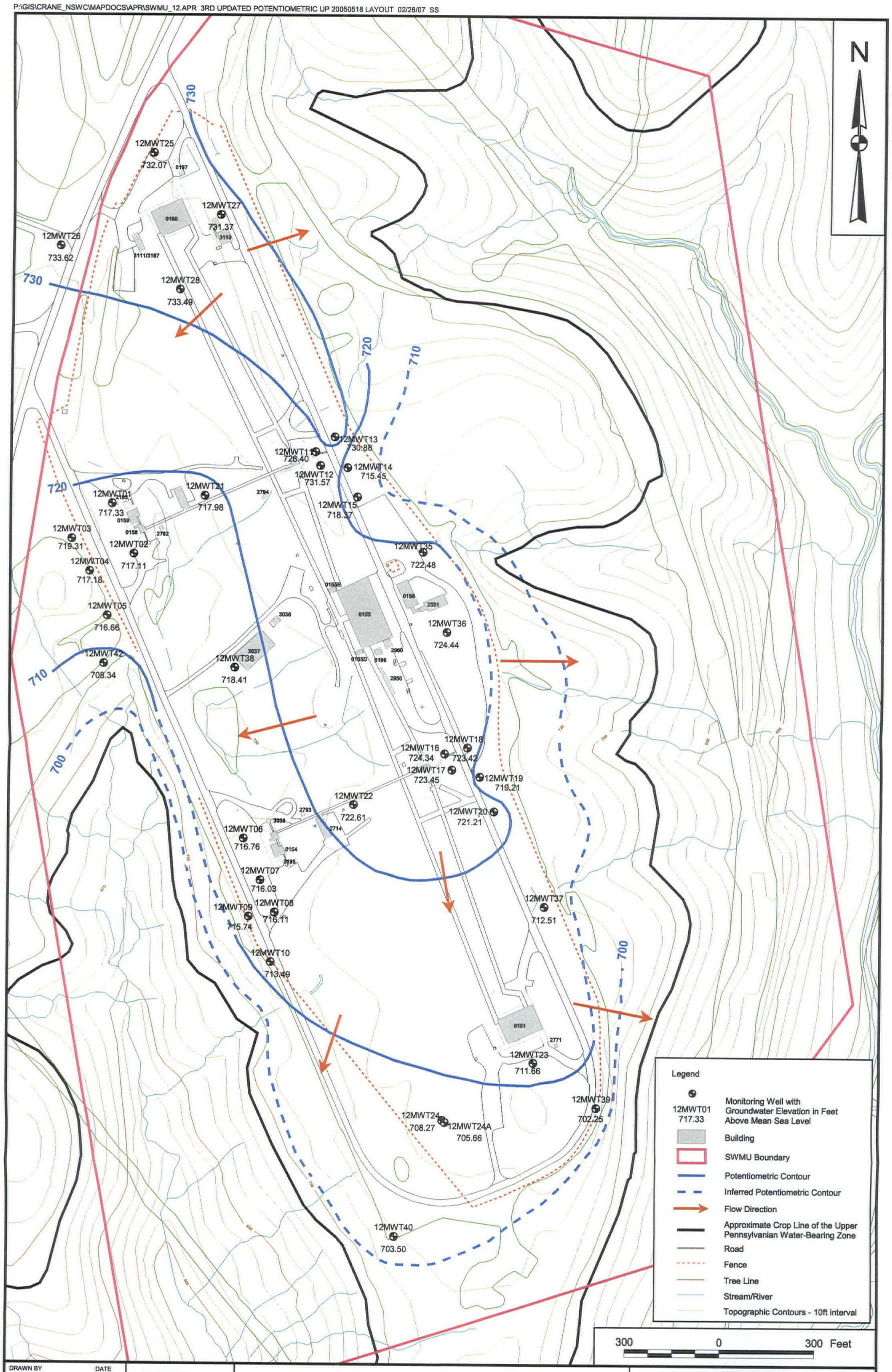

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S. STROZ	5/16/06
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J. LUCAS	2/28/07
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

POTENTIOMETRIC SURFACE MAP FOR THE UPPER PENNSYLVANIAN WATER-BEARING ZONE - MAY 5, 2006
ROUND 6
SWMU 12 MINE FILL A
NSWC CRANE
CRANE, INDIANA

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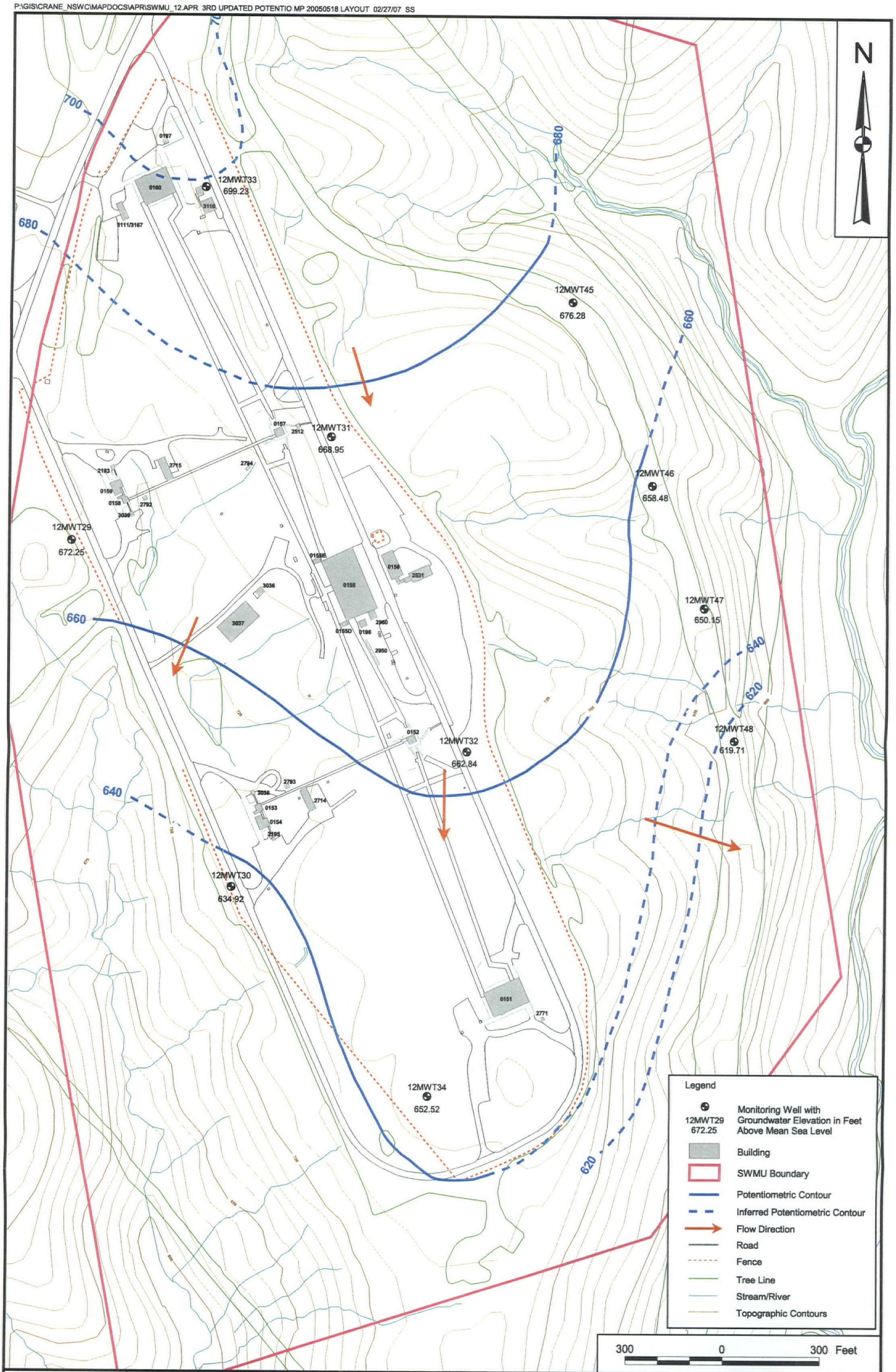

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J. LUCAS	2/27/07
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

POTENTIOMETRIC SURFACE MAP FOR THE MIDDLE PENNSYLVANIAN WATER-BEARING ZONE - MAY 5, 2006
ROUND 6
SWMU 12 MINE FILL A
NSWC CRANE
CRANE, INDIANA

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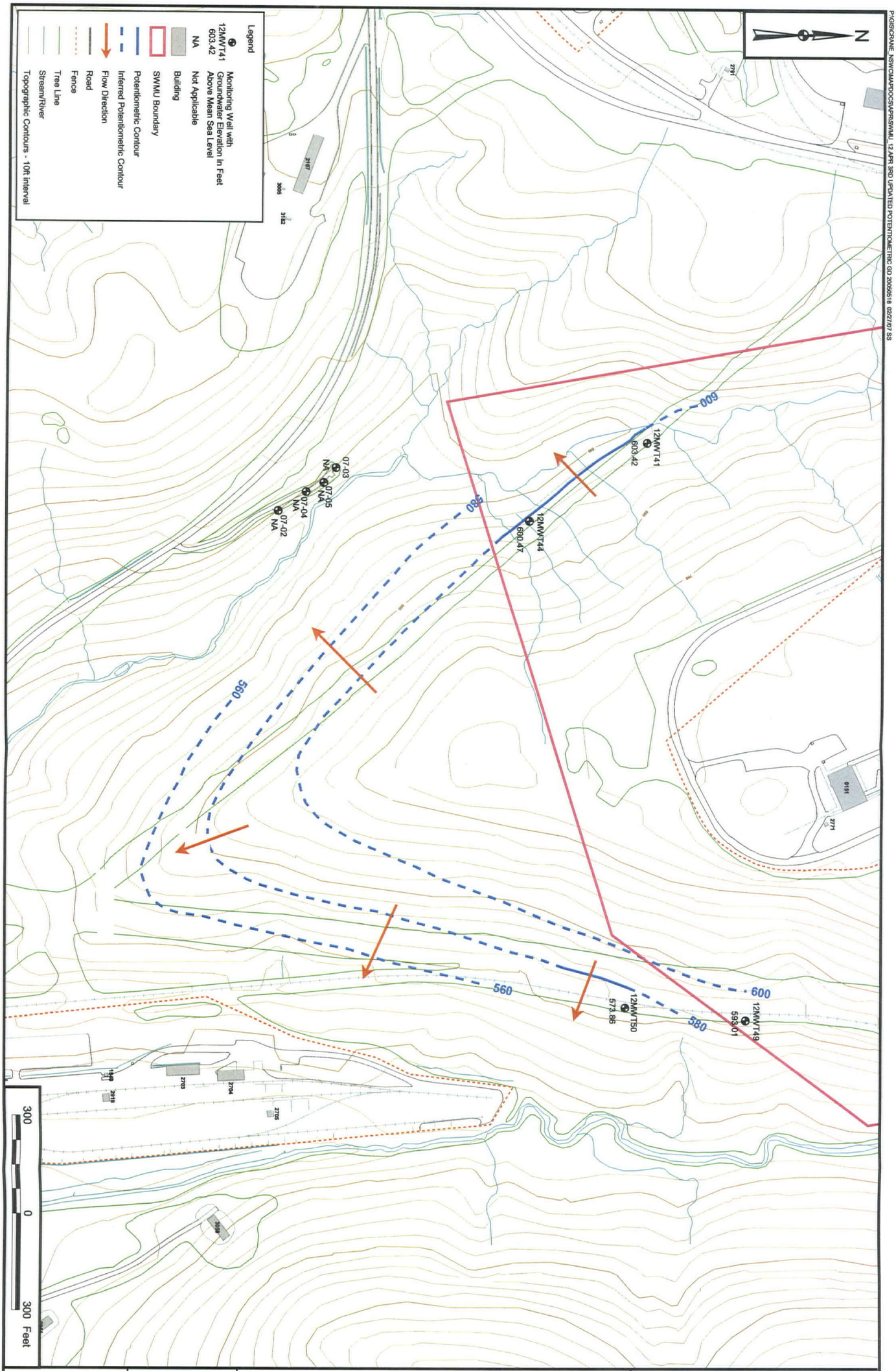

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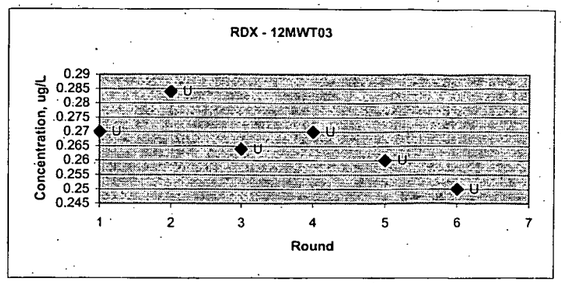
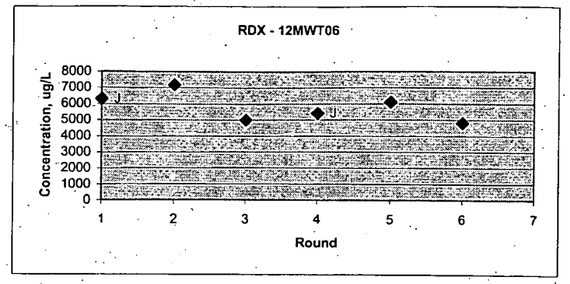
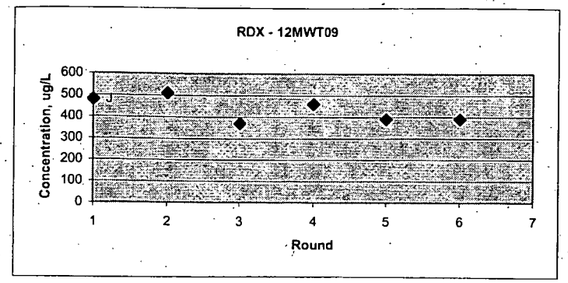
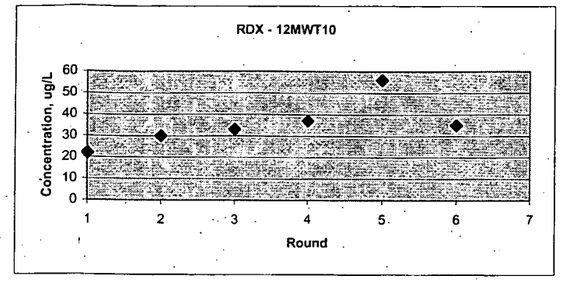
FIGURE 4-4

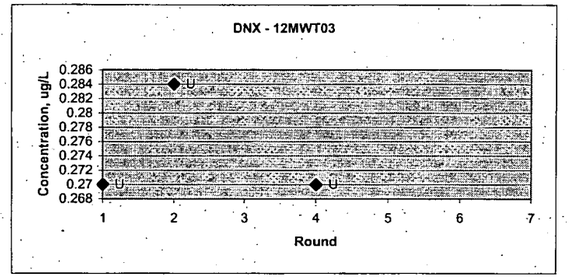
TEMPORAL PLOTS OF RDX AND DEGRADATION BY-PRODUCT CONCENTRATIONS IN
THE PENNSYLVANIA UPPER WATER BEARING ZONE AT SWMU 12
ROUNDS 1 THROUGH 6
NSWC CRANE,
CRANE, INDIANA
PAGE 1 OF 4

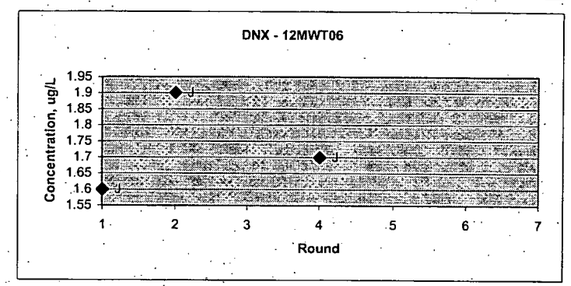


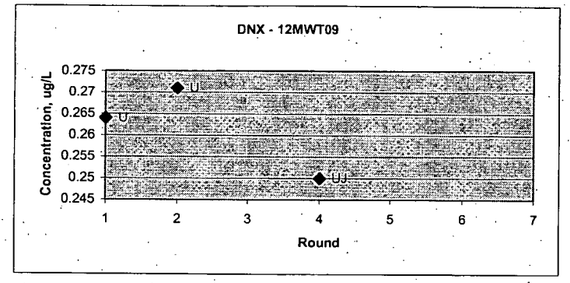


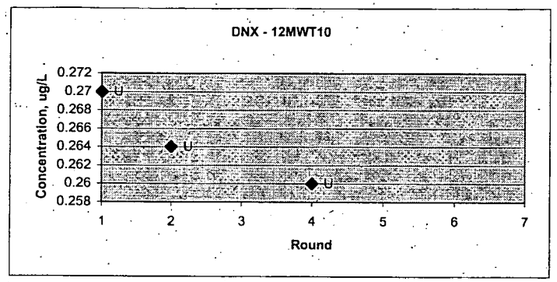


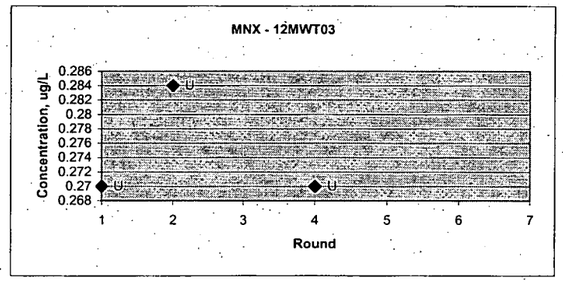


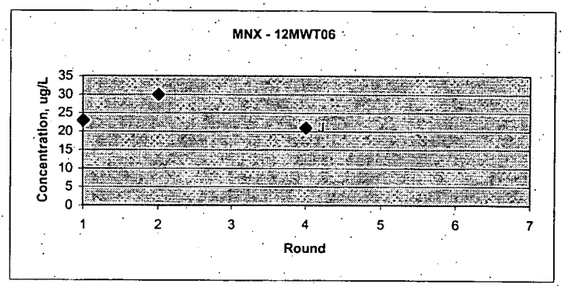


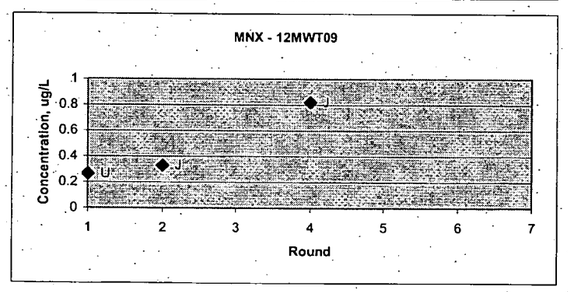


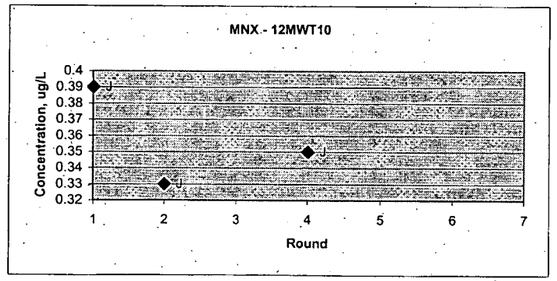


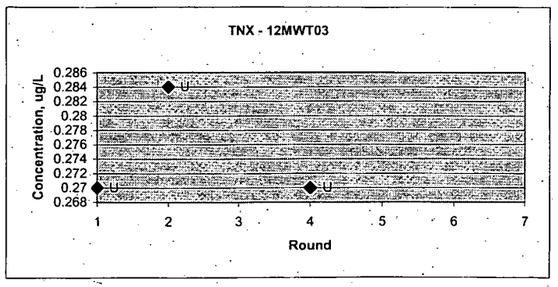


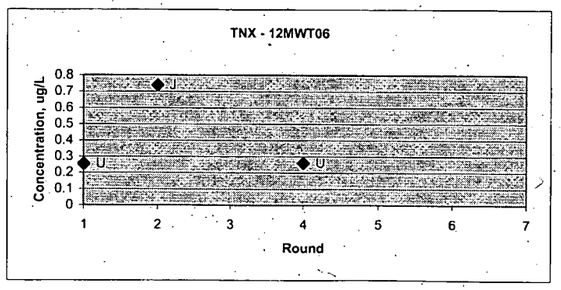


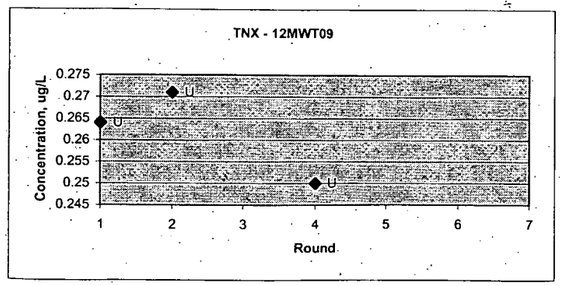












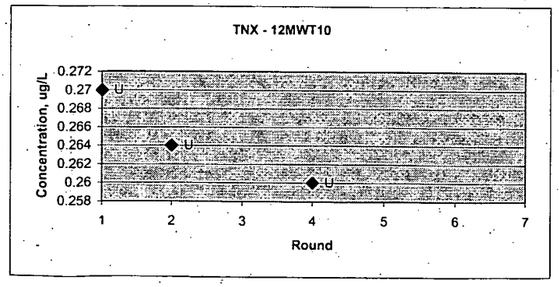
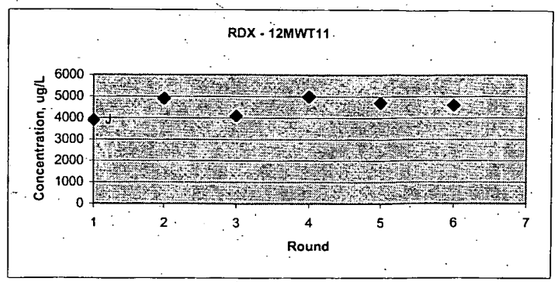
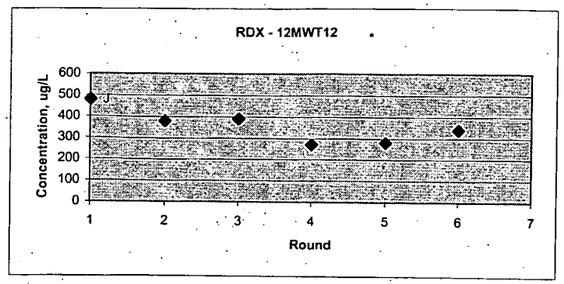
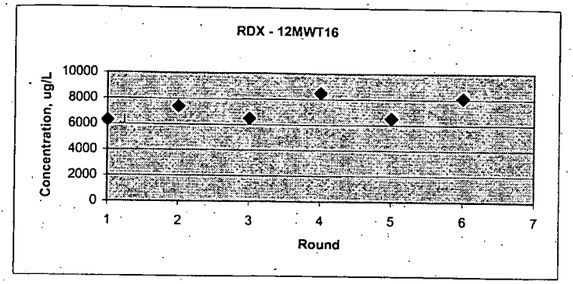


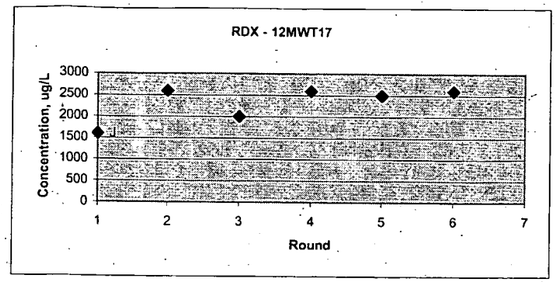
FIGURE 4-4

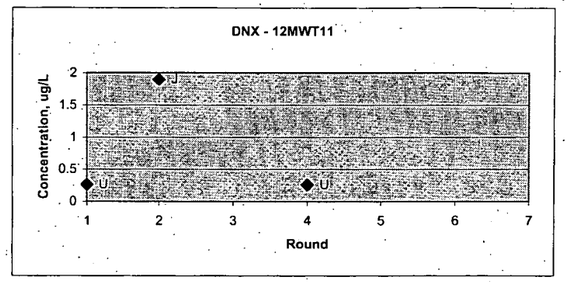
TEMPORAL PLOTS OF RDX AND DEGRADATION BY-PRODUCT CONCENTRATIONS IN
THE PENNSYLVANIA UPPER WATER BEARING ZONE AT SWMU 12
ROUNDS 1 THROUGH 6
NSWC CRANE,
CRANE, INDIANA
PAGE 2 OF 4

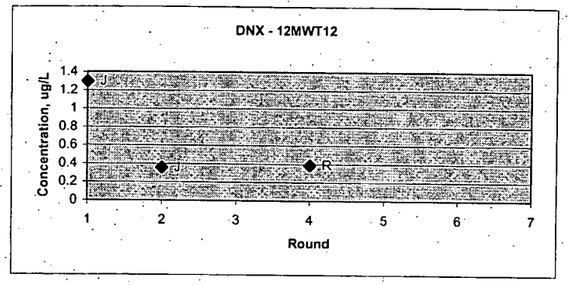


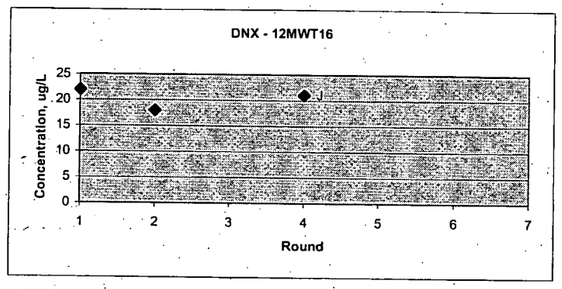


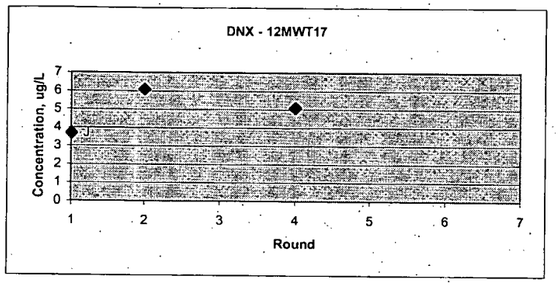


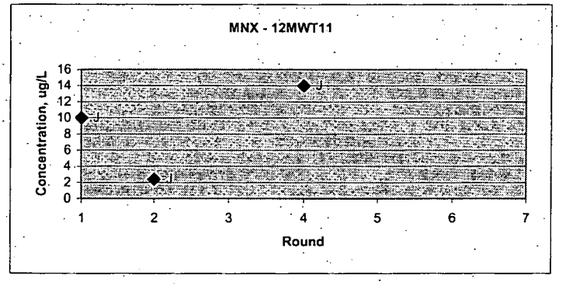


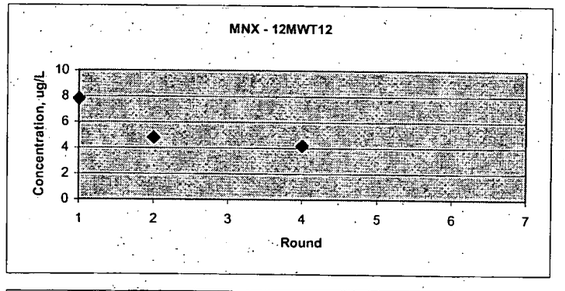


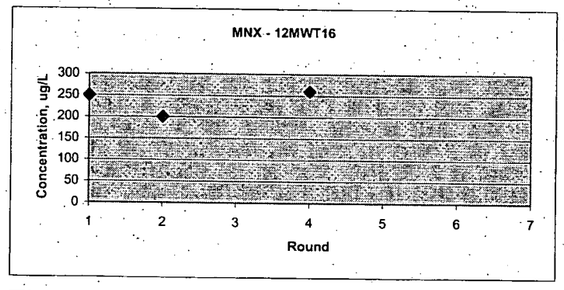


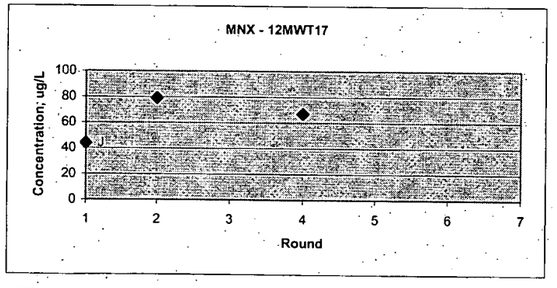


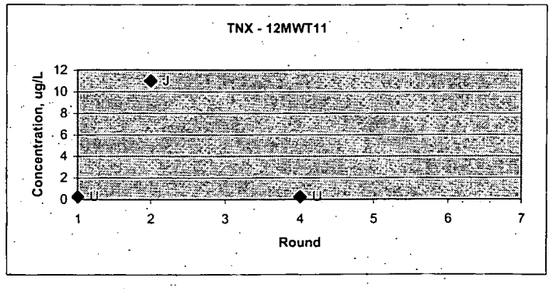


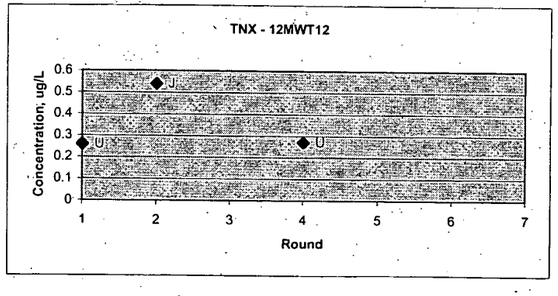


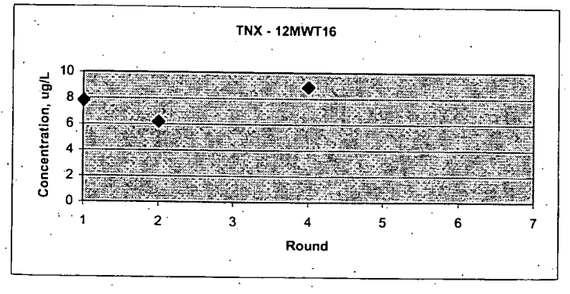












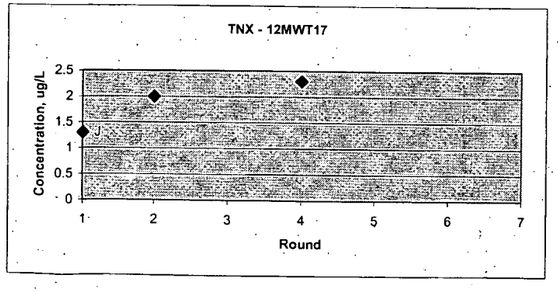


FIGURE 4-4

TEMPORAL PLOTS OF RDX AND DEGRADATION BY-PRODUCT CONCENTRATIONS IN THE PENNSYLVANIA UPPER WATER BEARING ZONE AT SWMU 12
ROUNDS 1 THROUGH 6
NSWC CRANE,
CRANE, INDIANA
PAGE 3 OF 4

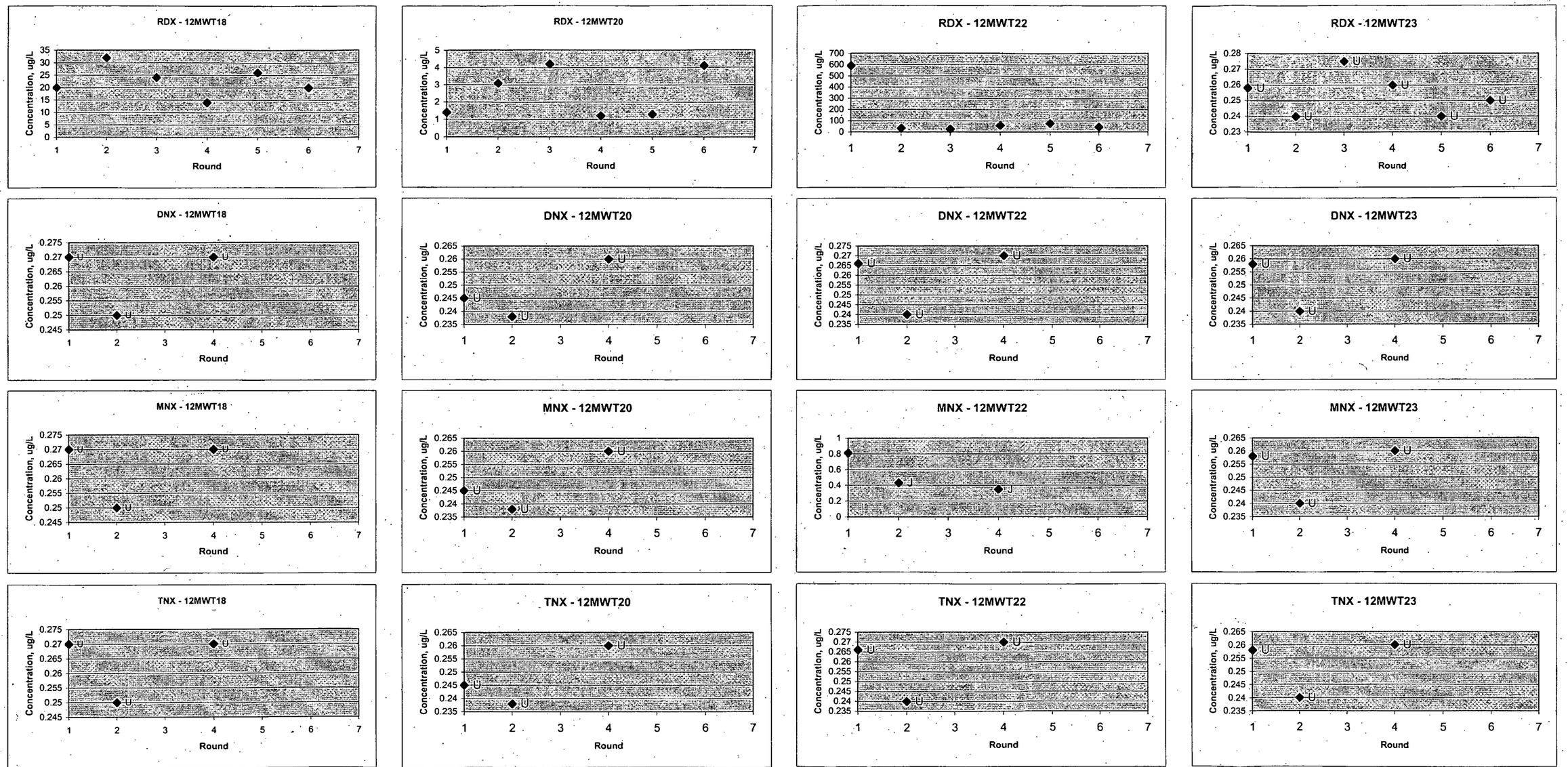
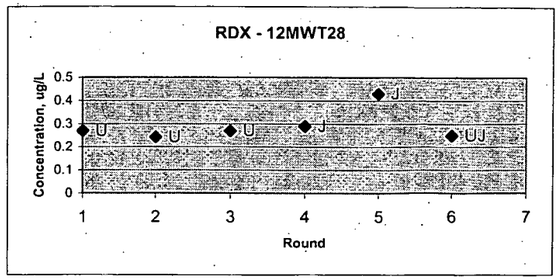
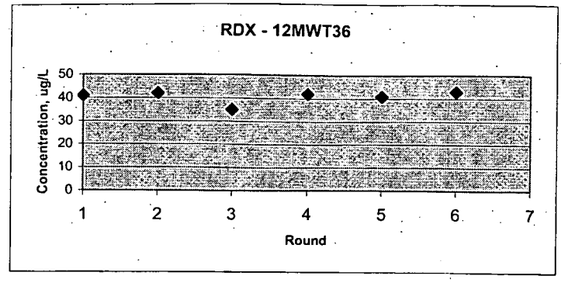
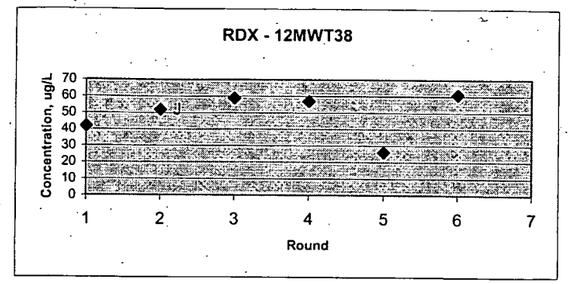


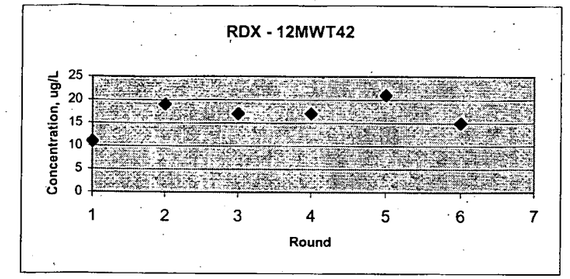
FIGURE 4-4

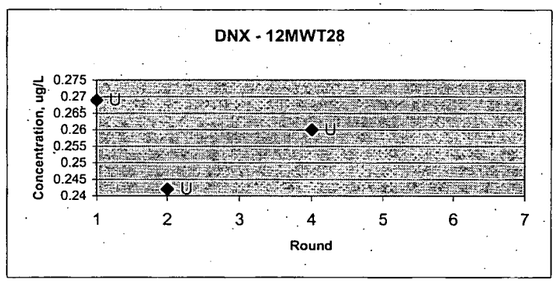
TEMPORAL PLOTS OF RDX AND DEGRADATION BY-PRODUCT CONCENTRATIONS IN THE PENNSYLVANIA UPPER WATER BEARING ZONE AT SWMU 12
ROUNDS 1 THROUGH 6
NSWC CRANE,
CRANE, INDIANA
PAGE 4 OF 4

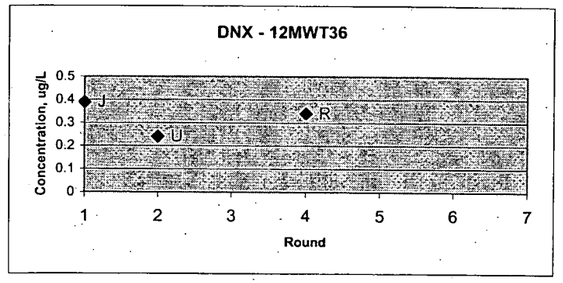


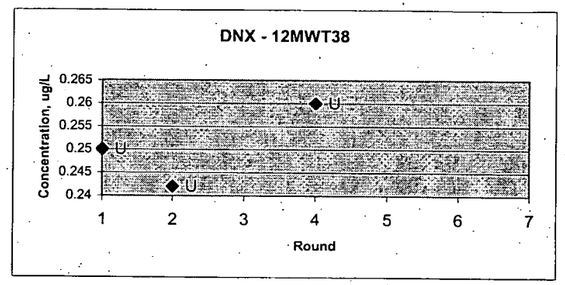


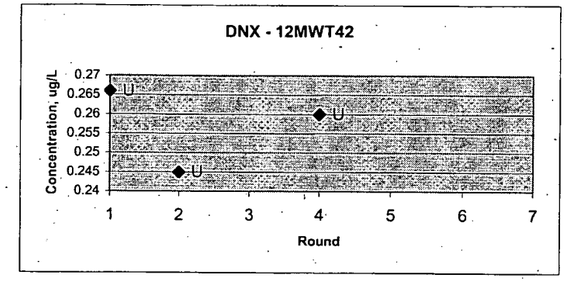


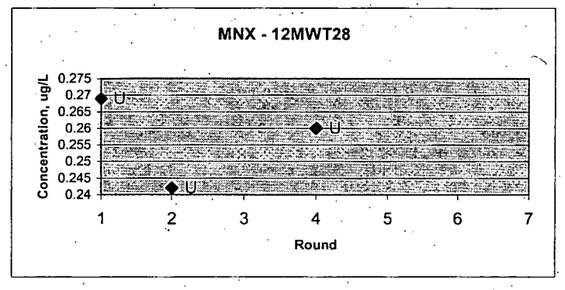


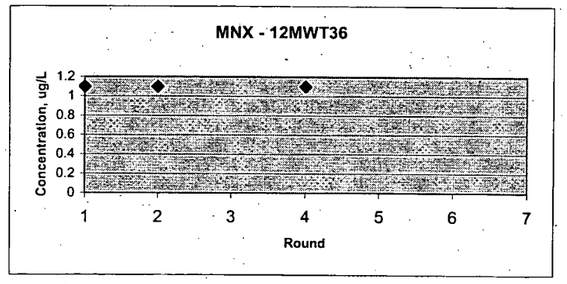


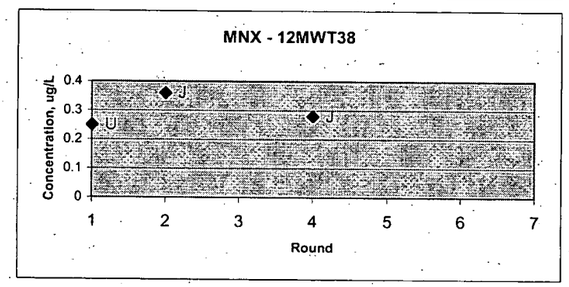


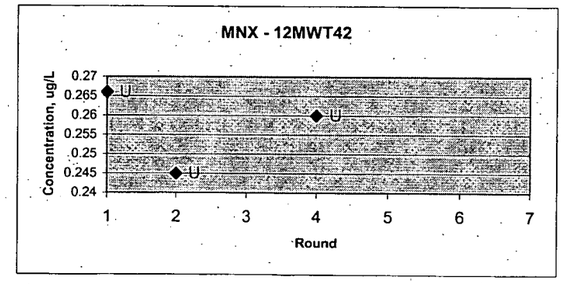


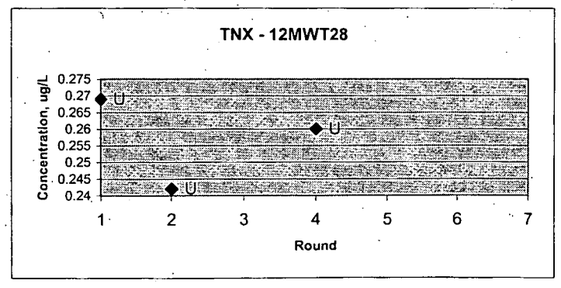


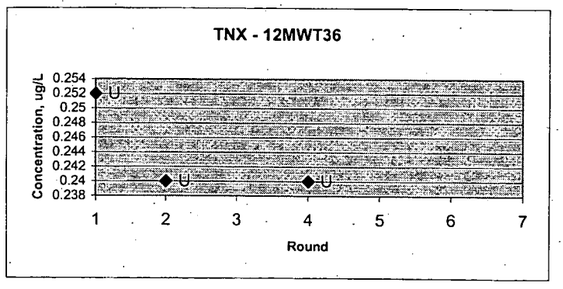


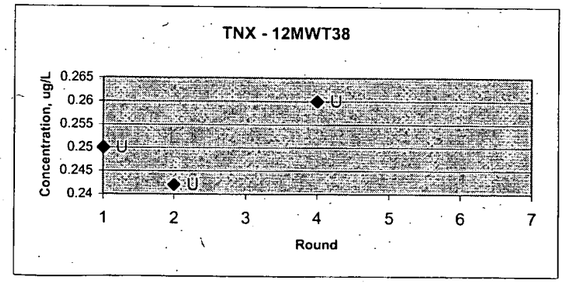












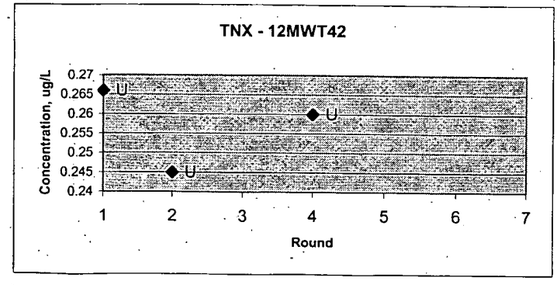


FIGURE 4-5

TEMPORAL PLOTS OF RDX AND DEGRADATION BY-PRODUCT CONCENTRATIONS IN
THE PENNSYLVANIA MIDDLE WATER BEARING ZONE AT SWMU 12
ROUNDS 1 THROUGH 6
NSWC CRANE
CRANE, INDIANA

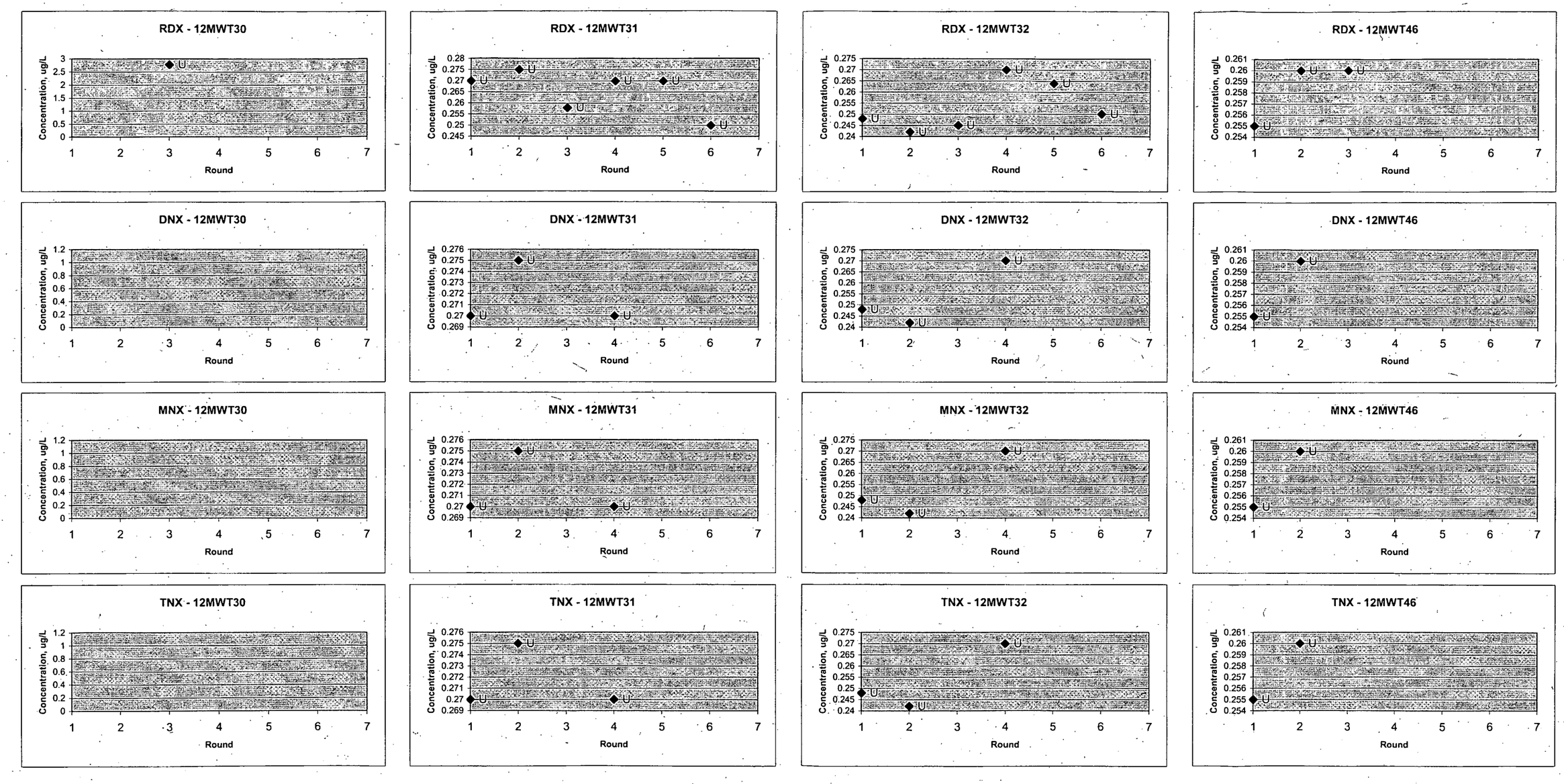
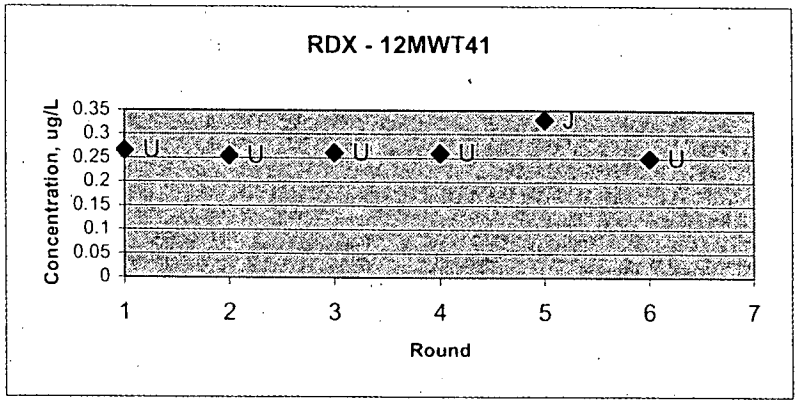
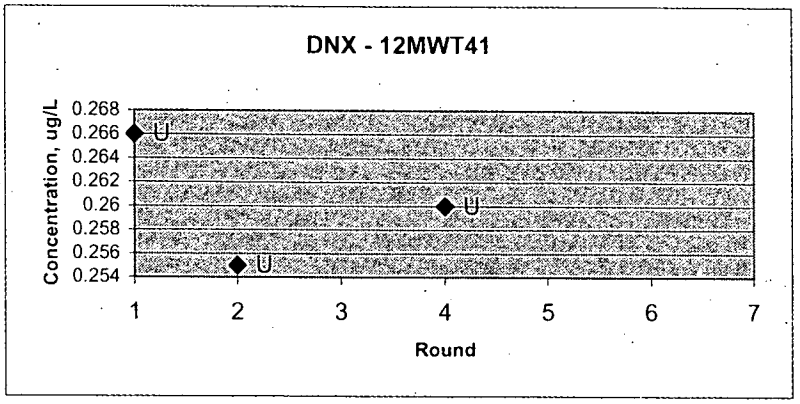
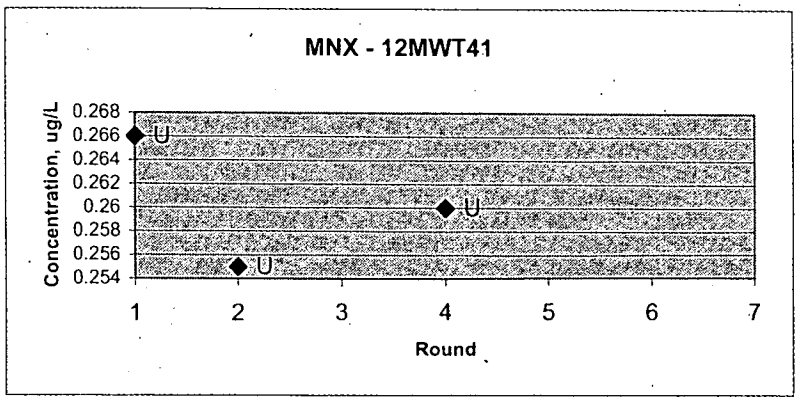


FIGURE 4-6

TEMPORAL PLOTS OF RDX AND DEGRADATION BY-PRODUCT CONCENTRATIONS IN THE MISSISSIPPIAN GLEN DEAN WATER BEARING ZONE AT SWMU 12
ROUNDS 1 THROUGH 6
NSWC CRANE
CRANE, INDIANA







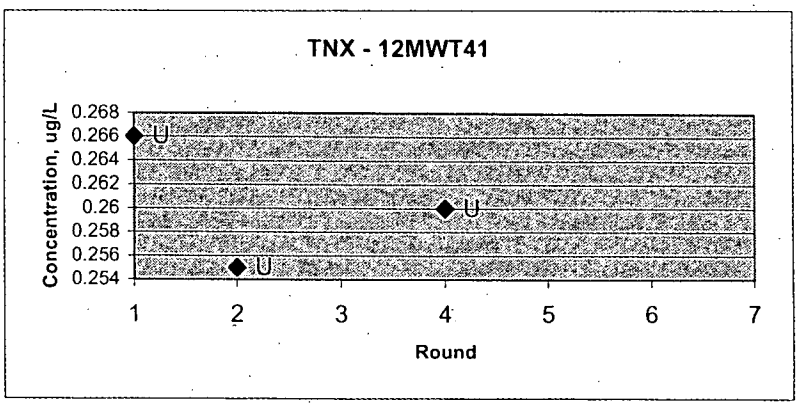
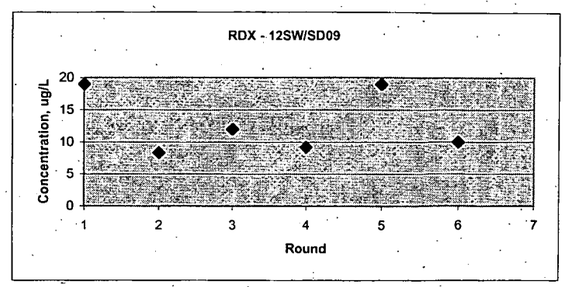
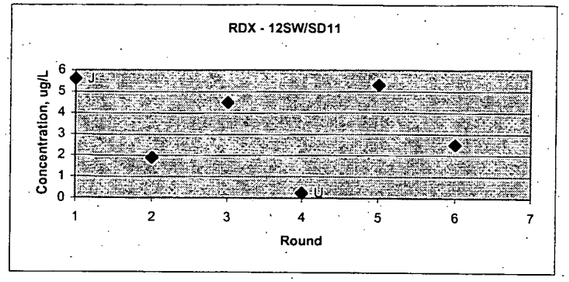
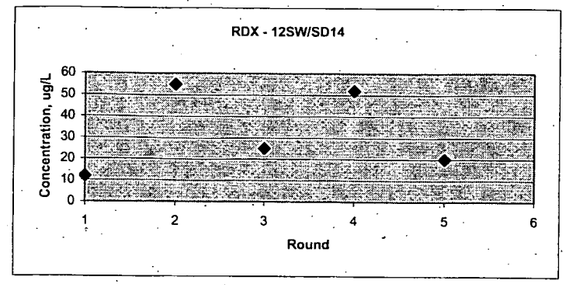


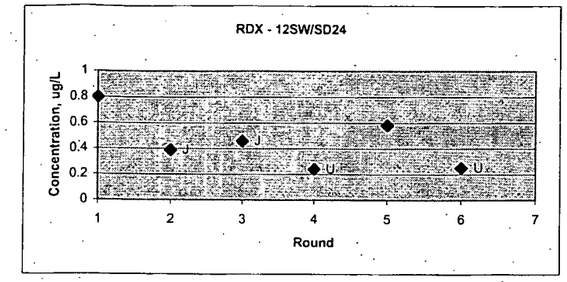
FIGURE 4-7

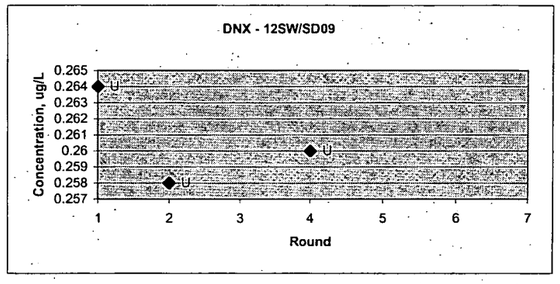
TEMPORAL PLOTS FOR RDX AND DEGRADATION BY-PRODUCT CONCENTRATIONS IN SURFACE WATER
AT SWMU 12 ROUNDS 1 THROUGH 6
NSWC CRANE
CRANE, INDIANA
PAGE 1 OF 2

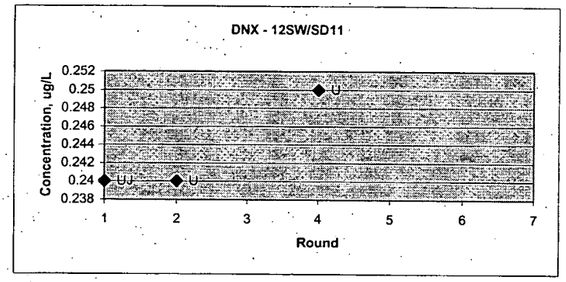


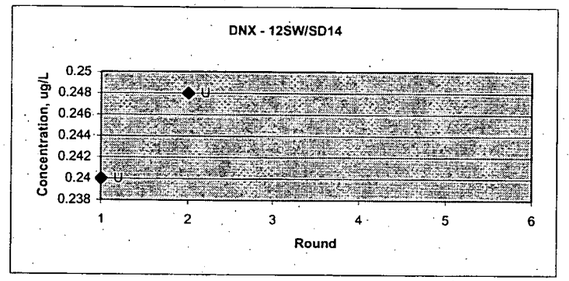


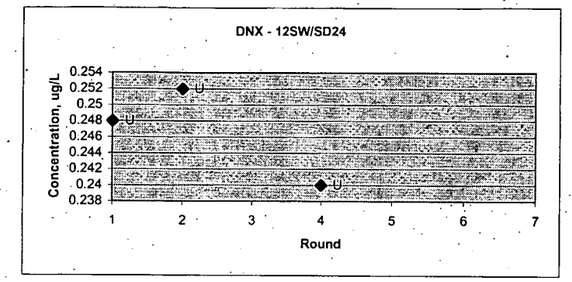


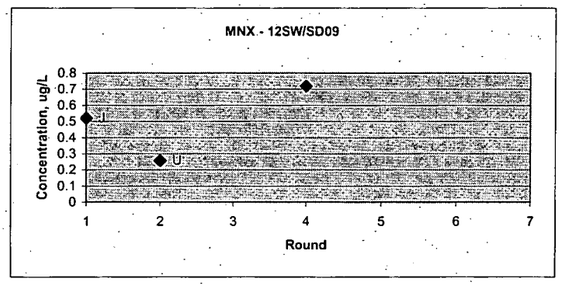


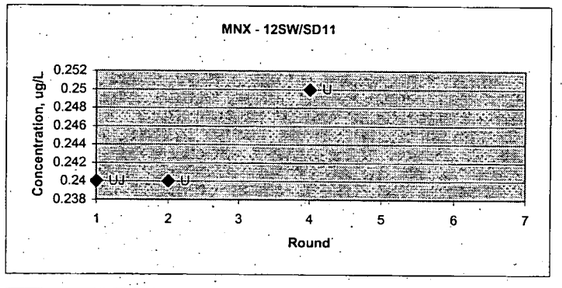


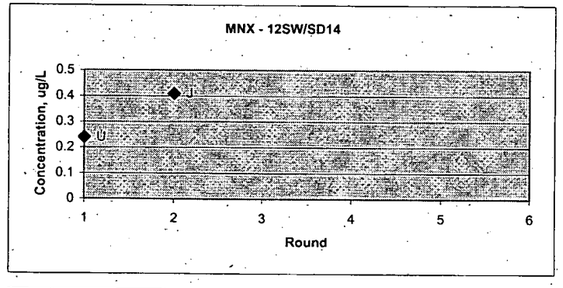


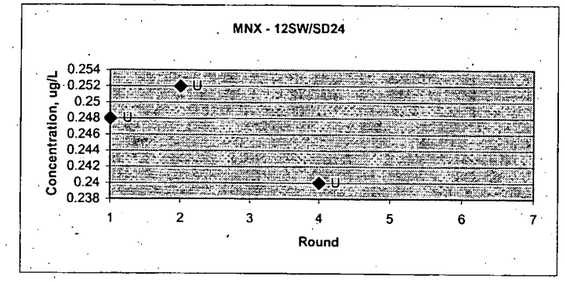


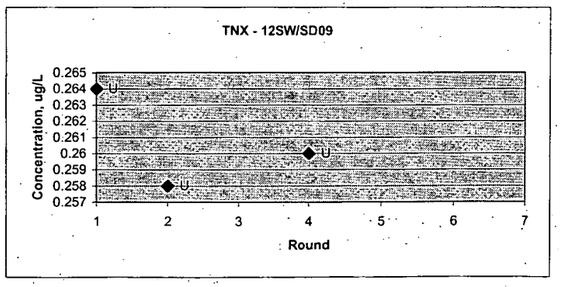


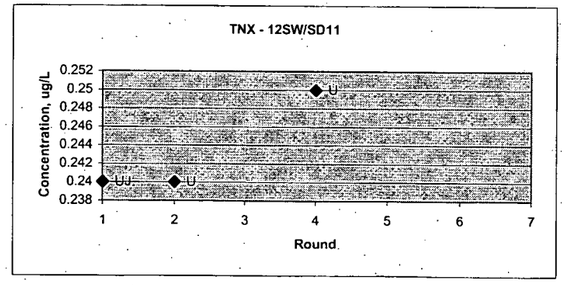


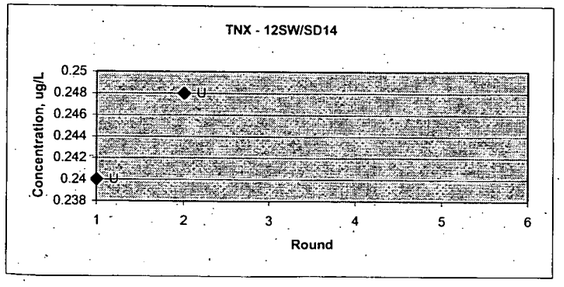












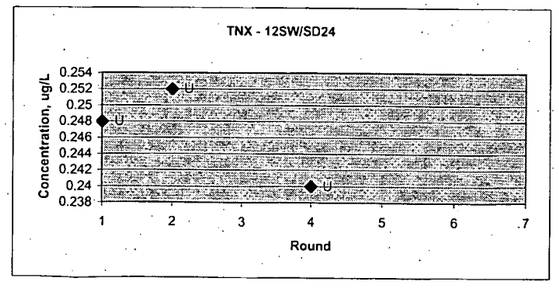
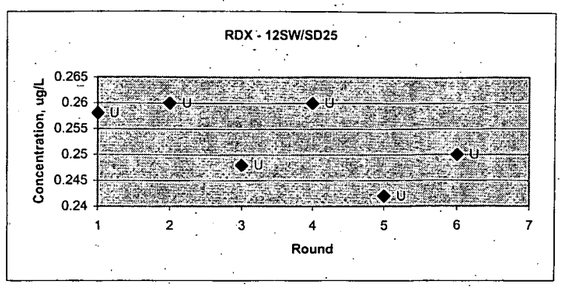
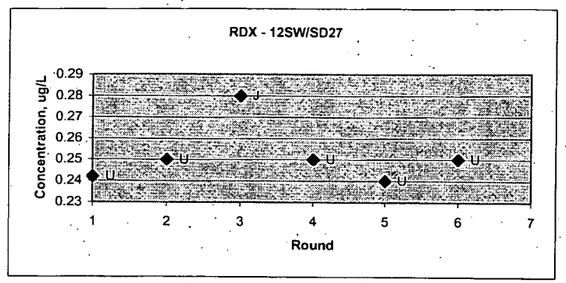
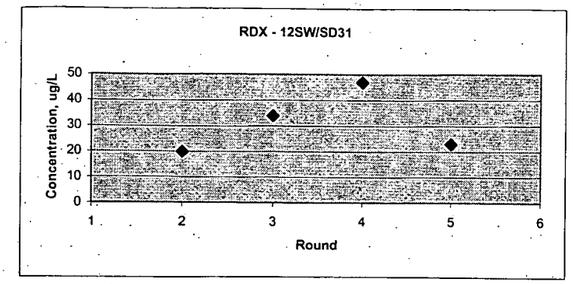


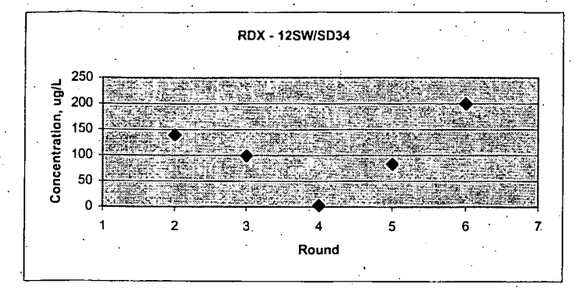
FIGURE 4-7

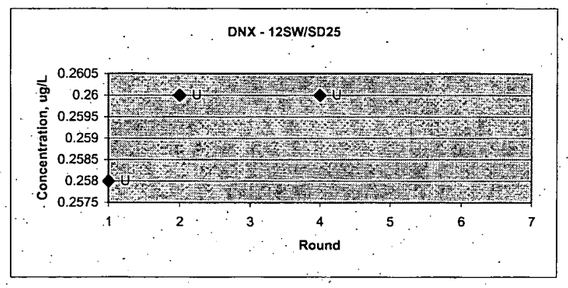
TEMPORAL PLOTS FOR RDX AND DEGRADATION BY-PRODUCT CONCENTRATIONS IN SURFACE WATER
AT SWMU 12 ROUNDS 1 THROUGH 6
NSWC CRANE
CRANE, INDIANA
PAGE 2 OF 2

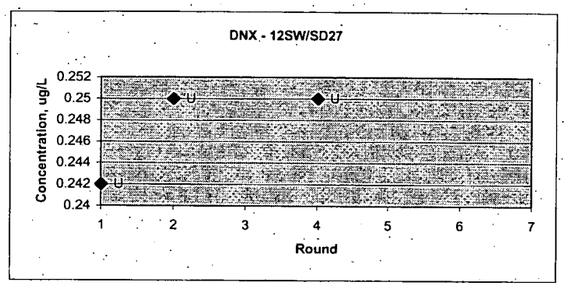


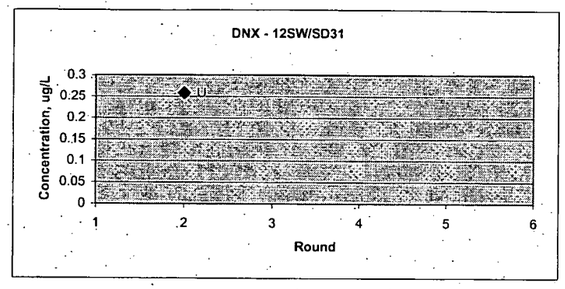


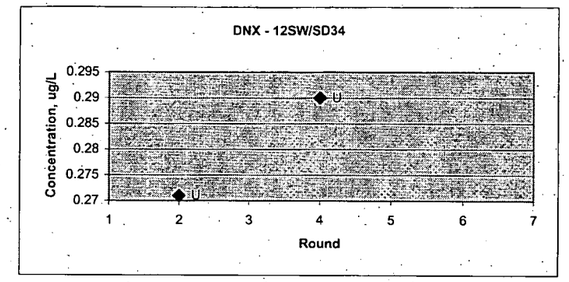


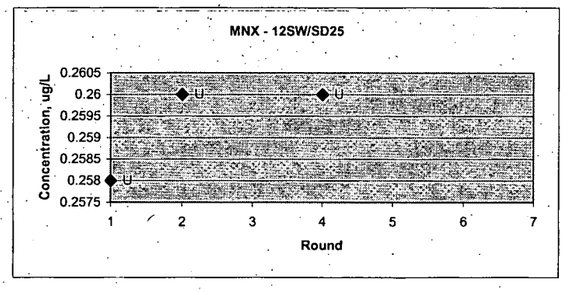


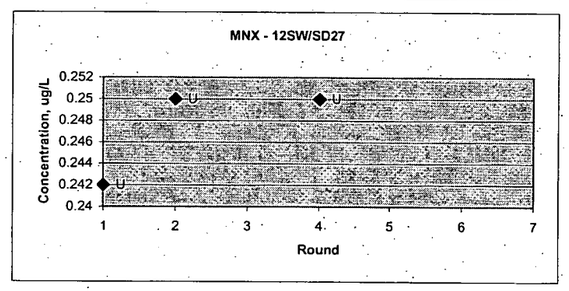


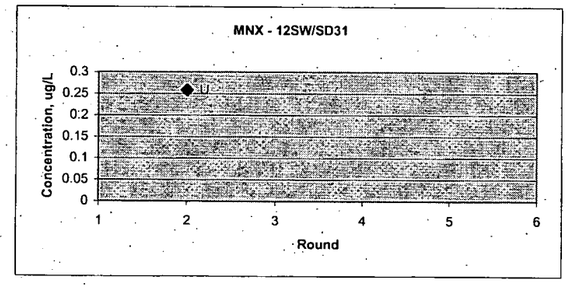


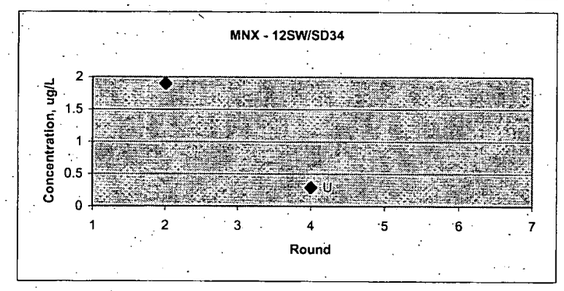


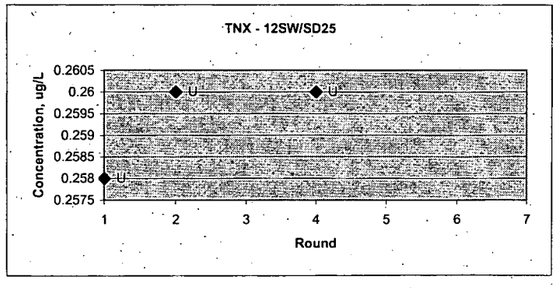


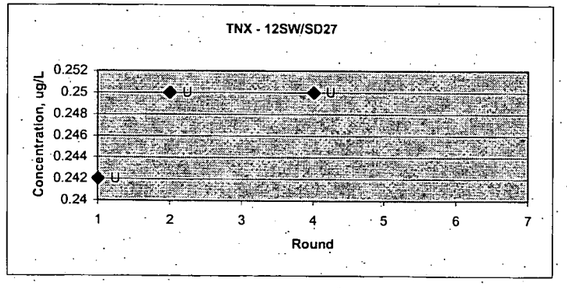


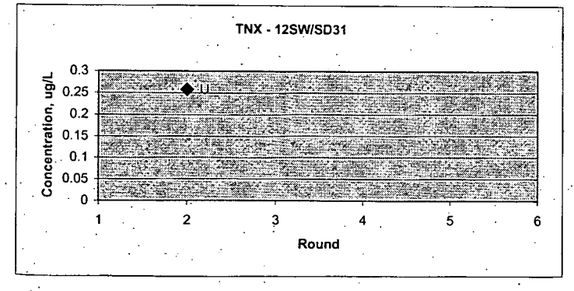


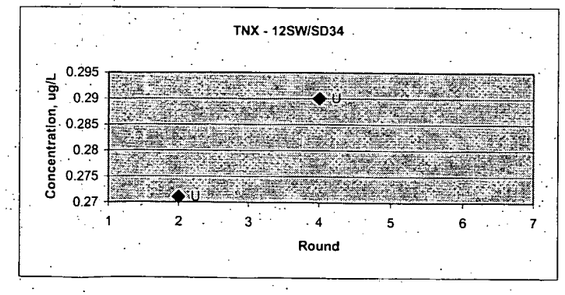












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APPENDIX A

SWMU 12
SAMPLE LOG SHEETS AND OTHER FIELD FORMS
ROUND 6

APPENDIX A.1

SWMU 12

GROUNDWATER SAMPLE LOG SHEETS

ROUND 6

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	Terry Rojahn	**Modified By**	John Wright	**Printed By**	James Goerdt
Created Date	5/18/06	**Modified Date**	7/20/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT0306
TtNUS Project #	112G00041	**Well ID**	12MWT03
Task/Contract #	CTO 377	**Well Type**	Monitoring Well
WBS Code #	TP00050125	**Sampled By**	Terry Rojahn
		Concentration	Low concentration

Well and Sample Data

Date	5/18/06	**Static Water Level (ft.)**	14.60	**Water Quality Meter**	928069
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**	28.05	**Pump Control Box**	MP10-1100
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**	2	**Turbidity Meter**	3254-1902
MS/MSD Collected?	N	**Well Volumes Req.**	1		
Duplicate Sample Collected?	N	**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/18/06	09:25	14.60	0	Clear	NA	NA	NA	NA	NA	NA	NA	NA	0
5/18/06	09:35	15.53	60	Clear	6.43	2.02	3.95	31	14.3	208	NA	NA	600

5/18/06	09:45	15.75	40	Clear	6.43	2.02	3.55	28	15.7	190	NA	NA	400
5/18/06	09:55	15.90	30	Clear	6.45	2.07	3.61	25	15.4	182	NA	NA	300
5/18/06	10:05	16.20	30	Clear	6.45	2.08	2.85	16	14.8	181	NA	NA	300
5/18/06	10:15	16.55	40	Clear	6.48	2.04	2.00	7.9	14.5	180	NA	NA	400
5/18/06	10:25	17.00	50	Clear	6.47	2.02	2.03	5.8	14.4	181	NA	NA	500
5/18/06	10:35	17.38	50	Clear	6.52	2.03	1.83	4.6	14.5	180	NA	NA	500

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/18/06	10:45	17.76	50	Clear	6.53	2.02	1.49	4.1	14.4	182			500
5/18/06	10:55	18.08	50	Clear	6.48	2.02	1.44	3.1	14.3	182	NA	NA	500
5/18/06	11:05	18.22	50	Clear	6.56	2.02	1.60	2.8	14.8	173	NA	NA	500
5/18/06	11:15	18.32	50	Clear	6.56	2.03	1.32	2.5	14.9	162	NA	NA	500
5/18/06	11:25	18.51	50	Clear	6.57	2.03	1.36	1.9	15.1	147	NA	NA	500
5/18/06	11:35	18.66	50	Clear	6.56	2.03	1.20	2.0	15.1	130	NA	NA	500
5/18/06	11:45	18.86	50	Clear	6.55	2.02	1.43	1.9	15.1	107	NA	NA	500
5/18/06	11:55	18.99	50	Clear	6.53	2.01	1.41	1.9	15.1	98	NA	NA	500
5/18/06	12:05	19.22	50	Clear	6.50	2.02	1.40	2.2	15.2	88	NA	NA	500
5/18/06	12:15	19.32	50	Clear	6.50	2.01	1.38	2.5	15.4	87	NA	NA	500
5/18/06	12:25	19.46	50	Clear	6.48	1.98	1.13	2.4	14.4	79	NA	NA	500
5/18/06	12:35	19.60	50	Clear	6.48	1.97	1.11	3.5	14.6	75	NA	NA	500
5/18/06	12:45	19.70	50	Clear	6.48	1.98	1.10	2.5	14.4	66	NA	NA	500
5/18/06	12:55	19.83	50	Clear	6.47	2.00	1.10	1.2	14.8	58	NA	NA	500
5/18/06	13:05	19.95	50	Clear	6.47	1.97	1.05	3.4	14.5	50	NA	NA	500
5/18/06	13:15	20.05	50	Clear	6.46	1.96	1.05	2.6	14.3	48			500
5/18/06	13:25	20.15	50	Clear	6.46	1.97	1.05	2.5	14.5	43	NA	NA	500

Final Purge / Sample Data

One Casing Volume	0
Total Vo. Purge (L)	11.5
Start Purge (hrs.)	9:25:00 AM
End Purge (hrs.)	1:25:00 PM
Total Purge Time (min.)	240

Method	Low flow - Bladder
Waterlevel (ft.)	20.15
Flowrate (mL/min)	50
Color	Clear
pH (S.U.)	6.46
Conductivity (mS/cm)	1.97

Dissolved Oxygen (mg/L)	1.05
Turbidity (NTUs)	2.5
Temp (C)	14.5
ORP (mV)	43
Salinity	NA
Other	NA

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/18/06	13:30	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	500ml PE		112G00041-5192006-8
✓	5/18/06	13:30	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-5192006-8

General Observations and Notes

SAMPLE pH (PAPER) = 6.5 SUs

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	David Hickey	**Modified By**	David Hickey	**Printed By**	James Goerdt
Created Date	5/18/06	**Modified Date**	5/18/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT0606
TtNUS Project #	112G00041	**Well ID**	12MWT06
Task/Contract #	CTO 377	**Well Type**	Monitoring Well
WBS Code #	TP00050125	**Sampled By**	David Hickey
		Concentration	Low concentration

Well and Sample Data

Date	5/18/06	**Static Water Level (ft.)**	9.51	**Water Quality Meter**	406032
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1335
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3327-2402
MS/MSD Collected?	N	**Well Volumes Req.**	1		
Duplicate Sample Collected?	Y	**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/18/06	08:50	9.51	100	Clear	4.77	0.575	4.53	2.26	13.53	327	NA	NA	0
5/18/06	09:00	9.89	100	Clear	4.60	0.567	1.82	0.00	13.47	331	NA	NA	1000

5/18/06	09:10	9.87	100	Clear	4.58	0.564	1.33	0.00	13.56	329	NA	NA	1000
5/18/06	09:20	9.89	100	Clear	4.60	0.562	1.20	0.00	13.46	327	NA	NA	1000
5/18/06	09:30	9.98	100	Clear	4.60	0.557	2.14	0.00	13.48	325	NA	NA	1000
5/18/06	09:40	10.00	100	Clear	4.62	0.559	1.10	0.00	13.58	322	NA	NA	1000
5/18/06	09:50	10.01	100	Clear	4.57	0.566	0.85	0.00	13.37	321	NA	NA	1000
5/18/06	10:00	10.02	100	Clear	4.61	0.580	1.06	0.00	13.76	315	NA	NA	1000

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/18/06	10:10	10.03	100	Clear	4.62	0.L578	2.16	0.00	13.81	318	NA	NA	1000
5/18/06	10:20	10.03	100	Clear	4.62	0.580	1.26	0.00	13.80	316	NA	NA	1000
5/18/06	10:30	10.03	100	Clear	4.63	0.582	1.01	0.00	13.78	313	NA	NA	1000

Final Purge / Sample Data

One Casing Volume		**Method**	Low flow - Bladder	**Dissolved Oxygen (mg/L)**	1.01
Total Vo. Purge (L)	10	**Waterlevel (ft.)**	10.03	**Turbidity (NTUs)**	0.00
Start Purge (hrs.)	8:50:00 AM	**Flowrate (mL/min)**	100	**Temp (C)**	13.78
End Purge (hrs.)	10:30:00 AM	**Color**	Clear	**ORP (mV)**	313
Total Purge Time (min.)	100	**pH (S.U.)**	4.63	**Salinity**	NA
		Conductivity (mS/cm)	0.582	**Other**	NA

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/18/06 1:00:00 AM	10:35	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	500ml PE		112G00041-5192006-8
✓	5/18/06 1:00:00 AM	10:35	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-5192006-8

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	David Hickey	**Modified By**	James Goerdt	**Printed By**	James Goerdt
Created Date	5/9/06	**Modified Date**	5/15/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT0906
TtNUS Project #	112G00041	**Well ID**	12MWT09
Task/Contract #	CTO 377	**Well Type**	-Select-
WBS Code #	TP00050125	**Sampled By**	David Hickey
		Concentration	Low concentration

Well and Sample Data

Date	5/9/06	**Static Water Level (ft.)**	12.18	**Water Quality Meter**	928069
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1335
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3327-2402
MS/MSD Collected?	N	**Well Volumes Req.**	1		
Duplicate Sample Collected?	N	**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/9/06	10:45	12.18	75	Clear	4.54	0.504	5.44	2.46	14.5	401	NA	NA	0
5/9/06	10:55	13.33	75	Clear	4.31	0.473	2.56	1.73	14.4	408	NA	NA	750

5/9/06	11:05	13.39	50	Clear	4.31	0.468	2.02	1.20	15.3	414	NA	NA	500
5/9/06	11:15	13.35	50	Clear	4.31	0.468	2.37	1.41	14.5	419	NA	NA	500
5/9/06	11:25	13.30	75	Clear	4.31	0.461	1.94	1.62	14.2	421	NA	NA	750
5/9/06	11:35	13.05	75	Clear	4.55	0.399	3.59	3.39	14.3	418	NA	NA	750
5/9/06	11:45	13.08	80	Clear	4.40	0.399	3.49	5.38	13.8	424	NA	NA	800
5/9/06	11:55	13.28	100	Clear	4.34	0.400	3.40	6.29	13.7	429	NA	NA	1000

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/9/06	12:05	13.42	100	Clear	4.38	0.412	3.32	5.10	13.5	432	NA	NA	1000
5/9/06	12:15	13.35	100	Clear	4.41	0.406	1.91	4.01	13.7	420	NA	NA	1000
5/9/06	12:25	13.34	100	Clear	4.43	0.403	2.26	3.90	13.5	427	NA	NA	1000

Final Purge / Sample Data

One Casing Volume		**Method**	Low flow - Bladder	**Dissolved Oxygen (mg/L)**	2.26
Total Vo. Purge (L)	8.05	**Waterlevel (ft.)**	13.34	**Turbidity (NTUs)**	3.90
Start Purge (hrs.)	10:45:00 AM	**Flowrate (mL/min)**	100	**Temp (C)**	13.5
End Purge (hrs.)	12:25:00 PM	**Color**	Clear	**ORP (mV)**	427
Total Purge Time (min.)	100	**pH (S.U.)**	4.43	**Salinity**	NA
		Conductivity (mS/cm)	0.403	**Other**	NA

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/9/06	12:30	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	1L HDPE		112G00041-592006-5
✓	5/9/06	12:30	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-592006-5
✓	5/9/06	12:30	Modified SW-846-8330	Explosives RDX Degradation Products	4°C	2	Glass	1L Amber		112G00041-592006-5

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	David Hickey	**Modified By**	David Hickey	**Printed By**	James Goerdt
Created Date	5/19/06	**Modified Date**	5/20/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT1006
TtNUS Project #	112G00041	**Well ID**	12MWT10
Task/Contract #	CTO 377	**Well Type**	-Select-
WBS Code #	TP00050125	**Sampled By**	David Hickey
		Concentration	Low concentration

Well and Sample Data

Date	5/19/06	**Static Water Level (ft.)**	12.97	**Water Quality Meter**	406032
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1335
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3327-2402
MS/MSD Collected?		**Well Volumes Req.**	1		
Duplicate Sample Collected?		**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/19/06	13:35	12.97	80	Clear	3.78	2.75	12.32	3.71	13.42	291	NA	NA	0
5/19/06	13:45	14.37	80	Clear	3.25	0.91	7.61	3.01	12.91	327	NA	NA	800

5/19/06	13:55	15.06	50	Clear	3.22	0.90	7.13	1.16	13.33	334	NA	NA	500
5/19/06	14:05	15.61	50	Clear	3.22	0.90	3.84	0.81	13.54	337	NA	NA	500
5/19/06	14:15	15.96	50	Clear	3.23	0.987	5.35	0.32	13.45	336	NA	NA	500
5/19/06	14:25	16.19	50	Clear	3.23	0.976	4.95	0.47	13.39	335	NA	NA	500
5/19/06	14:35	16.53	50	Clear	3.25	0.957	4.77	0.53	13.44	336	NA	NA	500
5/19/06	14:45	17.09	110	Clear	3.17	0.955	3.14	0.65	12.81	342	NA	NA	1100

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/19/06	14:55	17.59	110	Clear	3.11	0.961	2.57	2.26	12.75	350	NA	NA	1100
5/19/06	15:05	17.94	110	Clear	3.08	0.997	2.01	2.68	12.74	359	NA	NA	1100
5/19/06	15:15	18.19	110	Clear	3.07	0.999	3.29	5.47	12.71	357	NA	NA	1100
5/19/06	15:25	18.63	110	Clear	3.08	0.95	1.84	11.4	12.79	355	NA	NA	1100
5/19/06	15:35	18.94	110	Clear	3.08	0.93	0.79	19.7	12.88	352	NA	NA	1100
5/19/06	15:45	19.29	90	Clear	3.13	0.94	0.70	25.1	13.14	347	NA	NA	900
5/19/06	15:55	19.43	75	Clear	3.13	0.95	0.70	30.4	13.06	344	NA	NA	750
5/19/06	16:05	19.53	75	Clear	3.15	0.95	0.70	36.6	13.01	343	NA	NA	750
5/19/06	16:15	19.67	75	Clear	3.16	0.96	0.68	31.2	12.95	342	NA	NA	750
5/19/06	16:25	19.83	75	Clear	3.19	0.97	0.61	28.3	12.93	341	NA	NA	750
5/19/06	16:35	20.00	75	Clear	3.19	0.97	0.60	25.7	12.95	341	NA	NA	750
5/19/06	16:45	21.49	175	Clear	3.13	0.97	0.63	37.1	12.51	341	NA	NA	1750
5/19/06	16:55	21.74	200	Clear	3.13	0.98	0.61	86.1	12.53	340	NA	NA	2000
5/19/06	17:05	22.90	200	Clear	3.15	0.98	0.59	122	12.53	338	NA	NA	2000
5/19/06	17:15	22.87	260	Clear	3.14	0.99	0.56	287	12.41	340	NA	NA	2600
5/19/06	17:25	*	260	Clear	3.15	0.98	0.46	260	12.60	340	NA	NA	2600
5/19/06	17:35	DRY	260	Clear	3.17	0.97	0.52	194	12.81	339	NA	NA	2600

Final Purge / Sample Data

One Casing Volume	
Total Vo. Purge (L)	28.1
Start Purge (hrs.)	1:35:00 PM
End Purge (hrs.)	5:35:00 PM
Total Purge Time (min.)	240

Method	Low flow - Bladder
Waterlevel (ft.)	DRY
Flowrate (mL/min)	260
Color	Clear
pH (S.U.)	3.17
Conductivity (mS/cm)	0.97

Dissolved Oxygen (mg/L)	0.52
Turbidity (NTUs)	194
Temp (C)	12.81
ORP (mV)	339
Salinity	NA
Other	NA

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/20/06	12:45	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-5222006-10
✓	5/20/06	12:45	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	500ml PE		112G00041-5222006-10

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	David Hickey	**Modified By**	David Hickey	**Printed By**	James Goerdt
Created Date	5/20/06	**Modified Date**	5/20/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT1106
TtNUS Project #	112G00041	**Well ID**	12MWT11
Task/Contract #	CTO 377	**Well Type**	Monitoring Well
WBS Code #	TP00050125	**Sampled By**	David Hickey
		Concentration	Low concentration

Well and Sample Data

Date	5/20/06	**Static Water Level (ft.)**	11.77	**Water Quality Meter**	406032
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1335
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3327-2402
MS/MSD Collected?	N	**Well Volumes Req.**	1		
Duplicate Sample Collected?	N	**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/20/06	13:35	11.79	100	Clear	3.88	0.664	NA	1.96	15.47	386	NA	NA	0
5/20/06	13:45	12.50	100	Clear	2.59	0.569	NA	2.30	13.98	442	NA	NA	1000

5/20/06	13:55	12.67	100	Clear	2.57	0.565	NA	5.28	13.68	448	NA	NA	1000
5/20/06	14:05	12.83	100	Clear	2.60	0.565	NA	4.48	13.70	449	NA	NA	1000
5/20/06	14:15	12.95	100	Clear	2.63	0.568	NA	4.97	13.61	447	NA	NA	1000
5/20/06	14:25	13.03	100	Clear	2.64	0.572	NA	5.49	13.56	445	NA	NA	1000
5/20/06	14:35	13.06	100	Clear	2.68	0.571	NA	3.05	13.80	445	NA	NA	1000
5/20/06	14:45	13.09	100	Clear	2.68	0.573	NA	2.23	13.69	443	NA	NA	1000

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/20/06	14:55	13.14	100	Clear	2.69	0.573	NA	1.70	13.60	443	NA	NA	1000
5/20/06	15:05	13.16	100	Clear	2.67	0.574	NA	1.16	13.46	443	NA	NA	1000

Final Purge / Sample Data

One Casing Volume		**Method**	Low flow - Bladder	**Dissolved Oxygen (mg/L)**	NA
Total Vo. Purge (L)	9	**Waterlevel (ft.)**	13.16	**Turbidity (NTUs)**	1.16
Start Purge (hrs.)	1:35:00 PM	**Flowrate (mL/min)**	100	**Temp (C)**	13.46
End Purge (hrs.)	3:05:00 PM	**Color**	Clear	**ORP (mV)**	443
Total Purge Time (min.)	90	**pH (S.U.)**	2.67	**Salinity**	NA
		Conductivity (mS/cm)	0.574	**Other**	NA

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/20/06	15:15	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	500ml PE		112G00041-5222006-10
✓	5/20/06	15:15	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-5222006-10

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	David Hickey	**Modified By**	Terry Rojahn	**Printed By**	James Goerdt
Created Date	5/19/06	**Modified Date**	5/19/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT1206
TtNUS Project #	112G00041	**Well ID**	12MWT12
Task/Contract #	CTO 377	**Well Type**	Monitoring Well
WBS Code #	TP00050125	**Sampled By**	David Hickey
		Concentration	Low concentration

Well and Sample Data

Date	5/19/06	**Static Water Level (ft.)**	9.20	**Water Quality Meter**	406032
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1335
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3327-2402
MS/MSD Collected?	Y	**Well Volumes Req.**	1		
Duplicate Sample Collected?	N	**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/19/06	08:45	9.20	90	Clear	5.26	1.06	11.08	3.67	13.16	273	NA	NA	0
5/19/06	08:55	9.41	100	Clear	5.14	0.97	1.76	0.51	12.62	268	NA	NA	1000

5/19/06	09:05	9.47	100	Clear	5.13	0.95	1.22	0.28	12.53	259	NA	NA	1000
5/19/06	09:15	9.46	100	Clear	5.17	0.95	0.98	0.23	12.60	252	NA	NA	1000
5/19/06	09:25	9.48	100	Clear	5.18	0.95	1.82	0.00	12.68	251	NA	NA	1000
5/19/06	09:35	9.47	100	Clear	5.22	0.94	1.94	0.58	12.95	246	NA	NA	1000
5/19/06	09:45	9.47	100	Clear	5.24	0.94	1.08	0.25	13.04	238	NA	NA	1000
5/19/06	09:55	9.51	110	Clear	5.24	0.95	0.88	0.75	12.77	232	NA	NA	1100

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/19/06	10:05	9.50	110	Clear	5.27	0.95	0.78	0.16	12.88	230	NA	NA	1100
5/19/06	10:15	9.51	100	Clear	5.31	0.95	0.71	1.03	12.93	226	NA	NA	1000
5/19/06	10:25	9.51	100	Clear	5.33	0.95	0.68	0.25	12.91	223	NA	NA	1000

Final Purge / Sample Data

One Casing Volume	0	**Method**	Low flow - Bladder	**Dissolved Oxygen (mg/L)**	0.68
Total Vo. Purge (L)	10.2	**Waterlevel (ft.)**	9.51	**Turbidity (NTUs)**	0.25
Start Purge (hrs.)	8:45:00 AM	**Flowrate (mL/min)**	100	**Temp (C)**	12.91
End Purge (hrs.)	10:25:00 AM	**Color**	Clear	**ORP (mV)**	223
Total Purge Time (min.)	100	**pH (S.U.)**	5.33	**Salinity**	NA
		Conductivity (mS/cm)	0.95	**Other**	NA

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/19/06	10:30	SW-846-8330	Nitroaromatics and Nitramines	4°C	4	Glass	1L Amber		112G00041-5192006-8
✓	5/19/06	10:30	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	3	Plastic	500ml PE		112G00041-5192006-8

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	David Hickey	**Modified By**	David Hickey	**Printed By**	James Goerdt
Created Date	5/17/06	**Modified Date**	5/18/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT1606
TtNUS Project #	112G00041	**Well ID**	12MWT16
Task/Contract #	CTO 377	**Well Type**	-Select-
WBS Code #	TP00050125	**Sampled By**	David Hickey
		Concentration	Low concentration

Well and Sample Data

Date	5/17/06	**Static Water Level (ft.)**	21.42	**Water Quality Meter**	406032
Purge Method	-Select-	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1335
Sampling Method	-Select-	**Well Riser Diameter (in.)**		**Turbidity Meter**	3327-2402
MS/MSD Collected?		**Well Volumes Req.**	1		
Duplicate Sample Collected?		**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/17/06	17:00	21.42	100	Clear	5.75	0.632	9.60	23.6	14.87	351	NA	NA	0
5/17/06	17:10	22.05	100	Clear	5.48	0.634	7.76	8.14	14.41	377	NA	NA	1000

5/17/06	17:20	22.49	100	Clear	5.20	0.636	6.34	8.73	14.04	393	NA	NA	1000
5/17/06	17:30	23.36	100	Clear	5.18	0.638	5.86	16.0	13.89	421	NA	NA	1000
5/17/06	17:40	24.01	100	Clear	5.12	0.637	5.63	43.2	13.88	433	NA	NA	1000
5/17/06	17:50	24.55	100	Clear	5.14	0.635	5.50	71.6	13.84	442	NA	NA	1000
5/17/06	18:00	24.91	100	Clear	5.16	0.634	5.37	96.0	14.17	445	NA	NA	1000
5/17/06	18:10	25.27	100	Clear	5.16	0.637	5.37	81.6	14.38	451	NA	NA	1000

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/17/06	18:20	25.49	100	Clear	5.17	0.636	5.37	74.7	15.06	456	NA	NA	1000
5/17/06	18:30	DRY	100	Clear	4.95	0.634	3.56	106.8	14.77	489	NA	NA	1000

Final Purge / Sample Data

One Casing Volume	
Total Vo. Purge (L)	9
Start Purge (hrs.)	5:00:00 PM
End Purge (hrs.)	6:30:00 PM
Total Purge Time (min.)	90

Method	-Select-
Waterlevel (ft.)	DRY
Flowrate (mL/min)	100
Color	Clear
pH (S.U.)	4.95
Conductivity (mS/cm)	0.634

Dissolved Oxygen (mg/L)	3.56
Turbidity (NTUs)	106.8
Temp (C)	14.77
ORP (mV)	489
Salinity	NA
Other	NA

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/18/06	12:45	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-5192006-8
✓	5/18/06	12:45	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	500ml PE		112G00041-5192006-8

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	David Hickey	**Modified By**	David Hickey	**Printed By**	James Goerdt
Created Date	5/17/06	**Modified Date**	5/18/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT1706
TtNUS Project #	112G00041	**Well ID**	12MWT17
Task/Contract #	CTO 377	**Well Type**	-Select-
WBS Code #	TP00050125	**Sampled By**	David Hickey
		Concentration	Low concentration

Well and Sample Data

Date	5/17/06	**Static Water Level (ft.)**	23.48	**Water Quality Meter**	406032
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1335
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3327-2402
MS/MSD Collected?		**Well Volumes Req.**	1		
Duplicate Sample Collected?		**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/17/06	15:45	23.48	120	Clear	5.34	0.98	14.42	5.25	14.67	401	NA	NA	0
5/17/06	15:55	24.36	120	Clear	5.07	0.96	4.87	3.33	14.10	416	NA	NA	1200

5/17/06	16:05	25.15	120	Clear	4.93	0.96	3.55	12.9	14.03	418	NA	NA	1200
5/17/06	16:15	26.83	100	Clear	4.96	0.98	3.13	44.3	15.11	413	NA	NA	1000
5/17/06	16:25	DRY	75	Clear	5.08	0.97	2.95	55.4	17.58	370	NA	NA	750

Final Purge / Sample Data

One Casing Volume		**Method**	Low flow - Bladder	**Dissolved Oxygen (mg/L)**	2.95
Total Vo. Purge (L)	4.15	**Waterlevel (ft.)**	DRY	**Turbidity (NTUs)**	55.4
Start Purge (hrs.)	3:45:00 PM	**Flowrate (mL/min)**	75	**Temp (C)**	17.58
End Purge (hrs.)	4:25:00 PM	**Color**	Clear	**ORP (mV)**	370
Total Purge Time (min.)	40	**pH (S.U.)**	5.08	**Salinity**	NA
		Conductivity (mS/cm)	0.97	**Other**	NA

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/18/06	12:00	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	500ml PE		112G00041-5192006-8
✓	5/18/06	12:00	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-5192006-8

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	David Hickey	**Modified By**	David Hickey	**Printed By**	James Goerdt
Created Date	5/7/06	**Modified Date**	5/9/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT1806
TtNUS Project #	112G00041	**Well ID**	12MWT18
Task/Contract #	CTO 377	**Well Type**	-Select-
WBS Code #	TP00050125	**Sampled By**	David Hickey
		Concentration	Low concentration

Well and Sample Data

Date	5/7/06	**Static Water Level (ft.)**	22.57	**Water Quality Meter**	928069
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1335
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3327-2402
MS/MSD Collected?		**Well Volumes Req.**	1		
Duplicate Sample Collected?		**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/7/06	09:55	22.57	50	Clear	5.09	2.25	6.76	5.64	15.7	327	NA	NA	0
5/7/06	10:05	22.97	50	Clear	5.68	1.97	6.54	10.87	15.6	285	NA	NA	500

5/7/06	10:15	23.16	50	Clear	5.85	1.84	7.05	8.68	15.7	272	NA	NA	500
5/7/06	10:26	23.36	50	Clear	5.99	1.73	7.52	4.02	15.4	260	NA	NA	550
5/7/06	10:35	23.46	50	Clear	5.99	1.71	6.68	2.19	15.4	248	NA	NA	450
5/7/06	10:45	23.60	50	Clear	5.97	1.70	6.89	1.13	15.8	254	NA	NA	500
5/7/06	10:55	23.70	50	Clear	5.96	1.72	7.09	1.28	15.9	259	NA	NA	500
5/7/06	11:05	23.76	50	Clear	5.93	1.74	6.74	1.04	15.6	258	NA	NA	500

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/7/06	11:15	23.79	50	Clear	5.90	1.78	6.68	0.91	15.3	257	NA	NA	500
5/7/06	11:26	23.81	50	Clear	5.84	1.83	6.80	1.05	15.7	265	NA	NA	550
5/7/06	11:35	23.81	50	Clear	5.81	1.85	6.55	0.96	15.9	2.67	NA	NA	450
5/7/06	11:45	23.82	50	Clear	5.71	2.01	6.76	0.23	15.7	271	NA	NA	500
5/7/06	11:55	23.83	50	Clear	5.59	2.11	6.10	1.02	15.6	278	NA	NA	500

Final Purge / Sample Data

One Casing Volume		**Method**	Low flow - Bladder	**Dissolved Oxygen (mg/L)**
Total Vo. Purge (L)	5.5	**Waterlevel (ft.)**		**Turbidity (NTUs)**
Start Purge (hrs.)	9:55:00 AM	**Flowrate (mL/min)**		**Temp (C)**
End Purge (hrs.)	11:45:00 AM	**Color**		**ORP (mV)**
Total Purge Time (min.)	110	**pH (S.U.)**		**Salinity**
		Conductivity (mS/cm)		**Other**

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/7/06	12:00	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-582006-4
✓	5/7/06	12:00	Modified SW-846-8330	Explosives RDX Degradation Products	4°C	2	Glass	1L Amber		112G00041-582006-4
✓	5/7/06	12:00	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	1L HDPE		112G00041-582006-4

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	James Goerdt	**Modified By**	James Goerdt	**Printed By**	James Goerdt
Created Date	5/9/06	**Modified Date**	5/9/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT2006
TtNUS Project #	112G00041	**Well ID**	12MWT20
Task/Contract #	CTO 377	**Well Type**	-Select-
WBS Code #	TP00050125	**Sampled By**	James Goerdt
		Concentration	Low concentration

Well and Sample Data

Date	5/9/06	**Static Water Level (ft.)**	25.25	**Water Quality Meter**	4143005
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1100
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3254-1902
MS/MSD Collected?	N	**Well Volumes Req.**	1		
Duplicate Sample Collected?	N	**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/9/06	10:45	25.25		Cloudy	NA	NA	NA	NA	NA	NA	NA		0
5/9/06	10:55	25.41	50	Cloudy	4.97	3.76	1.66	487	16.21	361	NA		500

5/9/06	11:05	25.41	50	Cloudy	5.08	3.35	1.35	302	18.00	351	NA		500
5/9/06	11:15	25.41	50	Cloudy	5.17	3.00	1.35	227	18.29	345	NA		500
5/9/06	11:25	25.41	50	Slightly Turbid	5.28	2.64	1.45	103.9	18.53	345	NA		500
5/9/06	11:35	25.41	50	Slightly Turbid	5.28	2.65	1.67	56.8	16.95	352	NA		500
5/9/06	11:45	25.41	50	Clear	5.27	2.68	1.62	27.5	16.68	356	NA		500
5/9/06	11:55	25.41	50	Clear	5.24	2.78	1.49	18.6	16.90	358	NA		500

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/9/06	12:05	25.41	50	Clear	5.21	2.81	1.45	11.2	16.55	360	NA		500
5/9/06	12:15	25.41	50	Clear	5.18	2.84	1.42	7.29	16.51	363	NA		500

Final Purge / Sample Data

One Casing Volume		**Method**	Low flow - Bladder	**Dissolved Oxygen (mg/L)**	1.42
Total Vo. Purge (L)	4.5	**Waterlevel (ft.)**	25.41	**Turbidity (NTUs)**	7.29
Start Purge (hrs.)	10:45:00 AM	**Flowrate (mL/min)**	50	**Temp (C)**	16.51
End Purge (hrs.)	12:15:00 PM	**Color**	Clear	**ORP (mV)**	363
Total Purge Time (min.)	90	**pH (S.U.)**	5.18	**Salinity**	NA
		Conductivity (mS/cm)	2.84	**Other**	

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/9/06 1:00:00 AM	12:20	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-592006-5
✓	5/9/06 1:00:00 AM	12:20	Modified SW-846-8330	Explosives RDX Degradation Products	4°C	2	Glass	1L Amber		112G00041-592006-5
✓	5/9/06 1:00:00 AM	12:20	EPA 353.2	Nitrate + Nitrite (as N)	4° C/H2SO4	1	Plastic	1L HDPE		112G00041-592006-5

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	Terry Rojahn	**Modified By**	Terry Rojahn	**Printed By**	James Goerdt
Created Date	5/17/06	**Modified Date**	5/18/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT2206
TtNUS Project #	112G00041	**Well ID**	12MWT22
Task/Contract #	CTO 377	**Well Type**	-Select-
WBS Code #	TP00050125	**Sampled By**	Terry Rojahn
		Concentration	Low concentration

Well and Sample Data

Date	5/17/06	**Static Water Level (ft.)**	16.84	**Water Quality Meter**	928069
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1100
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3254-1902
MS/MSD Collected?	N	**Well Volumes Req.**	1		
Duplicate Sample Collected?	N	**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/17/06	10:00	16.84	0	Clear	NA	NA	NA	NA	NA	NA	NA	NA	0
5/17/06	10:10	17.65	150	Clear	5.92	0.307	10.55	10	13.9	244	NA	NA	1500

5/17/06	10:20	17.78	50	Clear	5.87	0.296	10.48	21	14.7	241	NA	NA	500
5/17/06	10:30	18.02	50	Clear	5.97	0.295	6.78	19	13.8	253	NA	NA	500
5/17/06	10:40	18.22	55	Clear	5.95	0.288	6.38	13	13.7	254	NA	NA	550
5/17/06	10:50	18.44	60	Clear	5.95	0.283	5.85	14	14.1	253			600
5/17/06	11:00	18.55	40	Clear	5.94	0.284	5.56	14	14.7	249	NA	NA	400
5/17/06	11:10	18.63	40	Clear	5.97	0.286	5.53	15	15.2	246	NA	NA	400

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/17/06	11:20	18.70	35	Clear	5.99	0.290	5.95	14	14.8	245	NA	NA	350
5/17/06	11:30	18.77	65	Clear	5.98	0.292	5.62	15	14.8	245	NA	NA	650
5/17/06	11:40	18.88	45	Clear	5.98	0.293	5.40	19	14.9	245	NA	NA	450
5/17/06	11:50	18.96	40	Clear	5.98	0.294	5.25	21	14.9	245	NA	NA	400
5/17/06	12:00	19.04	40	Clear	5.98	0.293	5.10	22	15.1	245	NA	NA	400
5/17/06	12:10	19.12	40	Clear	5.99	0.297	5.18	23	14.9	245	NA	NA	400
5/17/06	12:20	19.18	40	Clear	6.00	0.297	5.10	25	15.4	243	NA	NA	400
5/17/06	12:30	19.25	40	Clear	6.00	0.298	5.03	28	15.6	243	NA	NA	400
5/17/06	12:40	19.33	40	Clear	6.02	0.299	5.15	28	15.3	242	NA	NA	400
5/17/06	12:50	19.37	45	Clear	6.02	0.299	5.02	28	15.8	240	NA	NA	450
5/17/06	13:00	19.42	40	Clear	6.02	0.300	5.06	33	16.3	239	NA	NA	400
5/17/06	13:10	19.47	40	Clear	6.02	0.301	5.04	35	16.3	239	NA	NA	400
5/17/06	13:20	19.55	40	Clear	6.03	0.303	5.33	34	15.2	241	NA	NA	400
5/17/06	13:30	19.65	50	Clear	6.01	0.299	5.19	36	15.4	242	NA	NA	500
5/17/06	13:40	19.73	40	Clear	6.02	0.302	5.28	34	15.1	243	NA	NA	400
5/17/06	13:50	19.81	40	Clear	6.02	0.299	5.11	34	15.4	244	NA	NA	400
5/17/06	14:00	19.88	40	Clear	6.01	0.301	5.05	33	15.3	244	NA	NA	400

Final Purge / Sample Data

One Casing Volume	0
Total Vo. Purge (L)	11.65
Start Purge (hrs.)	10:00:00 AM
End Purge (hrs.)	2:00:00 PM
Total Purge Time (min.)	240

Method	Low flow - Bladder
Waterlevel (ft.)	19.88
Flowrate (mL/min)	40
Color	Clear
pH (S.U.)	6.01
Conductivity (mS/cm)	0.301

Dissolved Oxygen (mg/L)	5.05
Turbidity (NTUs)	33
Temp (C)	15.3
ORP (mV)	244
Salinity	NA
Other	NA

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/17/06	14:00	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	500ml PE		112G00041-5172006-7
✓	5/17/06	14:00	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-5172006-7

General Observations and Notes

SAMPLE pH PAPER = ~5.5 SU

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	David Hickey	**Modified By**	David Hickey	**Printed By**	James Goerdt
Created Date	5/18/06	**Modified Date**	5/19/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT2306
TtNUS Project #	112G00041	**Well ID**	12MWT23
Task/Contract #	CTO 377	**Well Type**	-Select-
WBS Code #	TP00050125	**Sampled By**	David Hickey
		Concentration	Low concentration

Well and Sample Data

Date	5/18/06	**Static Water Level (ft.)**	27.67	**Water Quality Meter**	406032
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1335
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3327-2402
MS/MSD Collected?		**Well Volumes Req.**	1		
Duplicate Sample Collected?		**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/18/06	14:40	27.67	50	Clear	3.03	8.05	4.04	20.4	14.41	476	NA	NA	0
5/18/06	14:50	28.55	50	Clear	2.96	7.91	2.56	5.56	14.41	495	NA	NA	500

5/18/06	15:00	28.82	50	Clear	3.04	7.76	2.89	7.75	14.72	486	NA	NA	500
5/18/06	15:10	29.17	50	Clear	3.09	7.80	2.82	8.91	15.12	479	NA	NA	500
5/18/06	15:20	29.44	50	Clear	3.04	7.84	2.77	8.48	15.48	472	NA	NA	500
5/18/06	15:30	29.69	50	Clear	3.03	7.95	2.71	8.05	15.53	463	NA	NA	500
5/18/06	15:40	29.81	50	Clear	2.95	7.92	2.25	7.36	14.89	457	NA	NA	500
5/18/06	15:50	30.15	50	Clear	3.02	7.91	1.86	16.8	15.35	449	NA	NA	500

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/18/06	16:00	30.37	50	Clear	2.96	7.97	3.06	18.6	14.70	443	NA	NA	500
5/18/06	16:10	30.54	50	Clear	3.16	7.99	3.27	35.7	14.76	441	NA	NA	500
5/18/06	16:20	30.89	50	Clear	2.98	8.03	3.29	49.1	14.47	439	NA	NA	500
5/18/06	16:30	DRY	50	Clear	3.02	8.09	2.01	127	13.84	426	NA	NA	500

Final Purge / Sample Data

One Casing Volume		**Method**	Low flow - Bladder	**Dissolved Oxygen (mg/L)**	2.01
Total Vo. Purge (L)	5.5	**Waterlevel (ft.)**	DRY	**Turbidity (NTUs)**	127
Start Purge (hrs.)	2:40:00 PM	**Flowrate (mL/min)**	50	**Temp (C)**	13.84
End Purge (hrs.)	4:30:00 PM	**Color**	Clear	**ORP (mV)**	426
Total Purge Time (min.)	110	**pH (S.U.)**	3.02	**Salinity**	NA
		Conductivity (mS/cm)	8.09	**Other**	NA

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/19/06	12:00	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-5192006-8
✓	5/19/06	12:00	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	500ml PE		112G00041-5192006-8

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	James Goerdt	**Modified By**	James Goerdt	**Printed By**	James Goerdt
Created Date	5/7/06	**Modified Date**	5/7/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT2806
TtNUS Project #	112G00041	**Well ID**	12MWT28
Task/Contract #	CTO 377	**Well Type**	Monitoring Well
WBS Code #	TP00050125	**Sampled By**	James Goerdt
		Concentration	Low concentration

Well and Sample Data

Date	5/7/06	**Static Water Level (ft.)**	12.08	**Water Quality Meter**	4143005
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1100
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3254-1902
MS/MSD Collected?	N	**Well Volumes Req.**	1		
Duplicate Sample Collected?	N	**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/7/06	12:55	12.08	110	Clear	5.88	1.82	1.62	12	14.16	290	NA		0
5/7/06	13:05	14.12	110	Clear	5.92	1.82	1.65	9.32	14.37	290	NA		1100

5/7/06	13:15	14.63	110	Clear	5.91	1.83	1.66	8.76	14.43	289	NA		1100
5/7/06	13:25	16.32	110	Clear	5.91	1.82	1.48	6.21	14.51	287	NA		1100
5/7/06	13:35	17.23	110	Clear	5.91	1.81	1.37	5.01	14.67	287	NA		1100
5/7/06	13:45	18.41	110	Clear	5.91	1.81	1.20	3.52	14.83	286	NA		1100
5/7/06	13:55	18.53	110	Clear	5.90	1.80	1.21	2.67	14.42	284	NA		1100
5/7/06	14:05	18.87	80	Clear	5.91	1.79	1.18	1.87	14.52	282	NA		800

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/7/06	14:15	19.14	80	Clear	5.92	1.79	1.13	0	14.63	281	NA		800
5/7/06	14:25	19.43	80	Clear	5.92	1.79	1.11	0	14.74	281	NA		800
5/7/06	14:35	19.73	80	Clear	5.95	1.76	1.35	4.89	14.81	277	NA		800
5/7/06	14:45	19.89	80	Clear	6.03	1.75	1.75	9.76	14.93	272	NA		800
5/7/06	14:55	19.98	80	Clear	6.06	1.74	1.87	12.4	14.96	269	NA		800
5/7/06	15:05	20.48	80	Clear	6.10	1.74	2.06	15.4	15.00	266	NA		800
5/7/06	15:15	20.73	80	Clear	5.94	1.74	1.11	32.4	15.41	264	NA		800
5/7/06	15:25	20.87	80	Clear	5.92	1.74	1.08	38.7	15.36	261	NA		800
5/7/06	15:35	21.23	80	Clear	5.91	1.73	1.03	41.2	14.93	260	NA		800
5/7/06	15:45	21.52	80	Clear	5.91	1.74	0.99	44.2	14.76	259	NA		800
5/7/06	15:55	21.57	80	Clear	5.90	1.72	1.47	57.3	14.91	252	NA		800
5/7/06	16:05	22.13	80	Clear	5.90	1.69	1.72	64.8	15.13	249	NA		800
5/7/06	16:15	22.74	80	Clear	5.90	1.68	2.04	82.8	15.26	246	NA		800
5/7/06	16:25	22.91	80	Clear	5.91	1.66	0.81	87.6	15.17	245	NA		800
5/7/06	16:35	23.18	80	Clear	5.91	1.52	0.75	97.3	15.12	244	NA		800
5/7/06	16:45	24.40	80	Clear	5.92	1.48	0.71	103	15.23	240	NA		800
5/7/06	16:55	24.72	80	Clear	5.92	1.46	0.68	145	15.27	241	NA		800

Final Purge / Sample Data

One Casing Volume	
Total Vo. Purge (L)	21
Start Purge (hrs.)	12:55:00 PM
End Purge (hrs.)	4:55:00 PM
Total Purge Time (min.)	240

Method	Low flow - Bladder
Waterlevel (ft.)	24.72
Flowrate (mL/min)	80
Color	Clear
pH (S.U.)	5.92
Conductivity (mS/cm)	1.46

Dissolved Oxygen (mg/L)	0.68
Turbidity (NTUs)	145
Temp (C)	15.27
ORP (mV)	241
Salinity	NA
Other	

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/7/06 1:00:00 AM	17:00	EPA 353.2	Nitrate + Nitrite (as N)	4° C/H2SO4	1	Plastic	1L HDPE		112G00041-582006-4
✓	5/7/06 1:00:00 AM	17:00	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-582006-4
✓	5/7/06 1:00:00 AM	17:00	Modified SW-846-8330	Explosives RDX Degradation Products	4°C	2	Glass	1L Amber		112G00041-582006-4

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	Terry Rojahn	**Modified By**	Terry Rojahn	**Printed By**	James Goerdt
Created Date	5/19/06	**Modified Date**	5/19/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT30-DRY
TtNUS Project #	112G00041	**Well ID**	12MWT30
Task/Contract #	CTO 377	**Well Type**	-Select-
WBS Code #	TP00050125	**Sampled By**	Terry Rojahn
		Concentration	Low concentration

Well and Sample Data

Date	5/19/06	**Static Water Level (ft.)**	NA	**Water Quality Meter**	No Data
Purge Method	-Select-	**Total Well Depth (ft.)**		**Pump Control Box**	No Data
Sampling Method	-Select-	**Well Riser Diameter (in.)**		**Turbidity Meter**	No Data
MS/MSD Collected?	N	**Well Volumes Req.**	1		
Duplicate Sample Collected?	N	**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)

Final Purge / Sample Data

One Casing Volume	**Method**	-Select-	**Dissolved Oxygen (mg/L)**
Total Vo. Purge (L)	**Waterlevel (ft.)**		**Turbidity (NTUs)**
Start Purge (hrs.)	**Flowrate (mL/min)**		**Temp (C)**
End Purge (hrs.)	**Color**		**ORP (mV)**
Total Purge Time (min.)	**pH (S.U.)**		**Salinity**
	Conductivity (mS/cm)		**Other**

General Observations and Notes

DRY WELL @ 1440 Hrs

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	Terry Rojahn	**Modified By**	Terry Rojahn	**Printed By**	James Goerdt
Created Date	5/19/06	**Modified Date**	5/19/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT3106
TtNUS Project #	112G00041	**Well ID**	12MWT31
Task/Contract #	CTO 377	**Well Type**	Monitoring Well
WBS Code #	TP00050125	**Sampled By**	Terry Rojahn
		Concentration	Low concentration

Well and Sample Data

Date	5/19/06	**Static Water Level (ft.)**	67.57	**Water Quality Meter**	928069
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1100
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3254-1902
MS/MSD Collected?	N	**Well Volumes Req.**	1		
Duplicate Sample Collected?	N	**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/19/06	09:40	67.57	0	Clear	NA	NA	NA	NA	NA	NA	NA	NA	0
5/19/06	09:50	68.45	60	Clear	7.88	0.641	9.86	4.3	14.2	211	NA	NA	600

5/19/06	10:00	69.55	110	Clear	7.94	0.622	8.74	2.4	14.2	187			1100
5/19/06	10:10	70.43	100	Clear	7.99	0.619	7.87	5.1	14.3	166			1000
5/19/06	10:20	71.22	85	Clear	8.02	0.617	7.13	1.3	14.4	149			850
5/19/06	10:30	71.75	100	Clear	8.06	0.616	6.36	1.1	14.8	129			1000
5/19/06	10:40	72.10	70	Clear	8.07	0.619	5.81	2.6	14.9	116			700
5/19/06	10:50	72.51	85	Clear	8.09	0.613	5.15	0.70	14.5	112			850

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/19/06	11:00	72.90	80	Clear	8.10	0.607	4.70	0.35	14.6	107			800
5/19/06	11:10	73.22	70	Clear	8.10	0.607	4.28	1.2	14.9	100			700
5/19/06	11:20	73.55	70	Clear	8.09	0.606	4.02	0.60	14.8	96			700
5/19/06	11:30	73.95	75	Clear	8.10	0.597	3.60	1.3	15.2	94			750
5/19/06	11:40	74.30	80	Clear	8.12	0.600	3.34	2.3	15.0	92			800
5/19/06	11:50	74.60	65	Clear	8.15	0.601	3.06	3.1	15.7	88			650
5/19/06	12:00	74.89	60	Clear	8.16	0.609	2.93	4.8	15.6	84			600
5/19/06	12:10	75.31	90	Clear	8.16	0.603	2.68	4.4	15.6	80			900
5/19/06	12:20	75.70	80	Clear	8.16	0.607	2.49	5.8	15.4	79			800
5/19/06	12:30	76.11	80	Clear	8.16	0.608	2.32	6.8	15.4	77			800
5/19/06	12:40	76.59	80	Clear	8.16	0.612	2.16	8.0	15.5	75			800
5/19/06	12:50	76.90	80	Clear	8.16	0.614	2.03	10	15.4	74			800
5/19/06	13:00	77.39	80	Clear	8.13	0.619	1.87	9.1	15.4	74			0
5/19/06	13:00	77.39	80	Clear	8.13	0.619	1.87	9.1	15.4	74			800
5/19/06	13:10	77.70	80	Clear	8.12	0.618	1.77	9.1	15.4	73			800
5/19/06	13:20	78.15	80	Clear	8.09	0.617	1.65	11	15.4	73			800
5/19/06	13:30	78.55	80	Clear	8.07	0.619	1.52	13	15.1	72			800
5/19/06	13:40	78.93	80	Clear	8.06	0.615	1.42	13	15.9	72			800

Final Purge / Sample Data

One Casing Volume		**Method**	Low flow - Bladder	**Dissolved Oxygen (mg/L)**	1.42
Total Vo. Purge (L)	19.2	**Waterlevel (ft.)**	78.93	**Turbidity (NTUs)**	13
Start Purge (hrs.)	9:40:00 AM	**Flowrate (mL/min)**	80	**Temp (C)**	15.9
End Purge (hrs.)	1:40:00 PM	**Color**	Clear	**ORP (mV)**	72
Total Purge Time (min.)	240	**pH (S.U.)**	8.06	**Salinity**	
		Conductivity (mS/cm)	0.615	**Other**	

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/19/06	13:45	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-5192006-8
✓	5/19/06	13:45	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	500ml PE		112G00041-5192006-8

General Observations and Notes

ONE WELL VOL. = 14.7 L

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	David Hickey	**Modified By**	David Hickey	**Printed By**	James Goerdt
Created Date	5/7/06	**Modified Date**	5/9/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT3206
TtNUS Project #	112G00041	**Well ID**	12MWT32
Task/Contract #	CTO 377	**Well Type**	Monitoring Well
WBS Code #	TP00050125	**Sampled By**	David Hickey
		Concentration	Low concentration

Well and Sample Data

Date	5/7/06	**Static Water Level (ft.)**	84.62	**Water Quality Meter**	928069
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1335
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3327-2402
MS/MSD Collected?		**Well Volumes Req.**	1		
Duplicate Sample Collected?		**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/7/06	14:20	84.62	90	Clear	6.54	2.37	7.08	5.51	17.7	144	NA	NA	0
5/7/06	14:30	85.26	90	Clear	6.49	2.21	1.49	4.22	16.3	128	NA	NA	900

5/7/06	14:41	85.70	75	Clear	6.49	2.20	0.52	2.62	15.6	138	NA	NA	825
5/7/06	14:50	85.98	75	Clear	6.50	2.20	0.29	1.53	16.2	140	NA	NA	675
5/7/06	15:00	86.28	75	Clear	6.55	2.20	0.20	1.30	16.6	140	NA	NA	750
5/7/06	15:10	86.64	75	Clear	6.54	2.21	1.25	1.73	16.2	151	NA	NA	750
5/7/06	15:20	86.93	75	Clear	6.54	2.20	0.74	1.23	16.6	148	NA	NA	750
5/7/06	15:30	87.28	75	Clear	6.54	2.20	0.63	1.11	16.6	149	NA	NA	750

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/7/06	15:40	87.64	75	Clear	6.53	2.18	0.30	1.36	15.5	148	NA	NA	750
5/7/06	16:00	88.10	75	Clear	6.58	2.17	0.11	1.93	15.8	127	NA	NA	1500
5/7/06	16:10	88.42	75	Clear	6.57	2.17	0.08	1.78	15.7	110	NA	NA	750
5/7/06	16:20	88.72	75	Clear	6.56	2.16	0.01	1.62	15.50	96	NA	NA	750
5/7/06	16:31	88.85	75	Clear	6.56	2.15	0.00	1.66	15.40	94	NA	NA	825
5/7/06	16:41	89.32	75	Clear	6.53	2.14	1.13	1.68	15.8	81	NA	NA	750
5/7/06	16:50	89.54	50	Clear	6.55	2.16	0.00	2.13	16.1	63	NA	NA	450
5/7/06	17:00	89.96	50	Clear	6.54	2.15	0.29	0.65	15.6	61	NA	NA	500
5/7/06	17:10	90.19	50	Clear	6.53	2.13	1.25	1.98	15.6	65	NA	NA	500
5/7/06	17:21	90.53	50	Clear	6.52	2.15	0.23	2.28	15.7	37	NA	NA	550
5/7/06	17:30	90.87	50	Clear	6.50	2.14	0.00	3.11	15.2	24	NA	NA	450
5/7/06	17:40	91.18	50	Clear	6.48	2.13	0.00	3.23	15.1	22	NA	NA	500

Final Purge / Sample Data

One Casing Volume		**Method**	Low flow - Bladder	**Dissolved Oxygen (mg/L)**
Total Vo. Purge (L)	13.175	**Waterlevel (ft.)**		**Turbidity (NTUs)**
Start Purge (hrs.)	2:20:00 PM	**Flowrate (mL/min)**		**Temp (C)**
End Purge (hrs.)	5:30:00 PM	**Color**		**ORP (mV)**
Total Purge Time (min.)	190	**pH (S.U.)**		

Conductivity (mS/cm)

Salinity

Other

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/7/06	17:45	Modified SW-846-8330	Explosives RDX Degradation Products	4°C	2	Glass	1L Amber		112G00041-582006-4
✓	5/7/06	17:45	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-582006-4
✓	5/7/06	17:45	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	1L HDPE		112G00041-582006-4

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	James Goerdt	**Modified By**	James Goerdt	**Printed By**	James Goerdt
Created Date	5/7/06	**Modified Date**	5/7/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT3606
TtNUS Project #	112G00041	**Well ID**	12MWT36
Task/Contract #	CTO 377	**Well Type**	-Select-
WBS Code #	TP00050125	**Sampled By**	James Goerdt
		Concentration	Low concentration

Well and Sample Data

Date	5/7/06	**Static Water Level (ft.)**	14.27	**Water Quality Meter**	4143005
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1100
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3254-1902
MS/MSD Collected?	N	**Well Volumes Req.**	1		
Duplicate Sample Collected?	N	**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/7/06	09:25	14.27	170	Clear	NA	NA	NA	NA	NA	NA	NA		0
5/7/06	09:35	16.07	90	Clear	5.50	.861	0.77	1.10	13.11	340	NA		900

5/7/06	09:45	16.53	90	Clear	5.54	.861	0.73	1.05	13.58	328	NA		900
5/7/06	09:55	16.72	90	Clear	5.57	.861	0.73	0.87	13.63	324	NA		900
5/7/06	10:05	16.83	90	Clear	5.60	.861	0.71	0.50	13.63	320	NA		900
5/7/06	10:15	16.98	90	Clear	5.58	.862	0.62	0.09	13.77	315	NA		900
5/7/06	10:25	17.17	90	Clear	5.53	.862	0.50	0.06	13.82	309	NA		900
5/7/06	10:45	17.18	90	Clear	5.57	.861	0.48	0.03	14.09	303	NA		1800

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/7/06	10:55	17.18	90	Clear	5.58	.859	0.45	0	14.19	300	NA		900
5/7/06	11:05	17.18	90	Clear	5.57	.859	0.45	0	14.25	299	NA		900

Final Purge / Sample Data

One Casing Volume	0	**Method**	Low flow - Bladder	**Dissolved Oxygen (mg/L)**	0.45
Total Vo. Purge (L)	9	**Waterlevel (ft.)**	17.18	**Turbidity (NTUs)**	0
Start Purge (hrs.)	9:25:00 AM	**Flowrate (mL/min)**	90	**Temp (C)**	14.25
End Purge (hrs.)	11:05:00 AM	**Color**	Clear	**ORP (mV)**	299
Total Purge Time (min.)	100	**pH (S.U.)**	5.57	**Salinity**	NA
		Conductivity (mS/cm)	.859	**Other**	

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/7/06 1:00:00 AM	11:10	EPA 353.2	Nitrate + Nitrite (as N)	4° C/H2SO4	1	Plastic	1L HDPE		112G00041-582006-4
✓	5/7/06 1:00:00 AM	11:10	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-582006-4
✓	5/7/06 1:00:00 AM	11:10	Modified SW-846-8330	Explosives RDX Degradation Products	4°C	2	Glass	1L Amber		112G00041-582006-4

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	David Hickey	**Modified By**	John Wright	**Printed By**	James Goerdt
Created Date	5/17/06	**Modified Date**	5/24/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT3806
TtNUS Project #	112G00041	**Well ID**	12MWT38
Task/Contract #	CTO 377	**Well Type**	CRA
WBS Code #	TP00050125	**Sampled By**	David Hickey
		Concentration	Low concentration

Well and Sample Data

Date	5/17/06	**Static Water Level (ft.)**	9.33	**Water Quality Meter**	406032
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**	25.00	**Pump Control Box**	MP10-1335
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**	2	**Turbidity Meter**	3327-2402
MS/MSD Collected?		**Well Volumes Req.**	1		
Duplicate Sample Collected?		**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/17/06	09:25	9.33	100	Clear	3.44	0.657	9.89	14.4	14.31	498	NA	NA	0
5/17/06	09:35	10.46	100	Clear	2.92	0.597	4.00	5.85	14.23	541	NA	NA	1000

5/17/06	09:45	10.68	75	Clear	2.85	0.593	3.88	2.77	14.24	544	NA	NA	750
5/17/06	09:55	11.29	75	Clear	2.83	0.583	3.26	2.27	14.50	523	NA	NA	750
5/17/06	10:05	11.35	50	Clear	2.94	0.584	3.25	1.91	14.97	522	NA	NA	500
5/17/06	10:15	10.37	50	Clear	2.99	0.576	4.66	1.64	16.67	524	NA	NA	500
5/17/06	10:25	11.35	50	Clear	2.97	0.580	4.01	1.61	16.85	524	NA	NA	500
5/17/06	10:35	11.32	50	Clear	2.95	0.582	3.20	1.60	16.39	526	NA	NA	500

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/17/06	10:45	11.86	70	Clear	2.92	0.579	3.02	1.57	15.99	526	NA	NA	700
5/17/06	10:55	12.18	70	Clear	2.86	0.570	2.96	4.86	15.03	517	NA	NA	700
5/17/06	11:05	12.21	50	Clear	2.81	0.568	2.84	6.04	14.95	492	NA	NA	500
5/17/06	11:15	12.23	50	Clear	2.86	0.581	2.92	1.34	14.65	493	NA	NA	500
5/17/06	11:25	12.35	50	Clear	2.90	0.576	2.84	1.41	14.78	491	NA	NA	500
5/17/06	11:35	12.43	50	Clear	2.94	0.568	2.78	1.63	15.34	487	NA	NA	500
5/17/06	11:45	12.47	50	Clear	2.92	0.568	2.76	1.36	15.15	485	NA	NA	500
5/17/06	11:55	12.54	50	Clear	2.97	0.562	2.71	1.32	15.53	483	NA	NA	500
5/17/06	12:05	12.60	40	Clear	3.03	0.559	2.64	1.30	15.97	483	NA	NA	400
5/17/06	12:15	12.62	40	Clear	3.04	0.562	2.68	1.02	15.91	483	NA	NA	400
5/17/06	12:25	12.70	50	Clear	2.99	0.558	2.72	2.06	14.87	478	NA	NA	500
5/17/06	12:45	13.30	60	Clear	2.99	0.580	2.50	2.18	14.72	475	NA	NA	1200
5/17/06	12:55	13.38	50	Clear	3.05	0.574	2.40	8.10	15.06	474	NA	NA	500
5/17/06	13:05	13.46	50	Clear	3.08	0.573	2.25	7.21	15.39	474	NA	NA	500
5/17/06	13:15	13.51	50	Clear	3.04	0.574	2.30	1.48	14.98	472	NA	NA	500
5/17/06	13:25	13.61	50	Clear	3.07	0.568	2.22	1.81	15.04	472	NA	NA	500

Final Purge / Sample Data

One Casing Volume 9.68 **Method** 1 **Dissolved Oxygen** 2.22

Total Vo. Purge (L)	13.4	**Waterlevel (ft.)**	13.61	**(mg/L)**	
Start Purge (hrs.)	9:25:00 AM	**Flowrate (mL/min)**	50	**Turbidity (NTUs)**	1.81
End Purge (hrs.)	1:25:00 PM	**Color**	Clear	**Temp (C)**	15.04
Total Purge Time (min.)	240	**pH (S.U.)**	3.07	**ORP (mV)**	472
		Conductivity (mS/cm)	0.568	**Salinity**	NA
				Other	NA

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/17/06	13:30	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-5172006-7
✓	5/17/06	13:30	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	500ml PE		112G00041-5172006-7

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	David Hickey	**Modified By**	David Hickey	**Printed By**	James Goerdt
Created Date	5/20/06	**Modified Date**	5/20/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT4106
TtNUS Project #	112G00041	**Well ID**	12MWT41
Task/Contract #	CTO 377	**Well Type**	-Select-
WBS Code #	TP00050125	**Sampled By**	David Hickey
		Concentration	Low concentration

Well and Sample Data

Date	5/20/06	**Static Water Level (ft.)**	19.36	**Water Quality Meter**	406032
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1335
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3327-2402
MS/MSD Collected?		**Well Volumes Req.**	1		
Duplicate Sample Collected?		**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/20/06	08:40	19.36	80	Clear	6.13	0.990	NA	59.6	12.63	124	NA	NA	0
5/20/06	08:50	20.23	80	Clear	6.22	0.948	NA	80.8	12.58	114	NA	NA	800

5/20/06	09:00	20.46	50	Clear	6.26	0.940	NA	70.3	12.58	110	NA	NA	500
5/20/06	09:10	20.58	50	Clear	6.28	0.937	NA	56.3	12.59	107	NA	NA	500
5/20/06	09:20	20.87	75	Clear	6.33	0.931	NA	44.8	12.60	103	NA	NA	750
5/20/06	09:30	20.89	75	Clear	6.33	0.934	NA	45.2	12.67	103	NA	NA	750
5/20/06	09:40	21.03	75	Clear	6.36	0.936	NA	42.3	12.79	99	NA	NA	750
5/20/06	09:50	21.21	75	Clear	6.39	0.943	NA	38.6	12.90	96	NA	NA	750

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/20/06	10:00	21.30	75	Clear	6.40	0.950	NA	34.9	12.97	94	NA	NA	750
5/20/06	10:10	21.47	75	Clear	6.42	0.958	NA	31.7	12.97	91	NA	NA	750
5/20/06	10:20	21.75	100	Clear	6.45	0.964	NA	29.1	12.91	87	NA	NA	1000
5/20/06	10:30	22.03	100	Clear	6.48	0.971	NA	28.3	12.93	84	NA	NA	1000
5/20/06	10:40	22.26	100	Clear	6.51	0.980	NA	27.4	12.93	79	NA	NA	1000
5/20/06	10:50	22.47	110	Clear	6.53	0.986	NA	22.6	13.03	77	NA	NA	1100
5/20/06	11:00	22.77	110	Clear	6.57	0.991	NA	21.1	13.06	73	NA	NA	1100

Final Purge / Sample Data

One Casing Volume		**Method**	Low flow - Bladder	**Dissolved Oxygen (mg/L)**	
Total Vo. Purge (L)	10.4	**Waterlevel (ft.)**		**Turbidity (NTUs)**	
Start Purge (hrs.)	8:40:00 AM	**Flowrate (mL/min)**		**Temp (C)**	
End Purge (hrs.)	10:50:00 AM	**Color**		**ORP (mV)**	
Total Purge Time (min.)	130	**pH (S.U.)**		**Salinity**	
		Conductivity (mS/cm)		**Other**	

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/20/06	11:05	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-5222006-10
✓	5/20/06	11:05	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	500ml PE		112G00041-5222006-10

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	Terry Rojahn	**Modified By**	John Wright	**Printed By**	James Goerdt
Created Date	5/18/06	**Modified Date**	5/25/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT4206
TtNUS Project #	112G00041	**Well ID**	12MWT42
Task/Contract #	CTO 377	**Well Type**	CRA
WBS Code #	TP00050125	**Sampled By**	Terry Rojahn
		Concentration	Low concentration

Well and Sample Data

Date	5/18/06	**Static Water Level (ft.)**	11.35	**Water Quality Meter**	928069
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**	29.00	**Pump Control Box**	MP10-1100
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**	2	**Turbidity Meter**	3254-1902
MS/MSD Collected?	N	**Well Volumes Req.**	1		
Duplicate Sample Collected?	N	**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/18/06	14:15	11.35	0	Clear	NA	NA	NA	NA	NA	NA	NA	NA	0
5/18/06	14:25	13.12	150	Clear	4.43	0.356	2.69	2.5	12.2	414	NA	NA	1500

5/18/06	14:35	15.35	100	Clear	4.27	0.356	2.01	2.3	12.2	416	NA	NA	1000
5/18/06	14:45	15.83	60	Clear	4.28	0.358	2.87	1.2	12.1	413			600
5/18/06	14:55	15.75	60	Clear	4.25	0.356	1.92	1.4	12.0	421			600
5/18/06	15:05	15.88	70	Clear	4.25	0.363	1.55	0.95	13.0	425			700
5/18/06	15:15	15.95	70	Clear	4.26	0.377	2.45	0.70	12.9	427			700
5/18/06	15:25	16.06	70	Clear	4.27	0.380	2.44	1.8	12.6	430			700

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/18/06	15:35	16.20	70	Clear	4.27	0.378	2.12	2.4	12.2	432			700
5/18/06	15:45	16.35	70	Clear	4.28	0.377	1.63	3.4	12.2	430			700
5/18/06	15:55	16.52	70	Clear	4.29	0.378	1.60	2.8	12.3	428			700
5/18/06	16:05	16.64	70	Clear	4.30	0.380	1.25	3.3	12.3	425			700
5/18/06	16:15	16.75	70	Clear	4.30	0.386	1.16	3.6	12.4	424			700
5/18/06	16:25	16.98	80	Clear	4.30	0.396	1.74	3.9	12.5	422			800
5/18/06	16:35	17.00	60	Clear	4.30	0.398	1.69	3.7	12.5	420			600
5/18/06	16:45	17.02	60	Clear	4.30	0.406	1.40	3.8	12.6	417			600
5/18/06	16:55	17.03	60	Clear	4.30	0.409	1.42	2.4	12.5	407			600
5/18/06	17:00	17.03	60	Clear	4.31	0.413	1.45	2.5	12.6	402			300
5/18/06	17:05	17.04	60	Clear	4.31	0.414	1.43	3.5	12.6	398			300

Final Purge / Sample Data

One Casing Volume	10.9	**Method**	Low flow - Bladder	**Dissolved Oxygen (mg/L)**	1.43
Total Vo. Purge (L)	12.5	**Waterlevel (ft.)**	17.04	**Turbidity (NTUs)**	3.5
Start Purge (hrs.)	2:15:00 PM	**Flowrate (mL/min)**	60	**Temp (C)**	12.6
End Purge (hrs.)	5:05:00 PM	**Color**	Clear	**ORP (mV)**	398
Total Purge Time (min.)	170	**pH (S.U.)**	4.31	**Salinity**	
		Conductivity (mS/cm)	0.414	**Other**	

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/18/06	17:10	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-5192006-8
✓	5/18/06	17:10	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	500ml PE		112G00041-5192006-8

General Observations and Notes

TD = 30.35

- End of Report -

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

Created By	Terry Rojahn	**Modified By**	Terry Rojahn	**Printed By**	James Goerdt
Created Date	5/20/06	**Modified Date**	5/20/06	**Printed Date**	7/28/06

Project Information

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Facility Name	CRANE NSWC	**Sample ID #**	12GWT4706
TtNUS Project #	112G00041	**Well ID**	12MWT47
Task/Contract #	CTO 377	**Well Type**	-Select-
WBS Code #	TP00050125	**Sampled By**	Terry Rojahn
		Concentration	Low concentration

Well and Sample Data

Date	5/20/06	**Static Water Level (ft.)**	12.28	**Water Quality Meter**	928069
Purge Method	Low flow - Bladder	**Total Well Depth (ft.)**		**Pump Control Box**	MP10-1100
Sampling Method	Low flow - Bladder	**Well Riser Diameter (in.)**		**Turbidity Meter**	3254-1902
MS/MSD Collected?	N	**Well Volumes Req.**	1		
Duplicate Sample Collected?	N	**Monitor Reading (ppm)**	NA		
Corresponding Duplicate Sample ID					

Purge Entries

Date	Time	Water Level (ft.)	Flow Rate (mL/min)	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTUs)	Temp °C	ORP (mV)	Salinity (%)	Other	Incremental Volume (mL)
5/20/06	09:50	12.28	0	Clear	NA	NA	NA	NA	NA	NA	NA	NA	0
5/20/06	10:00	12.30	150	Clear	6.49	1.24	9.75	1.6	12.1	221	NA	NA	1500

5/20/06	10:10	12.30	150	Clear	6.57	1.23	9.80	1.8	12.1	218			1500
5/20/06	10:20	12.30	150	Clear	6.61	1.23	9.82	0.30	12.1	216			1500
5/20/06	10:30	12.30	150	Clear	6.63	1.23	9.79	0.40	12.1	216			1500
5/20/06	10:40	12.30	150	Clear	6.64	1.23	9.77	0.70	12.1	217			1500
5/20/06	10:50	12.30	150	Clear	6.66	1.23	9.70	0.00	12.1	217			1500

Final Purge / Sample Data

One Casing Volume		**Method**	Low flow - Bladder	**Dissolved Oxygen (mg/L)**	9.70
Total Vo. Purge (L)	9	**Waterlevel (ft.)**	12.30	**Turbidity (NTUs)**	0.00
Start Purge (hrs.)	9:50:00 AM	**Flowrate (mL/min)**	150	**Temp (C)**	12.1
End Purge (hrs.)	10:50:00 AM	**Color**	Clear	**ORP (mV)**	217
Total Purge Time (min.)	60	**pH (S.U.)**	6.66	**Salinity**	
		Conductivity (mS/cm)	1.23	**Other**	

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Preservative	Count	Type	Requirements	Comments	Chain#
✓	5/20/06	10:55	SW-846-8330	Nitroaromatics and Nitramines	4°C	2	Glass	1L Amber		112G00041-5222006-10
✓	5/20/06	10:55	EPA 353.2	Nitrate + Nitrite (as N)	4°C/H2SO4	1	Plastic	500ml PE		112G00041-5222006-10

General Observations and Notes

TD = 26.80'

- End of Report -

APPENDIX A.2

SWMU 12

SURFACE WATER SAMPLE LOG SHEETS

ROUND 6

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLING LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Project Manager (PM)**	Ralph Basinski	**Created By**	Terry Rojahn
TtNUS Project #	112G00041	**PM Telephone**	412-921-8308	**Created Date**	5/16/06
Task/Contract #	CTO 377	**Field Op Leader (FOL)**	James Goerdt	**Modified By**	
WBS Code #	TP00050125	**FOL Phone**	412-921-8425	**Modified Date**	
Sample ID Number	12SW0906			**Printed By**	James Goerdt
Sample Location ID	12SW/SD09			**Printed Date**	8/3/06

Sample Collection Records

Date	5/16/06	**Color**	CLEAR	**Temp (C)**	12.0
Time	11:55	**pH (S.U.)**	7.58	**ORP (mV)**	183
Depth (ft.)	SURFACE	**S.C. (mS/cm)**	0.192	**Salinity (%)**	NA
Method	Direct bottle	**DO (mg/L)**	12.93		
MS/MSD Collected	N	**Turbidity (NTUs)**	5.13		
Duplicate Collected	N				
Duplicate ID					

Laboratory Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Count	Type	Requirements	Preservative	Comments	Chain of Custody #
✓	5/16/06	11:55	Nitroaromatics and Nitramines	SW-846-8330	2	Glass	1L Amber	4°C		112G00041-5172006-7
✓	5/16/06	11:55	Nitrate + Nitrite (as N)	EPA 353.2	1	Plastic	500ml PE	4° C/H2SO4		112G00041-5172006-7

General Observations and Notes

0.2 X 3 & 0.3FT/SEC

- End of Report -

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLING LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Project Manager (PM)**	Ralph Basinski	**Created By**	Terry Rojahn
TtNUS Project #	112G00041	**PM Telephone**	412-921-8308	**Created Date**	5/16/06
Task/Contract #	CTO 377	**Field Op Leader (FOL)**	James Goerdt	**Modified By**	
WBS Code #	TP00050125	**FOL Phone**	412-921-8425	**Modified Date**	
Sample ID Number	12SW1106			**Printed By**	James Goerdt
Sample Location ID	12SW/SD11			**Printed Date**	8/3/06

Sample Collection Records

Date	5/16/06	**Color**	CLEAR	**Temp (C)**	12.1
Time	10:10	**pH (S.U.)**	7.23	**ORP (mV)**	74
Depth (ft.)	SURFACE	**S.C. (mS/cm)**	0.211	**Salinity (%)**	NA
Method	Direct bottle	**DO (mg/L)**	11.59		
MS/MSD Collected	N	**Turbidity (NTUs)**	4.01		
Duplicate Collected	N				
Duplicate ID					

Laboratory Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Count	Type	Requirements	Preservative	Comments	Chain of Custody #
✓	5/16/06	10:10	Nitroaromatics and Nitramines	SW-846-8330	2	Glass	1L Amber	4°C		112G00041-5172006-7
✓	5/16/06	10:10	Nitrate + Nitrite (as N)	EPA 353.2	1	Plastic	500ml PE	4° C/H2SO4		112G00041-5172006-7

General Observations and Notes

.2 X 4.7 & 0.5FT/SEC

- End of Report -

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLING LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Project Manager (PM)**	Ralph Basinski	**Created By**	Terry Rojahn
TtNUS Project #	112G00041	**PM Telephone**	412-921-8308	**Created Date**	5/16/06
Task/Contract #	CTO 377	**Field Op Leader (FOL)**	James Goerdt	**Modified By**	
WBS Code #	TP00050125	**FOL Phone**	412-921-8425	**Modified Date**	
Sample ID Number	12SW1405			**Printed By**	James Goerdt
Sample Location ID	12SW/SD14			**Printed Date**	8/3/06

Sample Collection Records

Date	5/16/06	**Color**	CLEAR	**Temp (C)**	14.6
Time	17:55	**pH (S.U.)**	7.77	**ORP (mV)**	175
Depth (ft.)	SURFACE	**S.C. (mS/cm)**	0.430	**Salinity (%)**	NA
Method	Direct bottle	**DO (mg/L)**	10.01		
MS/MSD Collected	N	**Turbidity (NTUs)**	18		
Duplicate Collected	N				
Duplicate ID					

Laboratory Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Count	Type	Requirements	Preservative	Comments	Chain of Custody #
✓	5/16/06	17:55	Nitroaromatics and Nitramines	SW-846-8330	2	Glass	1L Amber	4°C		112G00041-5172006-7
✓	5/16/06	17:55	Nitrate + Nitrite (as N)	EPA 353.2	1	Plastic	500ml PE	4° C/H2SO4		112G00041-5172006-7

General Observations and Notes

5-10GPM

- End of Report -

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLING LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Project Manager (PM)**	Ralph Basinski	**Created By**	Terry Rojahn
TtNUS Project #	112G00041	**PM Telephone**	412-921-8308	**Created Date**	5/16/06
Task/Contract #	CTO 377	**Field Op Leader (FOL)**	James Goerdt	**Modified By**	
WBS Code #	TP00050125	**FOL Phone**	412-921-8425	**Modified Date**	
Sample ID Number	12SW2406			**Printed By**	James Goerdt
Sample Location ID	12SW/SD24			**Printed Date**	8/3/06

Sample Collection Records

Date	5/16/06	**Color**	CLEAR	**Temp (C)**	12.2
Time	11:20	**pH (S.U.)**	7.51	**ORP (mV)**	188
Depth (ft.)	SURFACE	**S.C. (mS/cm)**	0.266	**Salinity (%)**	NA
Method	Direct bottle	**DO (mg/L)**	12.89		
MS/MSD Collected	N	**Turbidity (NTUs)**	1.81		
Duplicate Collected	N				
Duplicate ID					

Laboratory Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Count	Type	Requirements	Preservative	Comments	Chain of Custody #
✓	5/16/06	11:20	Nitroaromatics and Nitramines	SW-846-8330	2	Glass	1L Amber	4°C		112G00041-5172006-7
✓	5/16/06	11:20	Nitrate + Nitrite (as N)	EPA 353.2	1	Plastic	500ml PE	4° C/H2SO4		112G00041-5172006-7

General Observations and Notes

.2 X 6 & 2FT/SEC

- End of Report -

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLING LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Project Manager (PM)**	Ralph Basinski	**Created By**	Terry Rojahn
TtNUS Project #	112G00041	**PM Telephone**	412-921-8308	**Created Date**	5/16/06
Task/Contract #	CTO 377	**Field Op Leader (FOL)**	James Goerdt	**Modified By**	
WBS Code #	TP00050125	**FOL Phone**	412-921-8425	**Modified Date**	
Sample ID Number	12SW2506			**Printed By**	James Goerdt
Sample Location ID	12SW/SD25			**Printed Date**	8/3/06

Sample Collection Records

Date	5/16/06	**Color**	CLEAR	**Temp (C)**	12.0
Time	10:40	**pH (S.U.)**	7.47	**ORP (mV)**	135
Depth (ft.)	SURFACE	**S.C. (mS/cm)**	0.160	**Salinity (%)**	NA
Method	Direct bottle	**DO (mg/L)**	11.80		
MS/MSD Collected	N	**Turbidity (NTUs)**	3.89		
Duplicate Collected	N				
Duplicate ID					

Laboratory Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Count	Type	Requirements	Preservative	Comments	Chain of Custody #
✓	5/16/06	10:40	Nitroaromatics and Nitramines	SW-846-8330	2	Glass	1L Amber	4°C		112G00041-5172006-7
✓	5/16/06	10:40	Nitrate + Nitrite (as N)	EPA 353.2	1	Plastic	500ml Amber	4° C/H2SO4		112G00041-5172006-7

General Observations and Notes

3.0 X 33 & 1FT/SEC

- End of Report -

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLING LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Project Manager (PM)**	Ralph Basinski	**Created By**	Terry Rojahn
TtNUS Project #	112G00041	**PM Telephone**	412-921-8308	**Created Date**	5/16/06
Task/Contract #	CTO 377	**Field Op Leader (FOL)**	James Goerdt	**Modified By**	
WBS Code #	TP00050125	**FOL Phone**	412-921-8425	**Modified Date**	
Sample ID Number	12SW2706			**Printed By**	James Goerdt
Sample Location ID	12SW/SD27			**Printed Date**	8/3/06

Sample Collection Records

Date	5/16/06	**Color**	CLEAR	**Temp (C)**	11.8
Time	09:45	**pH (S.U.)**	7.14	**ORP (mV)**	129
Depth (ft.)	SURFACE	**S.C. (mS/cm)**	0.179	**Salinity (%)**	NA
Method	Direct bottle	**DO (mg/L)**	13.31		
MS/MSD Collected	Y	**Turbidity (NTUs)**	2.04		
Duplicate Collected	N				
Duplicate ID					

Laboratory Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Count	Type	Requirements	Preservative	Comments	Chain of Custody #
✓	5/16/06	09:45	Nitrate + Nitrite (as N)	EPA 353.2	3	Plastic	500ml PE	4° C/H2SO4	Do MS/MSD	112G00041-5172006-7
✓	5/16/06	09:45	Nitroaromatics and Nitramines	SW-846-8330	4	Glass	1L HDPE	4°C	Do MS/MSD	112G00041-5172006-7

General Observations and Notes

.7 X 14 & 2FT/SEC

- End of Report -

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLING LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Project Manager (PM)**	Ralph Basinski	**Created By**	Terry Rojahn
TtNUS Project #	112G00041	**PM Telephone**	412-921-8308	**Created Date**	5/16/06
Task/Contract #	CTO 377	**Field Op Leader (FOL)**	James Goerdt	**Modified By**	
WBS Code #	TP00050125	**FOL Phone**	412-921-8425	**Modified Date**	
Sample ID Number	12SW3104			**Printed By**	James Goerdt
Sample Location ID	12SW/SD31			**Printed Date**	8/3/06

Sample Collection Records

Date	5/16/06	**Color**	CLEAR	**Temp (C)**	15.4
Time	17:35	**pH (S.U.)**	7.61	**ORP (mV)**	182
Depth (ft.)	SURFACE	**S.C. (mS/cm)**	0.242	**Salinity (%)**	NA
Method	Direct bottle	**DO (mg/L)**	11.65		
MS/MSD Collected	N	**Turbidity (NTUs)**	17		
Duplicate Collected	N				
Duplicate ID					

Laboratory Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Count	Type	Requirements	Preservative	Comments	Chain of Custody #
✓	5/16/06	17:35	Nitrate + Nitrite (as N)	EPA 353.2	1	Plastic	500ml PE	4° C/H2SO4		112G00041-5172006-7
✓	5/16/06	17:35	Nitroaromatics and Nitramines	SW-846-8330	2	Glass	1L Amber	4°C		112G00041-5172006-7

General Observations and Notes

~20GPM

- End of Report -

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLING LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Project Manager (PM)**	Ralph Basinski	**Created By**	Terry Rojahn
TtNUS Project #	112G00041	**PM Telephone**	412-921-8308	**Created Date**	5/16/06
Task/Contract #	CTO 377	**Field Op Leader (FOL)**	James Goerdt	**Modified By**	
WBS Code #	TP00050125	**FOL Phone**	412-921-8425	**Modified Date**	
Sample ID Number	12SW3405			**Printed By**	James Goerdt
Sample Location ID	12SW/SD34			**Printed Date**	8/3/06

Sample Collection Records

Date	5/16/06	**Color**	CLEAR	**Temp (C)**	14.0
Time	18:15	**pH (S.U.)**	7.72	**ORP (mV)**	146
Depth (ft.)	SURFACE	**S.C. (mS/cm)**	0.442	**Salinity (%)**	NA
Method	Direct bottle	**DO (mg/L)**	11.08		
MS/MSD Collected	N	**Turbidity (NTUs)**	45		
Duplicate Collected	Y				
Duplicate ID					

Laboratory Analysis Records

Collected	Date	Time	Analysis / Method	Description of Analysis	Count	Type	Requirements	Preservative	Comments	Chain of Custody #
✓	5/16/06	18:15	Nitrate + Nitrite (as N)	EPA 353.2	1	Plastic	500ml PE	4° C/H2SO4		112G00041-5172006-7
✓	5/16/06	18:15	Nitroaromatics and Nitramines	SW-846-8330	2	Glass	1L Amber	4°C		112G00041-5172006-7

General Observations and Notes

DUP COLLECTED FD05160601

- End of Report -

APPENDIX A.3

SWMU 12

CHAIN OF CUSTODY RECORDS

ROUND 6

Tetra Tech NUS, Inc.

CHAIN OF CUSTODY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Project Manager (PM)**	Ralph Basinski	**Created By**	James Goerdt
TtNUS Project #	112G00041	**PM Telephone**	412-921-8308	**Created Date**	5/8/06
Task/Contract #	CTO 377	**Field Op Leader (FOL)**	James Goerdt	**Modified By**	
WBS Code #	TP00050125	**FOL Phone**	412-921-8425	**Modified Date**	
Chain of Custody ID	112G00041-582006-4	**Carrier**	Federal Express	**Printed By**	James Goerdt
		Carrier/Waybill No.	849419217481	**Printed Date**	7/19/06

Chain of Custody Information

Chain of Custody #	**112G00041-582006-4**	**Lab Name**	Laucks Testing Laboratories	**Relenquished By**	James Goerdt
Carrier	Federal Express	**Address**	940 South Harney Street	**Date**	05/08/2006
Carrier/Waybill No.	849419217481	**City, State, Zip**	Seattle, WA 98108	**Time**	12:00
		Lab Contact	Hugh Prentice/Elaine Walker	**Received By:**	Federal Express
		Lab Telephone	206-767-5060 x1028	**Date**	5/8/06
				Time	12:00

Sample Records

Date	Sample ID#	Time	Analysis	Description	Loc ID	Matrix	Preservative	No.	Type	Requirements	Comments
5/6/06 1:00:00 AM	16GW0308	19:00	Modified SW-846-8330	Explosives RDX Degradation Products	16MW03	GW	4°C	2	Glass	1L Amber	
5/6/06 1:00:00 AM	16GW0308	19:00	SW-846-8330	Nitroaromatics and Nitramines	16MW03	GW	4°C	2	Glass	1L Amber	

5/6/06 1:00:00 AM	16GW0308	19:00	SW846 9056	Sulfate and Chloride	16MW03	GW	4°C	1	Plastic	1L HDPE	
5/6/06 1:00:00 AM	16GW0308	19:00	EPA 353.2	Nitrate + Nitrite (as N)	16MW03	GW	4° C/H2SO4	1	Plastic	1L HDPE	
5/6/06 1:00:00 AM	16GW0308	19:00	SW-846 8260B	Volatile Organic Compounds	16MW03	GW	4°C/HCL	3	Glass	40ml vials	
5/6/06 1:00:00 AM	16GW0408	15:00	SW-846-8330	Nitroaromatics and Nitramines	16MW04	GW	4°C	2	Glass	1L Amber	
5/6/06 1:00:00 AM	16GW0408	15:00	Modified SW-846-8330	Explosives RDX Degradation Products	16MW04	GW	4°C	2	Glass	1L Amber	
5/6/06 1:00:00 AM	16GW0408	15:00	SW846 9056	Sulfate and Chloride	16MW04	GW	4°C	1	Plastic	1L HDPE	

Tetra Tech NUS, Inc.

CHAIN OF CUSTODY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Sample Records

Date	Sample ID#	Time	Analysis	Description	Loc ID	Matrix	Preservative	No.	Type	Requirements	Comments
5/6/06 1:00:00 AM	16GW0408	15:00	SW-846 8260B	Volatile Organic Compounds	16MW04	GW	4°C/HCL	3	Glass	40ml vials	
5/6/06 1:00:00 AM	16GW0408	15:00	EPA 353.2	Nitrate + Nitrite (as N)	16MW04	GW	4° C/H2SO4	1	Plastic	1L HDPE	
5/6/06	16GWT1007	11:07	EPA 353.2	Nitrate + Nitrite (as N)	16MWT10	GW	4° C/H2SO4	1	Plastic	1L HDPE	
5/6/06	16GWT1007	11:07	SW-846-8330	Nitroaromatics and Nitramines	16MWT10	GW	4°C	2	Glass	1L Amber	
5/6/06	16GWT1007	11:07	SW-846 8260B	Volatile Organic Compounds	16MWT10	GW	4°C/HCL	3	Glass	40ml vials	
5/6/06	16GWT1007	11:07	SW846 9056	Sulfate and Chloride	16MWT10	GW	4°C	1	Plastic	1L HDPE	
5/6/06	16GWT1007	11:07	Modified SW-846-8330	Explosives RDX Degradation Products	16MWT10	GW	4°C	2	Glass	1L Amber	
5/6/06	16GWT1207	11:10	SW846 9056	Sulfate and Chloride	16MWT12	GW	4°C	1	Plastic	1L HDPE	
5/6/06	16GWT1207	11:10	SW-846-8330	Nitroaromatics and Nitramines	16MWT12	GW	4°C	2	Glass	1L Amber	
5/6/06	16GWT1207	11:10	EPA 353.2	Nitrate + Nitrite (as N)	16MWT12	GW	4° C/H2SO4	1	Plastic	1L HDPE	
5/6/06	16GWT1207	11:10	SW-846 8260B	Volatile Organic Compounds	16MWT12	GW	4°C/HCL	3	Glass	40ml vials	
5/6/06	16GWT1207	11:10	Modified SW-846-8330	Explosives RDX Degradation Products	16MWT12	GW	4°C	2	Glass	1L Amber	
5/6/06	16GWT1307	15:34	EPA 353.2	Nitrate + Nitrite (as N)	16MWT13	GW	4° C/H2SO4	1	Plastic	1L HDPE	
5/6/06	16GWT1307	15:34	SW-846-8330	Nitroaromatics and Nitramines	16MWT13	GW	4°C	2	Glass	1L Amber	

5/6/06	16GWT1307	15:34	SW-846 8260B	Volatile Organic Compounds	16MWT13	GW	4°C/HCL	3	Glass	40ml vials	
5/6/06	16GWT1307	15:34	Modified SW-846-8330	Explosives RDX Degradation Products	16MWT13	GW	4°C	2	Glass	1L Amber	
5/6/06	16GWT1307	15:34	SW846 9056	Sulfate and Chloride	16MWT13	GW	4°C	1	Plastic	1L HDPE	
5/7/06	12GWT1806	12:00	SW-846-8330	Nitroaromatics and Nitramines	12MWT18	GW	4°C	2	Glass	1L Amber	
5/7/06	12GWT1806	12:00	Modified SW-846-8330	Explosives RDX Degradation Products	12MWT18	GW	4°C	2	Glass	1L Amber	
5/7/06	12GWT1806	12:00	EPA 353.2	Nitrate + Nitrite (as N)	12MWT18	GW	4° C/H2SO4	1	Plastic	1L HDPE	

Tetra Tech NUS, Inc.

CHAIN OF CUSTODY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Sample Records

Date	Sample ID#	Time	Analysis	Description	Loc ID	Matrix	Preservative	No.	Type	Requirements	Comments
5/7/06 1:00:00 AM	12GWT2806	17:00	EPA 353.2	Nitrate + Nitrite (as N)	12MWT28	GW	4° C/H2SO4	1	Plastic	1L HDPE	
5/7/06 1:00:00 AM	12GWT2806	17:00	SW-846-8330	Nitroaromatics and Nitramines	12MWT28	GW	4°C	2	Glass	1L Amber	
5/7/06 1:00:00 AM	12GWT2806	17:00	Modified SW-846-8330	Explosives RDX Degradation Products	12MWT28	GW	4°C	2	Glass	1L Amber	
5/7/06	12GWT3206	17:45	Modified SW-846-8330	Explosives RDX Degradation Products	12MWT32	GW	4°C	2	Glass	1L Amber	
5/7/06	12GWT3206	17:45	SW-846-8330	Nitroaromatics and Nitramines	12MWT32	GW	4°C	2	Glass	1L Amber	
5/7/06	12GWT3206	17:45	EPA 353.2	Nitrate + Nitrite (as N)	12MWT32	GW	4° C/H2SO4	1	Plastic	1L HDPE	
5/7/06 1:00:00 AM	12GWT3606	11:10	EPA 353.2	Nitrate + Nitrite (as N)	12MWT36	GW	4° C/H2SO4	1	Plastic	1L HDPE	
5/7/06 1:00:00 AM	12GWT3606	11:10	SW-846-8330	Nitroaromatics and Nitramines	12MWT36	GW	4°C	2	Glass	1L Amber	
5/7/06 1:00:00 AM	12GWT3606	11:10	Modified SW-846-8330	Explosives RDX Degradation Products	12MWT36	GW	4°C	2	Glass	1L Amber	

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

CHAIN OF CUSTODY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Project Manager (PM)**	Ralph Basinski	**Created By**	David Hickey
TtNUS Project #	112G00041	**PM Telephone**	412-921-8308	**Created Date**	5/9/06
Task/Contract #	CTO 377	**Field Op Leader (FOL)**	James Goerdt	**Modified By**	
WBS Code #	TP00050125	**FOL Phone**	412-921-8425	**Modified Date**	
Chain of Custody ID	112G00041-592006-5	**Carrier**	Federal Express	**Printed By**	James Goerdt
		Carrier/Waybill No.	849419217460	**Printed Date**	7/19/06

Chain of Custody Information

Chain of Custody #	**112G00041-592006-5**	**Lab Name**	Laucks Testing Laboratories	**Relenquished By**	David Hickey
Carrier	Federal Express			**Date**	05/09/2006
Carrier/Waybill No.	849419217460	**Address**	940 South Harney Street	**Time**	18:30
		City, State, Zip	Seattle, WA 98108	**Received By:**	Federal Express
		Lab Contact	Hugh Prentice/Elaine Walker	**Date**	5/9/06
		Lab Telephone	206-767-5060 x1028	**Time**	18:30

Sample Records

Date	Sample ID#	Time	Analysis	Description	Loc ID	Matrix	Preservative	No.	Type	Requirements	Comments
5/8/06	16FD05080601	00:00	SW846 9056	Sulfate and Chloride	QC	GW	4°C	1	Plastic	1L HDPE	
5/8/06	16FD05080601	00:00	Modified SW-846-8330	Explosives RDX Degradation Products	QC	GW	4°C	2	Glass	1L Amber	
5/8/06	16FD05080601	00:00	SW-846-8330	Nitroaromatics and Nitramines	QC	GW	4°C	2	Glass	1L Amber	

5/8/06	16FD05080601	00:00	SW-846 8260B	Volatile Organic Compounds	QC	GW	4°C/HCL	3	Glass	40ml vials	
5/8/06	16FD05080601	00:00	EPA 353.2	Nitrate + Nitrite (as N)	QC	GW	4°C/H2SO4	1	Plastic	1L HDPE	
5/8/06	16GWT0408	11:15	SW-846 8260B	Volatile Organic Compounds	16MWT04	GW	4°C/HCL	3	Glass	40ml vials	
5/8/06	16GWT0408	11:15	SW-846-8330	Nitroaromatics and Nitramines	16MWT04	GW	4°C	2	Glass	1L Amber	
5/8/06	16GWT0408	11:15	EPA 353.2	Nitrate + Nitrite (as N)	16MWT04	GW	4°C/H2SO4	1	Plastic	1L HDPE	

Tetra Tech NUS, Inc.

CHAIN OF CUSTODY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Sample Records

Date	Sample ID#	Time	Analysis	Description	Loc ID	Matrix	Preservative	No.	Type	Requirements	Comments
5/8/06	16GWT0408	11:15	SW846 9056	Sulfate and Chloride	16MWT04	GW	4°C	1	Plastic	1L HDPE	
5/8/06	16GWT0408	11:15	Modified SW-846-8330	Explosives RDX Degradation Products	16MWT04	GW	4°C	2	Glass	1L Amber	
5/8/06 1:00:00 AM	16GWT0609	17:30	SW-846 8260B	Volatile Organic Compounds	16MWT06	GW	4°C/HCL	3	Glass	40ml vials	
5/8/06	16GWT0609	17:30	SW-846-8330	Nitroaromatics and Nitramines	16MWT06	GW	4°C	1	Glass	1L Amber	Well drying out. Collecting min sample of 1 L.
5/8/06	16GWT0609	17:30	Modified SW-846-8330	Explosives RDX Degradation Products	16MWT06	GW	4°C	1	Glass	1L Amber	Well drying out. Collecting min sample of 1 L.
5/8/06	16GWT1507	15:55	SW-846 8260B	Volatile Organic Compounds	16MWT15	GW	4°C/HCL	3	Glass	40ml vials	
5/8/06	16GWT1507	15:55	SW846 9056	Sulfate and Chloride	16MWT15	GW	4°C	1	Plastic	1L HDPE	
5/8/06	16GWT1507	15:55	Modified SW-846-8330	Explosives RDX Degradation Products	16MWT15	GW	4°C	2	Glass	1L Amber	
5/8/06	16GWT1507	15:55	SW-846-8330	Nitroaromatics and Nitramines	16MWT15	GW	4°C	2	Glass	1L Amber	
5/8/06	16GWT1507	15:55	EPA 353.2	Nitrate + Nitrite (as N)	16MWT15	GW	4° C/H2SO4	1	Plastic	1L HDPE	
5/8/06 1:00:00 AM	16GWT1707	11:15	Modified SW-846-8330	Explosives RDX Degradation Products	16MWT17	GW	4°C	5	Glass	1L Amber	
5/8/06 1:00:00 AM	16GWT1707	11:15	SW-846 8260B	Volatile Organic Compounds	16MWT17	GW	4°C/HCL	9	Glass	40ml vials	
5/8/06										1L	

1:00:00 AM	16GWT1707	11:15	SW846 9056	Sulfate and Chloride	16MWT17	GW	4°C	3	Plastic	HDPE	
5/8/06 1:00:00 AM	16GWT1707	11:15	SW-846-8330	Nitroaromatics and Nitramines	16MWT17	GW	4°C	5	Glass	1L Amber	
5/8/06 1:00:00 AM	16GWT1707	11:15	EPA 353.2	Nitrate + Nitrite (as N)	16MWT17	GW	4° C/H2SO4	3	Plastic	1L HDPE	
5/9/06	12GWT0906	12:30	EPA 353.2	Nitrate + Nitrite (as N)	12MWT09	GW	4° C/H2SO4	1	Plastic	1L HDPE	
5/9/06	12GWT0906	12:30	SW-846-8330	Nitroaromatics and Nitramines	12MWT09	GW	4°C	2	Glass	1L Amber	
5/9/06	12GWT0906	12:30	Modified SW-846-8330	Explosives RDX Degradation Products	12MWT09	GW	4°C	2	Glass	1L Amber	
5/9/06 1:00:00 AM	12GWT2006	12:20	SW-846-8330	Nitroaromatics and Nitramines	12MWT20	GW	4°C	2	Glass	1L Amber	
5/9/06 1:00:00 AM	12GWT2006	12:20	Modified SW-846-8330	Explosives RDX Degradation Products	12MWT20	GW	4°C	2	Glass	1L Amber	

Tetra Tech NUS, Inc.

CHAIN OF CUSTODY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Sample Records

Date	Sample ID#	Time	Analysis	Description	Loc ID	Matrix	Preservative	No.	Type	Requirements	Comments
5/9/06 1:00:00 AM	12GWT2006	12:20	EPA 353.2	Nitrate + Nitrite (as N)	12MWT20	GW	4°C/H2SO4	1	Plastic	1L HDPE	

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

CHAIN OF CUSTODY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Project Manager (PM)**	Ralph Basinski	**Created By**	Terry Rojahn
TtNUS Project #	112G00041	**PM Telephone**	412-921-8308	**Created Date**	5/17/06
Task/Contract #	CTO 377	**Field Op Leader (FOL)**	James Goerdt	**Modified By**	
WBS Code #	TP00050125	**FOL Phone**	412-921-8425	**Modified Date**	
Chain of Custody ID	112G00041-5172006-7	**Carrier**	Federal Express	**Printed By**	James Goerdt
		Carrier/Waybill No.	8494 1921 7437	**Printed Date**	7/19/06

Chain of Custody Information

Chain of Custody #	**112G00041-5172006-7**	**Lab Name**	Laucks Testing Laboratories	**Relenquished By**	Terry Rojahn
Carrier	Federal Express	**Address**	940 South Harney Street	**Date**	05/17/2006
Carrier/Waybill No.	8494 1921 7437	**City, State, Zip**	Seattle, WA 98108	**Time**	18:30
		Lab Contact	Hugh Prentice/Elaine Walker	**Received By:**	Federal Express
		Lab Telephone	206-767-5060 x1028	**Date**	5/17/06
				Time	18:30

Sample Records

Date	Sample ID#	Time	Analysis	Description	Loc ID	Matrix	Preservative	No.	Type	Requirements	Comments
5/16/06	12SW0906	11:55	SW-846-8330	Nitroaromatics and Nitramines	12SW/SD09	SW	4°C	2	Glass	1L Amber	
5/16/06	12SW0906	11:55	EPA 353.2	Nitrate + Nitrite (as N)	12SW/SD09	SW	4°C/H2SO4	1	Plastic	500ml PE	
5/16/06	12SW1106	10:10	SW-846-8330	Nitroaromatics and Nitramines	12SW/SD11	SW	4°C	2	Glass	1L Amber	

5/16/06	12SW1106	10:10	EPA 353.2	Nitrate + Nitrite (as N)	12SW/SD11	SW	4°C/H2SO4	1	Plastic	500ml PE	
5/16/06	12SW1405	17:55	SW-846-8330	Nitroaromatics and Nitramines	12SW/SD14	SW	4°C	2	Glass	1L Amber	
5/16/06	12SW1405	17:55	EPA 353.2	Nitrate + Nitrite (as N)	12SW/SD14	SW	4°C/H2SO4	1	Plastic	500ml PE	
5/16/06	12SW2406	11:20	SW-846-8330	Nitroaromatics and Nitramines	12SW/SD24	SW	4°C	2	Glass	1L Amber	
5/16/06	12SW2406	11:20	EPA 353.2	Nitrate + Nitrite (as N)	12SW/SD24	SW	4°C/H2SO4	1	Plastic	500ml PE	

Tetra Tech NUS, Inc.

CHAIN OF CUSTODY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Sample Records

Date	Sample ID#	Time	Analysis	Description	Loc ID	Matrix	Preservative	No.	Type	Requirements	Comments
5/16/06	12SW2506	10:40	SW-846-8330	Nitroaromatics and Nitramines	12SW/SD25	SW	4°C	2	Glass	1L Amber	
5/16/06	12SW2506	10:40	EPA 353.2	Nitrate + Nitrite (as N)	12SW/SD25	SW	4°C/H2SO4	1	Plastic	500ml Amber	
5/16/06	12SW2706	09:45	EPA 353.2	Nitrate + Nitrite (as N)	12SW/SD27	SW	4°C/H2SO4	3	Plastic	500ml PE	Do MS/MSD
5/16/06	12SW2706	09:45	SW-846-8330	Nitroaromatics and Nitramines	12SW/SD27	SW	4°C	4	Glass	1L HDPE	Do MS/MSD
5/16/06	12SW3104	17:35	EPA 353.2	Nitrate + Nitrite (as N)	12SW/SD31	SW	4°C/H2SO4	1	Plastic	500ml PE	
5/16/06	12SW3104	17:35	SW-846-8330	Nitroaromatics and Nitramines	12SW/SD31	SW	4°C	2	Glass	1L Amber	
5/16/06	12SW3405	18:15	EPA 353.2	Nitrate + Nitrite (as N)	12SW/SD34	SW	4°C/H2SO4	1	Plastic	500ml PE	
5/16/06	12SW3405	18:15	SW-846-8330	Nitroaromatics and Nitramines	12SW/SD34	SW	4°C	2	Glass	1L Amber	
5/16/06	FD05160601	00:00	SW-846-8330	Nitroaromatics and Nitramines	QC	SW	4°C	2	Glass	1L Amber	
5/16/06	FD05160601	00:00	EPA 353.2	Nitrate + Nitrite (as N)	QC	SW	4°C/H2SO4	1	Plastic	500ml PE	
5/17/06	12GWT2206	14:00	EPA 353.2	Nitrate + Nitrite (as N)	12MWT22	GW	4°C/H2SO4	1	Plastic	500ml PE	
5/17/06	12GWT2206	14:00	SW-846-8330	Nitroaromatics and Nitramines	12MWT22	GW	4°C	2	Glass	1L Amber	
5/17/06	12GWT3806	13:30	SW-846-8330	Nitroaromatics and Nitramines	12MWT38	GW	4°C	2	Glass	1L Amber	
5/17/06	12GWT3806	13:30	EPA 353.2	Nitrate + Nitrite (as N)	12MWT38	GW	4°C/H2SO4	1	Plastic	500ml PE	

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

CHAIN OF CUSTODY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Project Manager (PM)**	Ralph Basinski	**Created By**	Terry Rojahn
TtNUS Project #	112G00041	**PM Telephone**	412-921-8308	**Created Date**	5/19/06
Task/Contract #	CTO 377	**Field Op Leader (FOL)**	James Goerdt	**Modified By**	
WBS Code #	TP00050125	**FOL Phone**	412-921-8425	**Modified Date**	
Chain of Custody ID	112G00041-5192006-8	**Carrier**	Federal Express	**Printed By**	James Goerdt
		Carrier/Waybill No.	8494 1921 7426	**Printed Date**	7/19/06

Chain of Custody Information

Chain of Custody #	**112G00041-5192006-8**	**Lab Name**	Laucks Testing Laboratories	**Relenquished By**	Terry Rojahn
Carrier	Federal Express	**Address**	940 South Harney Street	**Date**	05/19/2006
Carrier/Waybill No.	8494 1921 7426	**City, State, Zip**	Seattle, WA 98108	**Time**	18:00
		Lab Contact	Hugh Prentice/Elaine Walker	**Received By:**	Federal Express
		Lab Telephone	206-767-5060 x1028	**Date**	5/19/06
				Time	18:00

Sample Records

Date	Sample ID#	Time	Analysis	Description	Loc ID	Matrix	Preservative	No.	Type	Requirements	Comments
5/18/06	12FD05180601	00:00	SW-846-8330	Nitroaromatics and Nitramines	QC	GW	4°C	2	Glass	1L Amber	
5/18/06	12FD05180601	00:00	EPA 353.2	Nitrate + Nitrite (as N)	QC	GW	4°C/H2SO4	1	Plastic	500ml PE	
5/18/06	12GWT0306	13:30	EPA 353.2	Nitrate + Nitrite (as N)	12MWT03	GW	4°C/H2SO4	1	Plastic	500ml PE	

5/18/06	12GWT0306	13:30	SW-846-8330	Nitroaromatics and Nitramines	12MWT03	GW	4°C	2	Glass	1L Amber	
5/18/06 1:00:00 AM	12GWT0606	10:35	EPA 353.2	Nitrate + Nitrite (as N)	12MWT06	GW	4°C/H2SO4	1	Plastic	500ml PE	
5/18/06 1:00:00 AM	12GWT0606	10:35	SW-846-8330	Nitroaromatics and Nitramines	12MWT06	GW	4°C	2	Glass	1L Amber	
5/18/06	12GWT1606	12:45	SW-846-8330	Nitroaromatics and Nitramines	12MWT16	GW	4°C	2	Glass	1L Amber	
5/18/06	12GWT1606	12:45	EPA 353.2	Nitrate + Nitrite (as N)	12MWT16	GW	4°C/H2SO4	1	Plastic	500ml PE	

Tetra Tech NUS, Inc.

CHAIN OF CUSTODY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Sample Records

Date	Sample ID#	Time	Analysis	Description	Loc ID	Matrix	Preservative	No.	Type	Requirements	Comments
5/18/06	12GWT1706	12:00	EPA 353.2	Nitrate + Nitrite (as N)	12MWT17	GW	4°C/H2SO4	1	Plastic	500ml PE	
5/18/06	12GWT1706	12:00	SW-846-8330	Nitroaromatics and Nitramines	12MWT17	GW	4°C	2	Glass	1L Amber	
5/18/06	12GWT4206	17:10	SW-846-8330	Nitroaromatics and Nitramines	12MWT42	GW	4°C	2	Glass	1L Amber	
5/18/06	12GWT4206	17:10	EPA 353.2	Nitrate + Nitrite (as N)	12MWT42	GW	4°C/H2SO4	1	Plastic	500ml PE	
5/19/06	12GWT1206	10:30	SW-846-8330	Nitroaromatics and Nitramines	12MWT12	GW	4°C	4	Glass	1L Amber	DO MS/MSD
5/19/06	12GWT1206	10:30	EPA 353.2	Nitrate + Nitrite (as N)	12MWT12	GW	4°C/H2SO4	3	Plastic	500ml PE	DO MS/MSD
5/19/06	12GWT2306	12:00	SW-846-8330	Nitroaromatics and Nitramines	12MWT23	GW	4°C	2	Glass	1L Amber	
5/19/06	12GWT2306	12:00	EPA 353.2	Nitrate + Nitrite (as N)	12MWT23	GW	4°C/H2SO4	1	Plastic	500ml PE	
5/19/06	12GWT3106	13:45	SW-846-8330	Nitroaromatics and Nitramines	12MWT31	GW	4°C	2	Glass	1L Amber	
5/19/06	12GWT3106	13:45	EPA 353.2	Nitrate + Nitrite (as N)	12MWT31	GW	4°C/H2SO4	1	Plastic	500ml PE	

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

CHAIN OF CUSTODY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Project Manager (PM)**	Ralph Basinski	**Created By**	Terry Rojahn
TtNUS Project #	112G00041	**PM Telephone**	412-921-8308	**Created Date**	5/22/06
Task/Contract #	CTO 377	**Field Op Leader (FOL)**	James Goerdt	**Modified By**	
WBS Code #	TP00050125	**FOL Phone**	412-921-8425	**Modified Date**	
Chain of Custody ID	112G00041-5222006-10	**Carrier**	Federal Express	**Printed By**	James Goerdt
		Carrier/Waybill No.	8494 1921 7415	**Printed Date**	7/19/06

Chain of Custody Information

Chain of Custody #	**112G00041-5222006-10**	**Lab Name**	Laucks Testing Laboratories	**Relenquished By**	Terry Rojahn
Carrier	Federal Express	**Address**	940 South Harney Street	**Date**	05/22/2006
Carrier/Waybill No.	8494 1921 7415	**City, State, Zip**	Seattle, WA 98108	**Time**	18:00
		Lab Contact	Hugh Prentice/Elaine Walker	**Received By:**	Federal Express
		Lab Telephone	206-767-5060 x1028	**Date**	5/22/06
				Time	18:00

Sample Records

Date	Sample ID#	Time	Analysis	Description	Loc ID	Matrix	Preservative	No.	Type	Requirements	Comments
5/20/06	12GWT1006	12:45	SW-846-8330	Nitroaromatics and Nitramines	12MWT10	GW	4°C	2	Glass	1L Amber	
5/20/06	12GWT1006	12:45	EPA 353.2	Nitrate + Nitrite (as N)	12MWT10	GW	4°C/H2SO4	1	Plastic	500ml PE	
5/20/06	12GWT1106	15:15	EPA 353.2	Nitrate + Nitrite (as N)	12MWT11	GW	4°C/H2SO4	1	Plastic	500ml PE	

5/20/06	12GWT1106	15:15	SW-846-8330	Nitroaromatics and Nitramines	12MWT11	GW	4°C	2	Glass	1L Amber	
5/20/06	12GWT4106	11:05	SW-846-8330	Nitroaromatics and Nitramines	12MWT41	GW	4°C	2	Glass	1L Amber	
5/20/06	12GWT4106	11:05	EPA 353.2	Nitrate + Nitrite (as N)	12MWT41	GW	4°C/H2SO4	1	Plastic	500ml PE	
5/20/06	12GWT4706	10:55	SW-846-8330	Nitroaromatics and Nitramines	12MWT47	GW	4°C	2	Glass	1L Amber	
5/20/06	12GWT4706	10:55	EPA 353.2	Nitrate + Nitrite (as N)	12MWT47	GW	4°C/H2SO4	1	Plastic	500ml PE	

Tetra Tech NUS, Inc.

CHAIN OF CUSTODY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Sample Records

Date	Sample ID#	Time	Analysis	Description	Loc ID	Matrix	Preservative	No.	Type	Requirements	Comments
5/21/06	13GWT3707	10:25	SW-846-8330	Nitroaromatics and Nitramines	13MWT37	GW	4°C	2	Glass	1L Amber	
5/21/06	13GWT3707	10:25	EPA 353.2	Nitrate + Nitrite (as N)	13MWT37	GW	4°C/H2SO4	1	Plastic	500ml PE	
5/21/06	13GWT4607	12:45	EPA 353.2	Nitrate + Nitrite (as N)	13MWT46	GW	4°C/H2SO4	1	Plastic	500ml PE	
5/21/06	13GWT4607	12:45	SW-846-8330	Nitroaromatics and Nitramines	13MWT46	GW	4°C	2	Glass	1L Amber	
5/21/06	13SW1906	16:53	SW-846-8330	Nitroaromatics and Nitramines	13SWSD19	SW	4°C	2	Glass	1L Amber	
5/21/06	13SW2006	16:40	SW-846-8330	Nitroaromatics and Nitramines	13SWSD20	SW	4°C	2	Glass	1L Amber	
5/21/06	16GWT1107	17:20	SW846 9056	Sulfate and Chloride	16MWT11	GW	4°C	1	Plastic	1L HDPE	
5/21/06	16GWT1107	17:20	SW-846 8260B	Volatile Organic Compounds	16MWT11	GW	4°C/HCL	3	Glass	40ml vials	
5/21/06	16GWT1107	17:20	EPA 353.2	Nitrate + Nitrite (as N)	16MWT11	GW	4°C/H2SO4	1	Plastic	500ml PE	
5/21/06	16GWT1107	17:20	SW-846-8330	Nitroaromatics and Nitramines	16MWT11	GW	4°C	2	Glass	1L Amber	
5/21/06	TB05210601	17:10	SW-846 8260B	Volatile Organic Compounds	QC	AQ	4°C/HCL	2	Glass	40ml vials	
5/22/06	13SW1105	12:25	SW-846-8330	Nitroaromatics and Nitramines	13SWSD11	SW	4°C	2	Glass	1L Amber	
5/22/06	13SW1407	10:40	SW-846-8330	Nitroaromatics and Nitramines	13SWSD14	SW	4°C	2	Glass	1L Amber	
5/22/06	13SW1507	11:00	SW-846-8330	Nitroaromatics and Nitramines	13SWSD15	SW	4°C	2	Glass	1L Amber	
5/22/06	13SW1607	11:25	SW-846-8330	Nitroaromatics and Nitramines	13SWSD16	SW	4°C	2	Glass	1L Amber	
5/22/06	13SW2206	13:00	SW-846-8330	Nitroaromatics and Nitramines	13SWSD22	SW	4°C	2	Glass	1L Amber	
5/22/06	13SW3007	11:55	SW-846-8330	Nitroaromatics and Nitramines	13SWSD30	SW	4°C	2	Glass	1L Amber	
5/22/06	FD05220601	00:00	SW-846-8330	Nitroaromatics and Nitramines	QC	SW	4°C	2	Glass	1L Amber	

General Observations and Notes

No Notes

- End of Report -

APPENDIX A.4

SWMU 12

WATER LEVEL MEASUREMENTS

ROUND 6

Tetra Tech NUS, Inc.

GROUNDWATER MEASUREMENT LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Site**	SWMU 12	**Created By**	James Goerdt
TtNUS Project #	112G00041	**Measuring Device**	M-scope	**Created Date**	5/6/06
Task/Contract #	CTO 377	**Sampled By**	James Goerdt	**Modified By**	James Goerdt
WBS Code #	TP00050125	**Weather**	PC 60's	**Modified Date**	9/8/06
Status	Archive			**Printed By**	James Goerdt
				Printed Date	2/7/07

Groundwater Measurements

Well ID	Date	Time	Water Level Indicator Reading (ft)	Total Well Depth (ft)	Free Product Thickness (ft)	PID/FID (ppm)	Reference Elevation (ft)	Groundwater Elevation	Tidally Influenced

12MWT01	5/5/06	12:48	9.54		NA	NA		e	N
12MWT02	5/5/06	12:46	8.53		NA	NA		e	N
12MWT03	5/5/06 1:00:00 AM	12:40	15.13		NA	NA		calc	N
12MWT04	5/5/06 1:00:00 AM	12:36	13.56		NA	NA		calc	N
12MWT05	5/5/06 1:00:00 AM	12:30	8.70		NA	NA		calc	N
12MWT06	5/5/06 1:00:00 AM	13:14	9.94		NA	NA		calc	N
12MWT07	5/5/06 1:00:00 AM	13:42	12.37		NA	NA		calc	N
12MWT08	5/5/06 1:00:00 AM	13:17	12.72		NA	NA		calc	N

Tetra Tech NUS, Inc.

GROUNDWATER MEASUREMENT LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Groundwater Measurements

Well ID	Date	Time	Water Level Indicator Reading (ft)	Total Well Depth (ft)	Free Product Thickness (ft)	PID/FID (ppm)	Reference Elevation (ft)	Groundwater Elevation	Tidally Influenced

12MWT09	5/5/06 1:00:00 AM	13:00	12.26		NA	NA		calc	N
12MWT10	5/5/06 1:00:00 AM	12:58	13.19		NA	NA		calc	N
12MWT11	5/5/06 1:00:00 AM	12:36	12.39		NA	NA		calc	N
12MWT12	5/5/06 1:00:00 AM	12:39	10.09		NA	NA		calc	N
12MWT13	5/5/06 1:00:00 AM	12:42	4.93		NA	NA		calc	N
12MWT14	5/5/06 1:00:00 AM	12:47	21.22		NA	NA		calc	N
12MWT15	5/5/06 1:00:00 AM	12:52	18.37		NA	NA		calc	N
12MWT16	5/5/06 1:00:00 AM	13:05	21.63		NA	NA		calc	N
12MWT17	5/5/06 1:00:00 AM	13:08	23.78		NA	NA		calc	N
12MWT18	5/5/06 1:00:00 AM	13:01	22.52		NA	NA		calc	N
12MWT19	5/5/06 1:00:00 AM	13:12	27.68		NA	NA		calc	N
12MWT20	5/5/06 1:00:00 AM	13:18	25.35		NA	NA		calc	N
12MWT21	5/5/06 1:00:00 AM	12:50	19.74		NA	NA		calc	N
12MWT22	5/5/06 1:00:00 AM	13:18	17.13		NA	NA		calc	N
12MWT23	5/5/06 1:00:00 AM	13:28	28.09		NA	NA		calc	N
12MWT24	5/5/06 1:00:00 AM	13:32	32.33		NA	NA		calc	N
12MWT24A	5/5/06 1:00:00 AM	13:29	34.87		NA	NA		calc	N
12MWT25	5/5/06 1:00:00 AM	12:24	16.59		NA	NA		calc	N
12MWT26	5/5/06 1:00:00 AM	13:48	10.10		NA	NA		calc	N
12MWT27	5/5/06 1:00:00 AM	12:28	9.15		NA	NA		calc	N

Tetra Tech NUS, Inc.

GROUNDWATER MEASUREMENT LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Groundwater Measurements

Well ID	Date	Time	Water Level Indicator Reading (ft)	Total Well Depth (ft)	Free Product Thickness (ft)	PID/FID (ppm)	Reference Elevation (ft)	Groundwater Elevation	Tidally Influenced

12MWT28	5/5/06 1:00:00 AM	12:53	12.04		NA	NA		calc	N
12MWT29	5/5/06 1:00:00 AM	12:34	58.98		NA	NA		calc	N
12MWT30	5/5/06 1:00:00 AM	13:02	92.67		NA	NA		calc	N
12MWT31	5/5/06 1:00:00 AM	12:49	67.80		NA	NA		calc	N
12MWT32	5/5/06 1:00:00 AM	13:14	84.60		NA	NA		calc	N
12MWT33	5/5/06 1:00:00 AM	12:30	41.26		NA	NA		calc	N
12MWT34	5/5/06 1:00:00 AM	13:31	88.00		NA	NA		calc	N
12MWT35	5/5/06 1:00:00 AM	16:18	12.36		NA	NA		calc	N
12MWT36	5/5/06 1:00:00 AM	12:57	14.19		NA	NA		calc	N
12MWT37	5/5/06 1:00:00 AM	13:23	26.26		NA	NA		calc	N
12MWT38	5/5/06 1:00:00 AM	13:04	9.62		NA	NA		calc	N
12MWT39	5/5/06 1:00:00 AM	13:33	35.39		NA	NA		calc	N
12MWT40	5/5/06 1:00:00 AM	13:23	24.00		NA	NA		calc	N
12MWT41	5/5/06 1:00:00 AM	14:25	19.55		NA	NA		calc	N
12MWT42	5/5/06 1:00:00 AM	12:25	11.88		NA	NA		calc	N
12MWT43	5/5/06 1:00:00 AM	14:11	78.28		NA	NA		calc	N
12MWT44	5/5/06 1:00:00 AM	14:35	26.22		NA	NA		calc	N
12MWT45	5/5/06 1:00:00 AM	15:10	14.79		NA	NA		calc	N
12MWT46	5/5/06	15:06	17.19		NA	NA		e	N
12MWT47	5/5/06 1:00:00 AM	15:04	12.97		NA	NA		calc	N

Tetra Tech NUS, Inc.

GROUNDWATER MEASUREMENT LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Groundwater Measurements

Well ID	Date	Time	Water Level Indicator Reading (ft)	Total Well Depth (ft)	Free Product Thickness (ft)	PID/FID (ppm)	Reference Elevation (ft)	Groundwater Elevation	Tidally Influenced

12MWT48	5/5/06 1:00:00 AM	15:01	30.34		NA	NA		calc	N
12MWT49	5/5/06 1:00:00 AM	14:54	26.24		NA	NA		calc	N
12MWT50	5/5/06 1:00:00 AM	14:50	35.15		NA	NA		calc	N

General Observations and Notes

No Notes

- End of Report -

Tetra Tech NUS, Inc.

SURFACE WATER MEASUREMENT LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Project Manager (PM)**	Ralph Basinski	**Created By**	James Goerdt
TtNUS Project #	112G00041	**PM Telephone**	412-921-8308	**Created Date**	5/6/06
Task/Contract #	CTO 377	**Field Op Leader (FOL)**	-Select-	**Modified By**	
WBS Code #	TP00050125	**FOL Phone**	412-921-8425	**Modified Date**	
Chain of Custody ID		**Carrier**		**Printed By**	James Goerdt
Status	Archive	**Carrier/Waybill No.**		**Printed Date**	2/7/07

Surface Water Measurements

Location ID	Date	Time	Flow Rate (est.)	Type	Measurement	Flow Width	Flow Depth	Flow Velocity
12SG01	5/5/06	16:23	0.0	Dry	Dry	Dry	Dry	Dry
12SG02	5/5/06	16:25	0.0	Dry	Dry	Dry	Dry	Dry
12SG03	5/5/06	16:29	0.0	Stagnant	1.10	NA	NA	NA
12SG04	5/5/06	16:31	0.0	Stagnant	4.12	NA	NA	NA
12SG05	5/5/06	16:33	0.0	Dry	Dry	Dry	Dry	Dry
12SG06	5/5/06	16:40	0.0	Dry	Dry	Dry	Dry	Dry
12SG07	5/5/06	16:47	3-5	Estimated	3.87	1.5	2.0	NA
12SG08	5/5/06	16:55	3-5	Estimated	5.86	2.0	0.1	NA

Tetra Tech NUS, Inc.

SURFACE WATER MEASUREMENT LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Surface Water Measurements

Location ID	Date	Time	Flow Rate (est.)	Type	Measurement	Flow Width	Flow Depth	Flow Velocity
12SG09	5/5/06	16:01	5-10	Estimated	17.43	7.9	.55	NA
12SG10	5/5/06	15:54		Estimated	14.52	30	2.5	2
12SG11	5/5/06	15:42		Estimated	19.95	15	.9.	2
12SG12	5/5/06	16:10		Estimated	6.05			

General Observations and Notes

No Notes

- End of Report -

APPENDIX A.5

SWMU 12

EQUIPMENT CALIBRATION FORMS

ROUND 6

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Instrument**	Horiba U-22 (JG)	**Created By**	David Hickey
TtNUS Project #	112G00041	**Manufacturer**	Horiba	**Created Date**	5/7/06
Task/Contract #	CTO 377	**Serial Number**	406032	**Modified By**	James Goerdt
WBS Code #	TP00050125			**Modified Date**	7/7/06
Client				**Printed By**	James Goerdt
				Printed Date	8/3/06

Calibration Records

Date	Calibrator	pH (4 SU)	Conductivity (mS/cm)	Comments
5/3/06	David Hickey	Pre: 4.53 Post: 3.98 Std: 5216 Exp: 03-20-2008	Pre: 4.33 Post: 4.47 Std: 5216 Exp: 03-20-2008	Conductivity standard = 4.49 mS/cm
5/4/06	David Hickey	Pre: 4.26 Post: 3.96 Std: 5216 Exp: 03-20-2008	Pre: 4.60 Post: 4.48 Std: 5216 Exp: 03-20-2008	
5/6/06	David Hickey	Pre: 3.14 Post: 4.00 Std: 5216 Exp: 03-20-2008	Pre: 4.37 Post: 4.48 Std: 5216 Exp: 03-20-2008	Conductivity standard = 4.49 mS/cm
5/7/06	David Hickey	Pre: 3.80 Post: 4.00 Std: 5216 Exp: 03-20-2008	Pre: 4.74 Post: 4.49 Std: 5216 Exp: 03-20-2008	Conductivity standard = 4.49 mS/cm
5/8/06	David Hickey	Pre: 4.22 Post: 4.00 Std: 5216 Exp: 03-	Pre: 4.46 Post: 4.49 Std: 5216 Exp: 03-	Conductivity standard = 4.49 mS/cm

		20-2008	20-2008	
5/9/06	David Hickey	Pre: 3.80 Post: 4.00 Std: 5216 Exp: 03-20-2008	Pre: 4.39 Post: 4.49 Std: 5216 Exp: 03-20-2008	Conductivity standard = 4.49 mS/cm
5/17/06	David Hickey	Pre: 4.15 Post: 4.00 Std: 5216 Exp: 03-20-2008	Pre: 4.65 Post: 4.49 Std: 5216 Exp: 03-20-2008	Conductivity standard = 4.49 mS/cm
5/18/06 1:00:00 AM	David Hickey	Pre: 4.00 Post: 4.00 Std: 5216 Exp: 03-20-2008	Pre: 4.32 Post: 4.49 Std: 5216 Exp: 03-20-2008	Conductivity standard = 4.49 mS/cm
5/19/06 1:00:00 AM	David Hickey	Pre: 4.08 Post: 3.98 Std: 5216 Exp: 03-20-2008	Pre: 4.80 Post: 4.49 Std: 5216 Exp: 03-20-2008	Conductivity standard = 4.49 mS/cm. Cal standard has no set value for DO but this parameter is included in the auto cal of the instrument
5/20/06 1:00:00 AM	David Hickey	Pre: 3.67 Post: 4.02 Std: 5216 Exp: 03-20-2008	Pre: 4.42 Post: 4.51 Std: 5216 Exp: 03-20-2008	Conductivity standard = 4.49 mS/cm. Received error message #6 for DO sensor indicating a malfunctioning sensor.
5/21/06 1:00:00 AM	David Hickey	Pre: 4.02 Post: 4.00 Std: 5216 Exp: 03-20-2008	Pre: 4.43 Post: 4.54 Std: 5216 Exp: 03-20-2008	Conductivity standard = 4.49 mS/cm. Received error message #6 for DO sensor indicating a malfunctioning sensor.
5/23/06 1:00:00 AM	David Hickey	Pre: 3.93 Post: 4.01 Std: 5216 Exp: 03-20-2008	Pre: 4.61 Post: 4.48 Std: 5216 Exp: 03-20-2008	Conductivity standard = 4.49 mS/cm. Received error message #6 for DO sensor indicating a malfunctioning sensor.

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Instrument**	LaMotte 2020 Turbidity Meter (DH)	**Created By**	David Hickey
TtNUS Project #	112G00041			**Created Date**	5/7/06
Task/Contract #	CTO 377	**Manufacturer**	LaMotte	**Modified By**	
WBS Code #	TP00050125	**Serial Number**	3327-2402	**Modified Date**	
Client				**Printed By**	James Goerdt
				Printed Date	8/3/06

Calibration Records

Date	Calibrator	Turbidity (0 NTU)	Turbidity (10 NTU)	Comments
5/3/06	David Hickey	Pre: 0.0 Post: 0.0 Std: 4771 Exp: 06/2007	Pre: 9.7 Post: 10.0 Std: P568485 Exp: 06/2007	Standards provided with instrument by US Environmental. 0 NTU - AMCO Clear Turbidity Standard. 10 NTU - LaMotte AMCO Primary Turbidity Standard.
5/6/06	David Hickey	Pre: 0.25 Post: 0.0 Std: 4771 Exp: 06/2007	Pre: 10.0 Post: 10.0 Std: P568485 Exp: 06/2007	
5/7/06	David Hickey	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 10.04 Post: 10.00 Std: P568485 Exp: 06/2007	
5/8/06	David Hickey	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 9.76 Post: 9.99 Std: P568485 Exp: 06/2007	
5/9/06	David Hickey	Pre: 0.19 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 9.95 Post: 10.01 Std: P568485 Exp: 06/2007	
		Pre: 0.00	Pre: 8.41	

5/16/06	David Hickey	Post: 0.00 Std: 4771 Exp: 06/2007	Post: 9.94 Std: P568485 Exp: 06/2007	Standards provided with instrument by US Environmental. 0 NTU - AMCO Clear Turbidity Standard. 10 NTU - LaMotte AMCO Primary Turbidity Standard.
5/18/06 1:00:00 AM	David Hickey	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 9.71 Post: 10.02 Std: P568485 Exp: 06/2007	
5/19/06 1:00:00 AM	David Hickey	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 10.14 Post: 10.03 Std: P568485 Exp: 06/2007	
5/20/06 1:00:00 AM	David Hickey	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 10.00 Post: 10.00 Std: P568485 Exp: 06/2007	
5/21/06 1:00:00 AM	David Hickey	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 10.12 Post: 9.99 Std: P568485 Exp: 06/2007	Standards provided with instrument by US Environmental. 0 NTU - AMCO Clear Turbidity Standard. 10 NTU - LaMotte AMCO Primary Turbidity Standard.
5/22/06 1:00:00 AM	David Hickey	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 9.81 Post: 10.00 Std: P568485 Exp: 06/2007	Standards provided with instrument by US Environmental. 0 NTU - AMCO Clear Turbidity Standard. 10 NTU - LaMotte AMCO Primary Turbidity Standard.
5/23/06 1:00:00 AM	David Hickey	Pre: 0.09 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 9.98 Post: 10.00 Std: P568485 Exp: 06/2007	Standards provided with instrument by US Environmental. 0 NTU - AMCO Clear Turbidity Standard. 10 NTU - LaMotte AMCO Primary Turbidity Standard.

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Instrument**	LaMotte 2020 Turbidity Meter (JG)	**Created By**	David Hickey
TtNUS Project #	112G00041			**Created Date**	5/7/06
Task/Contract #	CTO 377	**Manufacturer**	LaMotte	**Modified By**	
WBS Code #	TP00050125	**Serial Number**	3254-1902	**Modified Date**	
Client				**Printed By**	James Goerdt
				Printed Date	8/3/06

Calibration Records

Date	Calibrator	Turbidity (0 NTU)	Turbidity (10 NTU)	Comments
5/3/06	David Hickey	Pre: 0.35 Post: 0.0 Std: 4771 Exp: 06/2007	Pre: 8.4 Post: 9.8 Std: P568485 Exp: 06/2007	
5/4/06	David Hickey	Pre: 0.0 Post: 0.0 Std: 4771 Exp: 06/2007	Pre: 9.7 Post: 10.0 Std: P568485 Exp: 06/2007	
5/6/06	David Hickey	Pre: 0.0 Post: 0.0 Std: 4771 Exp: 06/2007	Pre: 10.0 Post: 10.0 Std: P568485 Exp: 06/2007	
5/7/06	David Hickey	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 9.61 Post: 9.97 Std: P568485 Exp: 06/2007	
5/8/06	David Hickey	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 10.1 Post: 10.0 Std: P568485 Exp: 06/2007	
5/9/06	David Hickey	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 10.13 Post: 10.00 Std: P568485 Exp: 06/2007	
5/16/06	T. Rojahn	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 9.98 Post: 10.00 Std: P568485 Exp: 06/2007	
5/17/06	David Hickey	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 5.5 Post: 10.0 Std: P568485 Exp: 06/2007	

5/18/06	T. Rojahn	Pre: 0.20 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 9.90 Post: 10.00 Std: P568485 Exp: 06/2007	
5/19/06	T. Rojahn	Pre: 0.04 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 9.l83 Post: 10.00 Std: P568485 Exp: 06/2007	Turbidity standard manufacture = AMCO
5/20/06	T. Rojahn	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 9.98 Post: 10.00 Std: P568485 Exp: 06/2007	
5/22/06	T. Rojahn	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 10.11 Post: 10.00 Std: P568485 Exp: 06/2007	
5/23/06	T. Rojahn	Pre: 0.03 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 9.90 Post: 10.00 Std: P568485 Exp: 06/2007	
6/1/06	T. Rojahn	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 10.12 Post: 10.00 Std: P568485 Exp: 06/2007	
6/2/06	T. Rojahn	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 10.09 Post: 10.00 Std: P568485 Exp: 06/2007	Turbidity standard manufacture = AMCO
6/3/06	T. Rojahn	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 9.45 Post: 10.00 Std: P568485 Exp: 06/2007	
6/4/06	T. Rojahn	Pre: 0.00 Post: 0.00 Std: 4771 Exp: 06/2007	Pre: 9.99 Post: 10.00 Std: P568485 Exp: 06/2007	Turbidity standard manufacture = AMCO

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Facility Name	CRANE NSWC	**Instrument**	Horiba U-22 (DH)	**Created By**	David Hickey
TtNUS Project #	112G00041	**Manufacturer**	Horiba	**Created Date**	5/7/06
Task/Contract #	CTO 377	**Serial Number**	928069	**Modified By**	James Goerdt
WBS Code #	TP00050125			**Modified Date**	7/7/06
Client				**Printed By**	James Goerdt
				Printed Date	8/3/06

Calibration Records

Date	Calibrator	pH (4 SU)	Conductivity (mS/cm)	Comments
5/4/06	David Hickey	Pre: 4.36 Post: 3.99 Std: 4951 Exp: 06/23/07	Pre: 5.1 Post: 4.49 Std: 4951 Exp: 06/23/07	Conductivity standard = 4.49 mS/cm
5/6/06	David Hickey	Pre: 4.03 Post: 4.00 Std: 4951 Exp: 06/23/07	Pre: 4.47 Post: 4.49 Std: 4951 Exp: 06/23/07	Conductivity standard = 4.49 mS/cm
5/7/06	David Hickey	Pre: 3.97 Post: 4.00 Std: 4951 Exp: 06/23/07	Pre: 4.52 Post: 4.49 Std: 4951 Exp: 06/23/07	Conductivity standard = 4.49 mS/cm
5/8/06	David Hickey	Pre: 4.12 Post: 4.00 Std: 4951 Exp: 06/23/07	Pre: 4.60 Post: 4.47 Std: 4951 Exp: 06/23/07	Conductivity standard = 4.49 mS/cm
5/9/06	David Hickey	Pre: 4.03 Post: 4.00 Std: 4951 Exp: 06/23/07	Pre: 4.40 Post: 4.47 Std: 4951 Exp: 06/23/07	Conductivity standard = 4.49 mS/cm
5/16/06	T. Rojahn	Pre: 3.94 Post: 4.00 Std: 4920 Exp: 5/10/07	Pre: 4.91 Post: 4.49 Std: 4920 Exp: 5/10/07	Conductivity standard = 4.49 mS/cm
5/17/06	David Hickey	Pre: 4.01 Post: 3.99 Std: 4951 Exp: 06/23/07	Pre: 4.07 Post: 4.50 Std: 4951 Exp: 06/23/07	Conductivity standard = 4.49 mS/cm
5/18/06	T. Rojahn	Pre: 4.00 Post: 4.00 Std: 4951	Pre: 4.71 Post: 4.49 Std: 4951	Conductivity standard = 4.49 mS/cm

		Exp: 06/23/07	Exp: 06/23/07	
5/19/06	T. Rojahn	Pre: 4.03 Post: 4.00 Std: 4951 Exp: 06/23/07	Pre: 4.20 Post: 4.48 Std: 4951 Exp: 06/23/07	Conductivity standard = 4.49 mS/cm
5/20/06	T. Rojahn	Pre: 4.02 Post: 4.00 Std: 4951 Exp: 06/23/07	Pre: 4.73 Post: 4.49 Std: 4951 Exp: 06/23/07	
5/22/06	T. Rojahn	Pre: 3.99 Post: 4.00 Std: 4951 Exp: 06/23/07	Pre: 4.50 Post: 4.49 Std: 4951 Exp: 06/23/07	Conductivity standard = 4.49 mS/cm
5/23/06	T. Rojahn	Pre: 4.03 Post: 4.00 Std: 4951 Exp: 06/23/07	Pre: 4.92 Post: 4.49 Std: 4951 Exp: 06/23/07	Conductivity standard = 4.49 mS/cm
6/1/06	-Select-	Pre: 4.00 Post: 4.00 Std: 4951 Exp: 06/23/07	Pre: 4.98 Post: 4.48 Std: 4951 Exp: 06/23/07	Conductivity standard = 4.49 mS/cm
6/2/06	T. Rojahn	Pre: 4.00 Post: 4.00 Std: 4951 Exp: 06/23/07	Pre: 4.04 Post: 4.49 Std: 4951 Exp: 06/23/07	Conductivity standard = 4.49 mS/cm
6/3/06	T. Rojahn	Pre: 4.02 Post: 4.00 Std: 4951 Exp: 06/23/07	Pre: 4.42 Post: 4.49 Std: 4951 Exp: 06/23/07	Conductivity standard = 4.49 mS/cm
6/4/06	T. Rojahn	Pre: 4.00 Post: 4.00 Std: 4951 Exp: 06/23/07	Pre: 4.48 Post: 4.49 Std: 4951 Exp: 06/23/07	Conductivity standard = 4.49 mS/cm

APPENDIX B

SWMU 12

DAILY ACTIVITIES RECORD

ROUND 6

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	5/1/06	**Weather/Temp**		**Created By**	James Goerdt
Facility Name	CRANE NSWC	**TtNUS Personnel**	J. Goerdt;D. Hickey	**Created Date**	5/1/06
TtNUS Project #	112G00041	**Subcontractor Personnel**	NA	**Modified By**	John Wright
Task/Contract #	TP00050125	**Visitors**	NA	**Modified Date**	6/10/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/1/06		James Goerdt	a.m. hours spent traveling from Pgh to Crane.
5/1/06	14:45	James Goerdt	Current time is CST. Checked in at security office and obtained visitors pass, and arrived at Bldg 3245 at 14:55. Spoke additionally with M. Francis.
5/1/06	14:45	James Goerdt	Checked in at hotel in Bloomington. Received Fed Ex shipment sent by J. Wright. Spoke with M. Francis about additional sediment samples at SWMU 17.
5/1/06	15:05	James Goerdt	Began unpacking and checking in GW sampling equipment which included the following:
5/1/06	15:20	James Goerdt	Left hotel for Crane Naval Base.
5/1/06	16:15	James Goerdt	Departed Crane for WalMart to purchase field supplies. 1650-1730.

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/04/2006	**Weather/Temp**	am PC low 60's / pm PC low 70's	**Created By**	James Goerdt
Facility Name	CRANE NSWC	**TtNUS Personnel**	J.Goerdt;D. Hickey	**Created Date**	5/4/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	James Goerdt
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	5/15/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/4/06	07:05	James Goerdt	Arrived at Bldg 3245 and attempted to connect to IPASS to sync toughbooks. Checking/responding to numerous e-mails. D. Hickey calibrated equipment.
5/4/06	08:30	James Goerdt	Left Bldg 3245 to to collect remaining SW samples at SWMU 16 and to finish measuring SG locations.
5/4/06	11:30	James Goerdt	Returned to Bldg 3245 and processed SW samples from locations 16SWSD12, 13, and 30. Collected FD and MS/MSD samples at location 16SWSD30.
5/4/06	12:30	James Goerdt	D. Hickey and myself went to Cafe for lunch. Returned to Bldg 3245 at 13:05 and prepared vehicles for GW sampling at SWMU 16.
5/4/06	14:15	James Goerdt	Arrived at SWMU 16 to conduct GW sampling. Stopped at well 16GW02 to help D. Hickey set purge/sample equipment.
5/4/06	15:00	James Goerdt	Setting up on well 16MWT09 to purge and sample.
5/4/06	18:00	James Goerdt	Finished sampling at at 16MWT09 and returned to Bldg 3245 to process samples and unload vehicle.
5/4/06	18:45	James Goerdt	Departed the base.

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/06/2006	**Weather/Temp**	am-sun upper 40's	**Created By**	James Goerdt
Facility Name	CRANE NSWC	**TtNUS Personnel**	J. Goerdt;D. Hickey	**Created Date**	5/6/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	James Goerdt
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	5/7/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/6/06	07:30	James Goerdt	Arrive at Bldg 3245 from Martinsville. Sync computers and prepare vehicles for GW sampling at SWMU 16.
5/6/06	08:20	James Goerdt	Arrived at SWMU 16 to begin GW sampling. Setting up on well 16MWT12 and purged and sampled the well from 8:50-12:10. Stopped at Subway and thne began setting up at well 12MW04. Purged and sampled this well from 12:55-15:35. Moved to well 12MW03 and sampled and purged from 15:45-20:20.
5/6/06	20:30	James Goerdt	Returned to Bldg 3245 and unloaded samples and vehicle. Departed Crane at 20:45 for Martinsville.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/07/2006	**Weather/Temp**	AM-PC 50's	**Created By**	James Goerdt
Facility Name	CRANE NSWC	**TtNUS Personnel**	J. Goerdt;D. Hickey	**Created Date**	5/7/06
TtNUS Project #	112G00041	**Subcontractor Personnel**	NA	**Modified By**	James Goerdt
Task/Contract #	TP00050125	**Visitors**	NA	**Modified Date**	5/8/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/7/06	08:00	James Goerdt	Arrive at Bldg 3245 from Martinsville. Process sample bottles from previous day. Load vehicles for GW sampling.
5/7/06	09:00	James Goerdt	Arrive at SWMU 12 to conduct GW sampling. Gate to SWMU 12 was open. Ran out of bottleware for MEE so had to switch from SWMU 16 to SWMU 12.
5/7/06	12:30	James Goerdt	Finished sampling at 12MWT36. Stopped by Subway and began setting up at 12MWT28 at 12:50.
5/7/06	12:55	James Goerdt	Purged and sampled well 12MWT28 from 12:55-17:25. Stopped by to check on D. Hickey and then headed back to Bldg 3245 to unload samples and vehicle.
5/7/06	18:00	James Goerdt	Departed the base.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/03/2006	**Weather/Temp**	PM-70's	**Created By**	James Goerdt
Facility Name	CRANE NSWC	**TtNUS Personnel**	J. Goerdt;D. Hickey	**Created Date**	5/8/06
TtNUS Project #	112G00041	**Subcontractor Personnel**	NA	**Modified By**	James Goerdt
Task/Contract #	TP00050125	**Visitors**	NA	**Modified Date**	5/8/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/3/06		James Goerdt	Morning spent working on SWMU 17.
5/3/06	13:25	James Goerdt	Preparing to measure GW and SG levels.
5/3/06	14:00	James Goerdt	Checked in at SWMU 16. Was told it was OK to be in the area today, however Friday they would be working at Bldg 146 and therefore not accessible to us. Weekend would be OK to sample.
5/3/06	14:20	James Goerdt	From 14:20-16:30 Measured GW levels at SWMU 16 and collected SW sample at 16SWSD10.
5/3/06	16:35	James Goerdt	Returned to Bldg 3245. Left the base at 16:45.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/08/2006	**Weather/Temp**	AM-Sun low 60's	**Created By**	James Goerdt
Facility Name	CRANE NSWC	**TtNUS Personnel**	J. Goerdt;D.Hickey	**Created Date**	5/8/06
TtNUS Project #	112G00041	**Subcontractor Personnel**	NA	**Modified By**	James Goerdt
Task/Contract #	TP00050125			**Modified Date**	5/8/06
WBS Code #	TP00050125	**Visitors**	NA	**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/8/06	07:10	James Goerdt	Arrived at Bldg 3245. Processed weekend samples for shipping. Called Fed Ex and scheduled pick up today. Rcv'd additional MEE bottleware from Microseeps and the Cyanide sample bottles from Laucks.
5/8/06	09:50	James Goerdt	Checked in at SWMU 16. Spoke with Supervisor Wanda who said it was OK to sample wells in the area.
5/8/06	10:00	James Goerdt	Setting up on well 16MWT17. Purged and sampled 10:00-12:40. Collected MS/MSD.
5/8/06	10:50	James Goerdt	Contacted E. Sedlmyer and requested 12 cases of 1 L glass amber bottles, 3 cases of 1 L plastic bottles with H2SO4, and 20 additional coolers for shipping.
5/8/06	12:50	James Goerdt	Stopped by to check on D. Hickey. Stopped by cafe for lunch and fueled vehicle. Returned to SWMU 16 and set up on well 16MWT06.
5/8/06	13:20	James Goerdt	Purged and sampled well 16MWT06 from 13:20-18:30. Water level dropped below pump intake after collecting VOC's, MEE, Nitrates, and 1 L of explosives. Well not recovering. Will complete sampling on 5/9/06.
5/8/06	18:45	James Goerdt	Returned to Bldg 3245 to drop off samples and unload vehicle. Departed base at 19:00.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/09/2006	**Weather/Temp**	AM-sun 50's	**Created By**	James Goerdt
Facility Name	CRANE NSWC	**TtNUS Personnel**	J. Goerdt;D. Hickey	**Created Date**	5/9/06
TtNUS Project #	112G00041	**Subcontractor Personnel**	NA	**Modified By**	James Goerdt
Task/Contract #	TP00050125	**Visitors**	NA	**Modified Date**	5/15/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/9/06	07:15	James Goerdt	Arrived at Crane Bldg 3245. Calibrated equipment. Went over area map for SWMU 17. Started initial cleaning of field office. Awaiting on conference call from PGH office regarding SWMU 17. Never received the call. Loaded vehicles and headed to SWMU 8 to collect SW samples at the pond.
5/9/06	09:30	James Goerdt	Arrived at SWMU 08 and began collecting SW samples from the pond at locations 08SWSD022, 23, and 24, including field duplicate and MS/MSD. 08-22 collected just inside fence area near access gate (SW corner). 08-23 collected on SE side of pond. 08-24 collected next to concrete basin on west side of pond.
5/9/06	10:35	James Goerdt	Returned to well location 16MWT06 at SWMU 16 to check water level. Water level still below pump intake. No additional sample to be collected at this location this shift.
5/9/06	10:45	James Goerdt	Began purge/sample at location 12MWT20 at SWMU 12. Water level of the well is much lower than last round. Set purge rate very low (50 mL/min) and water level seems to be holding.
5/9/06	12:20	James Goerdt	Began collecting sample at location 12MWT20. Finished sampling ~ 14:00. Returned to Bldg 3245 to process samples and get them ready for shipping via Fed Ex. Cleaned up the field office.
5/9/06	18:15	James Goerdt	Dropped off samples at Fed Ex in Bloomington.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/02/2006	**Weather/Temp**		**Created By**	James Goerdt
Facility Name	CRANE NSWC	**TtNUS Personnel**	J. Goerdt;D. Hickey	**Created Date**	5/15/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	James Goerdt
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	5/15/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/2/06		James Goerdt	Day spent working at SWMU 17. See Daily Activity at CTO 376.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/05/2006	**Weather/Temp**	AM PC 50's PM PC 60's	**Created By**	James Goerdt
Facility Name	CRANE NSWC	**TtNUS Personnel**	J. Goerdt;D. Hickey	**Created Date**	5/15/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	James Goerdt
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	5/15/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/5/06	07:10	James Goerdt	Arrived at Bldg 3245. Sync computers, completed time sheets for submittal, printed labels for a few of the previous days samples. Processed samples for shipment and called Fed Ex for pick up. Generated COCs for Laucks and Microseeps. Spoke with US Environmental regarding the wrong flow thru cell they sent with one of the Horibas. They will ship a replacement overnight. Spoke with T. Brent regarding collection of cyanide samples at SWMU 8 pond. Faxed COCs to E. Sedlmyer.
5/5/06	11:00	James Goerdt	Went to SWMU 12 to measure GW level and staff gauge levels.
5/5/06	17:10	James Goerdt	Returned to Bldg 3245. Prepared vehicles for GW sampling for next day. Left Crane at 18:30

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/15/2006	**Weather/Temp**	Overcast and light rain	**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	T. Rojahn	**Created Date**	5/15/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	Terry Rojahn
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	5/15/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/15/06	12:00	Terry Rojahn	Arrive at B-3245:
5/15/06	16:00	Terry Rojahn	Leave B-3245 for Sam's Club and Menards to pick up supplies.
5/15/06	16:59	Terry Rojahn	Purchase supplies at Sam's Club.
5/15/06	17:25	Terry Rojahn	Purchase supplies at Menards.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/16/2006	**Weather/Temp**	Partly sunny to rainy and 60s	**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	T.Rojahn;D. Hickey	**Created Date**	5/16/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	Terry Rojahn
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	5/16/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/16/06	07:17	Terry Rojahn	Arrive at B-3245.
5/16/06	09:30	Terry Rojahn	Arrive @ SWMU 12 to sample surface water.
5/16/06	12:30	Terry Rojahn	Lunch
5/16/06	13:00	Terry Rojahn	Return to B-3245.
5/16/06	15:00	Terry Rojahn	Sit in on a conference call regarding soil sampling at SWMUs 9 & 13 w/ Mr Tom Brent, Mr Bill Gates, R. Basinski and R. Clark.
5/16/06	16:00	Terry Rojahn	Return to B-3245.
5/16/06	16:45	Terry Rojahn	D. hickey arrived at B-3245
5/16/06	17:15	Terry Rojahn	Arrive at SWMU 12 w/DH.

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Daily Activity

Date	Time	Author	Notes
5/16/06	18:40	Terry Rojahn	Return to B-3245:
5/16/06	19:00	Terry Rojahn	Leave B-3245 for Wal Mart
5/16/06	19:50	Terry Rojahn	Purchase field supplies.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/17/2006	**Weather/Temp**	Partly cloudy and 70s	**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	D. Hickey;T. Rojahn	**Created Date**	5/17/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	Terry Rojahn
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	5/18/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/17/06	07:00	Terry Rojahn	Arive at B-3245:
5/17/06	09:40	Terry Rojahn	Arrive at SWMU 12
5/17/06	10:00	Terry Rojahn	Begin purge at monitoring well 12MWT22.
5/17/06	14:00	Terry Rojahn	Finish purge at monitoring well 12MWT22
5/17/06	14:50	Terry Rojahn	Finish collecting ground water sample 12GWT2206.
5/17/06	15:05	Terry Rojahn	Arrive at B-3245:
5/17/06	17:30	Terry Rojahn	Leave B-3245 for Federal Express.
5/17/06	18:10	Terry Rojahn	Dropped off samples on COC# 112G00041-5172006-7 at Fed Ex.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/18/2006	**Weather/Temp**	Mostly cloundy, periods of rain and 60s	**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	D. Hickey;T. Rojahn	**Created Date**	5/18/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	Terry Rojahn
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	5/19/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/18/06	07:15	Terry Rojahn	Arrive at B-3245:
5/18/06	08:30	Terry Rojahn	Talked to Ryan Roberts at Public Works regarding dig permits for hand auger holes - he wants both SWMUs (9 & 13) to go through the utility clearance process.
5/18/06	08:45	Terry Rojahn	Talked to R. Basinki regarding Mr Roberts comments - need to send both dig permit requests.
5/18/06	09:00	Terry Rojahn	Arrive at SWMU 12
5/18/06	09:25	Terry Rojahn	Start purge at monitoring well 12MWT03.
5/18/06	13:25	Terry Rojahn	End purge at monitoring well 12MWT03.
5/18/06	13:30	Terry Rojahn	Start collecting groud water sample 12GWT0306.
5/18/06	14:15	Terry Rojahn	Start purge at monitoring well 12MWT42.

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Daily Activity

Date	Time	Author	Notes
5/18/06	17:05	Terry Rojahn	End purge at monitoring well 12MWT42.
5/18/06	17:10	Terry Rojahn	Start collecting groud water sample 12GWT4206.
5/18/06	18:11	Terry Rojahn	Finish clean up at SWMU 12
5/18/06	18:20	Terry Rojahn	Arrive at B-3245:
5/18/06	18:35	Terry Rojahn	Leave B-3245 for Bloomington.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/20/2006	**Weather/Temp**	Mostly sunny & 60s	**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	D. Hickey;T. Rojahn	**Created Date**	5/20/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	Terry Rojahn
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	5/20/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/20/06	07:10	Terry Rojahn	Arrive at B-3245:
5/20/06	09:15	Terry Rojahn	Arrive at base gas station - fill flat tire on pull cart.
5/20/06	09:35	Terry Rojahn	Arrive at monitoring well 12MWT47.
5/20/06	09:50	Terry Rojahn	Begin purge at monitoring well 12MWT47.
5/20/06	10:50	Terry Rojahn	End purge at monitoring well 12MWT47.
5/20/06	10:55	Terry Rojahn	Start collecting ground water samlpe 12GWT4706.
5/20/06	11:20	Terry Rojahn	Finish clean up at monitoring well 12MWT47.
5/20/06	11:55	Terry Rojahn	Arrive at B-3245:

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Daily Activity

Date	Time	Author	Notes
5/20/06	12:55	Terry Rojahn	Arrive at B-2708 and check in for B-146 area (SWMU 16).
5/20/06	13:15	Terry Rojahn	Start collecting ground water samlpe 16GWT1107.
5/20/06	14:30	Terry Rojahn	DRIED OUT MONITORING WELL 16MWT11 - SAVED ALL FILLED CONTAINERS FOR SAMPLE IN CASE WELL DOESN'T RECHARGE. ALSO, REPACED BLADDER PUMP WITH DEDICATED TEFLON BAILER - WATER LEVEL WAS BELOW PUMP.
5/20/06	14:40	Terry Rojahn	Return to building B-3245:
5/20/06	15:10	Terry Rojahn	Checked on DH at SWMU 12 - he got out of the utility line corridor OK.
5/20/06	15:25	Terry Rojahn	Arrive at SWMU 9 to collect water levels.
5/20/06	16:25	Terry Rojahn	Finish collecting water levels ay SWMU 9.
5/20/06	16:35	Terry Rojahn	Stop at SWMU 12 to check non DH - DH cleaning up at 12MWT11 - will meet DH back at B-3245.
5/20/06	16:42	Terry Rojahn	Return to B-3245:
5/20/06	17:25	Terry Rojahn	Prep to leave B-3245 for Bloomington.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/19/2006	**Weather/Temp**	Mostly sunny and 60s	**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	David Hickey;Terry Rojahn	**Created Date**	5/19/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	Terry Rojahn
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	5/20/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/19/06	07:10	Terry Rojahn	Arrive at B-3245:
5/19/06	09:15	Terry Rojahn	Arrive at SWMU 12
5/19/06	09:40	Terry Rojahn	Begin purge at monitoring well 12MWT31.
5/19/06	13:40	Terry Rojahn	End purge at monitoring well 12MWT22.
5/19/06	13:45	Terry Rojahn	Begin collecting ground water sample 12GWT3106.
5/19/06	14:30	Terry Rojahn	Finish clean up at 12MWT31
5/19/06	14:40	Terry Rojahn	Check monitoring well 12MWT30 - DRY WELL.
5/19/06	14:55	Terry Rojahn	Leave SWMU 12.

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Daily Activity

Date	Time	Author	Notes
5/19/06	15:10	Terry Rojahn	Arrive at B-3245.
5/19/06	17:00	Terry Rojahn	Prep to leave B-3245 for Fed. Ex.
5/19/06	17:45	Terry Rojahn	Dropped off samples on COC# 112G00041-5192006-8 at Fed Ex.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/21/2006	**Weather/Temp**	Mostly sunny and 60s	**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	D. Hickey;T. Rojahn	**Created Date**	5/21/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	Terry Rojahn
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	5/21/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/21/06	07:15	Terry Rojahn	Arrive at B-3245:
5/21/06	08:40	Terry Rojahn	Arrive at SWMU 13 - 13SG12
5/21/06	09:20	Terry Rojahn	Meet DH ongravel road west on SWMU 13 - tree across utility corridor just north of 13MWT36 - showed DH how to access wells from sewer line corridor just north of 13SW/SD16.
5/21/06	11:20	Terry Rojahn	Break for lunch and to address this log.
5/21/06	11:50	Terry Rojahn	Return to SWMU 12 for water level and staff gauge measurements.
5/21/06	14:38	Terry Rojahn	Finished water level & staff gauge measurements - checked table to make sure all wells and SGs were measured.
5/21/06	15:00	Terry Rojahn	Meet w/DH - downed trees blocking access to 13MWT 40 & 41 cluster - DH will go back and get water levels on foot - will finish out the day collecting surface water samples at 13SW/SD19 & 20.
5/21/06	15:25	Terry Rojahn	Return to B-3245 to pick up sample containers for surface water sampling.

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Daily Activity

Date	Time	Author	Notes
5/21/06	15:40	Terry Rojahn	Arrive at SWMU 13 south gate to meet with DH.
5/21/06	16:40	Terry Rojahn	Collected surface water sample 13SW2006.
5/21/06	16:53	Terry Rojahn	Collected surface water sample 13SW1906.
5/21/06	17:10	Terry Rojahn	Prepare trip blank TB05210601.
5/21/06	17:20	Terry Rojahn	Begin collecting ground water sample (purged 5/20) 16GWT1107.
5/21/06	18:05	Terry Rojahn	Finish collecting ground water sample 16GWT1107 and clean up.
5/21/06	18:10	Terry Rojahn	Arrive at B-3245.
5/21/06	18:30	Terry Rojahn	Leave B-3245 for Bloomington.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/22/2006	**Weather/Temp**	Sunny and 60s	**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	D. Hickey;T. Rojahn	**Created Date**	5/22/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	Terry Rojahn
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	5/22/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/22/06	06:55	Terry Rojahn	Arrive at B-3245:
5/22/06	09:00	Terry Rojahn	Meet with Mr Hicks at B-2516 - trees blocking access to monitoring wells should be removed within the week.
5/22/06	09:30	Terry Rojahn	Returned to B-3245:
5/22/06	10:20	Terry Rojahn	Arrive at SWMU 13 to sample surface water - collected samples at 12SWSD11, 14, 15, 16, 22 & 30.
5/22/06	13:30	Terry Rojahn	Return to B-3245:
5/22/06	17:30	Terry Rojahn	Prep to leave B-3245 for Fed. Ex.
5/22/06	18:00	Terry Rojahn	Dropped off samples on COC#s 112G00041-5192206-9 & 10 at Fed Ex.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/23/2006	**Weather/Temp**	Sunny and 70s	**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	D. Hickey;T.Rojahn	**Created Date**	5/23/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	Terry Rojahn
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	5/23/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/23/06	06:55	Terry Rojahn	Arrive at B-3245:
5/23/06	08:30	Terry Rojahn	Meet with Mr Larry Hicks - took Mr Hicks to SWMU 13 and showed him fallen trees along the utility corridor.
5/23/06	09:10	Terry Rojahn	Drop off Mr. Hicks @ B-2516.
5/23/06	09:15	Terry Rojahn	Arrive at Public Works office:
5/23/06	10:05	Terry Rojahn	Begin purge at monitoring well 13MWT47.
5/23/06	11:25	Terry Rojahn	End purge at monitoring well 13MWT47.
5/23/06	12:08	Terry Rojahn	Finish clean up at monitoring well 13MWT47.
5/23/06	12:20	Terry Rojahn	Begin purge at monitoring well 13MWT13.

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Daily Activity

Date	Time	Author	Notes
5/23/06	14:00	Terry Rojahn	End purge at monitoring well 13MWT13.
5/23/06	14:50	Terry Rojahn	Return to B-3245:
5/23/06	17:30	Terry Rojahn	Prep to leave B-3245 for Fed. Ex.
5/23/06	18:00	Terry Rojahn	Dropped off samples on COC#s 112G00041-5192306-11 at Fed Ex.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	05/31/2006	**Weather/Temp**		**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	T. Rojahn	**Created Date**	6/1/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	Terry Rojahn
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	6/1/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
5/31/06	15:00	Terry Rojahn	Arrive at Bloomington gate - obtain 10 day pass. Flight in was delayed almost 2Hrs.
5/31/06	15:15	Terry Rojahn	Arrive at B-3245:
5/31/06	16:45	Terry Rojahn	Leave B-3245 for Sam's Club to pick up supplies (paper towels,copy paper & drinking water).
5/31/06	17:44	Terry Rojahn	Check out at Sam's Club.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	06/02/2006	**Weather/Temp**	lt. rain - overcast & 60s	**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	T. Rojahn	**Created Date**	6/2/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	Terry Rojahn
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	6/2/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
6/2/06	07:10	Terry Rojahn	Arrive at B-3245:
6/2/06	09:15	Terry Rojahn	Checked on dig permits @ public works (Mr Ryan Roberts and Mr Steve Reddick) -up dated SWMU 9 - told above that holes would be installed via DPT to ~11' and that two additional holes were added 1 between each cluster of 2.
6/2/06	09:45	Terry Rojahn	Stopped @ Mr Mike Roach and Mr Tom Flynn's office to check on SWMU 13 activity - Mike and Tom were both gone. Checked in office down stairs - got in touch w/ Mr Dave Baker -OK to access MFB this week and next.
6/2/06	10:00	Terry Rojahn	Arrive at monitoring well 13MWT01.
6/2/06	10:15	Terry Rojahn	Start purge at monitoring well 13MWT01.
6/2/06	11:25	Terry Rojahn	Finish purge at monitoring well 13MWT01.
6/2/06	11:30	Terry Rojahn	Start collecting ground water sample 13GWT0108.
6/2/06	11:54	Terry Rojahn	Finish clean up at monitoring well 13MWT01.

Daily Activity

Date	Time	Author	Notes
6/2/06	12:00	Terry Rojahn	Start purge at monitoring well 13MWT11.
6/2/06	13:10	Terry Rojahn	Finish purge at monitoring well 13MWT11.
6/2/06	13:15	Terry Rojahn	Start collecting ground water sample 13GWT1108.
6/2/06	13:38	Terry Rojahn	Finish clean up at monitoring well 13MWT11.
6/2/06	13:50	Terry Rojahn	Start collecting ground water sample 13GWT4507 purged 6-01-06.
6/2/06	15:00	Terry Rojahn	Finish clean up at monitoring well 13MWT45.
6/2/06	15:12	Terry Rojahn	Return to B-3245:
6/2/06	16:55	Terry Rojahn	Prep to leave B-3245 for Fed Ex.
6/2/06	17:30	Terry Rojahn	Drop off samples for shipment at Fed Ex.
6/2/06	17:43	Terry Rojahn	Purchase supplies at Kroger to decon soil core sampler.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	06/01/2006	**Weather/Temp**	Overcast & 70s.	**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	T. Rojahn	**Created Date**	6/1/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	Terry Rojahn
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	6/1/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
6/1/06	07:15	Terry Rojahn	Arrive at B-3245: Complete 5/31/06 daily log.
6/1/06	08:45	Terry Rojahn	Arrive at monitoring well 13MWT40.
6/1/06	09:00	Terry Rojahn	Start purge at monitoring well 13MWT40.
6/1/06	10:20	Terry Rojahn	Finish purge at monitoring well 13MWT40.
6/1/06	10:25	Terry Rojahn	Start collecting ground water sample 13GWT4007.
6/1/06	11:15	Terry Rojahn	Finish clean up at monitoring well 13MWT40.
6/1/06	11:30	Terry Rojahn	Lunch
6/1/06	11:50	Terry Rojahn	Stopped @ Mr Mike Roach and Mr Tom Flynn's office to check on SWMU 13 activity - Mike and Tom were both gone. Will check again later.

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Daily Activity

Date	Time	Author	Notes
6/1/06	12:00	Terry Rojahn	Arrive at monitoring well 13MWT21.
6/1/06	12:15	Terry Rojahn	Start purge at monitoring well 13MWT21.
6/1/06	13:15	Terry Rojahn	End purge at monitoring well 13MWT21.
6/1/06	13:20	Terry Rojahn	Start collecting ground water sample 13GWT2108.
6/1/06	13:58	Terry Rojahn	Finish clean up at monitoring well 13MWT21.
6/1/06	14:10	Terry Rojahn	Start purge at monitoring well 13MWT45.
6/1/06	16:05	Terry Rojahn	End purge at monitoring well 13MWT45.
6/1/06	16:24	Terry Rojahn	Finish clean up at monitoring well 13MWT45.
6/1/06	16:34	Terry Rojahn	Arrive at B-3245:Ret
6/1/06	17:25	Terry Rojahn	Prep to leave B-3245 for Bloomington.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	06/03/2006	**Weather/Temp**	Mostly sunny & 80s	**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	T. Rojahn	**Created Date**	6/3/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	Terry Rojahn
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	6/3/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
6/3/06	07:15	Terry Rojahn	Arrive at B-3245:
6/3/06	08:20	Terry Rojahn	Arrive at monitoring well 13MWT09.
6/3/06	08:45	Terry Rojahn	Start purge at monitoring well 13MWT09.
6/3/06	09:55	Terry Rojahn	End purge at monitoring well 13MWT09.
6/3/06	10:00	Terry Rojahn	Start collecting ground water sample 13GWT0909 (MS/MSD).
6/3/06	10:55	Terry Rojahn	Start purge at monitoring well 13MWT28.
6/3/06	13:41	Terry Rojahn	End purge at monitoring well 13MWT28 will sample 6/04/06.
6/3/06	14:00	Terry Rojahn	Return to B-32435

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Daily Activity

Date	Time	Author	Notes
6/3/06	14:45	Terry Rojahn	Arrive at monitoring well 13MWT51.
6/3/06	15:05	Terry Rojahn	Start purge at monitoring well 13MWT51.
6/3/06	15:45	Terry Rojahn	End purge at monitoring well 13MWT51.
6/3/06	15:50	Terry Rojahn	Start collecting ground water sample 13GWT5106.
6/3/06	16:47	Terry Rojahn	Finish clean up at monitoring well 13MWT51.
6/3/06	17:00	Terry Rojahn	Start purge at monitoring well 13MWT34.
6/3/06	18:30	Terry Rojahn	End purge at monitoring well 13MWT34.
6/3/06	18:35	Terry Rojahn	Start collecting ground water sample 13GWT3407 & FD06030601.
6/3/06	19:21	Terry Rojahn	Finish clean up at monitoring well 13MWT34.
6/3/06	19:30	Terry Rojahn	Arrive at B-3245:
6/3/06	19:50	Terry Rojahn	Prep to leave B-3245 for Bloomington.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	06/04/2006	**Weather/Temp**	Mostly sunny and 70s.	**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	T. Rojahn	**Created Date**	6/4/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	Terry Rojahn
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	6/5/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
6/4/06	07:10	Terry Rojahn	Arrive @ B-3245.
6/4/06	08:10	Terry Rojahn	Arrive at monitoring well 13MWT31.
6/4/06	08:25	Terry Rojahn	Begin purging monitoring well 13MWT31.
6/4/06	09:35	Terry Rojahn	End purging monitoring well 13MWT31.
6/4/06	09:40	Terry Rojahn	Begin collecting ground water sample 13GWT3107.
6/4/06	10:19	Terry Rojahn	Finish clean up at monitoring well 13MWT31.
6/4/06	10:30	Terry Rojahn	Begin collecting ground water sample 13GWT3107 (purged 6/03/06).
6/4/06	11:00	Terry Rojahn	Finish clean up at monitoring well 13MWT28.

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Daily Activity

Date	Time	Author	Notes
6/4/06	11:25	Terry Rojahn	Begin purging monitoring well 13MWT17.
6/4/06	12:25	Terry Rojahn	End purging monitoring well 13MWT17.
6/4/06	12:30	Terry Rojahn	Begin collecting ground water sample 13GWT1708.
6/4/06	12:55	Terry Rojahn	Finish clean up at monitoring well 13MWT17.
6/4/06	13:10	Terry Rojahn	Begin purging monitoring well 13MWT15.
6/4/06	15:10	Terry Rojahn	End purging monitoring well 13MWT15.
6/4/06	15:28	Terry Rojahn	Begin collecting ground water sample 13GWT1508.
6/4/06	16:05	Terry Rojahn	Finish clean up at monitoring well 13MWT15.
6/4/06	16:15	Terry Rojahn	Returned to B-3245:
6/4/06	17:30	Terry Rojahn	Prep to leave B-3245 for Bloomington. SAMPLPE SUMMARY FOR THIS DATE - FINISH GROUND WATER SAAMPLING AT SWMU 12 WITH THE COLLECTION OF GROUND WATER SAMPLES AT MONITORING WELLS 13MWT25, 17, 28 & 31.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	06/05/2006	**Weather/Temp**	Mostly sunny & 70s	**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	D. Hickey;T. Rojahn	**Created Date**	6/5/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	Terry Rojahn
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	6/5/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
6/5/06	07:00	Terry Rojahn	Arrive @ B-3245:
6/5/06	07:50	Terry Rojahn	Arrive @ Public Works - check on MFB dig permit. Talked to Mr Ryan Roberts - he thinks that all utilities been cleared, but a few signatures are needed on the permit - said to stop back at lunch time and the permit should been ready.
6/5/06	08:20	Terry Rojahn	Return to B-32435:
6/5/06	11:45	Terry Rojahn	Lunch
6/5/06	12:15	Terry Rojahn	Stop at Public Works - no one around - water wasn't signed off on as of yet.
6/5/06	12:35	Terry Rojahn	Return to B-3245:
6/5/06	13:55	Terry Rojahn	Pick up dig permit at Public Works - cancel permit request for SWMU 9.
6/5/06	14:20	Terry Rojahn	Arrive at SWMU 13: Collect sediment samples at locations 13SD46, 48 through 50 and 54. Sediment location 13SD47 was a catch basin/culvert w/ a concrete bottom - voll of any sediment material. Also, collect surface soil sample at location 13SB76 inside inclosed transport corridor w/ concrete floor.

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Daily Activity

Date	Time	Author	Notes
6/5/06	15:45	Terry Rojahn	Return to B-3245:
6/5/06	17:30	Terry Rojahn	Leave B-3245 for Fed Ex.
6/5/06	18:05	Terry Rojahn	Drop off rental equipment and ground water samples for shipment on the above AB#s at Fed Ex.

- End of Report -

Tetra Tech NUS, Inc.

DAILY ACTIVITY LOG

SWMUs 12 (Round 6) and 13/16 (Round 8) MNA Routine Sampling (May 2006) - CRANE NSWC

Project Information

Activity Date	6/6/06	**Weather/Temp**	Sunny, Humid & 80s	**Created By**	Terry Rojahn
Facility Name	CRANE NSWC	**TtNUS Personnel**	D.Hickey;T.Rojahn	**Created Date**	6/6/06
TtNUS Project #	112G00041	**Subcontractor Personnel**		**Modified By**	John Wright
Task/Contract #	TP00050125	**Visitors**		**Modified Date**	6/10/06
WBS Code #	TP00050125			**Printed By**	James Goerdt
Client	SouthDiv			**Printed Date**	7/19/06

Daily Activity

Date	Time	Author	Notes
6/6/06	07:00	Terry Rojahn	Arrive at B-3245
6/6/06	08:30	Terry Rojahn	Arrive at SWMU 13 - collected sediment samples at 13SD51 through 53 and soil samples at boring locations 13SB73, 75 and 77.
6/6/06	11:55	Terry Rojahn	Return to B-3245:
6/6/06	12:10	Terry Rojahn	Lunch at cafe
6/6/06	12:35	Terry Rojahn	Return to B-3245:
6/6/06	16:10	Terry Rojahn	Return to SWMU 13: Collected soil samples at boring locations 13SB74, and 78 through 84.
6/6/06	18:45	Terry Rojahn	Return to B-3245:
6/6/06	19:45	Terry Rojahn	Prep to leave B-3245 for Bloomington.

- End of Report -

APPENDIX C

SWMU 12

HEALTH AND SAFETY DOCUMENTATION

ROUND 6

TETRA TECH NUS

CERTIFICATE OF TRAINING

THIS CERTIFIES THAT

Terry R. Rojahn

has successfully completed an 8-hour course of instruction in

OSHA 29 CFR 1910.120

GENERAL SITE WORKER REFRESHER AND SUPERVISOR REFRESHER TRAINING

prepared and instructed by
Tetra Tech NUS, Inc.
Pittsburgh, Pennsylvania

February 9, 2006

Date of Award

Clyde Snyder
Senior Instructor
Training Services

James K. Laffey
Manager
Training Services

October 28, 2005

TETRA TECH NUS

CERTIFICATE OF TRAINING

THIS CERTIFIES THAT

James Goerdt

has successfully completed an 8-hour course of instruction in

OSHA 29 CFR 1910.120

GENERAL SITE WORKER
REFRESHER TRAINING

prepared and instructed by
Tetra Tech NUS, Inc.
Pittsburgh, Pennsylvania

December 29, 2005

Date of Award

Clyde Snyder
Senior Instructor
Training Services

James K. Laffey
Manager
Training Services

MEDICAL DATA SHEET

This Medical Data Sheet must be completed by all on-site personnel and kept in the command post during the conduct of site operations. This data sheet will accompany any personnel when medical assistance is needed or if transport to hospital facilities is required.

Project NSWC Crane

Name David Alan Hickey JR Home Telephone (865) 925-2255

Address 7646 Emory Cove Way

Age 41 Height 5'10" Weight 185'

Name of Next Kin Kristi Hickey

Drug or other Allergies None

Particular Sensitivities None

Do You Wear Contacts? NO

Provide a Checklist of Previous Illnesses or Exposure to Hazardous Chemicals NA

What medications are you presently using? Xyrem (8-16 ml/day), D-Amphetamine w/ Salt (40 mg/day), Clarinex (5mg/day)

Do you have any medical restrictions? No

Name, Address, and Phone Number of personal physician: DR. Sunil John 865-632-5885 Knoxville, TN

I am the individual described above. I have read and understand this HASP.

David A. Hickey Jr

Signature

2-14-06

Date

MEDICAL DATA SHEET

This Medical Data Sheet must be completed by all on-site personnel and kept in the command post during the conduct of site operations. This data sheet will accompany any personnel when medical assistance is needed or if transport to hospital facilities is required.

Project NSWC Crane CTO 377

Name Jim Goerdt Home Telephone 412-319-7303

Address 5418 Forest Edge Drive McDonald PA

Age 41 Height 5'11" Weight 175

Name of Next Kin Shanan Goerdt

Drug or other Allergies None

Particular Sensitivities Poison Ivy

Do You Wear Contacts? No

Provide a Checklist of Previous Illnesses or Exposure to Hazardous Chemicals NA

What medications are you presently using? NA

Do you have any medical restrictions? NA

Name, Address, and Phone Number of personal physician: Dr. Fatigati 412-343-1770

I am the individual described above. I have read and understand this HASP.

Signature

1/5/06

Date

MEDICAL DATA SHEET

This Medical Data Sheet must be completed by all on-site personnel and kept in the command post during the conduct of site operations. This data sheet will accompany any personnel when medical assistance is needed or if transport to hospital facilities is required.

Project: NSWC CRANE

Name: TERRY ROJAHN Home Telephone: (724) 695-3573

Address: 61 Rodgers Dr Coraopolis PA 15108

Age: 57 Height: 5'11" Weight: 205

Name of Next Kin: VERONICA ROJAHN

Drug or other Allergies: Hay Fever

Particular Sensitivities: Cat Dander, Poison Ivy, Rubber Cement

Do You Wear Contacts? No

Provide a Checklist of Previous Illnesses or Exposure to Hazardous Chemicals: NA

What medications are you presently using? NA

Do you have any medical restrictions? NONE

Name, Address, and Phone Number of personal physician:

Family Practice Asso., Moon Township

412-264-1918 Dr Cone

I am the individual described above. I have read and understand this HASP.

Signature: [signature] Date: 1-4-06

APPENDIX D

SWMU 12

ANALYTICAL DATA

ROUND 5

APPENDIX D.1

SWMU 12

ROUND 5

SUMMARY OF GROUNDWATER WATER ANALYTICAL RESULTS

APPENDIX D.1
NSWC CRANE
SUMMARY OF ANALTICAL RESULTS - GROUNDWATER ROUND 6
UPPER AND MIDDLE PENNSYLVANIA, AND MISSISSIPPIAN GLEN DEAN WATER BEARING ZONES
SWMU 12 (MINE FILL A)

SITE	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A
WATER BEARING ZONE	PUZ	PUZ	PUZ	PUZ	PUZ	PUZ	PUZ
SWMU	12	12	12	12	12	12	12
LOCATION	12MWT03	12MWT06	12MWT06	12MWT09	12MWT10	12MWT11	12MWT12
SAMPLE	12GWT0306	12GWT0606	12GWT0606-D	12GWT0906	12GWT1006	12GWT1106	12GWT1206
MATRIX	GW	GW	GW	GW	GW	GW	GW
SACODE	NORMAL	NORMAL	DUP	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	20060518	20060518	20060518	20060509	20060520	20060520	20060519
EXPLOSIVES (UG/L)							
1,3,5-TRINITROBENZENE	0.25 U	12	12	0.25 U	0.25 U	95	0.25 U
1,3-DINITROBENZENE	0.25 U	7.2	7	0.25 U	0.25 U	10	0.25 U
2,4,6-TRINITROTOLUENE	0.25 U	120	130	0.25 U	0.25 U	140	0.25 U
2,4-DINITROTOLUENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,6-DINITROTOLUENE	0.25 U	25 U	25 U	0.25 U	0.25 U	25 U	0.25 U
2-AMINO-4,6-DINITROTOLUENE	0.25 U	28 J	29 J	6.3 J	0.25 U	21 J	3.7 J
2-NITROTOLUENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
3-NITROTOLUENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-AMINO-2,6-DINITROTOLUENE	0.25 U	35 J	35 J	5.4	0.25 U	38 J	4.5
4-NITROTOLUENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
HMX	0.25 U	390	420	54	6.7	520	110
NITROBENZENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RDX	0.25 U	4800	4800	390	35	4600	340
TETRYL	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
MISCELLANEOUS PARAMETERS (MG/L)							
NITRITE/NITRATE-N	0.025 U	1.1	1.1	0.75	0.025 U	5.3	2.2

APPENDIX D.1
NSWC CRANE
SUMMARY OF ANALTICAL RESULTS - GROUNDWATER ROUND 6
UPPER AND MIDDLE PENNSYLVANIA, AND MISSISSIPPIAN GLEN DEAN WATER BEARING ZONES
SWMU 12 (MINE FILL A)

SITE	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A
WATER BEARING ZONE	PUZ	PUZ	PUZ	PUZ	PUZ	PUZ	PUZ-UPGRAD
SWMU	12	12	12	12	12	12	12
LOCATION	12MWT16	12MWT17	12MWT18	12MWT20	12MWT22	12MWT23	12MWT28
SAMPLE	12GWT1606	12GWT1706	12GWT1806	12GWT2006	12GWT2206	12GWT2306	12GWT2806
MATRIX	GW	GW	GW	GW	GW	GW	GW
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	20060518	20060518	20060507	20060509	20060517	20060519	20060507
EXPLOSIVES (UG/L)							
1,3,5-TRINITROBENZENE	5.2	2	0.25 U	0.25 U	0.25 U	0.25 U	0.25 UJ
1,3-DINITROBENZENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 UJ
2,4,6-TRINITROTOLUENE	9.9	2.2	0.25 U	0.25 U	0.86	0.25 U	0.25 UJ
2,4-DINITROTOLUENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 UJ
2,6-DINITROTOLUENE	2.5 J	1.5	0.25 U	0.25 U	0.25 U	0.25 U	0.25 UJ
2-AMINO-4,6-DINITROTOLUENE	120 J	32 J	0.25 U	0.25 U	0.25 U	0.25 U	0.25 UJ
2-NITROTOLUENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 UJ
3-NITROTOLUENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 UJ
4-AMINO-2,6-DINITROTOLUENE	210	46	0.25 U	0.25 U	0.25 U	0.25 U	0.25 UJ
4-NITROTOLUENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 UJ
HMX	600	150	1.9 J	0.25 U	5	0.25 U	0.25 UJ
NITROBENZENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 UJ
RDX	8100	2600	20	4.1	46	0.25 U	0.25 UJ
TETRYL	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 UJ
MISCELLANEOUS PARAMETERS (MG/L)							
NITRITE/NITRATE-N	2.1	1.6	0.56	0.41	0.081	0.13	0.025 U

APPENDIX D.1
NSWC CRANE
SUMMARY OF ANALTICAL RESULTS - GROUNDWATER ROUND 6
UPPER AND MIDDLE PENNSYLVANIA, AND MISSISSIPPIAN GLEN DEAN WATER BEARING ZONES
SWMU 12 (MINE FILL A)

SITE	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A
WATER BEARING ZONE	PMZ	PMZ	PUZ	PUZ	PLZMGD	PUZ
SWMU	12	12	12	12	12	12
LOCATION	12MWT31	12MWT32	12MWT36	12MWT38	12MWT41	12MWT42
SAMPLE	12GWT3106	12GWT3206	12GWT3606	12GWT3806	12GWT4106	12GWT4206
MATRIX	GW	GW	GW	GW	GW	GW
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	20060519	20060507	20060507	20060517	20060520	20060518
EXPLOSIVES (UG/L)						
1,3,5-TRINITROBENZENE	0.25 U	0.25 U	0.29 U	0.25 U	0.25 U	0.25 U
1,3-DINITROBENZENE	0.25 U	0.25 U	0.29 U	0.25 U	0.25 U	0.25 U
2,4,6-TRINITROTOLUENE	0.25 U	0.25 U	0.29 U	0.25 U	0.25 U	0.25 U
2,4-DINITROTOLUENE	0.25 U	0.25 U	0.29 U	0.25 U	0.25 U	0.25 U
2,6-DINITROTOLUENE	0.25 U	0.25 U	0.29 U	0.25 U	0.25 U	0.25 U
2-AMINO-4,6-DINITROTOLUENE	0.25 U	0.25 U	0.29 U	0.25 U	0.25 U	0.25 U
2-NITROTOLUENE	0.25 U	0.25 U	0.29 U	0.25 U	0.25 U	0.25 U
3-NITROTOLUENE	0.25 U	0.25 U	0.29 U	0.25 U	0.25 U	0.25 U
4-AMINO-2,6-DINITROTOLUENE	0.25 U	0.25 U	0.29 U	0.25 U	0.25 U	0.25 U
4-NITROTOLUENE	0.25 U	0.25 U	0.29 U	0.25 U	0.25 U	0.25 U
HMX	0.25 U	0.25 U	7.5	0.78	0.25 U	30
NITROBENZENE	0.25 U	0.25 U	0.29 U	0.25 U	0.25 U	0.25 U
RDX	0.25 U	0.25 U	43	61	0.25 U	15
TETRYL	0.25 U	0.25 U	0.29 U	0.25 U	0.25 U	0.25 U
MISCELLANEOUS PARAMETERS (MG/L)						
NITRITE/NITRATE-N	0.089	0.12	5.9	0.025 U	0.025 U	0.19

APPENDIX D.2

SWMU 12

ROUND 5

SUMMARY OF SURFACE WATER ANALYTICAL RESULTS

APPENDIX D.2
NSWC CRANE
SUMMARY OF ANALYTIC RESULTS - SURFACE WATER ROUND 6
SWMU 12 (MINE FILL A)

SITE	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A	MINE FILL A
AOC	GULLY	GULLY	GULLY	ET	TC-UPGRAD	TC	GULLY	GULLY	GULLY
SWMU 12	12	12	12	12	12	12	12	12	12
LOCATION	12SW/SD09	12SW/SD11	12SW/SD14	12SW/SD24	12SW/SD25	12SW/SD27	12SW/SD31	12SW/SD34	12SW/SD34
SAMPLE	12SW0906	12SW1106	12SW1405	12SW2406	12SW2506	12SW2706	12SW3104	12SW3405	12SW3405-D
MATRIX	SW	SW	SW	SW	SW	SW	SW	SW	SW
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP
SAMPLE DATE	5/16/2006	5/16/2006	5/16/2006	5/16/2006	5/16/2006	5/16/2006	5/16/2006	5/16/2006	5/16/2006
EXPLOSIVES (UG/L)									
1,3,5-TRINITROBENZENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
1,3-DINITROBENZENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-TRINITROTOLUENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	180	0.25 U	0.25 U
2,4-DINITROTOLUENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,6-DINITROTOLUENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-AMINO-4,6-DINITROTOLUENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	5.9 J	0.25 U	0.25 U
2-NITROTOLUENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
3-NITROTOLUENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-AMINO-2,6-DINITROTOLUENE	0.25 U	0.25 U	1.1	0.25 U	0.25 U	0.25 U	32	0.78	0.71
4-NITROTOLUENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
HMX	6.8	2.1	8.6	0.25 U	0.25 U	0.25 U	5.1	55	53
NITROBENZENE	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RDX	10	2.5	20	0.25 U	0.25 U	0.25 U	23	200	180
TETRYL	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
MISCELLANEOUS PARAMETERS (MG/L)									
NITRITE/NITRATE-N	0.19	0.077	1.3	0.12	0.025 U	0.063 J	0.4	1.2	1.2

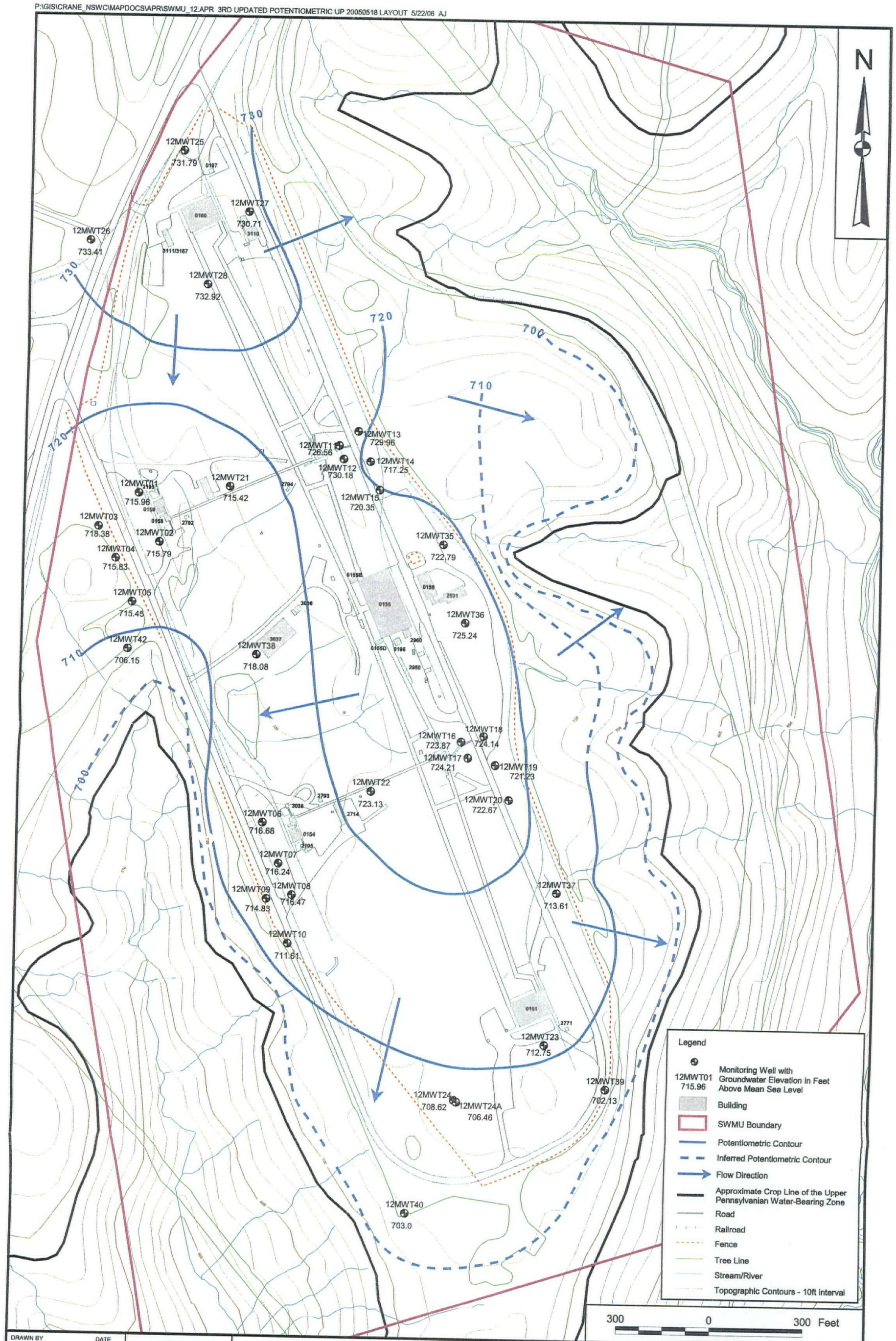
APPENDIX E

SWMU 12

ROUND 4

POTENTIOMETRIC SURFACE MAPS

P:\GIS\CRANE_NSWC\MAPDOCS\APR\SWMU_12.APR 3RD UPDATED POTENTIOMETRIC UP 20050518 LAYOUT 5/22/06 AJ



DRAWN BY	DATE
S. STROZ	5/16/06
CHECKED BY	DATE
J. LUCAS	5/23/06
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

POTENTIOMETRIC SURFACE MAP FOR THE UPPER PENNSYLVANIAN WATER-BEARING ZONE - NOVEMBER 29, 2005
SWMU 12 MINE FILL A
NSWC CRANE
CRANE, INDIANA

CONTRACT NUMBER	
CTO 0357	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 4 - 1	REV 0

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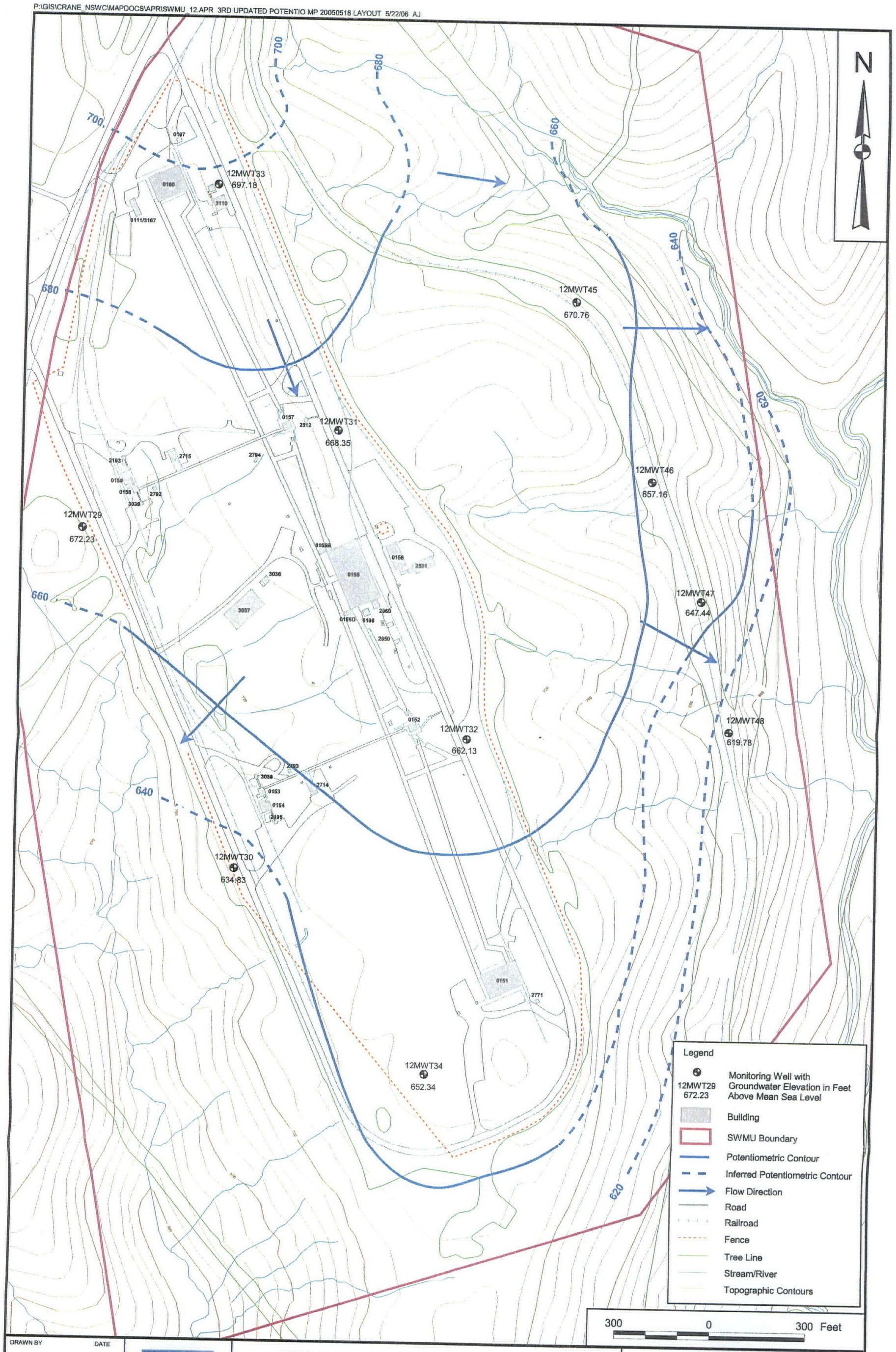

DRAWN BY	DATE
S. STROZ	5/17/06
CHECKED BY	DATE
J. LUCAS	5/23/06
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

POTENTIOMETRIC SURFACE MAP FOR THE MIDDLE PENNSYLVANIAN WATER-BEARING ZONE - NOVEMBER 29, 2005
SWMU 12 MINE FILL A
NSWC CRANE
CRANE, INDIANA

CONTRACT NUMBER	
CTO 0357	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 4 - 2	REV 0

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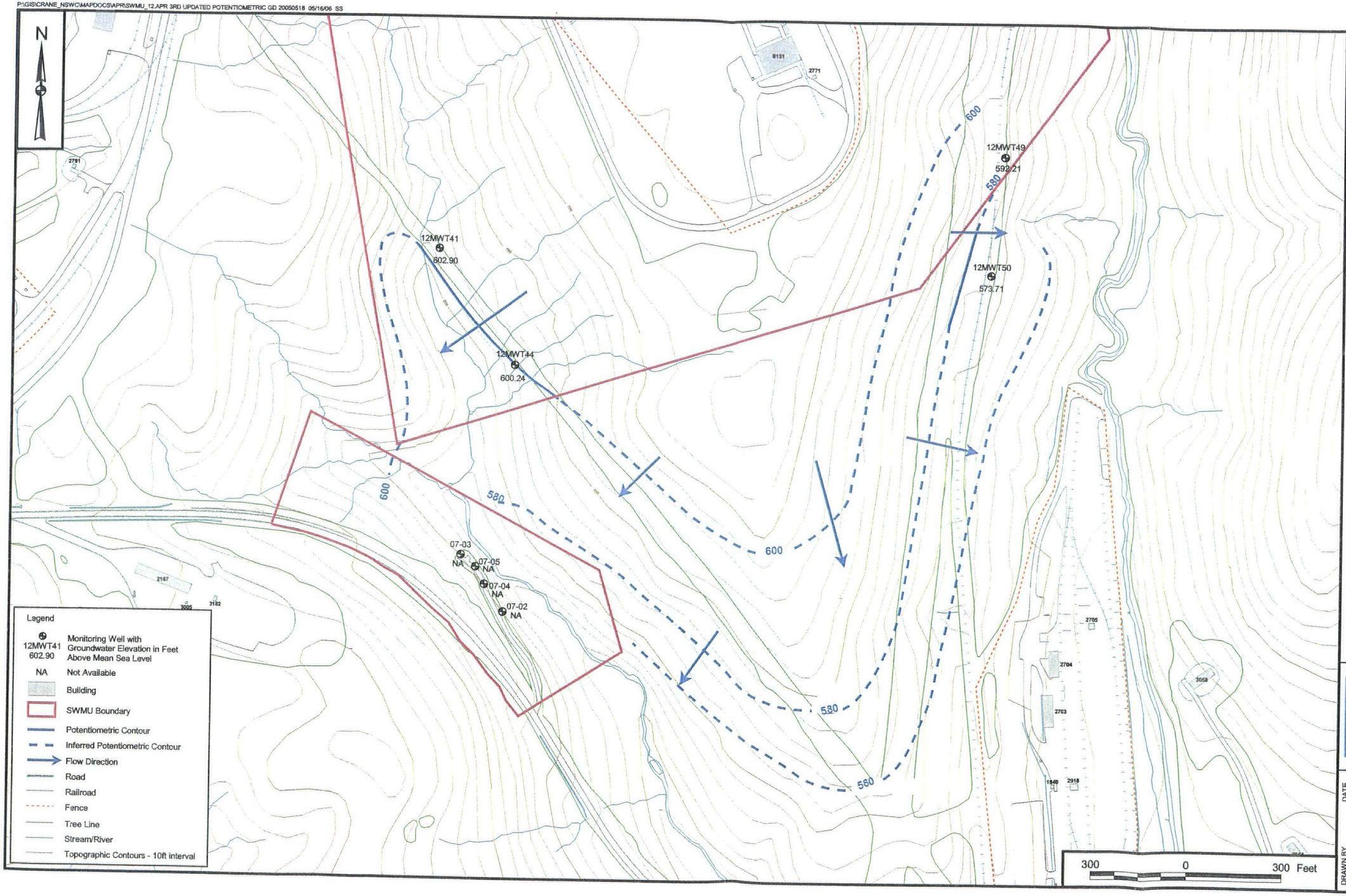

CONTRACT NO. 6878

APPROVED BY ____ DATE ____

APPROVED BY ____ DATE ____

DRAWING NO. FIGURE 4 - 3

REV 0

POTENTIOMETRIC SURFACE MAP FOR THE GLEN DEAN LIMESTONE (MISSISSIPPIAN) AQUIFER ON NOVEMBER 29, 2005
SWMU 12 MINE FILL A
NSWC CRANE
CRANE, INDIANA

NAVFAC

DRAWN BY S. STROZ DATE 05/16/06

CHECKED BY J. LUCAS DATE 05/16/06

COST/SCHED-AREA

SCALE AS NOTED