Comprehensive Long-term Environmental Action Navy

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NSWC CRANE
5090.3a

CONTRACT NUMBER N62467-94-D-0888

Rev. 0
01/23/06

Resource Conservation and Recovery Act Facility Investigation Report
for
Mine Fill A (SWMU 12)

VOLUME II OF III - APPENDICES A - C

Naval Surface Warfare Center Crane
Crane, Indiana

Contract Task Order 0357

January 2006

NAVFAC
Naval Facilities Engineering Command
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406

TETRA TECH NUS, Inc.

SWMU 12 RFI
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APPENDIX A

SWMU 12

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SWMU 12

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SWMU 12

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SWMU 12

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Figure A-1 Photographs
SWMU 12

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SWMU 12

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Figure A-1 Photographs
SWMU 12

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Figure A-1 Photographs
SWMU 12

Figure A-1aa: Up gradient 12SWSD04 (3-05)

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Figure A-1 Photographs
SWMU 12

Figure A-1ee: Up gradient 12SWSD09 (3-05)

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Figure A-1 Photographs
SWMU 12

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Figure A-1 Photographs
SWMU 12

Figure A-1mm: Up gradient 12SWSD23 (3-05)

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Figure A-1oo: Up gradient 12SWSD25 (3-05)

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Figure A-1 Photographs
SWMU 12

Figure A-1qq: Up gradient 12SWSD27 (3-05)

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SWMU 12

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SWMU 12

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Figure A-1 Photographs
SWMU 12

Figure A-1aaa: Staff gauge 12SG01 (10-04)

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Figure A-1ccc: Staff gauge 12SG03 (10-04)

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Figure A-1 Photographs
SWMU 12

Figure A-1eee: Staff gauge 12SG05 (10-04)

Figure A-1fff: Staff gauge 12SG06 (10-04)

Figure A-1ggg: Staff Gauge 12SG07 (10-04)

Figure A-1hhh: Staff gauge 12SG08 (10-04)

Figure A-1 Photographs
SWMU 12

Figure A-1iii: Staff gauge 12SG09 (10-04)

Figure A-1jjj: Staff gauge 12SG10 (10-04)

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SWMU 12

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Figure A-2b: 12MWT27 and 12MWT33 (6-04)

Figure A-2c: 12MWT10 location

Figure A-2d: Accessing railroad tracks

Figure A-2 Photographs
SWMU 12

Figure A-2e: 600 hill corridor

Figure A-2f: 600 hill corridor

Figure A-2g: 600 hill corridor

Figure A-2h: 600 hill corridor

Figure A-2 Photographs
SWMU 12

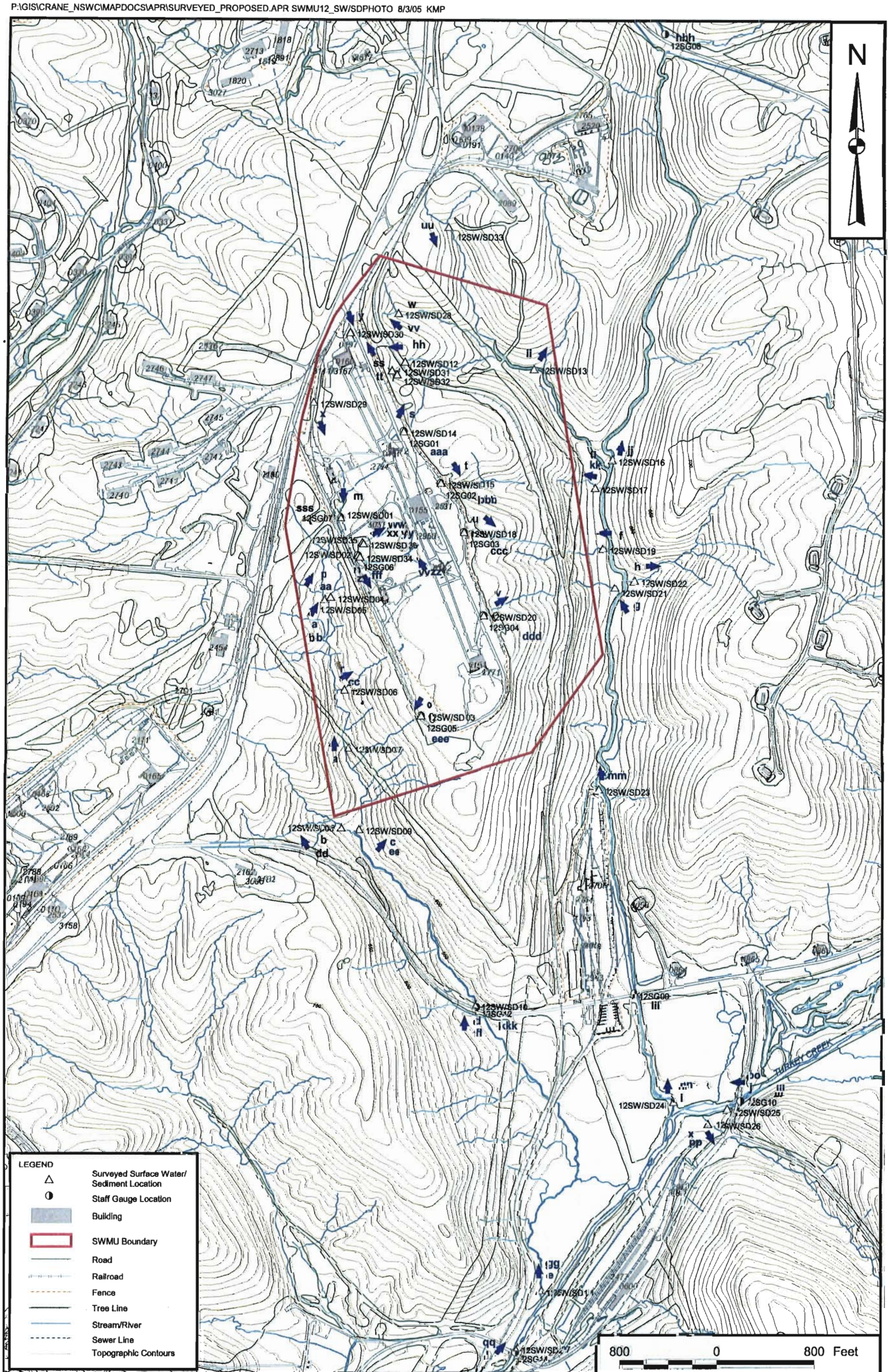
Figure A-2i: 600 hill corridor

APPENDIX A.2

SWMU 12

FIGURE A-2 AND PHOTOGRAPHS

P:\GIS\CRANE_NSWC\MAPDOCS\APR\SURVEYED_PROPOSED.APR SWMU12_SW/SDPHOTO 8/3/05 KMP



DRAWN BY	DATE
K. PEILA	5/31/05
CHECKED BY	DATE
J. LUCAS	5/31/05
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

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

CONTRACT NUMBER	
6878	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE A - 1	REV 0

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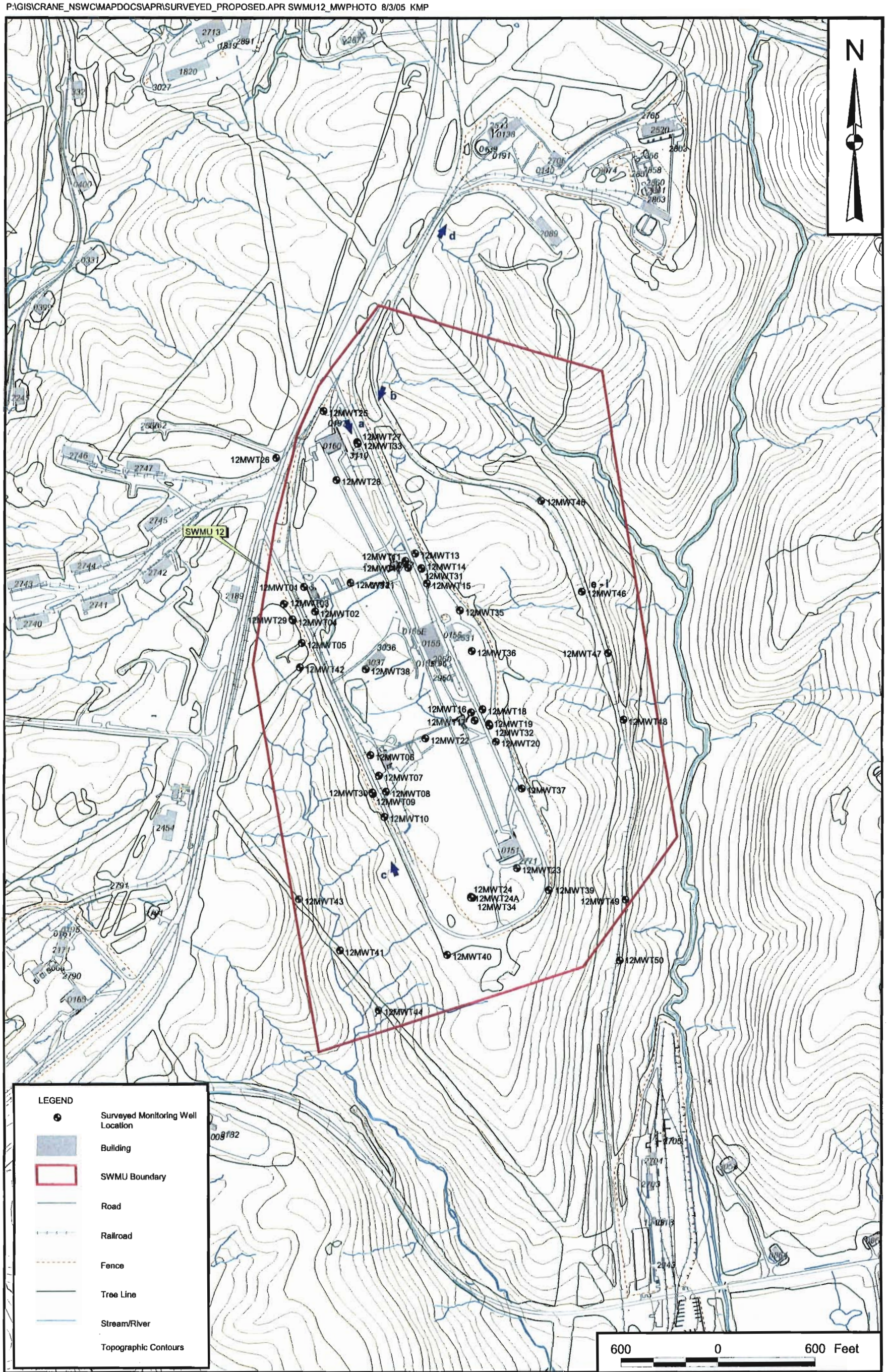


DRAWN BY	DATE
K. PEILA	3/23/05
CHECKED BY	DATE
J. GOERDT	3/23/05
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

PHOTOGRAPH DIRECTION MARKERS
SURVEYED MONITORING WELL LOCATIONS
SWMU 12 - MINE FILL A AND SWMU 25 - HIGHWAY 58 DUMP SITE A
NSWC CRANE
CRANE, INDIANA

CONTRACT NUMBER	
6878	
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
DRAWING NO.	REV
FIGURE A - 2	0

Figure A-2 Photographs
SWMU 12

Figure A-2a: 12MWT27 and 12MWT33 (6-04)

Figure A-2b: 12MWT27 and 12MWT33 (6-04)

Figure A-2c: 12MWT10 location

Figure A-2d: Accessing railroad tracks

Figure A-2 Photographs
SWMU 12

Figure A-2e: 600 hill corridor

Figure A-2f: 600 hill corridor

Figure A-2g: 600 hill corridor

Figure A-2h: 600 hill corridor

Figure A-2 Photographs
SWMU 12

Figure A-2i: 600 hill corridor

APPENDIX B

SWMU 12

BORING LOGS, MONITORING WELL CONSTRUCTION DIAGRAMS AND RELATED MATERIALS

APPENDIX B.1.1

SMWU 12

BORING LOGS AND MONITORING WELL CONSTRUCTION DIAGRAMS

ROUND 1

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: ATV CME 550

BORING No.: 12 MWT01
DATE: 7-9-04 / 7-24-04
GEOLOGIST: CONTI
DRILLER: BRUCE KIRKPATRICK

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
S-1	0	2/11	2/2	1'	M DENSE	BRN	SANDY SILT-TR ROCK-TR ROOTS	ML	MOIST	0			
C 1015	2	34/18			DENSE	LT BRN	SILTY F SAND	SM	MOIST.	0			
S-2 C		4/5	1.8/2				TR ROCK FRAGS		MOIST → WET	0			
1025	4	50/100		4'±	V DENSE		TO SILTY F SAND	SM	TR H_2O IN HOLE AT 4' (PERCHED)	0			
S-3 C	5	50/100	1/1	WEATH SS.	V	TAN BRN	SILTY SAND AND	SM	MOIST - MICA	0			
1050 S-4	6	50/100	1/1		DENSE		WEATHERED SANDSTONE	SM	MOIST	0			
S-5 C		12/58	1/1.5						LAMINATED	0			
1130	7.5	81/50/1"								0			
S-6 1200	8.0 8.7	68/100/2"		9.0					8"-DRIVE	0			
	9.5			9.5					START CORE @ 9.5 (NX)	0			
1000				10.0	M HARD	BRN	SANDSTONE			0			
					M SOFT	BRN GRAY	SANDSTONE THINLY BEDDED W/ SHALE	VBR	MOIST	0			
									NO SIGN OF WATER	0			
.4/9	1	40%	6/9						STICKS TO CORE BARREL	0			
									(2" Φ CORE) FROM ≈ 11 - 18.5'	0			
									FRIABLE SANDSTONE W/ V. THIN	0			
									SEAMS OF SHALE	0			
										0			
										0			
1050 1110	18.5				M SOFT	GRAY	SANDSTONE - INTERBEDDED W/ SHALE		MOIST	0			
					M HARD			BR	SEVERAL HORIZ JNTS THRUOUT	0			
										0			
										0			
2.9/10	2	29%	8.6/10							0			
									23.6 → 23.7 POSSIBLE WATER	0			
				25.0					AT THIS HORIZ JNT	0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4" ID HSA TO START. - HAD TO DEMOB DUE TO ARMY H&S, RESUME 7-24-04 - JIM WALSH AUGERS TO 9' - WILL SET 6" TEMP STEEL CASING TO 9' & WILL CORE FROM 9' (USING AIR)

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT01

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT01
DATE: 7-24-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	25.0			24									
					SOFT	BLK	COAL	BR	SOME VERT JNTS IN COAL	0			
				26.5					MOIST → WET				
					M SOFT	GRAY	SHALE			0			
				27.5									
					M HARD	GRAY	SANDY SILTSTONE /	BR	MOIST	0			
1135 1250	28.5						SANDSTONE			0			
									TR WATER	0			
									EXITING BORE HOLE	0			
										0			
								TO		0			
				34						0			
4/10	3	40%	5/10	34.5				VER		0			
				SHALE	M SOFT / M HARD	GRAY	SHALE - SILTY IN PLACES		SEVERAL HORIZ BREAKS - BUT NOT WATER	0			
								BR	STAINED	0			
1335	38.5			38.5						0			
				BOTM			SMALL PC OF COAL IN SHOE @ 38.5						
									WILL REAM W/ 5½" BIT TO 35.				
									WELL 34 - 24 SAND 35 - 21				
									CHIPS 11 - 21				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: USED AIR TO CORE
" " TO REAM - BLEW OUT HOLE TO CLEAN

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT01

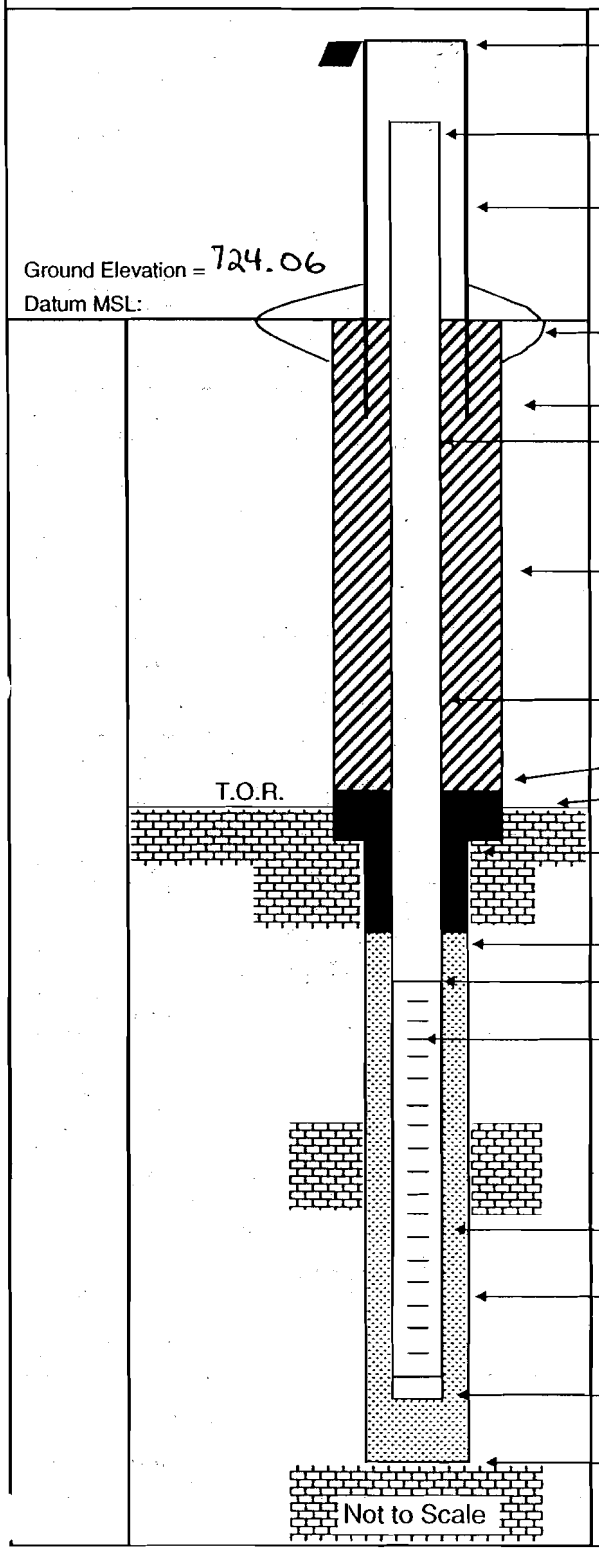
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT01

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT01
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	7/24/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	1312852.79
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026150.48



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 726.87

I.D. of Surface Casing:

Type of Surface Casing: STEEL

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) TEMP - 9.5

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2" TO 9'

Type of Backfill: CEMENT GROUT

Elevation / Depth Top of Seal: 713.06 / 11

Elevation / Depth Top of Bedrock: 720.06 / 4'

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: — / NA

Elevation / Depth of Top of Filter Pack: 703.06 / 21

Elevation / Depth of Top of Screen: 700.06 / 24

Type of Screen: PVC

Slot Size x Length: 20 x 10'

I.D. of Screen: 2"

Type of Filter Pack: QUARTZ SAND - GLOBAL #5

Diameter of Hole in Bedrock: Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 690.06 / 34.0

Elevation / Total Depth of Borehole: 689.06 / 35.0

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT02
DATE: 7-24-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 e	0	6/4	.2/2		LOOSE	GRAY BRN	SILTY SAND - TR ROOTS	SM	MOIST LOGGED FROM	0			
1700	2	3/2		2			ROCK FRAGS		CUTTINGS - DUE TO POOR REC.	0			
S-2 e		2/1	1.5/2		LOOSE /SOFT		CLAYEY SAND - TR	SC	MOIST → WET	0			
1705	4	2/1					GRAVEL TR ROCK FRAG		COULD BE FILL.	0			
S-3 e		2/1	1/2		SOFT		CLAYEY SAND/ SANDY CLAY TR		MOIST	0			
1708	6	2/4		6			ROCK FRAGS		LOOKS LIKE FILL	0			
S-4 e		16/2	1/2	▼ 7'	M DENSE	GRAY BRN	SILTY SAND - SOME	SM	WATER ≈ 7' ± COULD BE WEATH	0			
1710	8	3/21		7.5			S.S. FRAGS - TR CLAY		ROCK ≈ 7.5' WET	0			
S-5 e	8.5	100/.5		8 REFUSE	V DENSE	ORANGE BRN	WEATH SANDSTONE	VER BR	MOIST	0			
1718	9.5			9.5									
1735			▼		M SOFT	BRN	WEATH SANDSTONE	VER	MOIST	0			
							W/ SOFT SEAMS CLAY FILLED			0			
							JOINTS		ROCK IS VERY BR - CRUMBLES	0			
									AND MOIST FEW WET	0			
									ZONES.	0			
.5/10	1	15%	7/10							0			
										0			
					M HARD				BECOMES HARDER @ BOTM	0			
				18		GRAY	SANDSTONE			0			
										0			
1800	19.5		◆	19.5	M SOFT	LT		BR		0			
1930						GRAY	SILTSTONE (SANDY)		HOLE MAKING SIG. WATER	0			
									19.5 → 29.5	0			
				23.0				VER	SEVERAL HORIZ	0			
5.4/10	2	54%	9/10	23.7	M SOFT	GRAY	CLAY SHALE		JNTS	0			
					M HARD		SANDSTONE	BR		0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼" ID HSA TO 9.5' - 2" SPOONS - AUTO HAMMER
PULLED HSA - SET 6" STEEL CAS TO 9.5' (TEMP) INTO 8½" HOLE.
ADD PELLETS TO SEAL OFF WATER.

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT02

REAM TO 29
WELL TO 28-18

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 55 ATV

BORING No.: 12MWT02
DATE: 7-24-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sample BZ*	Borehole**	Driller BZ**
	25												
					M HARD	GRAY	SANDSTONE	BR		0			
										0			
				27.5									
				28	M SOFT	GRAY	SHALE	BR		0			
										0			
1900	29.5			29.5						0			
				BOTM									
							REAM TO 29'						
							WELL 18-28 FEET						
							SAND 15-29 "						
							PELLETS 15-						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT02

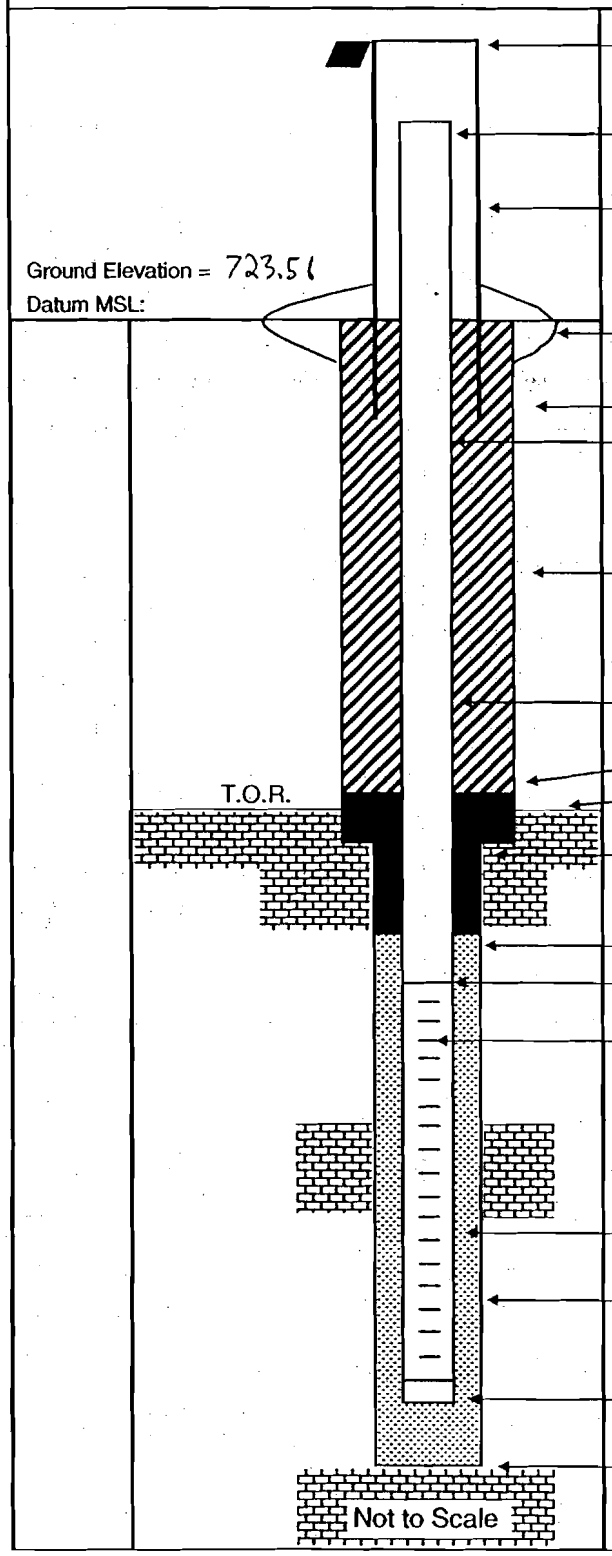
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT02

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT02
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	7-25-04
SITE:	SWMU-12	DRILLING METHOD:	HSA / ROT	NORTHING:	1312701.31
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026218.56



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 725.64

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) TEMP 6" TO 9.5

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2"

Type of Backfill: CEMENT BENT

Elevation / Depth Top of Seal: /

Elevation / Depth Top of Bedrock: 715.56 / 8'±

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 708.56 / 15

Elevation / Depth of Top of Screen: 705.56 / 18

Type of Screen: PVC

Slot Size x Length: 20 SL x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5 QUARTZ SAND

Diameter of Hole in Bedrock: Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 695.56 / 28

Elevation / Total Depth of Borehole: 694.56 / 29

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT03
DATE: 8/31/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sample BZ	Borehole**	Driller BZ
S-1 e	0	0/1	1.5/2		M STIFF TO	BRN	TOP 3" TOPSOIL CLAYEY SILT - TR ROOTS	ML	MOIST	0			
17/40	2	6/40		2'	LOOSE	GRAY BRN	SILTY SAND - TR ROCK FRAGS TO	SM	DAMP	0			
S-2 e	2.3	50/3"	3/3	2.5 WEATHERED	M SOFT	RED BRN	WEATHERED ROCK SANDSTONE - WEATHERED		DAMP	0			
17/45	4	50/3"	.3/.3			TAN BRN			FRIABLE	0			
S-3 e	4.3									0			
17/50	6	50/6"				TAN BRN			DAMP	0			
S-4 e	6.5									0			
1800 S-5 e 1812	8	50/2"	.1/.1			BRN			DAMP	0			
	8.1									0			
	9.5				M	GRAY				0			
					HARD	BRN	SANDSTONE - SHALY	BR	SEVERAL HORIZ	0			
							CONGLOMERATE		JNTS - SOME H2O 12 → 14.	0			
1/5.5	1	18%	4.7/5.5							0			
										0			
	15								LAST 1' MORE	0			
				15	M HARD		SANDSTONE	BR	16.4 } SHALY 16.9 } JNTS H2O	0			
						GRAY e	(CONGLOMERATE)		17.3 } 16.5 VUGS	0			
3/5	2	60%	5/5			17'	APPEARANCE W/SHALE		16.9 TIGHT JNT	0			
									18' HORIZ JNT	0			
	20									0			
									20 - 21 SEVERAL JNTS 22.1 LO % JNT/H2O	0			
				21.4									
				21.9	SOFT	BLK	COAL	VBR	WET	0			
2.5/5	3	50%	5/5		M HARD	GRAY	SHALY SANDSTONE	BR		0			
							/SILTSTONE			0			
	25			25			(CONGLOMERATE)			0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼" HSA / AUTO HAMMER / 2" SPOONS
SET TEMP CASING TO 9.5
REAM TO 26. WELL 25 TO 15 SAND TO 12.

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT03

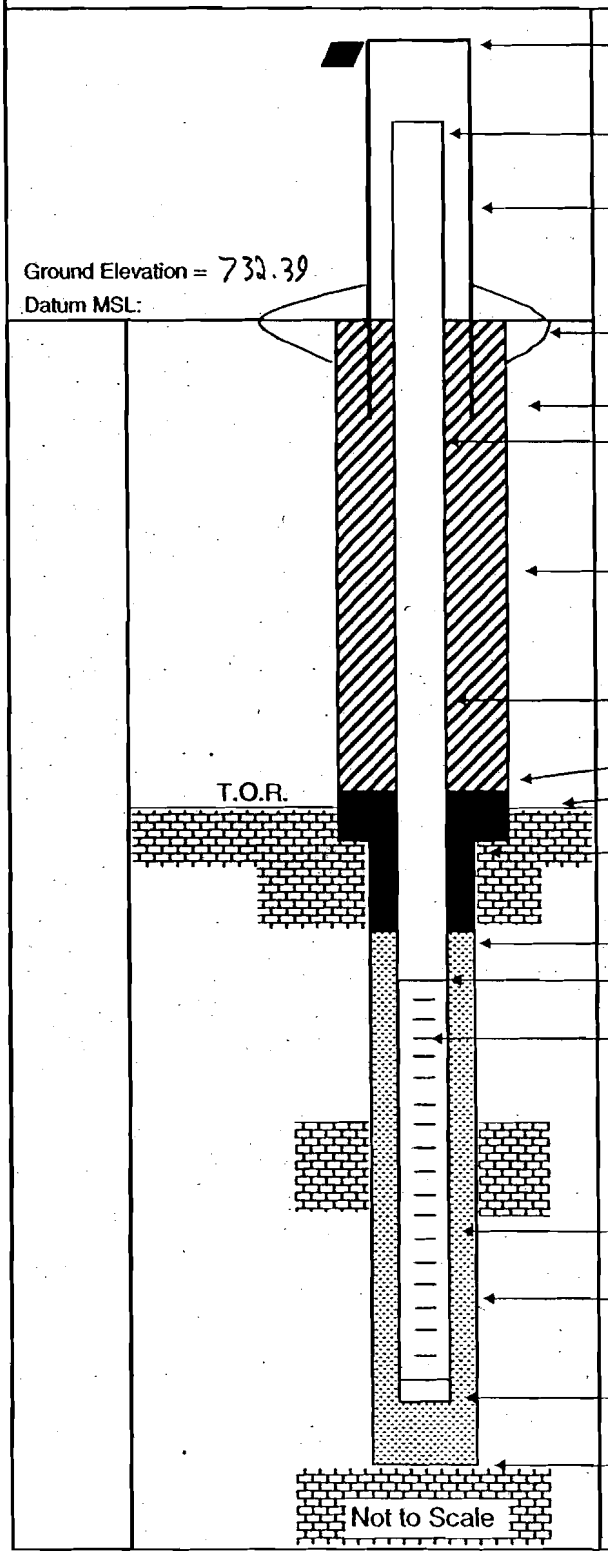
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT03

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT03
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/31/04
SITE:	SWMU-12	DRILLING METHOD:	HSA / ROT	NORTHING:	1312747.34
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026026.90



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 734.44

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TEMP TO 9.5
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2"

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 729.39 / 3

Elevation / Depth Top of Bedrock: 729.89 / 2.5

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 720.39 / 12

Elevation / Depth of Top of Screen: 717.39 / 15

Type of Screen: PVC

Slot Size x Length: 20 X 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock:
Core / Ream: 5 1/2" Φ

Elevation / Depth of Bottom of Screen: 707.39 / 25

Elevation / Total Depth of Borehole: 706.39 / 26

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT04
DATE: 9-10-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1530	0						4¼" ID HSA		SEE T03		0		
							TO 9.5 FEET		FOR DETAILS				
							SET TEMP 6" ID		OF LITHOLOGY				
							CASING TO 9.5		ORANG BRN				
	5								SILTS/CLAY		0		
							REAM W/ 5½"		IN O.B.				
							BIT TO 25						
				7.5'					7.5' TOR				
				WELL	M SOFT		SET WELL 14-24		BASED ON CUTTINGS				
1550	10				↓		SAND 11-25				0		
							CHIPS TO 3'						
					M		SANDSTONE						
					HARD		TO						
				14			≈ BOTM @ 25'						
	15										0		
	20										0		
	25			24							0		

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT04

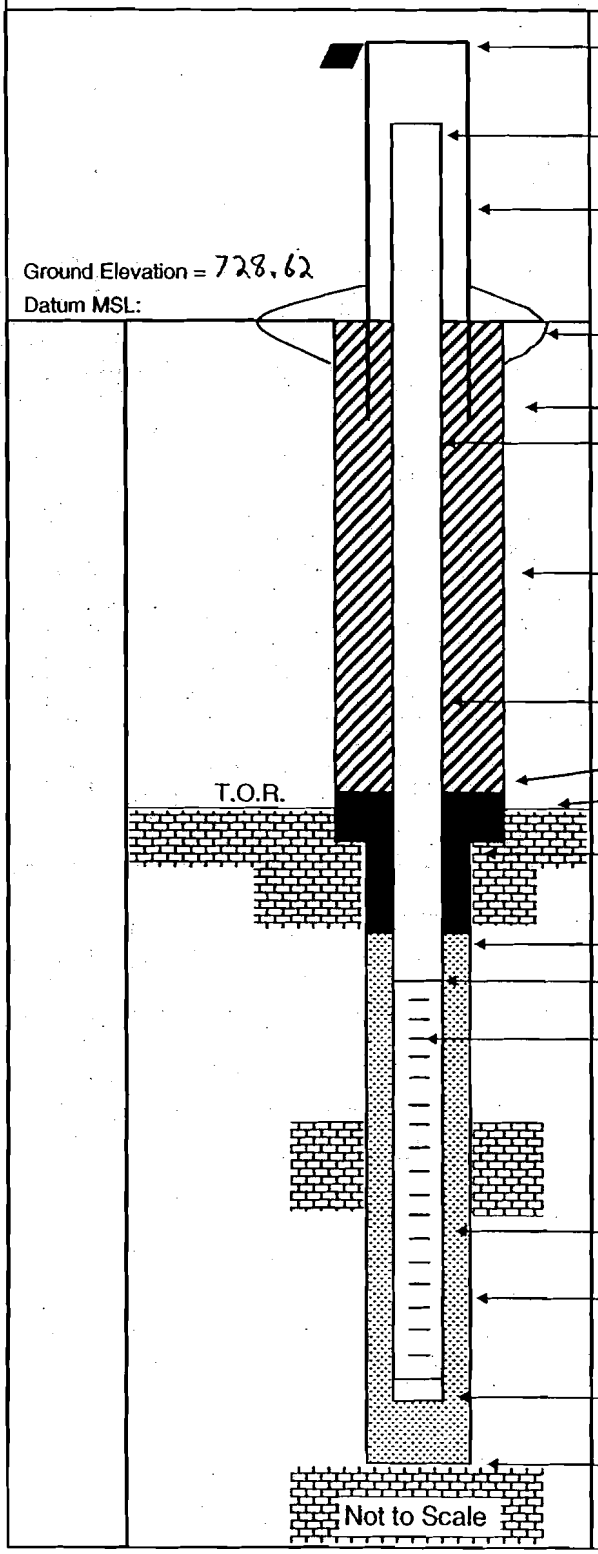
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12 MW T04

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT04
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	9-10-04
SITE:	SWMU-12	DRILLING METHOD:	HSA / ROT	NORTHING:	1312847.57
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026082.64



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 730.74

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TIEM TO 9.5
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 725.62 / 3'

Elevation / Depth Top of Bedrock: 721.12 / 7.5

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 717.62 / 11

Elevation / Depth of Top of Screen: 714.62 / 14

Type of Screen: PVC

Slot Size x Length: 20 x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock:
Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 704.62 / 24

Elevation / Total Depth of Borehole: 703.62 / 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT05
DATE: 9-1-04 / 9-8-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
						MOTTLED							
S-1 e	0	1/2	2/2		M STIFF	GRAY BRN	CLAYEY SILT - TR ROOTS	ML	MOIST	0			
2100	2	2/3			STIFF					0			
S-2 e		3/4	1.8/2		M	BRN TO	CLAYEY SILT	ML	MOIST	0			
2105	4	4/5			STIFF	ORANG BRN		/CL		0			
S-3 e		5/6	2/2							0			
2110	6	11/9		5.5									
S-4 e		11/24	1.8/2	WEATH	LOOSE M DENSE	ORANG BRN	SILTY SAND - SOME WEATH ROCK FRAGS	SM	MOIST	0			
2115	8	26/27			TO DENSE		TOR ≈ 5.5			0			
S-5 e		15/25	1.5/1.5				TO 9.0		MOIST	0			
2120	9.5	35				ORANG				0			
2130					M SOFT	GRAY BRN	HIGHLY WEATH SANDSTONE	VBR		0			
					M HARD					0			
-4/5.5	①	7/8	3.4/5.5		M SOFT			BR		0			
					M HARD		LAST 6"	VBR	14.2 LO 4 JNT (H2O)	0			
2145	15			14			SHALY	BR	DUE	0			
2150								VBR	FOOR REC TO BR ROCK - ALSO	0			
							(SILTY)		LOST SOME AIR CIRCULATION.	0			
1.2/5	②	24%	1.7/5		M SOFT	GRAY	SHALY SANDSTONE			0			
								BR	2 HORIZ JNTS	0			
* 9-1-04	20								NEAR BOTM HOLE IS MAKING	0			
9-8				21	M HARD		SHALY SILTSTONE	VBR e	"DECENT" AMT WATER FROM 9.5	0			
					M SOFT	GRAY		20' BR	TO 25	0			
1.6/5	③	32%	4.5/5	22.5	SOFT	BLK	COAL - DECOMPOSED TR PYRITE	VBR	- AND DEC.	0			
				23.5									
				24	M SOFT	GRAY	SHALY SILTSTONE	BR	SOME HORIZ JNT W/ H2O.	0			
	25						CLAYEY IN PARTS			0			

* When rock coring, enter rock brokeness: * RIG BROKE DOWN (WATER SWIVEL SEAL) 9/1/04.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4" ID HSA TO 9.5' BGS / AUTO HAMMER 2" SPOONS
SET 6" CAS TO 9.5 - NX CORE IN ROCK.
REAM TO 25 WELL 14 TO 24 ; SAND 11 TO 25

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT05

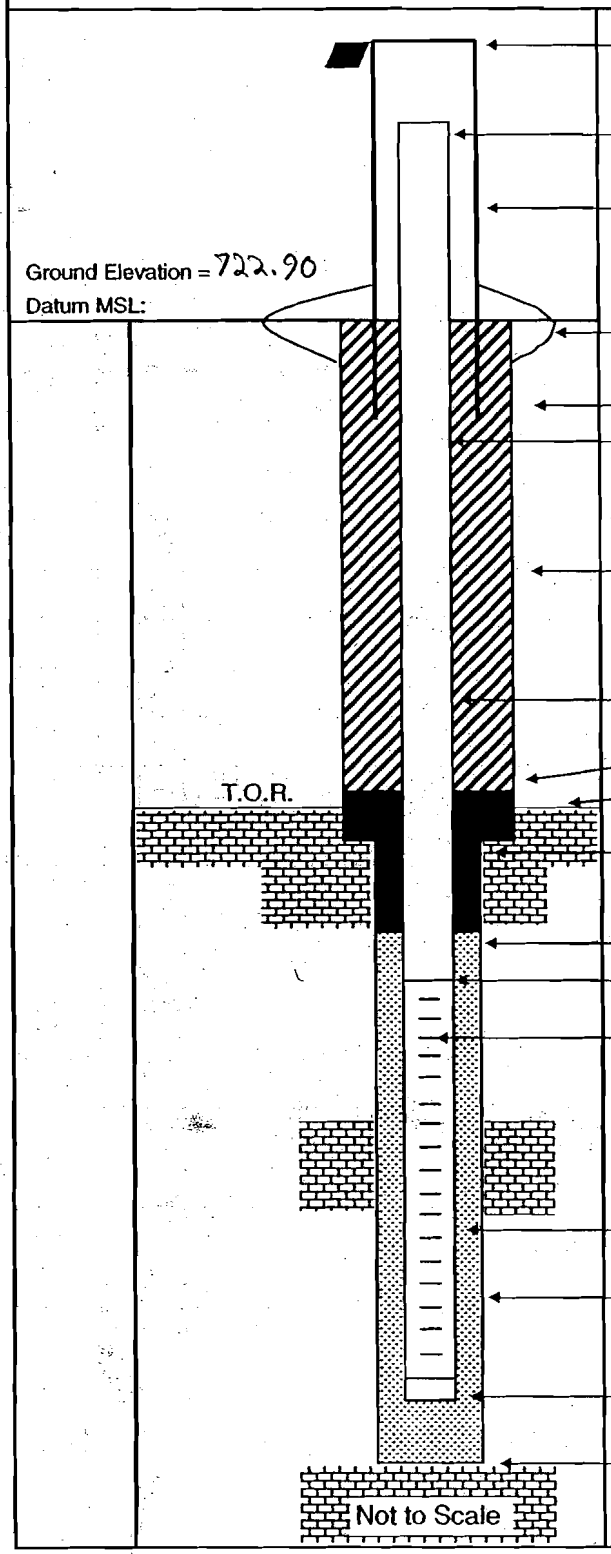
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT05

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12 MWT05
PROJECT No.:	N6878	DRILLER:		DATE COMPLETED:	9-8-04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	1312511.09
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026137.13



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 725.36

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) TEMP TO 9.5

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2"

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 719.90 / 3

Elevation / Depth Top of Bedrock: 717.40 / 5.5±

Type of Seal:

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 711.90 / 11

Elevation / Depth of Top of Screen: 708.90 / 14

Type of Screen: PVC

Slot Size x Length: 20 X 10

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock: Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 698.90 / 24

Elevation / Total Depth of Borehole: 697.90 / 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12 MW TO6
DATE: 8/15/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 @ 1215	0	2/2	1/2		M STIFF	BRN	SANDY SILT - TR	ML	MOIST	0			
	2	4/11					CLAY - TR ROOTS	/SM		0			
S-2 @ 1220		11/9	2/2		STIFF	GRAY	SANDY SILT - TR	ML	MOIST	0			
	4	10/12					LAST 6" ROCK FRAGS CLAY	/SM		0			
S-3 @ 1225	5	22/50	1/1	5' REF 11' FILL		BRN			DAMP	0			
S-4 @ 1230	6	50/5	.5/.5		M SOFT	GRAY	WEATH SANDSTONE	VBR	REF @5 SAMPLED TO 8 TO ADVANCE BORING TO SET CAS	0			
	6.5						BECOMES LESS WEATH		DAMP	0			
S-5 @ 1237	8	50/2"	—		M HARD					0			
	8.2									0			
9.5 1250	9.5		9.5			BRN		VBR		0			
					M SOFT	GRAY	SANDSTONE	BR	11.4 - 11.5 VERT BRK 12.8 HORIZ JNT	0			
					M HARD		10.6 → 11 - M SOFT (SILTY SHALY)	VBR	CLAY H2O 13.4 FILLED JNT	0			
2.3/5.5	1	4/2%	5.2/5.5	13	M SOFT		11.8 → 12.5 M SOFT (SILTY SHALY)	BR	14.0 - 14.5 VERT	0			
					M HARD				JNT - H2O	0			
1310	15									0			
							SANDSTONE			0			
										0			
NA/5	2	—	NA/5		M HARD					0			
									POOR REC AND CANT KEEP	0			
1335	20						REAM TO 24		CORE IN CORE BARREL.	0			
1340							WILL SET WELL		RUN 3 TRIED	0			
							23 - 13		TO PICK UP RUN 2 BUT	0			
NA/5	3	—	NA/5	23			11 - 24 SAND		ONLY REC ABOUT 2'	0			
							CHIPS TO 3			0			
1400	25									0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼" HSA / AUTO HAMMER / 2" SPOONS
SET TEMP CAS TO 9.5 NX IN ROCK - REAM TO 5½" Φ

Converted to Well: Yes ✓ No _____ Well I.D. #: 12 MW TO6

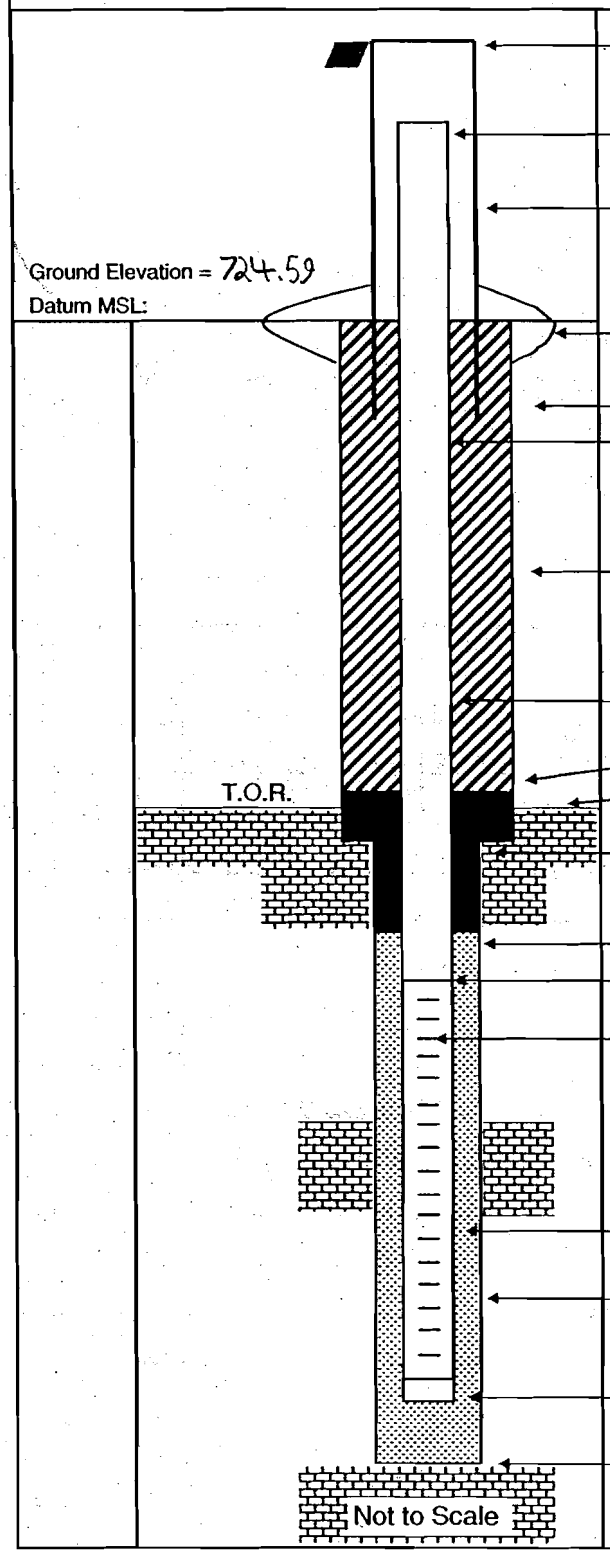
Tetra Tech NUS, Inc.

BEDROCK MONITORING WELL SHEET

WELL No.: 12MW106

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MW106
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/15/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/MR	NORTHING:	1311833.50
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	302656 2.65



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 726.70

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TEMP TO 9.5
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8½"

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 721.59 / 3

Elevation / Depth Top of Bedrock: 719.59 / ≈5'

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 713.59 / 11

Elevation / Depth of Top of Screen: 711.59 / 13

Type of Screen: PVC

Slot Size x Length: 20 SL x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock:
Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 701.59 / 23

Elevation / Total Depth of Borehole: 700.59 / 24

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT07
DATE: 8/27/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample*	Sample BZ*	Borehole**	Driller BZ**
	0						4¼" HSA TO		FOR LITH		0		
							≈ 9.5'		SEE				
							SET 6" TEMP		12MWT06				
							CASING TO ≈		or 12MWT08				
	5						9.5'				0		
							REAM W/ 5½"Ø						
							TO 25						
	10										0		
							SET WELL 14-24						
							SAND 10-25						
							CHIPS TO 3'						
	15			14									
	20												
	25			24									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: SEE ABOVE.

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT07

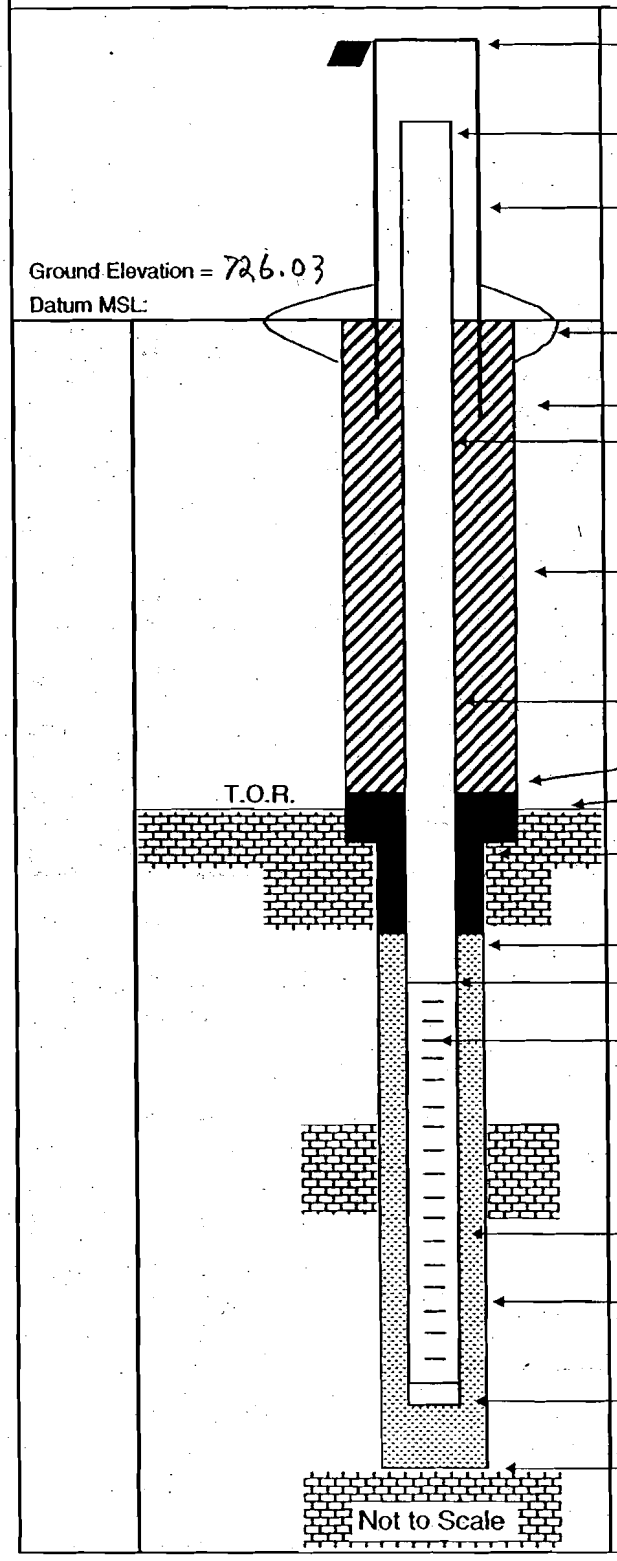
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT07

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT07
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/27/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	1311707.13
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	302661S.62



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 728.40

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TEMP TO 9.5
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 723.03 / 3

Elevation / Depth Top of Bedrock: 722.03 / ≈4'

Type of Seal:

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 716.03 / 10

Elevation / Depth of Top of Screen: 712.03 / 14

Type of Screen: PVC

Slot Size x Length: 20SL x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock:
Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 702.03 / 24

Elevation / Total Depth of Borehole: 701.03 / 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12 MWT08
DATE: 7/25/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 e	0	3/6	1.5/2	1.0	M DENSE	YELLOW BRN	CLAYEY SILT-TR ROOTS		MOIST	0			
1000	2	5/4			/ M STIFF		TO SANDY CLAY-TR ROCK FRAGS			0			
S-2 e		3/6	1/1.5						MOIST	0			
1005	3.5 4.0	50/5"		3.5 4.0	M SOFT	GRAY TO TAN	WEATH SANDSTONE ≈ 3.5		TOR ≈ 4 TO 4.5 NO WATER OBSERVED	0			
S-3 e	4.5	100/5"				BRN	GRAY			0			
1010 S-4 e	6	100/5"								0			
1015	6.5								MORE WEATH SS @ 6'	0			
S-5 e	8	100/5"				GRAY	WEATH SANDSTONE		DAMP	0			
1025	8.5 9.0			9'					6" CAS TO 9' START CORING	0			
1038					M HARD	TAN GRAY	SANDSTONE	BR	AT 9'	0			
								VBR	SEVERAL HORIZ BREAKS	0			
2.5/5	1	50%	5/5		M SOFT M HARD		(SILTY)	BR	TR WATER ≈ 9.5 → 9.8	0			
				13					DRY WHILE CORING	0			
1050	14			13.5 14	M SOFT	LT GRAY	SHALY SILTSTONE	VBR	TR WATER IN HOLE - BUT DRIES UP.	0			
1105					M HARD	TAN BRN				0			
						TO GRAY	SANDSTONE	BR		0			
							(Fe Stained)		17.3 CLAY FILLED JNT → 17.4	0			
									17.7, 17.8, 17.9 CLAY FILLED JNT	0			
6/10	2	60%	10/10						SANDSTONE	0			
									MICACEOUS SEVERAL	0			
									BEDDING PLANE BREAKS	0			
							WELL 13-23		LAST 6" VBR.	0			
				23			SAND 9-24		NO SIG WATER HOWEVER.	0			
1140	24						CHIPS 3-9	VBR	≈ 22' HORIZ JNT	0			
				TD 24									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4" HSA TO 9' USED 2" SPOONS AUTO HAMMER SET TEMP 6" STEEL CASING TO 9' - BEGIN CORING.

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT08

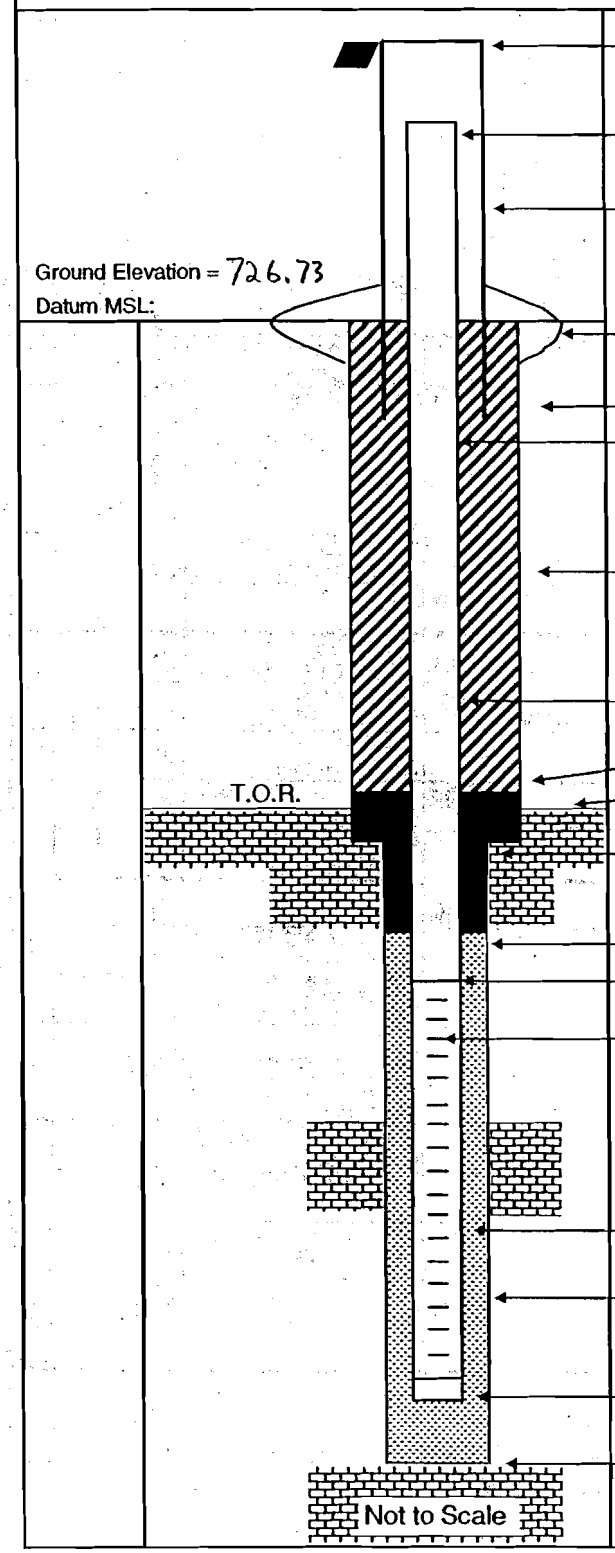
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT08

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT08
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	7-25-04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	1311609.35
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026660.10



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 728.83

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: 6" TEMP TO 9'
(if applicable)

I.D. of Riser: 2

Type of Riser: PVC

Borehole Diameter: 8 1/2 TO 9'

Type of Backfill: CEMENT BENT GROUT

Elevation / Depth Top of Seal: 723.73 / 3'

Elevation / Depth Top of Bedrock: 722.73 / 4

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 717.73 / 9

Elevation / Depth of Top of Screen: 713.73 / 13

Type of Screen: PVC

Slot Size x Length: 20 SL x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5 QUARTZ SAND

Diameter of Hole in Bedrock:
Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 703.73 / 23

Elevation / Total Depth of Borehole: 702.73 / 24

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT09
DATE: 8/28/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ**	Borehole**	Driller BZ**
	0						SEE BORING LOGS		O.B.		0		
							12MWT07		SILTS & CLAYS				
							" T08		TO ≈ 8'				
							" T10						
	5						FOR LITHOLOGY				0		
				8'			TOP ROCK ≈ 8'						
	10										0		
	15			14			SANDSTONE				0		
	20										0		
							SET 2" WELL 14-24						
							SAND 12-25						
							CHIPS TO 3'						
				24									
	25										0		

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4" HSA TO ≈ 9.5' SET TEMP CASING TO 9.5
REAM 5 1/2" Φ TO 25. SET WELL

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT09

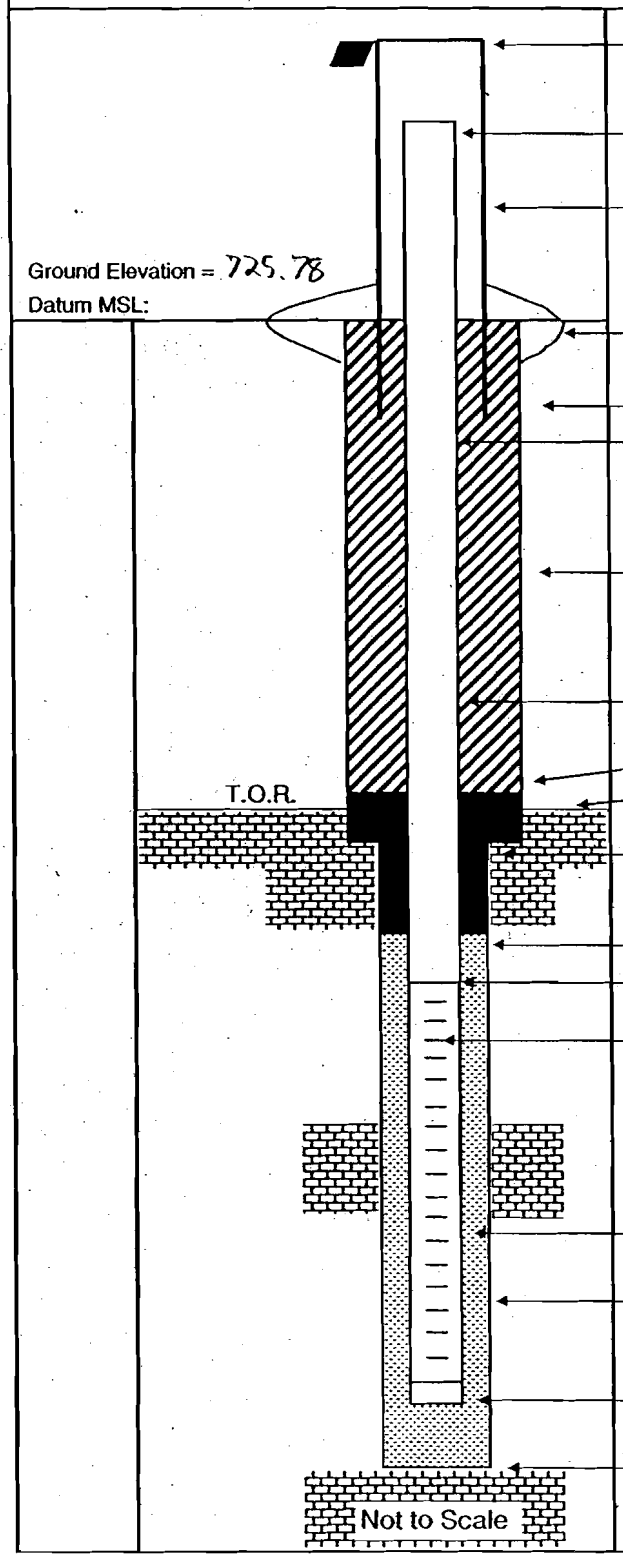
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT09

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT09
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/29/04
SITE:	SWMU-12	DRILLING METHOD:	HSA-ROT	NORTHING:	1311595.76
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	302658 0.09



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 728.00

I.D. of Surface Casing:

Type of Surface Casing: STEEL

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TEMP CAS TO 9.5
(if applicable)

I.D. of Riser: 2"Φ

Type of Riser: PVC

Borehole Diameter: 8 1/2

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 722.78 / 3

Elevation / Depth Top of Bedrock: 717.78 / ≈8'

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 713.78 / 12

Elevation / Depth of Top of Screen: 711.78 / 14

Type of Screen: PVC

Slot Size x Length: 20 x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL # 5

Diameter of Hole in Bedrock:
Core / Ream: 5 1/2

Elevation / Depth of Bottom of Screen: 701.78 / 24

Elevation / Total Depth of Borehole: 700.78 / 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT10
DATE: 8/11/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 e	0	4/4	1.8/2	4"	STIFF	OLIVE GRAY	TOP 4" TOPSOIL SILTY CLAY TO	CL	MOIST	0			
1348	2	6/5				GRAY	SANDY SILT - TR ROOTS	ML		0			
S-2 e		5/7	1.7/2		STIFF	BRN	SILTY CLAY/ CLAYEY		MOIST → WET	0			
1352	4	6/6			SOFT	BRN	SILT - TR ROOTS TR ROCK FRAG		? COULD BE FILL	0			
S-3 e		1/2	1/2			GRAY	CLAYEY SILT/SILTY	CL/ML	MOIST → WET	0			
1403	6	3/3			SOFT	OLIVE	CLAY TR ROOTS		TR WEATH ROCK	0			
S-4 e		3/5	1.5/2		TO	GRAY	TR ROOTS	CL/ML	MOIST	0			
1406	8	7/7			M STIFF		TR ROCK FRAG		TR SAND	0			
S-5 e	9	10/50	1/1	8.5 9.0		BRN	SANDSTONE FRAGS		NOT MUCH WEATH ROCK MOIST	0			
1410	9.5		9.5	HEAVE 10.0	M SOFT	BRN	WEATHERED SHALE SANDSTONE (CLAY)		HERE 9'± REFUSAL	0			
1430					M HARD	GRAY	SANDSTONE	BR	DAMP	0			
					M SOFT			VBR	10.5 11.0 VBR	0			
8/5.5	1	15%	3.8/5.5					BR	12.0 M SOFT NO SIGN OF	0			
					M HARD				H2O SEVERAL BEDDING	0			
1444	15			14			BLEW OUT SOME WATER POSSIBLE H2O @ 15'		PLANE BREAKS BOTTOM 3" VERT	0			
1500						BRN GRAY	START OF RUN (2) SANDSTONE	BR	JNT H2O 15.5-15.6 STAINS	0			
							15.1-16.6 (TR H2O VERTICAL JNT)		TR H2O 16.2 HORIZ JNT	0			
2.8/5	2	56%	5/5		M SOFT		FRIABLE CLAYSTONE SEAM ≈ 17'		H2O SEVERAL	0			
				18.5	M HARD		SANDSTONE - INTERBEDDED		18.2 HORIZ JNT	0			
1510	20						W/ SHALE-SILTSTONE		18.4 " " TRACE H2O	0			
1523					M SOFT		(MICACEOUS)	VBR	TIGHTLY SPACED JNTS	0			
					TO				20-21 VBR TR H2O	0			
.4/5	3	8%	4.7/5	22.5	M HARD	BRN	SANDSTONE	BR	23.2 HORIZ	0			
				24					23.7 JNTS W TR	0			
1535	25						LAST 6" BECOMES MORE INTERBEDDED (THIN SEAME)		24.1 H2O	0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼ HSA W/ AUTO HAMMER - 2" SPOONS
SET 6" TEMP CASING TO 9.5 BGS - Then NX CORE TO 25.
WELL 14-24, SAND 12 TO 25 REAM TO 25

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT10

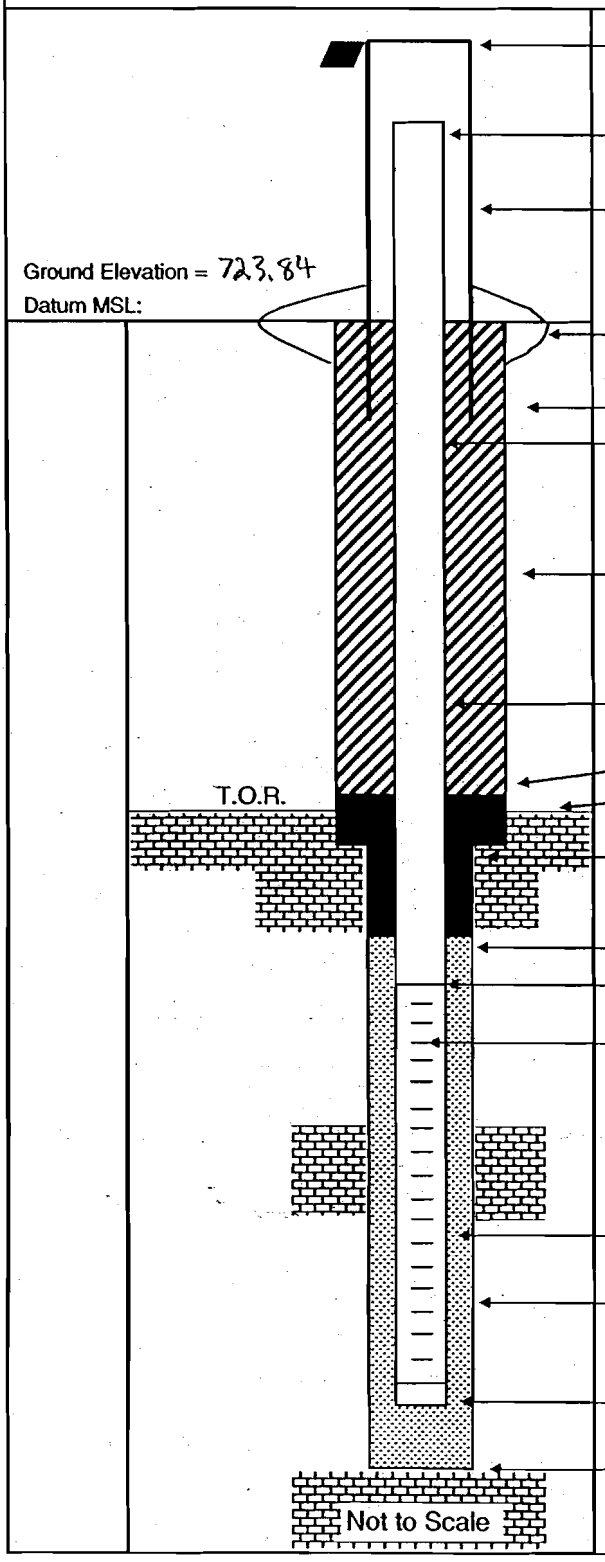
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT10

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT10
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/11/04
SITE:	SWMU-12	DRILLING METHOD:	HSA-ROT	NORTHING:	1311456.81
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026649.95



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 726.68

I.D. of Surface Casing:

Type of Surface Casing: STEEL

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) TEMP TO 9.5'

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2

Type of Backfill: CONC PAD

Elevation / Depth Top of Seal: 720.84 / 3'

Elevation / Depth Top of Bedrock: 714.84 / 9'

Type of Seal:

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 711.84 / 12

Elevation / Depth of Top of Screen: 709.89 / 14

Type of Screen: PVC

Slot Size x Length: 20 SL x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5 FILTER PACK

Diameter of Hole in Bedrock: Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 699.84 / 24

Elevation / Total Depth of Borehole: 698.84 / 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT11
DATE: 8/14/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						SEE LOG FOR		HSA TO 9.5		0		
							12MWT12 FOR		SET 6" CAS				
							DETAILS ON		TO 9.5				
							LITHOLOGY		REAM 9.5 TO				
	5								25'		0		
				7.5					TOR - AS PER				
									DRILLER				
	10			9.5					~~SET~~ TEMP CASING @9.5		0		
							BEDROCK SIMILAR						
							TO 12MWT12						
	15			14							0		
									SET WELL				
									14-24				
									SAND				
									12-25				
	20								CHIPS TO		0		
									3'				
				24									
	25										0		

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: SEE ABOVE

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT11

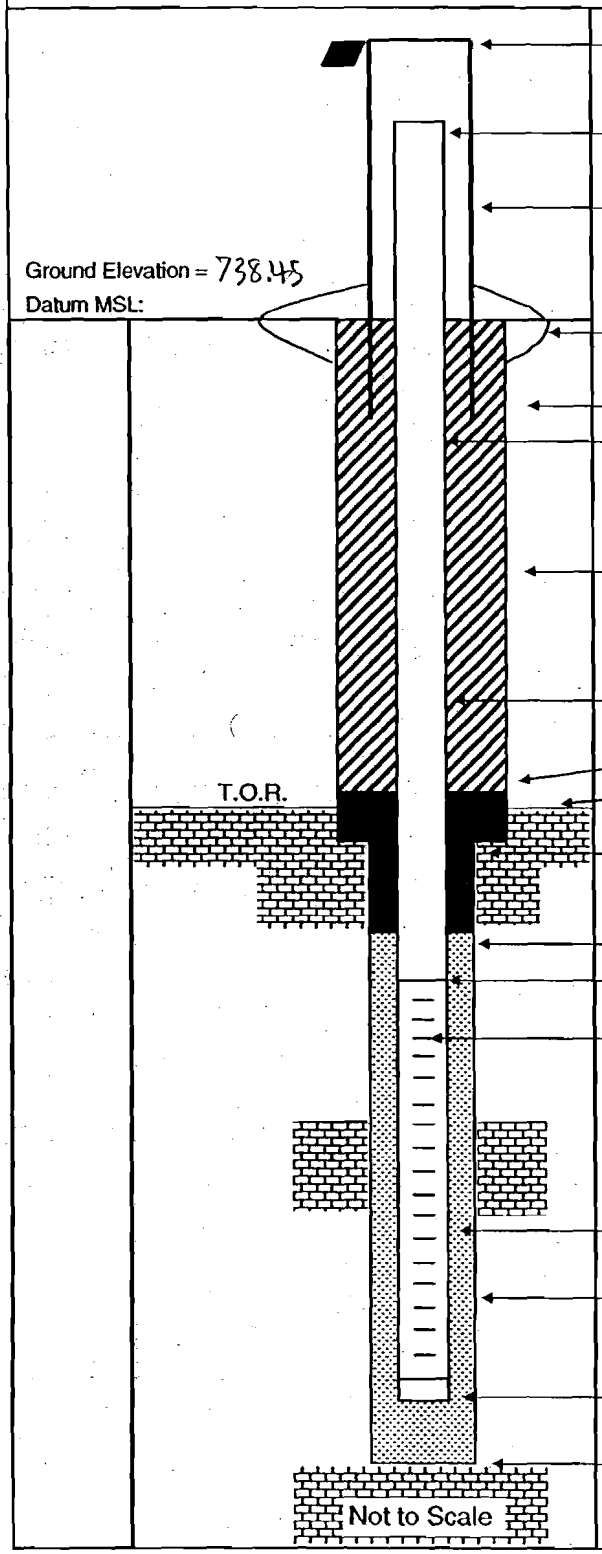
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT11

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT11
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/14/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	1313014.33
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	302677.15



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 740.79

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) TEMP TO 9.5

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 735.45 / 3

Elevation / Depth Top of Bedrock: 730.95 - 728.95 / 7.5 - 9.5 ≈

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 726.45 / 12

Elevation / Depth of Top of Screen: 724.45 / 14

Type of Screen: PVC

Slot Size x Length: 20 x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock: Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 714.45 / 24

Elevation / Total Depth of Borehole: 713.45 / 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT12
DATE: 8/12/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sample BZ	Borehole**	Driller BZ**
S-1 e	0	3/3	.2/2		SOFT	BRN	3" TOPSOIL		MOIST (POOR REC)	0			
1728	2	1/2		2	TO					0			
S-2 e		1/3	2/2	3	SOFT	DK BRN YELLOW	CLAYEY SILT TR ROOTS	PT	LOOKS LIKE PEAT (FILL?)	0			
1731	4	4/5			STIFF	BRN	SILTY CLAY - TR ROOTS	CL	MOIST	0			
S-3 e		3/4	1/2		M STIFF	GRAY	" " CLAYEY SILT - TR ROOTS	CL	MOIST	0			
1734	6	5/6		6	SOFT	BRN OLIVE		ML		0			
S-4 e		2/2	1/2			GRAY	CLAYEY SAND -	SC	MOIST → WET	0			
1739	8	2/2		8			TR ROCK FRAG / SANDY CLAY		(FILL?)	0			
S-5 e		3/18	1/1.5		LOOSE	BRN GRAY	TO SILTY SAND		SS REF @ 9.5	0			
1745	9.5 TOT	50/5"		9.5±	DENSE	YELLOW BRN	SILTY SAND	SM	MOIST	0			
8/13 9/14 0810					SOFT TO		WEATHERED SANDSTONE	VBR	LOST CORE TOP±2' (SOFT)	0			
				12.0	M HARD			TC	12.0 H2O	0			
1.9/5	1	38%	3.5/5		TO	TAN BRN	SANDSTONE	BR	Fe Stains, VUGS w/ HORIZ JNTS	0			
				14.2	M SOFT		13.4 CLAY FILLED JNT w/ BLK (LIGNITE?)		12.6 → JNTS TR 13.4 → H2O	0			
0830	15			14		GRAY	WEATHERED SANDY SHALE	BR		0			
0840										0			
				17.0						0			
0/5	2	0%	3.7/5		M HARD	ORANGE BRN	SANDSTONE	VBR	17.5 → 19 SOME H2O	0			
				19.2					W/ SEVERAL JNTS 18.4 VERT JNT	0			
0900	20				M SOFT	GRAY	SANDY SHALE	BR		0			
										0			
				22±						0			
2/5	3	40%	/5		M SOFT	GRAY	CLAYSTONE (SANDY)	VBR	SOME HORIZ BREAKS	0			
				24				BR		0			
	25									0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼" HSA W AUTO HAMMER - 2" SPOONS
TEMP CASING TO 9.5
NX CORE 10 - 25 WELL 14 - 24 SAND 25 → 12

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT12

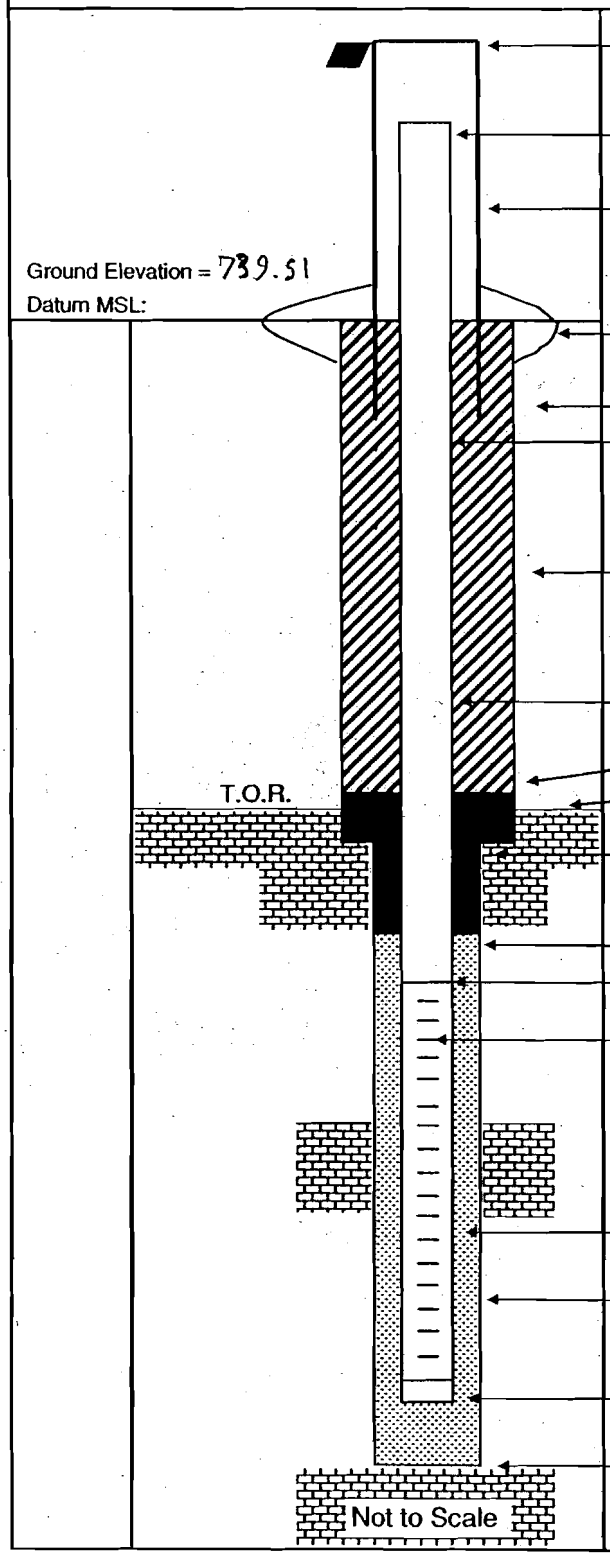
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT12

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT12
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/14/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	1312972.30
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026791.19



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 741.66

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) TEMP TO 9.5

I.D. of Riser: 2

Type of Riser: PVC

Borehole Diameter: 8½

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 736.51 / 3'

Elevation / Depth Top of Bedrock: 730.01 / 9.5

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 727.51 / 12

Elevation / Depth of Top of Screen: 725.51 / 14

Type of Screen: PVC

Slot Size x Length: 20 X 10

I.D. of Screen: 2

Type of Filter Pack: GLOBAL #5 FILTER PACK

Diameter of Hole in Bedrock: Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 715.51 / 24

Elevation / Total Depth of Borehole: 714.51 / 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT13
DATE: 7-31-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 e	0	2/3	1/2		SOFT	BRN	3" TOPSOIL SILTY CLAY - TR ROCK	CL	MOIST - LOOKS	0			
0830	2	4/5		2'			FRAG - ROOTS TR SAND NEAR 2'		LIKE FILL.	0			
S-2 e		5/9	1.5/2		STIFF	TAN BRN	SANDY SILT - TR	ML	MOIST (NAT)	0			
0840	4	9/12					CLAY			0			
S-3 e		3/5	2/2		STIFF	TAN BRN	SANDY SILT - TR	ML	MOIST	0			
0843	6	7/9					CLAY			0			
S-4 e		7/10	1.9/2		STIFF	ORANG BRN	SANDY SILT - TR CLAY			0			
0846	8	15/26		7.5± 8.0±			MORE SAND LAST 6"	SM ML	MOIST V. WEATH SS?	0			
S-5 e		50/3"	0.2/.3	11FEIIE	MSOFT	TAN	SANDSTONE TOR ≈ 8.2'	VBR	MOIST → DAMP START TO CORE	0			
0854 0910	9.5			10	M HARD	TAN BRN	SANDSTONE	BR	@ 9.5'	0			
								VBR	SOME H2O ≈ 10' IN VBR ZONE	0			
				12'				BR	WET.	0			
1.6/5.5	1	89%	5/5.5	13	SOFT	BLK	COAL (SMALL VOID WHEN COAL WAS	VBR	11.5→11.8 VBR H2O STAINED	0			
					M SOFT	GRAY	HIGHLY WEATH (HF) SILTY SANDSTONE	BR	13.0→13.6 VERT (H2O) JNT	0			
0930	15.0							VBR	MOIST	0			
								VBR	↓ WET & VBR 15 TO 16	0			
				16.7						0			
.8/5	2	16%	4.9/5		M HARD	TAN BRN	SANDSTONE (SILTY)		16.4 VBR - TR H2O	0			
				19.0	MSOFT	TO GRAY			SEV BEDDING PLANE BRKS ALSO	0			
1000	20.0				M SOFT	GRAY	SILTY SHALE	BR		0			
	21.0			20 21									
				TD			REAM TO 21						
							WELL 10 - 20						
							SAND 9 - 21						
							CHIPS 3 - 9						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼" ID HSA / AUTO HAMMER / 2" SPOONS
AUGERED TO 9.5 SET 6" CASING @ 9.5

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT13

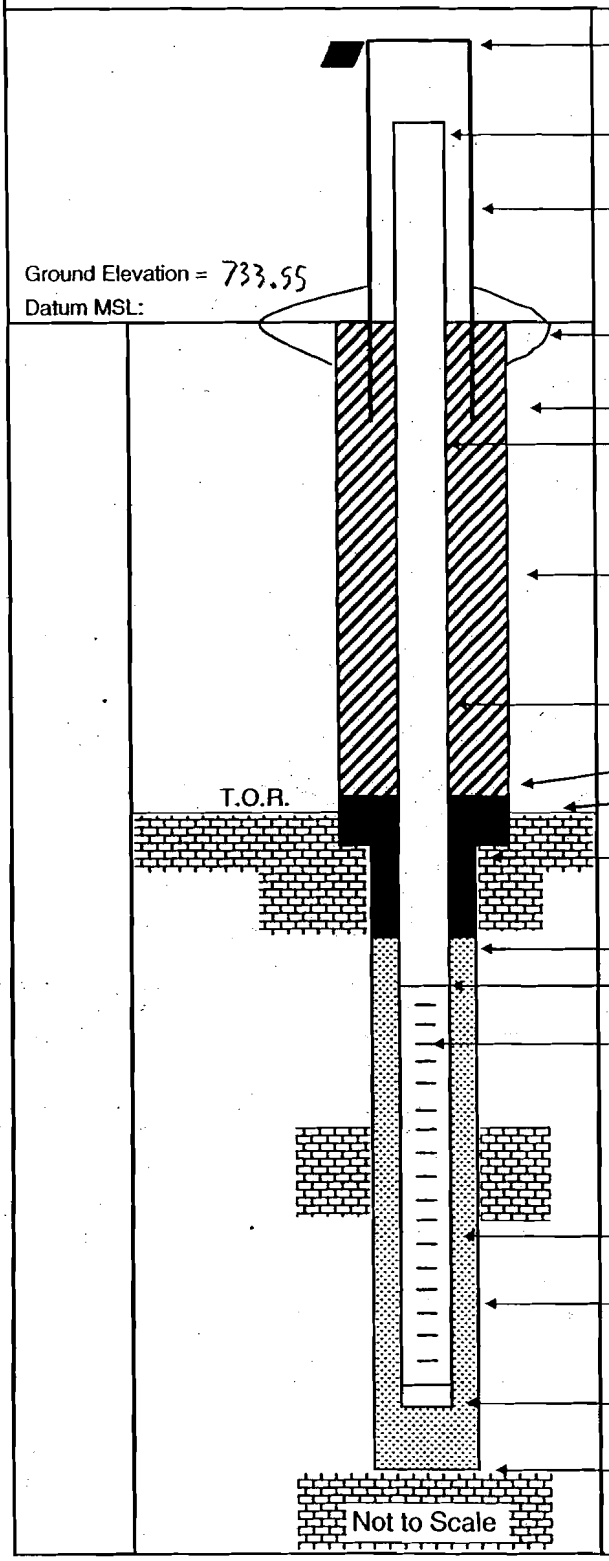
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT13

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT13
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	7 31 04
SITE:	SWMU-12	DRILLING METHOD:	HSA / ROT	NORTHING:	1313060.01
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026835.37



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 735.81

I.D. of Surface Casing: _____

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) TEMP TO 9.5'

I.D. of Riser: 2

Type of Riser: PVC

Borehole Diameter: 8 1/2

Type of Backfill: _____

Elevation / Depth Top of Seal: /

Elevation / Depth Top of Bedrock: 725.55 / 8'±

Type of Seal: BENT CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 724.55 / 9

Elevation / Depth of Top of Screen: 723.55 / 10

Type of Screen: PVC

Slot Size x Length: 20 SL × 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5 FILTER PACK

Diameter of Hole in Bedrock: Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 713.55 / 20

Elevation / Total Depth of Borehole: 712.55 / 21

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12 MWT 14
DATE: 8/30 → 8/31/04
GEOLOGIST: Charles C. Lancy III
DRILLER: Ken Boehmer

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1						See Boring Log				Ø	Ø	Ø
	2						12 MWT IS FOR						
	3						Lithology						
	4												
	5										Ø	Ø	Ø
	6						Boring was Drilled						
	7						without Sampling/Coring						
	8												
	9												
	10										Ø	Ø	Ø
	11												
	12												
	13												
	14												
	15			15							Ø	Ø	Ø
	16												
	17												
	18												
	19												
	20										Ø	Ø	Ø
	21												
	22												
	23												
	24												
	25			25							Ø	Ø	Ø

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø

Remarks: 6" Temp. Casing Set to 11' bgs.
Borehole was Reamed to 26' bgs.

Converted to Well: Yes X No ____ Well I.D. #: 12MWT 14

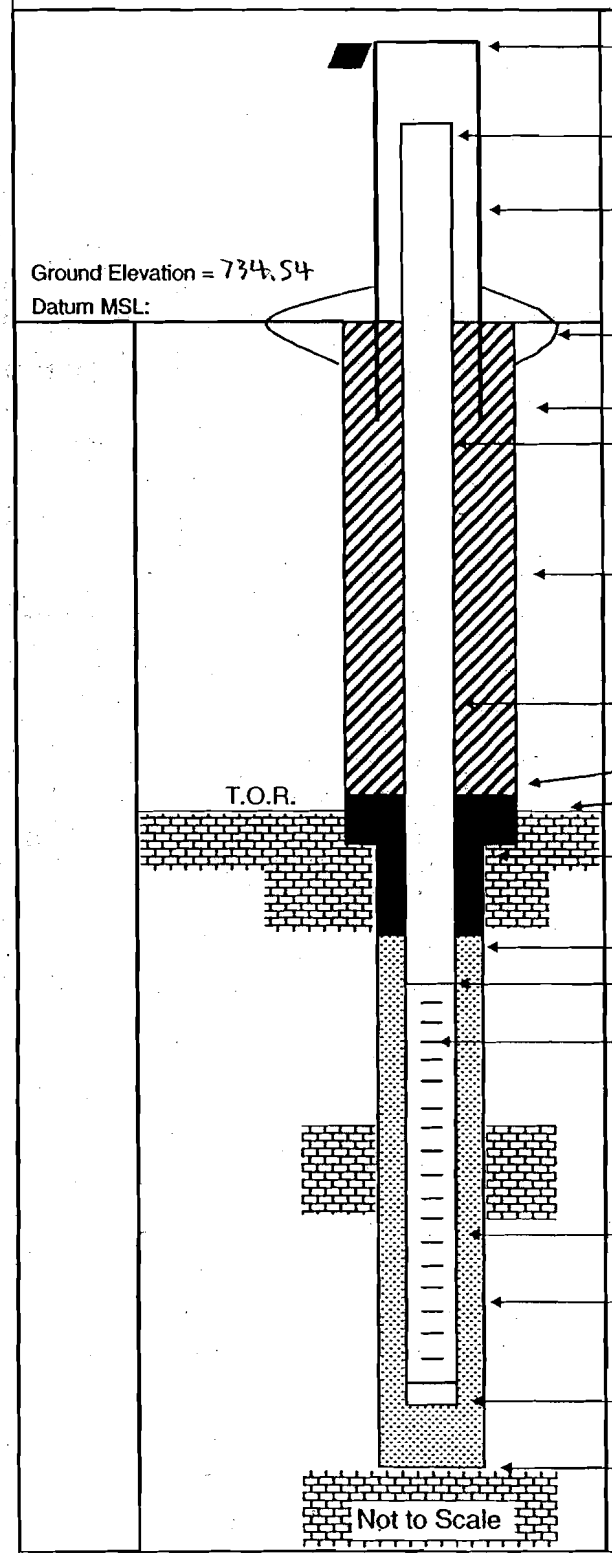
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT14

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT14
PROJECT No.:	N6878	DRILLER:	Ken Bochmer	DATE COMPLETED:	8/31/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	1312965.79
GEOLOGIST:	Charles C. Lanoy III	DEV. METHOD:	Surge & Purge	EASTING:	3026875.34



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 736.67

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: 6" Temp To 11.0'
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8½ to 9'

Type of Backfill: Cement Bent. Grout

Elevation / Depth Top of Seal: 731.54 / 3.0'

Elevation / Depth Top of Bedrock: 723.54 / 11.0'

Type of Seal: Bentonite Chips

Elevation / Depth of Top of Fine Sand: NA / N/A

Elevation / Depth of Top of Filter Pack: 722.54 / 12.0'

Elevation / Depth of Top of Screen: 719.54 / 15.0'

Type of Screen: PVC

Slot Size x Length: 20 SL x 10'

I.D. of Screen: 2"

Type of Filter Pack: Global #5 Quartz Sand

Diameter of Hole in Bedrock:
Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 709.54 / 25.0'

Elevation / Total Depth of Borehole: 708.54 / 26.0'

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT15
DATE: 8130104
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 @	0	15/11	2/2		M DENSE TO STIFF	ORANGE BRN TO BRN	SILTY SAND - TR CLAY	SM	DAMP → MOIST	0			
2045	2	7/8					GRAY CLAYEY SAND TO WEATHERED ROCK (SANDSTONE)	SC	? (FILL)	0			
S-2 @		5/6	1.5/1.5						MOIST	0			
2150	3.5 4.0	26/50/1"		4'±					TOR @ ≈ 4'±	0			
S-3 @		16/31	1.5/1.5		M SOFT	BRN GRAY	WEATHERED SANDSTONE		DAMP	0			
2200	5.5 6.0	50								0			
S-4 @	6.5	50	.5/.5							0			
2205 S-5 @	8.0		.5/.5		M SOFT		WEATHERED SHALY @ 8± SANDSTONE		DAMP	0			
2215	8.5 9.0	50/5	9.0							0			
					M HARD	GRAY TO GRAY BRN	SANDSTONE	BR		0			
									10.6 HORIZ JNT TR H2O	0			
									11.3 TR H2O JNT	0			
1.3/6	①	22%	6/6						SEVERAL HORIZ JNTS.	0			
					M SOFT	TO	@ 14.1 - GRAY w/ BLACK STREAKS		13.9 HORIZ JNT TR H2O	0			
	15			14	M HARD	GRAY			15.3 → 15.9 VBR	0			
2300				16±					M SOFT TR H2O	0			
				17	M SOFT	GRAY	SHALE (SILTY)	VBR	17.5 HORIZ JNT	0			
2.1/5	②	42%	5/5		M SOFT		SANDSTONE	BR	18.7 " " TR H2O	0			
					M HARD					0			
	20				M SOFT			VBR	LAST 6" M SOFT	0			
					M HARD	GRAY	SANDSTONE	BR		0			
									21.2 HORIZ JNT TR H2O	0			
3.4/5	③	68%	4.5/5						22.1 22.9 HORIZ JNT	0			
				24						0			
	25									0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼" HSA w/ AUTO HAMMER IN OB. (2" SPOONS)
SET TEMP CASING TO 9 WELL 14-24 SAND 10 → 25 CHIPS TO 3
REAM TO 25 w/ 5½" ϕ

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT15

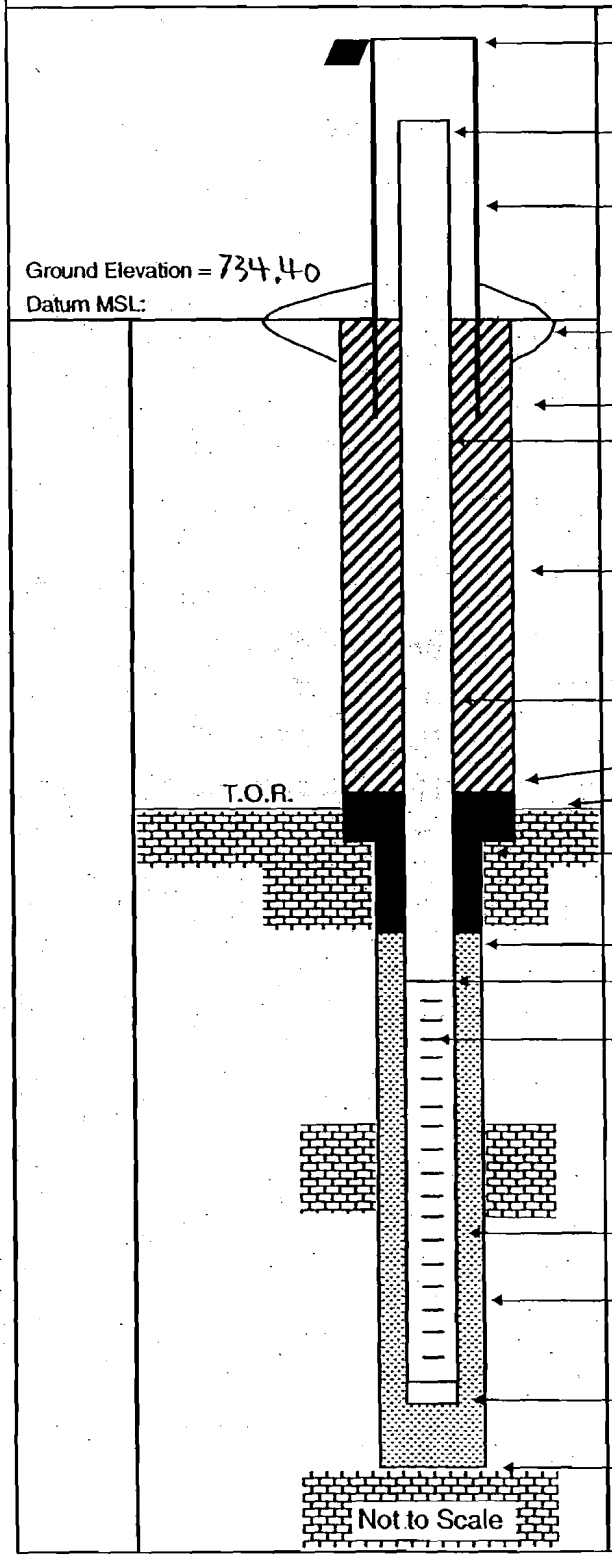
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT15

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT15
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/31/04
SITE:	SWMU-12	DRILLING METHOD:	HSA-ROT	NORTHING:	1312876.08
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026906.85



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 736.74

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) TEMP TO 9'

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2"

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 731.40 / 3'

Elevation / Depth Top of Bedrock: 730.40 / 4'±

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 724.40 / 10

Elevation / Depth of Top of Screen: 720.40 / 14

Type of Screen: PVC

Slot Size x Length: 20 x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock: Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 710.40 / 24

Elevation / Total Depth of Borehole: 709.40 / 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT 16
DATE: 8/14/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 e	0	3/4	1/2		STIFF	BRN	3" TOPSOIL CLAYEY SILT - TR ROOTS	ML	MOIST → DAMP	0			
1432	2	4/3								0			
S-2 e		1/1	1/2		M STIFF	GRAY BRN	CLAYEY SILT - TR ROCK FRAG.	ML	MOIST	0			
1435	4	3/4		4					↓ WET	0			
S-3 e		2/5	1.8/2		STIFF	GRAY BRN	SILTY CLAY - CLAYEY	CL	MOIST	0			
1440	6	8/10			TO V STIFF		SILT TR ROCK FRAGS	ML		0			
S-4 e		6/10	1.5/2			TO	SILTY CLAY/ WEATHERED ROCK			0			
1445	8	11/50	8/1	8'±		GRAY	SHOE HAD GRAY SS.		REF @ 8'±	0			
S-5 1450	8.2 ±9	50/3"		11 TO 11.5	MSOFT	GRAY	SANDSTONE FRAGS WEATHERED - FRIABLE		DAMP	0			
					M HARD	TAN GRAY	SANDSTONE	BR	S-5 8 → 8.2 ± 50 BLOWS	0			
1505					MSOFT M HARD				9.6 } 9.9 } HORIZ JNT W/ H2O	0			
									10.3 → 10.9 M SOFT (WEATH)	0			
2.7/6	1	45%	5.9/6						10.2 - JNT W/ H2O 12.1 M SOFT	0			
									13.5 Fe Stained TR H2O JNT	0			
1525	15			14	MSOFT			V BR		0			
1535									LOST SOME CORE HAD TO BLOW OUT	0			
					M HARD				W/ WATER TO FREE UP RODS	0			
2/5	2	40%	3/5				18-19		17.3 } 17.8 } HORIZ JNT	0			
						RED BRN	INTERBEDDED W/ SILTSTONE		18.0 } TR H2O 18.5 "	0			
1550	20					TO	DARK STREAKS		LAST 1' ALMOST BLOCKY.	0			
1600				20.5		20.8 GRAY		BR		0			
							SANDSTONE W/ THIN INTERBEDS		21 SOFT SEAM 22.2 " " W/ TR H2O	0			
1.1/5	3	20%	/5							0			
				23.5	M SOFT				LOST CORE 23.5	0			
1625	25			24		GRAY	SANDY SHALE/ CLAYSTONE (CUTTINGS)		TO 25 DRILLER STATES SOFT SHALE?	0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4 HSA / AUTO HAMMER 2" SPOONS
TEMP CASING SET @ 9 NX CORE 9 → 25 REAM TO 5 1/2"
WELL 14-24, SAND 11-25, CHIPS 11 → 3

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT 16

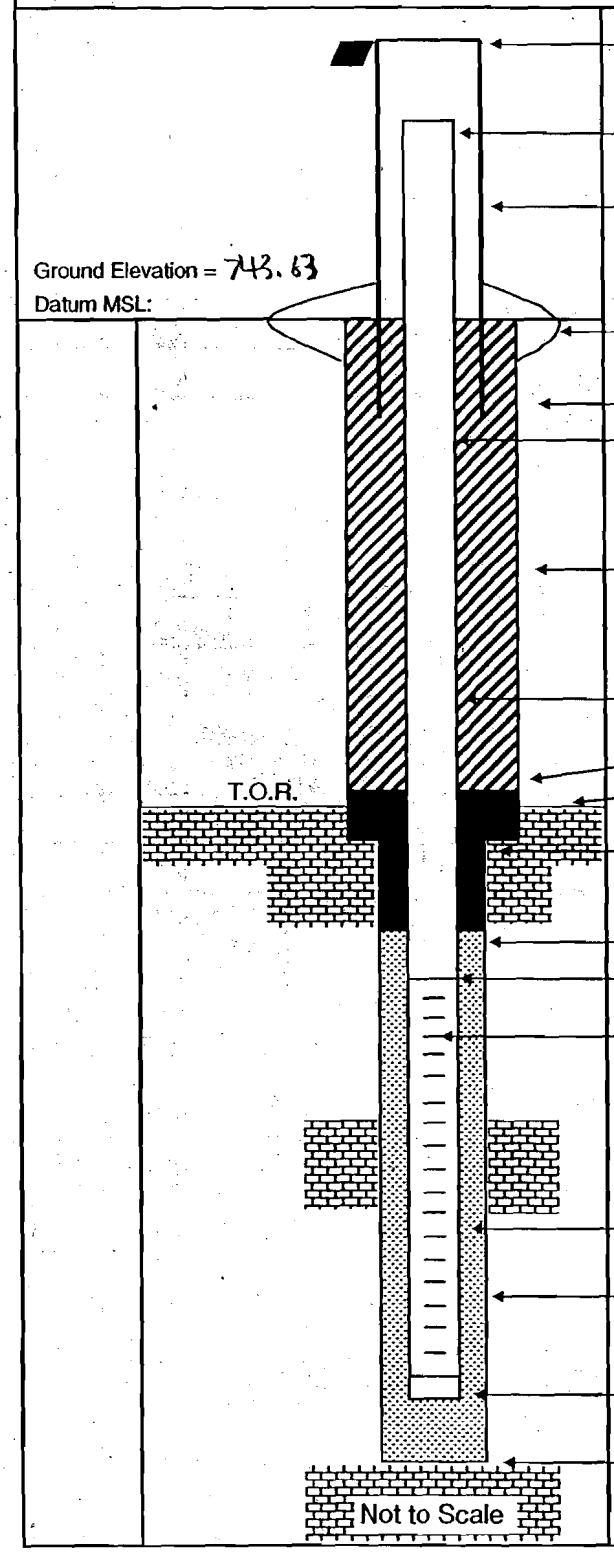
Tetra Tech NUS, Inc.

BEDROCK MONITORING WELL SHEET

WELL No.: 12MWT16

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT16
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/14/04
SITE:	SWMU-12	DRILLING METHOD:	HSA - ROT	NORTHING:	1312096.13
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	302718 2.94



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 745.97

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TEMP TO 9'
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8½

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 740.63 / 3'

Elevation / Depth Top of Bedrock: 735.63 / 8'±

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 732.63 / 11

Elevation / Depth of Top of Screen: 729.63 / 14

Type of Screen: PVC

Slot Size x Length: 20 x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock:
Core / Ream: 5½

Elevation / Depth of Bottom of Screen: 719.63 / 24

Elevation / Total Depth of Borehole: 718.63 / 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12 MWT 17
DATE: 8/15/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						FOR LITHOLOGY		SET 6" CAS		0		
							SEE 12MWT16		(TEMP) TO				
									9.5' ON 8/14				
									Resume Air				
	5								Rotary on 8/15/04		0		
				8'±									
				HEAVE									
	10		9.5								0		
							AIR ROTARY 9.5						
							TO 26						
					M HARD TO		SANDSTONE						
					M SOFT								
	15				TO						0		
				15	M HARD								
									SET WELL				
									15-25				
	20								SAND 12-26		0		
									CHIPS TO 3'				
	25			25							0		

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: HSA TO 9.5 (NO SAMPLES)
5 1/2" AIR ROT TO 26 (NO CORING)

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT17

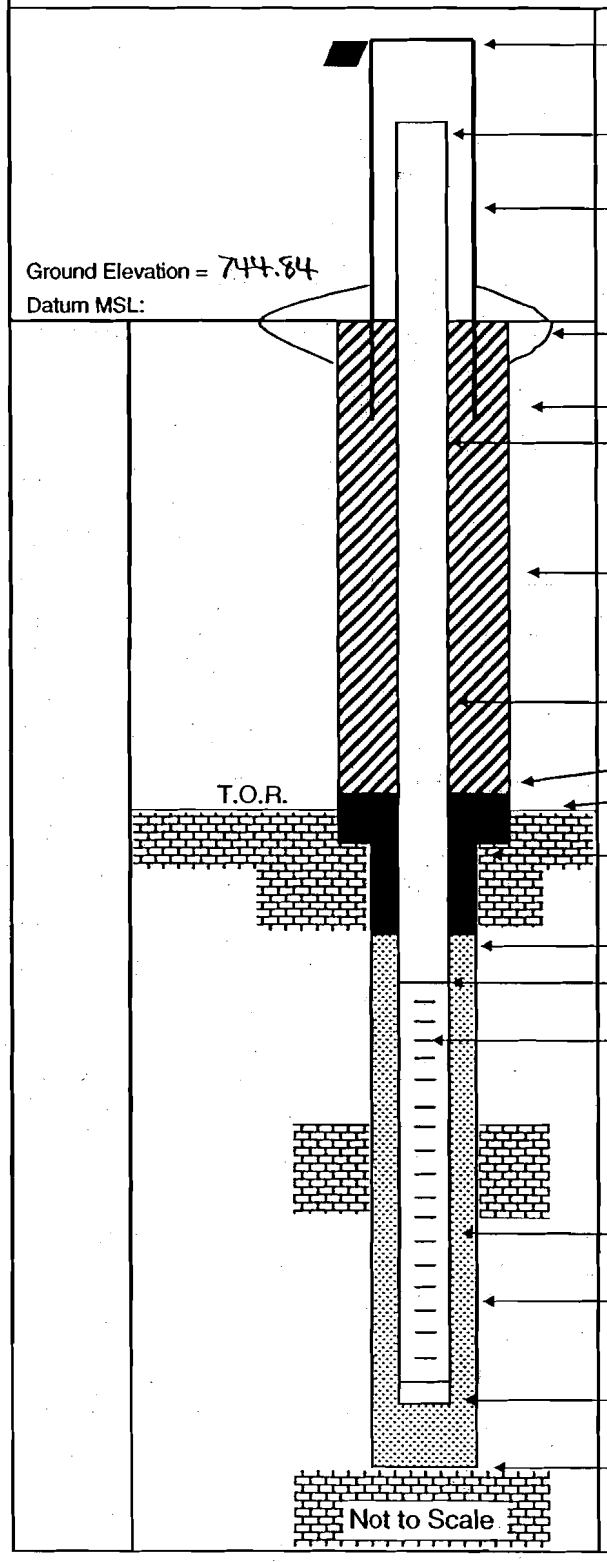
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT17

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT17
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/15/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ AIR ROT	NORTHING:	1312047.38
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3027205.14



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 747.23

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TEMP TO 9.5
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8½"

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 741.84 / 3

Elevation / Depth Top of Bedrock: 736.84 / 8'±

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 732.84 / 12

Elevation / Depth of Top of Screen: 729.84 / 15

Type of Screen: PVC

Slot Size x Length: 20 x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock:
Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 719.84 / 25

Elevation / Total Depth of Borehole: 718.84 / 26

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12 MWT 18
DATE: 8/27/04
GEOLOGIST: Charles C. Laney III
DRILLER: Ken Boehmer

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 @	1	5/11	3"		MED. DENSE		STONE (0-3")						
					—	—	NO RECOVERY	—		0	0	0	0
1445	2	10/10			—	—	"	—		—			
S-2 @	3	5/6	8"		MED. DENSE	ORG. BRN.	SILTY CLAY (2'-2'8")	CL	Trace Damp	0	0	0	0
1450	4	9/11			—	—	NO RECOVERY	—		—			
S-3 @	5	7/9	20"		MED. DENSE	ORG. BRN. mot. GRAY	SILTY CLAY w/ some Pebbles	CL	Trace Damp	0	0	0	0
1454	6	16/21			"	"	"	CL	"	0			
S-4 @	7	7/12	15"		"	ORG. BRN	SILTY CLAY (6'-6'4") SILTY SAND w/ some compacted Sand	CL -SM	DRY Loose (6'4" → 6'8")	0	0	0	0
1458	8	16/18			"	ORG. BRN. mot. GRAY	SILTY CLAY (6'8" → 7'3")	CL	DRY	0			
S-5 @	9	8/10	6"		DENSE	GRAY mot. ORG. BRN.	SILTY CLAY (8' → 8'6")	CL	DRY	0	0	0	0
1504	10	58/100/3"			—	—	NO RECOVERY	—		—			
	11				MEDIUM HARD	ORG. BRN mot. GRAY	SANDSTONE		BR. / Fe Stains	0	0	0	0
	12				"	"	"		"	0			
C-1 1.75/5	13	35%/0	4.5/5'		"	GRAY	"		"	0			
	14				"	"	"		BR.	0			
1550	15			15	"	"	"		"	0			
	16				"	"	"		BL. / Fe Stains	0	0	0	0
	17				"	"	"		"	0			
C-2 2.33/5	18	47%/0	3.5/5'		"	"	"		"	0			
	19				"	"	"		"	0			
1615	20				"	"	"		"	0			
	21				"	"	"		BR. / Fe Stains	0	0	0	0
	22				"	"	"		Fractures Have wet CLAY	0			
C-3 1.4/5	23	28%/0	3.7/5'		"	"	"		"	0			
	24				"	"	"		"	0			
1650	25			25	"	GRAY to ORG. GRAY	SANDSTONE Interbedded w/ Shaly SILTSTONE		"	0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: Surface Area is Grass Covered / Gravel,
Temp. Casing set to 9.5' bgs.
Hole Reamed to 26' bgs

Converted to Well: Yes X No ____ Well I.D. #: 12 MWT 18

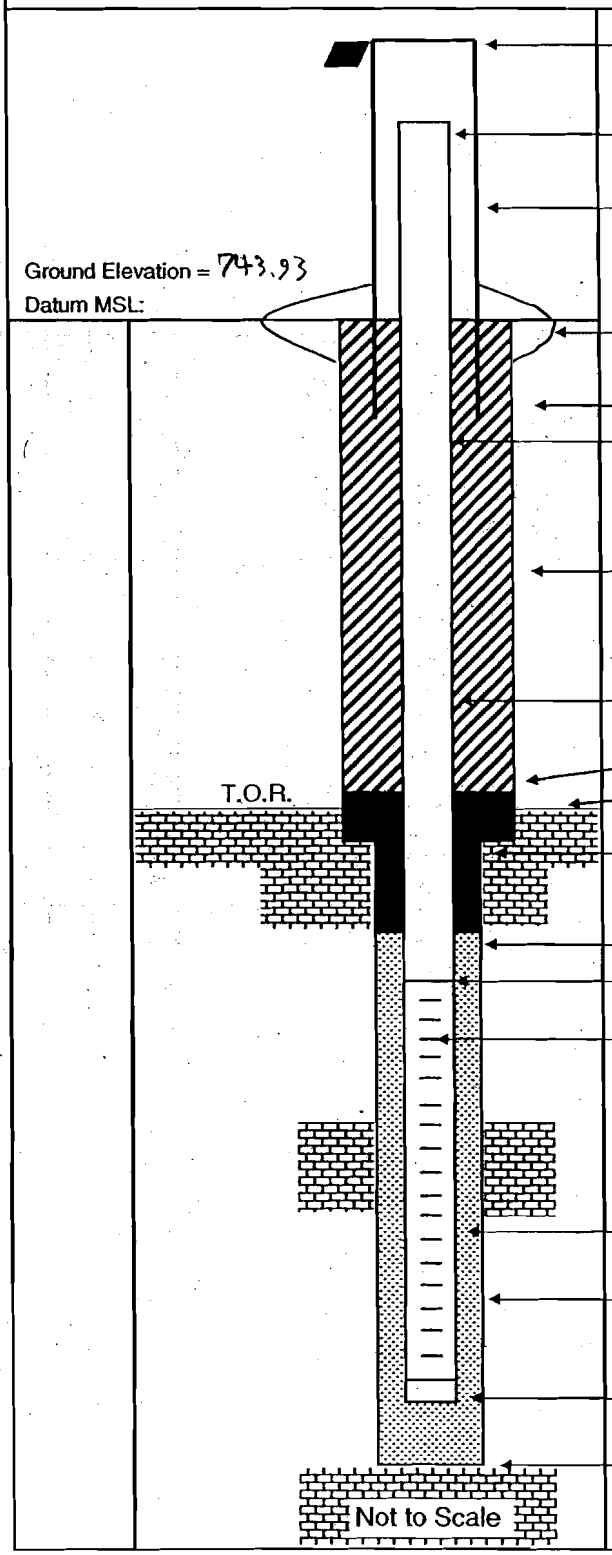
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT18

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT18
PROJECT No.:	N6878	DRILLER:	Ken Boehmer	DATE COMPLETED:	8/27/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	1312114.82
GEOLOGIST:	CHARLES C. LANCY III	DEV. METHOD:	Surge & Purge	EASTING:	3027253.63



Elevation of Top of Casing:	NA
Stick Up of Casing Above Ground Surface:	NA
Elevation of Top of Riser:	745.94
I.D. of Surface Casing:	
Type of Surface Casing:	Steel
Type of Surface Seal:	
I.D. and Depth of Permanent Casing: (if applicable)	6" Temp to 9.5'
I.D. of Riser:	2"
Type of Riser:	PVC
Borehole Diameter:	8½ to 9'
Type of Backfill:	Cement Bent. Grout
Elevation / Depth Top of Seal:	740.93 / 3'
Elevation / Depth Top of Bedrock:	734.43 / 9.5'
Type of Seal:	Bentonite Chips
Elevation / Depth of Top of Fine Sand:	NA / N/A
Elevation / Depth of Top of Filter Pack:	731.93 / 12'
Elevation / Depth of Top of Screen:	728.93 / 15'
Type of Screen:	PVC
Slot Size x Length:	20 SL x 10'
I.D. of Screen:	2"
Type of Filter Pack:	Global #5 Quartz Sand
Diameter of Hole in Bedrock: Core / Ream:	5½"
Elevation / Depth of Bottom of Screen:	718.93 / 25'
Elevation / Total Depth of Borehole:	717.93 / 26'

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12 MWT 19
DATE: 8/28/04
GEOLOGIST: Charles C. Laney III
DRILLER: Ken Boehmer

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 ②	1	2/6	13"		MEDIUM DENSE	BRN	TOPSOIL (Ø-2"), SILTY CLAY W/ROOTS (2"-9")	CL		Ø	Ø	Ø	Ø
Ø820	2	8/8			"	"	SILTY CLAY (9"-13")	CL		Ø			
S-2 ③	3	6/13	18"		"	ORG-BRN MOT. GRAY	SILTY CLAY	CL		Ø	Ø	Ø	Ø
Ø825	4	13/15			"	"	"	CL		Ø			
S-3 ②	5	7/12	22"		"	"	"	CL		Ø	Ø	Ø	Ø
Ø830	6	13/16			"	"	"	CL	TRACE MOISTURE	Ø			
S-4 ④	7	8/11	19"		"	"	SILTY CLAY W/trace Gravels	CL		Ø	Ø	Ø	Ø
Ø835	8	16/17			"	" / DRK ORG-BRN	" / SILTY SAND @ Bottom of Spoon	CL		Ø			
S-5 ④	9	8/10	20"		"	GRAY MOT. ORG-BRN	SILTY CLAY W/trace Gravels	CL		Ø	Ø	Ø	Ø
Ø840	10	13/20			"	"	"	CL		Ø			
S-6 ④	11	100/4"	4"		VERY DENSE	GRAY	SANDSTONE (10'-10'4")	—		Ø	Ø	Ø	Ø
Ø850	12				MEDIUM SOFT	GRAY MOT. ORG-BRN	SANDSTONE	—	BR. Fe STAINS	Ø			
	13				"	"	"		"	Ø			
C-1 1.66/5	14	33%/0	4/5'		MEDIUM HARD	GRAY	SANDSTONE W/ Black Banding		" Fractures Have Tr. CLAY	Ø			
	15				"	"	"			Ø			
1030	16			16	"	"	"		"	Ø			
	17				"	GRAY	"		"	Ø	Ø	Ø	Ø
	18				"	"	"		"	Ø			
C-2 1.66/5	19	33%/0	3.75/5'		SOFT	DRK GRAY	SILTY CLAY, MOIST (18'3"→18'7")		BR.	Ø			
	20				MEDIUM HARD	GRAY	SANDSTONE		"	Ø			
1050	21				Medium SOFT	"	SANDSTONE W/ Very Small Shale Seams in last 9".		V.BR. Shale	Ø			
	22				MEDIUM HARD	GRAY	SANDSTONE W/ Shaley Siltstone Interbedded		Black Banding Fe STAINS / BR.	Ø	Ø	Ø	Ø
	23				"	"	"		"	Ø			
C-3 3.25/5	24	65%/0	4.66/5'		"	"	"		"	Ø			
	25				"	"	"		"	Ø			

26

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø

Remarks: Grassy Surface Area.
Temp. Casing Set to 10.5' bgs

Converted to Well: Yes X No ____ Well I.D. #: 12 MWT 19

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12MWT 19
DATE: 8/28/04
GEOLOGIST: Charles C. Lowey III
DRILLER: Ken Boehmer

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	26				"	"	"		"	Ø			
	27												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Hole Reamed to 27' bgs

Drilling Area Background (ppm): Ø

Converted to Well: Yes X No ____ Well I.D. #: 12 MW T 19

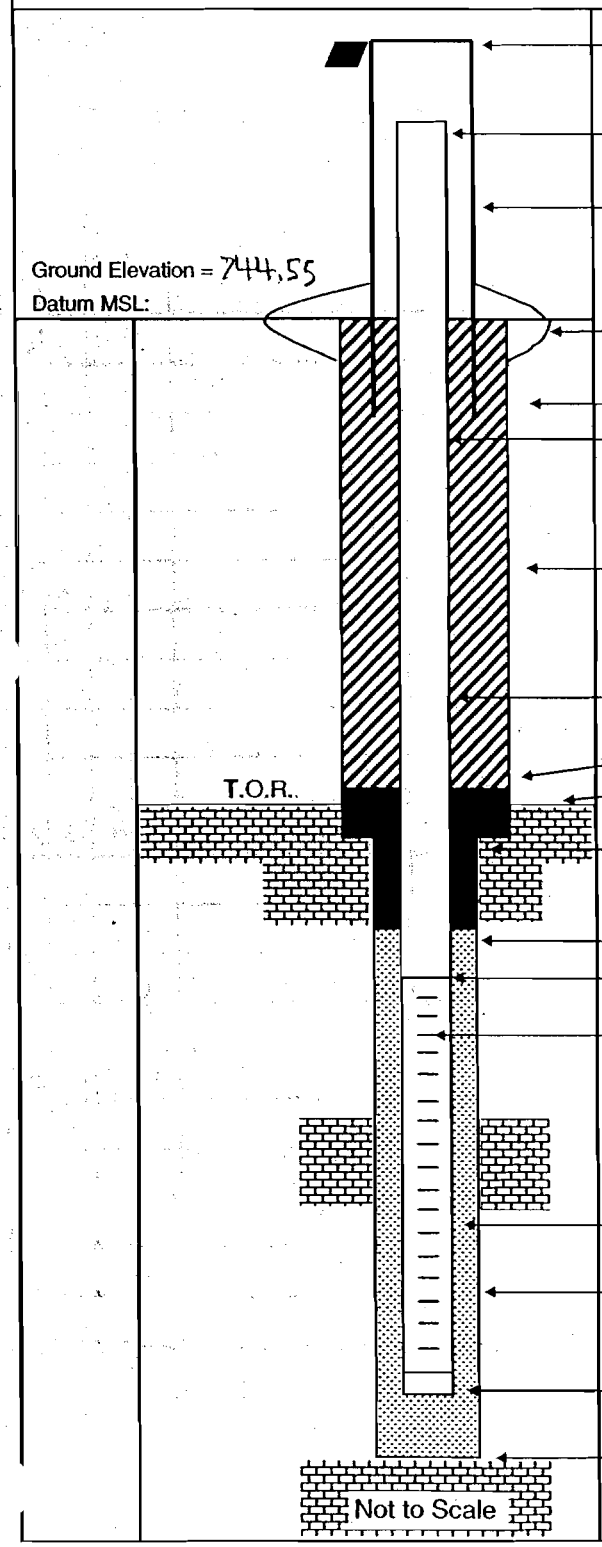
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12 MWT 19

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12 MWT 19
PROJECT No.:	N6878	DRILLER:	Ken Boehmer	DATE COMPLETED:	8/20/04
SITE:	SWMU-12	DRILLING METHOD:	HSA / ROT	NORTHING:	1312026.45
GEOLOGIST:	Charles C. Lowery III	DEV. METHOD:	Surge & Purge	EASTING:	3027292.38



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 746.89

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) 6" Temp To 10.5'

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8½ To 9'

Type of Backfill: Cement Bent. Grout

Elevation / Depth Top of Seal: 741.55 / 3'

Elevation / Depth Top of Bedrock: 734.55 / 10'

Type of Seal: Bentonite Chips

Elevation / Depth of Top of Fine Sand: NA / N/A

Elevation / Depth of Top of Filter Pack: 731.55 / 13'

Elevation / Depth of Top of Screen: 728.55 / 16'

Type of Screen: PVC

Slot Size x Length: 20 SL X 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5 Quartz Sand

Diameter of Hole in Bedrock: Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 718.55 / 26'

Elevation / Total Depth of Borehole: 717.55 / 27'

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12 MWT 20
DATE: 9/1/04
GEOLOGIST: Charles C. Laney III
DRILLER: Ken Boehmer

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1						See Boring Log				Ø	Ø	Ø
	2						12 MWT 19 FOR						
	3						LITHOLOGY						
	4												
	5										Ø	Ø	Ø
	6						Boring was Drilled						
	7						without Sampling/Coring						
	8												
	9												
	10										Ø	Ø	Ø
	11												
	12												
	13												
	14												
	15			15							Ø	Ø	Ø
	16												
	17												
	18												
	19												
	20										Ø	Ø	Ø
	21												
	22												
	23												
	24												
	25			25							Ø	Ø	Ø

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 6" Temp. Casing Set to 11' bgs.
Borehole was Reamed to 26' bgs.

Drilling Area Background (ppm): Ø

Converted to Well: Yes X No ____ Well I.D. #: 12 MWT 20

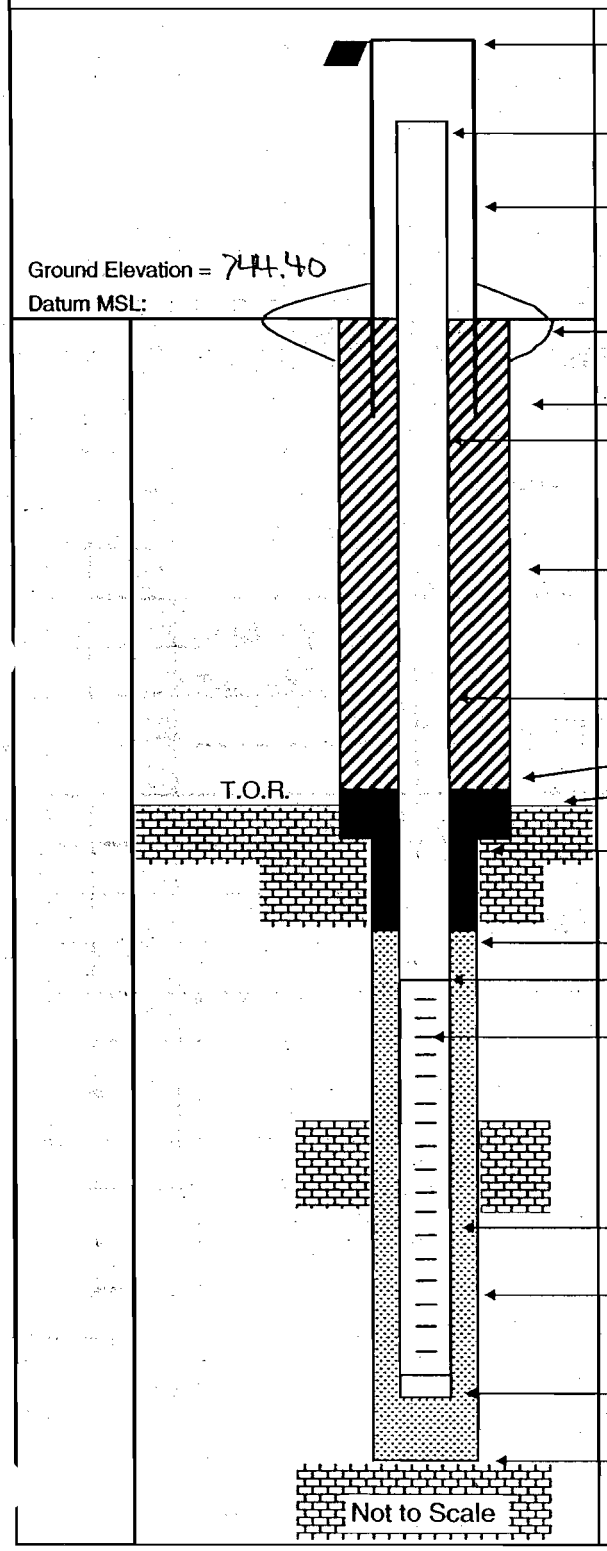
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT 2Ø

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT 2Ø
PROJECT No.:	N6878	DRILLER:	Ken Boehmer	DATE COMPLETED:	9/1/Ø4
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	1311919.40
GEOLOGIST:	CHARLES C. LANEY III	DEV. METHOD:	Surge & Purge	EASTING:	3027337.61



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 746.56

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) 6" Temp To 11'

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8½ to 9'

Type of Backfill: Cement Bent. Grout

Elevation / Depth Top of Seal: 741.40 / 3.Ø'

Elevation / Depth Top of Bedrock: 733.40 / 11.Ø'

Type of Seal: Bentonite Chips

Elevation / Depth of Top of Fine Sand: NA / N/A

Elevation / Depth of Top of Filter Pack: 732.40 / 12.Ø'

Elevation / Depth of Top of Screen: 729.40 / 15.Ø'

Type of Screen: PVC

Slot Size x Length: 2Ø SL X 1Ø'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5 QUARTZ SAND

Diameter of Hole in Bedrock: Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 719.40 / 25.Ø'

Elevation / Total Depth of Borehole: 718.40 / 26.Ø'

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT21
DATE: 9-11-04 / 9-12-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 @	0	2/4	1/2		STIFF	GRAY BRN	TOP 3" TOPSOIL CLAYEY SILT-TR	ML	MOIST	0			
1640	2	8/9				ORANGE	SAND AND ROOTS			0			
S-2 @		7/7	2/2		V STIFF	GRAY BRN	CLAYEY SAND-TR ROOTS	SC	MOIST	0			
1645	4	9/10					SANDY CLAY	ML		0			
S-3 @		5/8	1.8/2		V STIFF	GRAY BRN	CLAYEY SAND-TR ROCK FRAGS	SC	MOIST	0			
1650	6	10/24						ML	WEATH S.S.?	0			
S-4 @ 1655		18/26	1.5/2	7'±						0			
	8	34/40			V DENSE	TAN BRN	WEATH SANDSTONE	VBR		0			
S-5 @ 1700		26/35	1.5/2		TO	TO			REF @ 9.5	0			
9/11	9.5	50/5		9.5	M SOFT	BRN	WEATH SANDSTONE	VBR		0			
9/12 0750							TO		HIGHLY WEATH	0			
								BR	POOR REC NOT MUCH WATER	0			
1/5.5	1	18%	3.3/5.5				CLAYEY SANDSTONE	VBR	OBSERVED	0			
				14						0			
0815	15			14.5	M. SOFT	GRAY	SHALY SANDSTONE	VBR		0			
0825					TO					0			
				16.5	16.5 M HARD	GRAY	SANDSTONE-STREAKED W/ SHALE	BR	16.5 TR H2O	0			
										0			
									18.4→18.7 M SOFT SHALY	0			
7.9/10	2	79%	10/10							0			
				21						0			
				22.2	SOFT	BLK	COAL	BR		0			
					M HARD	LT. GRAY	SANDSTONE		22.8→23.3 VERT JNT (H2O)	0			
				24						0			
0840	25							BL		0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4" HSA – AUTO HAMMER – 2" SPOONS
SET TEMP CASE @ 9.5
NX IN ROCK – REAM TO 5 1/2".

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT21

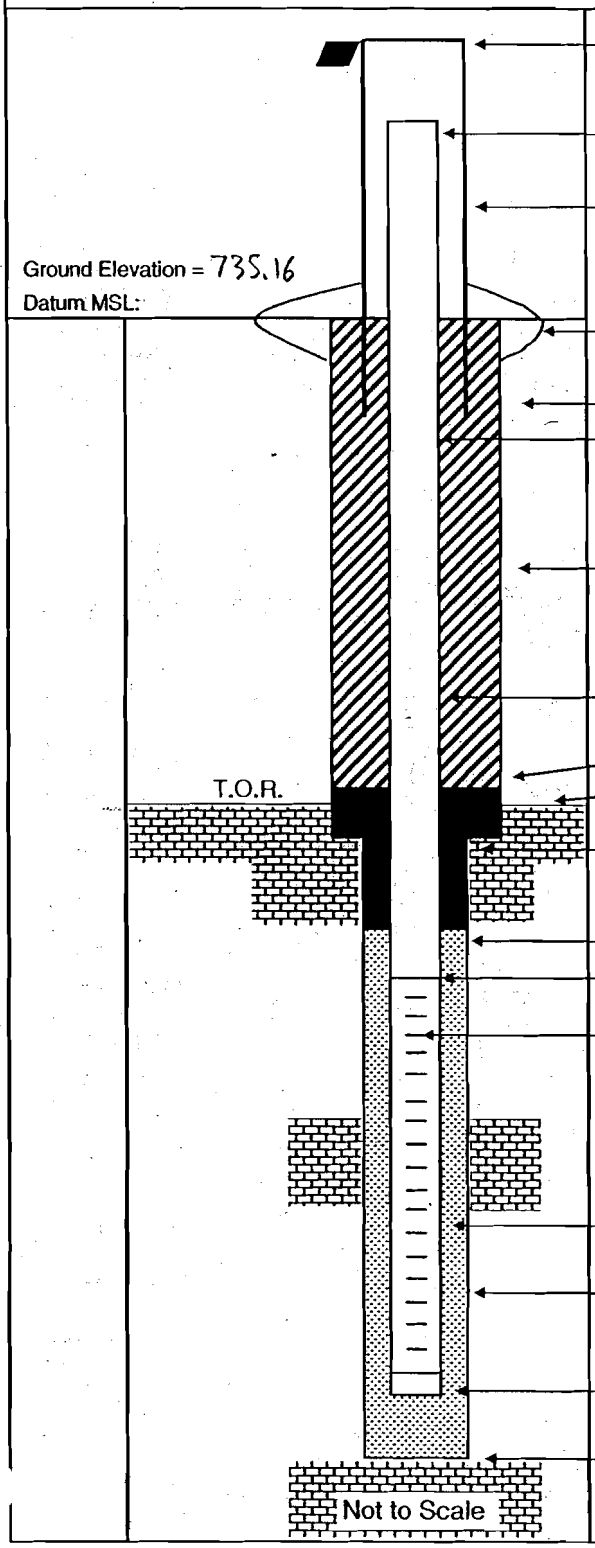
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT21

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT21
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	9-12-04
SITE:	SWMU-12	DRILLING METHOD:	HSA - ROT	NORTHING:	1312878.00
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	302636.50



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 737.72

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TEMP TO 9.5
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2"

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 732.16 / 3

Elevation / Depth Top of Bedrock: 725.66 / 9.5

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 724.16 / 11

Elevation / Depth of Top of Screen: 721.16 / 14

Type of Screen: PVC

Slot Size x Length: 20 x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL # 5

Diameter of Hole in Bedrock:
Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 711.16 / 24

Elevation / Total Depth of Borehole: 710.16 / 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT22
DATE: 9-11-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
S-1	0	5/4	1/2		M STIFF	BRN	TOP 3" TOPSOIL CLAYEY SILT	CL/ML	MOIST	0			
0820	2	4/5				MOTTLD	TO SANDY SILT-TR ROOTS		MOIST	0			
S-2		4/6	1.5/2			GRAY BRN	CLAYEY SILT		MOIST	0			
0825	4	8/10				MOTTLD				0			
S-3		6/6	1.9/2		STIFF	ORANG GRY	SILTY CLAY-TR ROCK	CL/	MOIST	0			
0830	6	8/14				BRN	FRAG-TR SAND	ML		0			
S-4		16/18	2/2	6.5 REF @7.2	V	TAN				0			
0833	7.2	50/3"			DENSE M SOFT	GRAY BRN	WEATHERED SANDSTONE		REF @ 7.2'	0			
						TAN				0			
0840	9.5		9.5		M HARD	GRAY BRN	SANDSTONE (FINE GR)	BR	TR WATER @	0			
							TR V THIN INTERBEDS		10.5, 10.9 11.9	0			
									12.0	0			
9/5.5	1	18%	/5.5			TO GRAY				0			
				14			LAST 1'	VBR		0			
0905	15						(COARSER)	BR	14.6 LOW X JNT TR WATER	0			
0920						TAN		BR	SEVERAL SANDY CLAY FILLED JNTS	0			
						BRN		BL	TR H2O 15.5 HORIZ JNT	0			
2.9/5	2	58%	5/5					BR	17.0-17.1 CLAY FILLED	0			
						TAN	19.3-19.4 M SOFT		17.8-18.1 VBR M SOFT	0			
0940	20					BRN GRAY	19.7-19.8 CLAY & SAND FILLED		18.8 SAND FILLED JNT TR H2O	0			
0950					M HARD		SANDSTONE	BR	20.6 → 21.4 VBR	0			
								VBR	W/ TR H2O 23.1 HORIZ JNT	0			
1.5/5	3	30%	5/5					BR	24.0 " " 24.5 " " TR H2O	0			
				24						0			
1010	25									0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼" ID HSA TO 9.5'- AUTO HAMMER & 2" SPOONS
NX CORE IN ROCK / SET TEMP CASING TO 9.5
REAM TO 5½" Φ WELL 14-24, SAND 11 TO 25

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT22

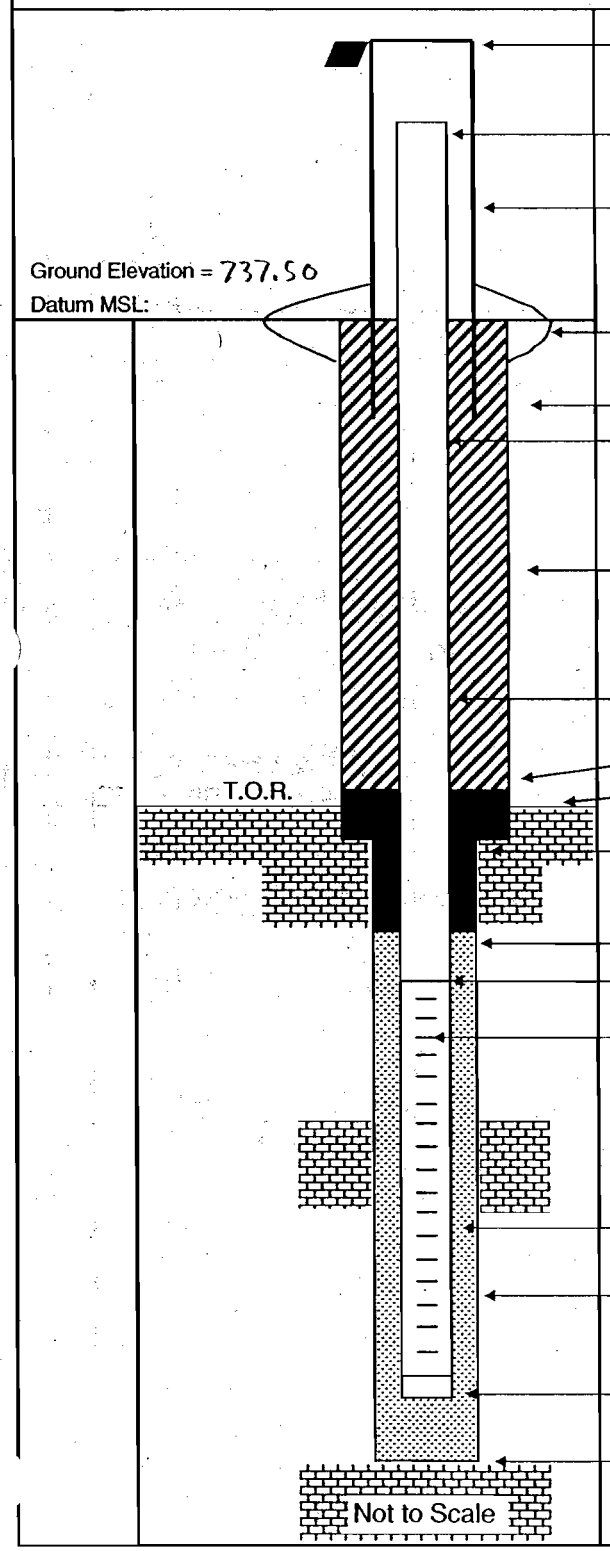
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT22

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT22
PROJECT No.:	N6878	DRILLER:		DATE COMPLETED:	9-11-04
SITE:	SWMU-12	DRILLING METHOD:	HSA - ROT	NORTHING:	1311937.84
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026901.94



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 739.74

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TEMP TO 9.5
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2"

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 734.50 / 3'

Elevation / Depth Top of Bedrock: 730.30 / 7.2

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 726.50 / 11

Elevation / Depth of Top of Screen: 723.50 / 14

Type of Screen: PVC

Slot Size x Length: 20 SL x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL # 5

Diameter of Hole in Bedrock:
Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 713.50 / 24

Elevation / Total Depth of Borehole: 712.50 / 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT23
DATE: 8/10/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
						MOTTLED	TOP 4" TOPSOIL						
S-1 e	0	2/4	1.5/2		STIFF	GRAY BRN	SILTY CLAY - TR ROOTS	CL	MOIST	0			
0850	2	5/5								0			
S-2 e		4/4	1.5/2		STIFF		SILTY CLAY - TR ROOTS	CL	MOIST	0			
0855	4	6/7					TR SAND			0			
S-3 e		6/7	2/2	5'±	STIFF		SILTY CLAY - TR SAND	CL/ML	MOIST	0			
0900	6	11/17			STIFF		CLAYEY SILT - TR SAND	CL/ML	MOIST	0			
S-4 e		14/22	2/2	6.5±	- - -	- - -	- - - - - - - - - - -	- - -	MOIST	0			
0905	8	28/32			DENSE TO	GRAY TAN	SILTY SAND - SOME WEATH S.S. FRAGS	SM	COULD BE START OF WEATH	0			
S-5 e		25/28	1.9/2	9'±	M SOFT	BRN			SANDSTONE ≈ 6.5'	0			
0910	9.5	45/32	9.5				WEATH. SANDSTONE FRAGS TR		TR Fe Stains Near Botm.	0			
0925				11'		MOTTLED GRAY	SHALE WEATHERED SANDSTONE		9.5→11-MOIST→WET 9.5→14-HIGHLY	0			
				LINE ?		BRN	AND SHALE TO 14'±		WEATH BR. REF MATL @ 11'±	0			
3/5.5	1	55%	3.8/5.5						MOIST	0			
				14'					GOOD REC DESPITE DEGREE OF WEATH.	0			
0954	15				M HARD	GRAY	SANDSTONE	BR		0			
1007								VBR	15.7-TR H2O SEVERAL BEDDING	0			
								BR	PLANE BREAKS	0			
1-6/5	2	38%	4.9/5						18.4 TR H2O	0			
						TO			19.0 TR H2O LO	0			
1029	20			20		DARK GRAY	19.3→20 BECOMES THINLY BEDDED W/ SHALE (SHALY)		& JNT-ORANG COLOR AT JNT	0			
1045					M HARD	BRN GRAY	SANDSTONE - INTERBEDS W/ SHALE	VBR	DRY CUTTING WHEN START RUN 3	0			
									TR H2O @ 21	0			
1/5	3	20%	4.7/5		M SOFT				22.5→23.5± MSOFT	0			
					M HARD				SEV. BEDDING PL JOINTS TR H2O @ 24'±	0			
1100	25									0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: ATV - 4¼" HSA TO START (AUTO HAMMER) 2" SPOONS
SET 6" ST CAS TO 9.5 (TEMP)
NX CORE THEN REAM TO 5½" IN BR

Converted to Well: Yes ✓ No _____ Well I.D. #: 12 MW T23

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT23
DATE: 8/10/09
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
1120	25				M HARD	GRAY	SANDSTONE -	BR	DRY CUTTINGS @ START @ RUN (4)	0			
					M SOFT		INTERBEDDED W/ SHALE &	VBR	25.4 TR H2O 26.5 TR H2O	0			
1-8/5	(4)		5/5		TO		SILTSTONE	BR	ALL HORIZ JNT. 27.1 TR H2O	0			
					M HARD				28.2 Fe Stains TR H2O	0			
1136	30								28.7 → 29.2 GRAY (Friable)	0			
				31 30									
				BOTM									
							REAM TO 31						
							WELL 20 → 30						
							SAND 16 → 31						
							CHIPS 8 → 16						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT23

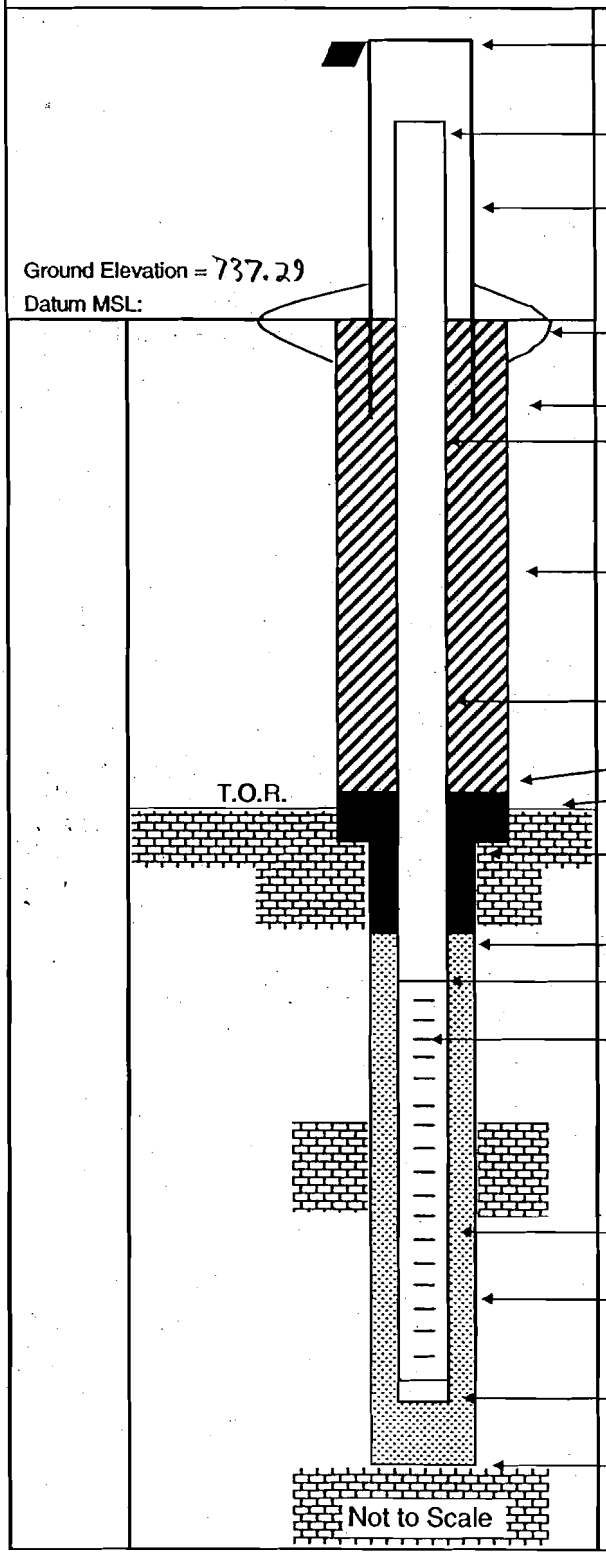
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT23

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT23
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/10/04
SITE:	SWMU-12	DRILLING METHOD:	HSA / ROT	NORTHING:	1311150.87
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	302 7466.57



Elevation of Top of Casing:	NA
Stick Up of Casing Above Ground Surface:	NA
Elevation of Top of Riser:	739.75
I.D. of Surface Casing:	
Type of Surface Casing:	STEEL
Type of Surface Seal:	
I.D. and Depth of Permanent Casing: (if applicable)	TEMP TO 9.5'
I.D. of Riser:	2"
Type of Riser:	PVC
Borehole Diameter:	8 1/2
Type of Backfill:	CONC PAD
Elevation / Depth Top of Seal:	734.29 / 3'
Elevation / Depth Top of Bedrock:	723.29 / ≈14
Type of Seal:	BENT CHIPS
Elevation / Depth of Top of Fine Sand:	NA / NA
Elevation / Depth of Top of Filter Pack:	721.29 / 16
Elevation / Depth of Top of Screen:	717.29 / 20
Type of Screen:	PVC
Slot Size x Length:	20 SL x 10'
I.D. of Screen:	2
Type of Filter Pack:	GLOBAL #5 FILTER PACK
Diameter of Hole in Bedrock: Core / Ream:	5 1/2"
Elevation / Depth of Bottom of Screen:	707.29 / 30
Elevation / Total Depth of Borehole:	706.29 / 31

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT24
DATE: 8/10/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 e	0	4/10	1/2		M STIFF	BRN	TOP 4" TOPSOIL TO SANDY SILT TO	SM	MOIST	0			
1435	2	19/6		2'		TAN	SANDSTON FRAGMENT	—		0			
S-2 e		4/5	1.8/2		STIFF	MOTTLD BRN	SILTY CLAY - TR	CL	MOIST	0			
1440	4	7/7				GRAY	ROOTS			0			
S-3 e		5/6	1.8/2		STIFF	GRAY BRN	CLAYEY SILT - TR	ML	MOIST	0			
1445	6	7/7				BRN	ROCK FRAG			0			
S-4 e		9/16	2/2		STIFF	TO YELLOW	CLAYEY SILT - TR	ML	MOIST	0			
1450	8	11/10				BRN	ROCK FRAGS TRACE SAND		COULD BE FILL ?	0			
S-5 e		10/19	1.5/2		STIFF	BRN GRAY	SILTY CLAY TO	CL		0			
1454	10	25/45		9.5	DENSE		SILTY SAND - TR ROCK FRAGS	SM	MOIST	0			
1510				11±	M SOFT	GRAY BRN	WEATHERED SHALE AND SANDSTONE	VBR	MOIST → DAMP	0			
									POOR REC	0			
.6/5	1	12%	1.7/5						POSSIBLE REF @ 11.0±	0			
20m									4m/ft	0			
1530	15									0			
1545								VBR	MOIST → DAMP	0			
								BR		0			
20m 2.4/5	2	48%	3.1/5						4m/ft	0			
				18.5	M HARD	GRAY	SANDSTONE		LAST 1.5 WAS WET 19.6 H2O 19.8 STAINS	0			
1605	20			20				BR		0			
1617								VBR	W LOW ∠ JNTS SEVERAL HORIZ	0			
								BR	TIGHTLY SPACED JNTS - TR WATER	0			
15m 1.9/5	3	38%	5/5						120 → 23 3 min/ft	0			
				23.5	M SOFT TO M HARD	GRAY	SANDSTONE INTERBEDDED W/SHALE		23.2 VBR	0			
1632	25									0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4" HSA W/ AUTO HAMER - 2" SPOONS
SET 6" ST CAS TO 10'± (TEMP)
NX CORE IN ROCK / REAM TO 5 1/2"

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT24

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT24
DATE: 8/10/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1645	25				M SOFT	BRN	SANDSTONE	VBR	NUMEROUS	0			
					M HARD	GRAY	INTERBEDDED W/ SILTSTONE		TIGHTLY SPACED JNTS	0			
2/5	4	40%	5/5				AND SHALE	BR	W/ TR OF WATER.	0			
										0			
1702	30			30				BR		0			
				31.0 BOTM									
							REAM TO 31						
							WELL 20-30						
							SAND 16-31						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT24

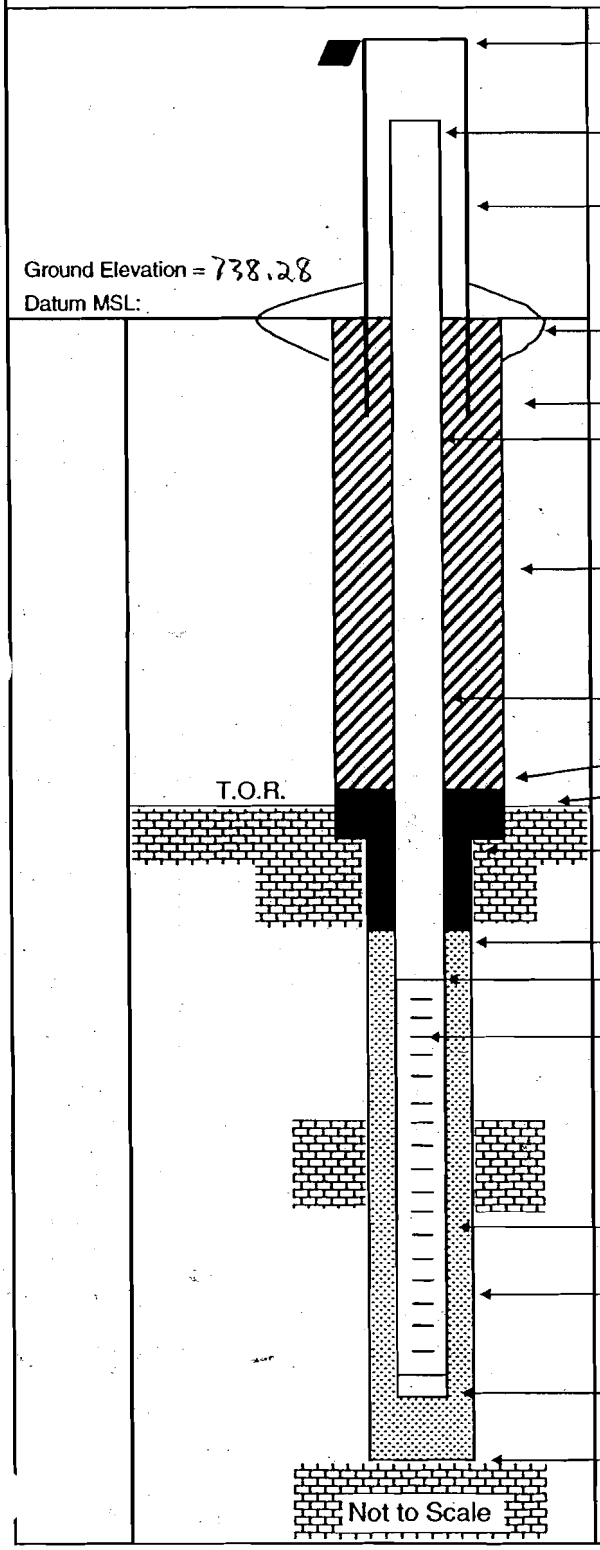
Tetra Tech NUS, Inc.

BEDROCK MONITORING WELL SHEET

WELL No.: 12MWT24

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT24
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/10/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	1310974.75
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3027184.02



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 740.60

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) TEMP 6" TO 10'

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2

Type of Backfill: CONC PAD

Elevation / Depth Top of Seal: 735.28 / 3'

Elevation / Depth Top of Bedrock: 727.28 / ≈11'

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 722.28 / 16

Elevation / Depth of Top of Screen: 718.28 / 20

Type of Screen: PVC

Slot Size x Length: 20 X10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5 FILTER PACK

Diameter of Hole in Bedrock: Core / Ream: 5 1/2" Φ

Elevation / Depth of Bottom of Screen: 708.28 / 30

Elevation / Total Depth of Borehole: 707.28 / 31

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT24A
DATE: 8/16/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ**	Borehole**	Driller BZ**
	0						HSA 4¼" ID 8½		ALTERATE WELL FOR T24, WHICH HAS BEEN DRY.		0		
							OD TO ≈ 9.5						
							SET TEMP 6" GAS						
							TO 9.5						
	5						REAM TO 5½"				0		
							W/ ROLLER BIT						
	10										0		
	15										0		
	20										0		
	25										0		

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: HSA TO 9.5 (NO SAMPLING)
REAM (5½") 9.5 TO 54

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT24A

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT24A
DATE: 8/16/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	25												
							SANDSTONE		SEE 12MWT34		0		
									FOR LITHOLOGY				
	30										0		
	35										0		
	40										0		
				44									
	45			45.5			SHALE				0		
				47									
							SANDSTONE						
	54			54			SHALE @ 54' ±				0		

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT24A

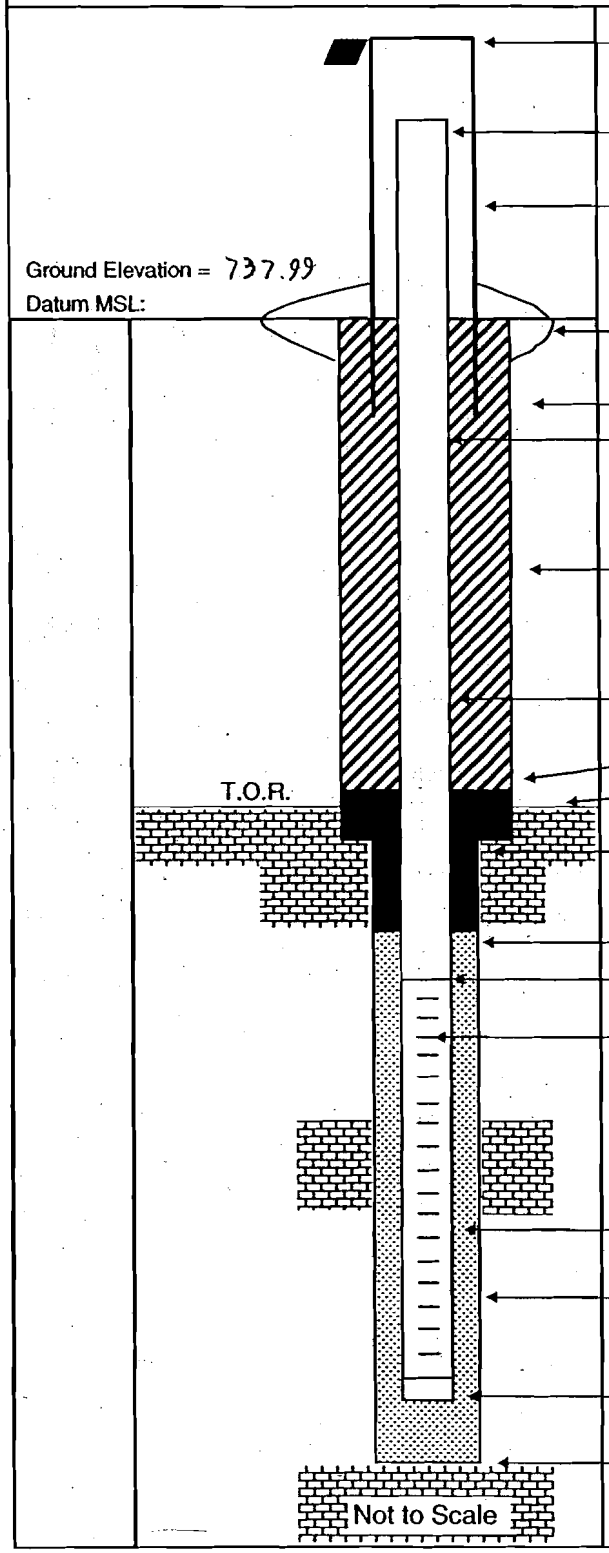
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT24A

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT24A
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/16/04
SITE:	SWMU-12	DRILLING METHOD:	HSA / AIR ROT	NORTHING:	1310968.91
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3027192.97



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 740.53

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) Temp to 9.5'

I.D. of Riser: 2

Type of Riser: PVC

Borehole Diameter: 8½

Type of Backfill: CEMENT / BENT GROUT

Elevation / Depth Top of Seal: 709.99 / 28

Elevation / Depth Top of Bedrock: 727.99 / ≈ 10'

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 697.99 / 40

Elevation / Depth of Top of Screen: 693.99 / 44

Type of Screen: PVC

Slot Size x Length: 20 x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock: Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 683.99 / 54

Elevation / Total Depth of Borehole: 683.99 / 54

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT25
DATE: 9-12-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 @	0	8/7	.4/2		M DENSE	BRN GRAY	TOP 3" TOPSOIL SILT - SOME ROAD GRAVEL	ML	DAMP → DRY	0			
1040	2	7/12		2		MOTTLED			FILL ?	0			
S-2 @		6/7	1.6/2		STIFF	GRAY BRN	CLAYEY SILT -	ML	MOIST	0			
1045	4	9/10				ORANG	TR ROOTS TR F. SAND			0			
S-3 @		6/7	2/2		V STIFF	GRAY BRN	CLAYEY SILT - SOME	ML	MOIST	0			
1050	6	8/12		6			SAND AND SANDSTONE FRAGMENTS	SC	DAMP	0			
S-4 @	7±	36/50	1/1.1	7'	V STIFF M SOFT	GRAY BRN	SANDY SILT & WEATHERED SANDSTONE			0			
		50/2"		REFUSAL					REF @ 7'±	0			
										0			
9.5 1105	9.5		9.5		M SOFT	GRAY	SHALY SANDSTONE	VBR	SEVERAL HORIZ	0			
							(V. THIN STREAKS OF SHALE)		BREAKS ALONG BEDDING PLANES	0			
							(10.4 10.9 Fe Stained Jnts)		TIGHTLY SP. NOT MUCH H2O	0			
8/55	①	15%	5.5/5.5		M HARD			TO		0			
					AT 13±	GRAY		BR		0			
1130	15									0			
1140				15	M SOFT			VBR	SEVERAL HORIZ	0			
					M HARD	GRAY			BEDDING PLANE JNTS W/ TR.	0			
								BR	WATER THRU OUT	0			
										0			
4.3/10	②	42%	10/10							0			
										0			
										0			
										0			
									24.2 → 24.6 VERT	0			
1210				25					JNT TR H2O EL WATER @ 1300	0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4" ID HSA w/ AUTO HAMMER / 2" SPOONS
SET TEMP CAS TO 9.5
NX IN ROCK - REAM TO 26 w 5 1/2" BIT - SCREEN 15-25 SAND 10-26

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT25

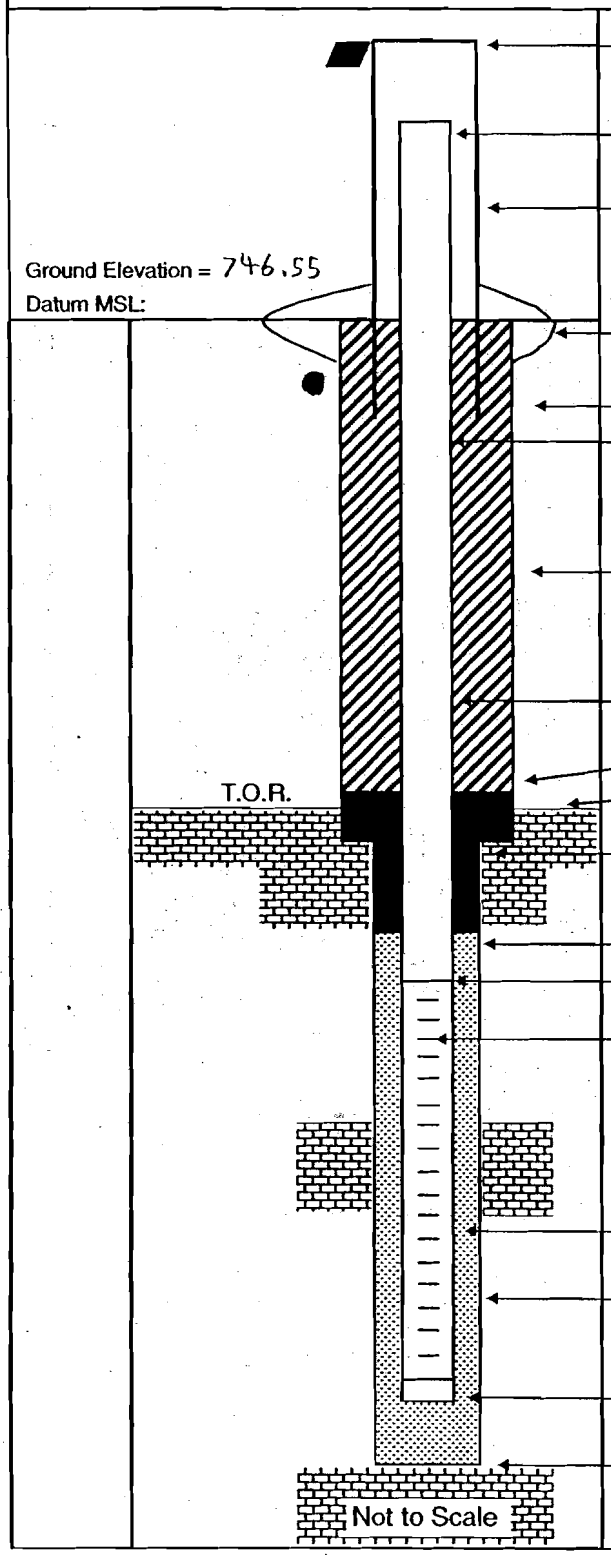
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT25

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT25
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	9-12-04
SITE:	SWMU-12	DRILLING METHOD:		NORTHING:	1313924.59
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	302 6269.42



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 748.66

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TEMP TO 9.5'
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8½"

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 743.55 / 3'

Elevation / Depth Top of Bedrock: 739.55 / 7'

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 736.55 / 10

Elevation / Depth of Top of Screen: 731.55 / 15

Type of Screen: PVC

Slot Size x Length: 20 x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock:
Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 721.55 / 25

Elevation / Total Depth of Borehole: 720.55 / 26

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT26
DATE: 9-12-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 e	0	3/4	1.8/2		STIFF	BRN	TOP 3" TOP SOIL CLAYEY SILT - TR ROOTS	ML	MOIST	0			
1430	2	5/4		2		ORANGE				0			
S-2 e		2/2	2/2		M STIFF	BRN	CLAYEY SILT/SILTY CLAY	ML CL	MOIST → WET	0			
1435	4	4/3				MOTTLED	TR ROOTS			0			
S-3 e		2/2	1.5/2		M STIFF	GRAY BRN	SILTY CLAY - TR SAND	CL/ML	MOIST	0			
1440	6	5/7		6			TR ROCK FRAGS		WEATH ROCK IN SHOE	0			
S-4 e		18/24	1.5/2		M STIFF	GRAY BRN	WEATHERED SANDSTONE	VBR	DAMP	0			
1445	8	36/50		8'	M SOFT					0			
									REF @ 8'±	0			
	9.5		9.5										
1450					M SOFT	BRN	WEATHERED SANDSTONE - TR	VBR		0			
					M HARD		RED BRN CLAY SEAMS		SEVERAL HORIZ BEDDING PLANE	0			
							(FRIABLE) W/ RED BRN LAMINATIONS		BREAKS AND JNTS - SOME	0			
5/5.5	1	9%	5.5/5.5						H2O THROUGHOUT RUN 1	0			
				14						0			
1515	15									0			
1525				15.5±	M HARD	TAN BRN	SANDSTONE	BR		0			
									16.8 17.1 17.3 HORIZ JNTS TR H2O	0			
									18' VUG 18.7'	0			
7.5/10	2	76%	9.5/10							0			
						GRAY @ 21'	SANDSTONE - LAMINATED W/ SHALE STREAKS		20.3 20.8 HORIZ JNT TR H2O	0			
							22.4 COAL LENS 1/2" W/ COAL INTERBEDS			0			
				24±			TO 23.8		M SOFT 24.3 TR H2O	0			
1550	25				M SOFT	GRAY	SANDY SHALE	BR		0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4" HSA W/ AUTO HAMMER | 2" SPOONS
SET 6" CAS TO 9-5
NX CORE IN ROCK - REAM TO 5 1/2"

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT26

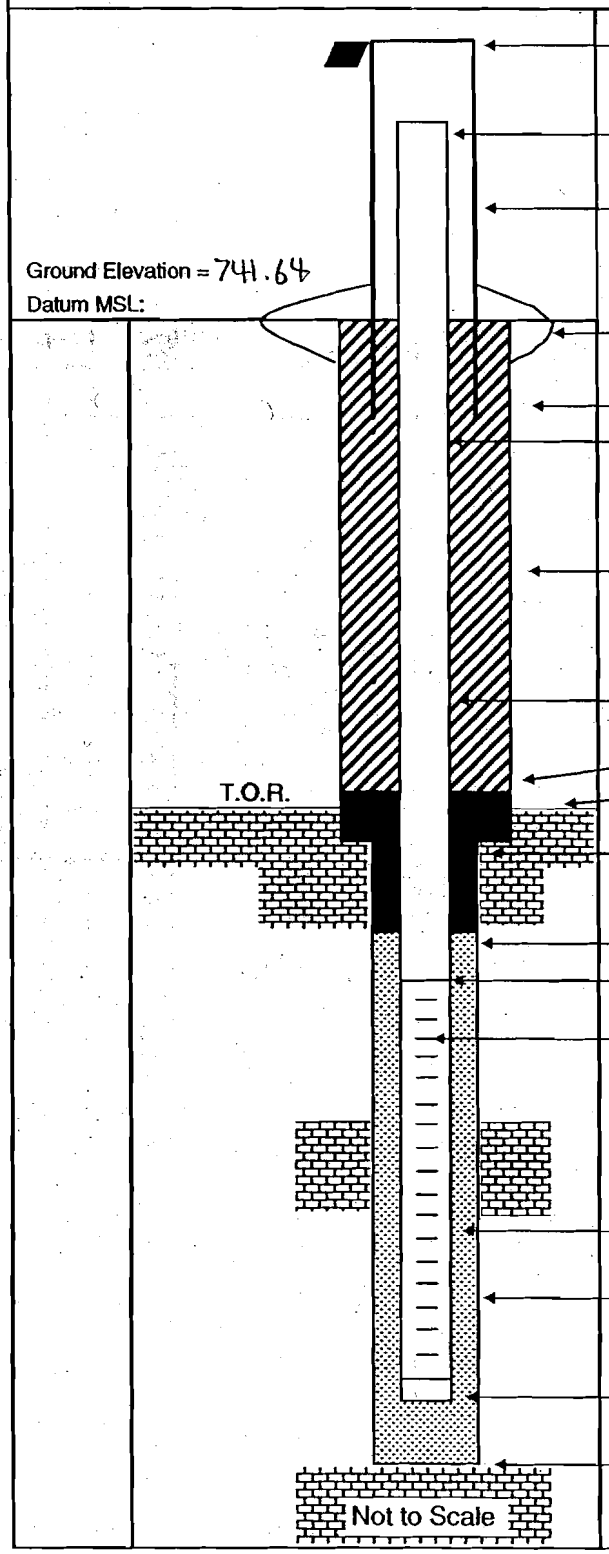
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT26

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT26
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	9-12-04
SITE:	SWMU-12	DRILLING METHOD:	HSA-ROT	NORTHING:	1313638.57
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3025981.12



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 743.72

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TEMP TO 9.5
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8½

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 738.64 / 3'

Elevation / Depth Top of Bedrock: 733.68 / 8'

Type of Seal:

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 730.68 / 11

Elevation / Depth of Top of Screen: 727.68 / 14

Type of Screen: PVC

Slot Size x Length: 20 x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock:
Core / Ream: 5½

Elevation / Depth of Bottom of Screen: 717.68 / 24

Elevation / Total Depth of Borehole: 716.68 / 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: TRUCK MOUNT B-59

BORING No.: 12 MWT 27
DATE: 9/2/04
GEOLOGIST: Charles C. Laney III
DRILLER: Ken Bochmer

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1						See Boring Log			Ø	Ø	Ø	Ø
	2						12MWT25 FOR						
	3						LITHOLOGY						
	4												
	5										Ø	Ø	Ø
	6						Boring was Drilled						
	7						without Sampling/coring						
	8												
	9												
	10										Ø	Ø	Ø
	11												
	12												
	13												
	14												
	15			15							Ø	Ø	Ø
	16												
	17												
	18												
	19												
	20										Ø	Ø	Ø
	21												
	22												
	23												
	24												
	25			25							Ø	Ø	Ø

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø

Remarks: 6" Temporary Casing set to 11' bgs.
Borehole was Reamed to 26' bgs.

Converted to Well: Yes X No ____ Well I.D. #: 12MWT27

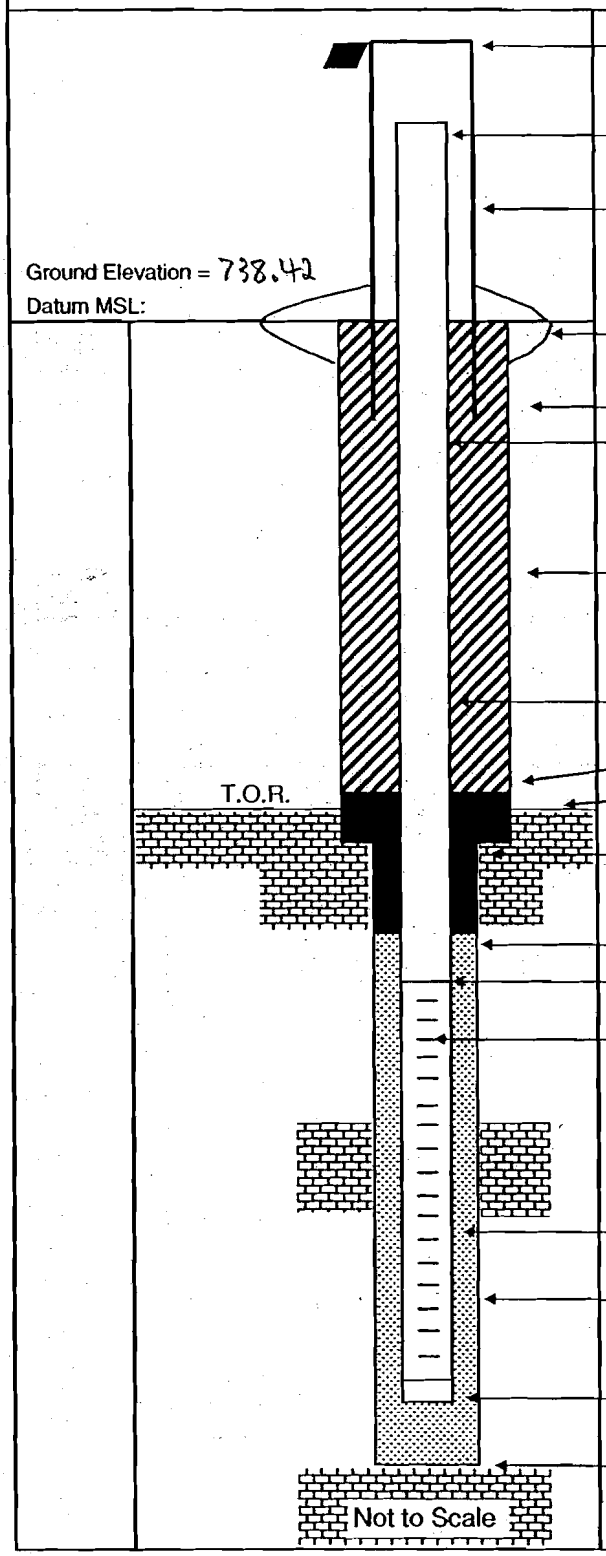
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12 MWT 27

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12 MWT 27
PROJECT No.:	N6878	DRILLER:	Ken Boehmer	DATE COMPLETED:	9/2/04
SITE:	SWMU-12	DRILLING METHOD:	HSA / ROT	NORTHING:	1313736.63
GEOLOGIST:	Charles C. Lowery III	DEV. METHOD:	Surge & Purge	EASTING:	3026477.23



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 740.52

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) 6" Temp To 11'

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8½ to 9'

Type of Backfill: Cement Bent. Grout

Elevation / Depth Top of Seal: 735.42 / 3'

Elevation / Depth Top of Bedrock: 728.42 / 10'

Type of Seal: Bentonite Chips

Elevation / Depth of Top of Fine Sand: NA / N/A

Elevation / Depth of Top of Filter Pack: 726.42 / 12'

Elevation / Depth of Top of Screen: 723.42 / 15'

Type of Screen: PVC

Slot Size x Length: 2ØSL x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5 QUARTZ SAND

Diameter of Hole in Bedrock: Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 713.42 / 25'

Elevation / Total Depth of Borehole: 712.42 / 26'

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT28
DATE: 8/30/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 e	0	2/4	1.5/2		STIFF	BRN TO GRAY	CLAYEY SILT/ SILTY	CL	MOIST.	0			
1700	2	4/5				BRN	CLAY-TR ROOTS	ML		0			
S-2 e		5/7	2/2		M STIFF	GRAY BRN	CLAYEY SILT-TR	ML	MOIST	0			
1715	4	7/10					ROOTS			0			
S-3 e		4/7	2/2		STIFF	BRN	CLAYEY SILT-TR	ML	MOIST	0			
1718	6	8/12				GRAY	WEATH ROCK FRAGS			0			
S-4 e		9/11	1.5/2		V STIFF	ORANG BRN	CLAYEY SILT-TO	ML	MOIST	0			
1722	8	23/36	.5/1.5				WEATH SANDSTONE	SM		0			
S-5 e	8.5	50/5"		8.5 11FE11E		TAN BRN			REF @ 8.5±	0			
1730	9.5		9.5		M SOFT	GRAY BRN	CLAYEY WEATH SANDSTONE	VBR	START CORING @	0			
1745						TO ORANG			1745 POOR REC DUE	0			
						BRN			TO WEATHERING AND HARDNESS	0			
0	1	0%	2/5.5						CORED MOSTLY DRY	0			
									VBR AND FRIABLE TR WATER ≈ 11'.	0			
1800	15			15						0			
1810				16.0±				VBR	SEVERAL HORIZ	0			
					M HARD	BRN	SANDSTONE		JNTS-SOME H2O TIGHTLY TO LOOSELY	0			
4/5	2	8%	4.4/5					TO	SPACED JNTS SHOULD MAKE	0			
				19.0				BR	WATER (THIS RUN)	0			
1825	20			19.6	M SOFT	BRN	MUDSTONE/SHALE	BR		0			
					M HARD	BRN	SANDSTONE			0			
1830				GRAY @ 21'		GRAY TO	SANDSTONE W/ BLACK	VBR	VBR @ 21' W/ H2O	0			
						GRAY	LAMINATED STREAKS	BR	21.7 HORIZ JNT TR H2O	0			
4/5	3	28%	5/5						21.4 } HORIZ JNTS 22.6 } TIGHTLY	0			
									23.9 } SPACED TR H2O	0			
1850	25			25					FRIABLE @ 25±	0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4 HSA TO USING AUTO HAMMER & 2" SPOONS
SET TEMP CASING TO 9.5 WELL 15-25, SAND 12-26
REAM W 5 1/2" TO 26 CHIPS TO 3'.

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT28

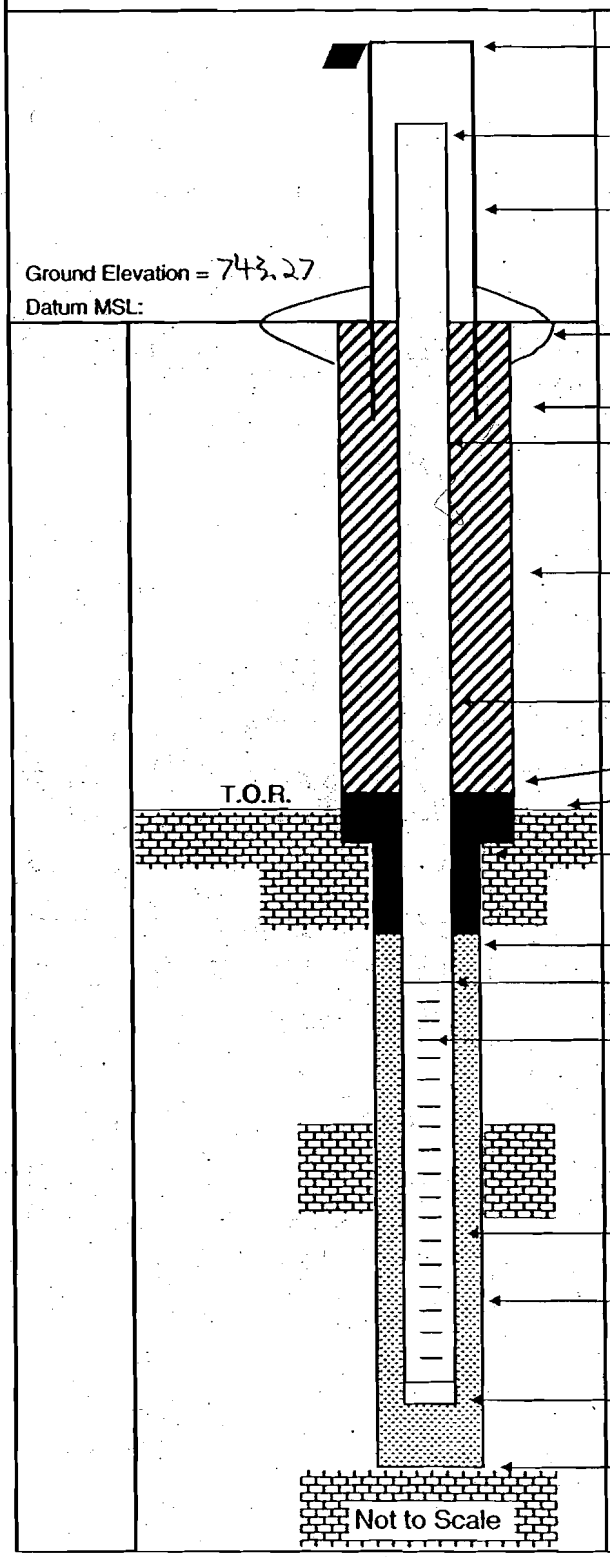
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT28

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT28
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/30/04
SITE:	SWMU-12	DRILLING METHOD:	HSA - ROT	NORTHING:	1313506.96
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026352.09



Elevation of Top of Casing:	NA
Stick Up of Casing Above Ground Surface:	NA
Elevation of Top of Riser:	745.53
I.D. of Surface Casing:	
Type of Surface Casing:	steel
Type of Surface Seal:	
I.D. and Depth of Permanent Casing: (if applicable)	TEMP TO 9.5
I.D. of Riser:	2"
Type of Riser:	PVC
Borehole Diameter:	8½"
Type of Backfill:	BENTONITE CHIPS
Elevation / Depth Top of Seal:	740.27 / 3'
Elevation / Depth Top of Bedrock:	734.77 / 8.5'
Type of Seal:	
Elevation / Depth of Top of Fine Sand:	NA / NA
Elevation / Depth of Top of Filter Pack:	731.27 / 12
Elevation / Depth of Top of Screen:	728.27 / 15
Type of Screen:	PVC
Slot Size x Length:	20 x 10'
I.D. of Screen:	2"
Type of Filter Pack:	GLOBAL #5
Diameter of Hole in Bedrock: Core / Ream:	5½"
Elevation / Depth of Bottom of Screen:	718.27 / 25
Elevation / Total Depth of Borehole:	717.27 / 26

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT29
DATE: 8/31/04
GEOLOGIST: CONTI
DRILLER: WALSH

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sample BZ	Borehole**	Driller BZ**
8/31	2300 HRS	0						6 1/4" ID HSA TO		FOR LITHOLOGY		0		
								TO SET 8"		SEE T03				
								TEMP CASING		BORING				
								DRILL 8" ϕ THRU		IN 12MWT03				
		5						8" CASING TO ~				0		
								9.5 FEET - SET						
								6" PERM CASING						
								TO 39.5 FEET (BGS)						
		10										0		
		15										0		
		20										0		
		25										0		

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT29

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT29
DATE: 8/31/04
GEOLOGIST: CONTI
DRILLER: WALSH

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness*	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sample BZ	Borehole**	Driller BZ**
		25						SANDSTONE				0		
		30										0		
		35						SANDSTONE				0		
8/31		40								SET 6" PERM		0		
9/10	0840					M HARD	GRAY	FINE GR SANDSTONE VBR & DEC TO ≈ 44' TR THIN SHALE INTERBEDS	VBR	CASING TO 39.5' BGS ON 9-1-04 @ 0100 HRS TR H2O 40→44				
	2.9/9	①	32%	9/4					BR			0		
					45.5	M SOFT	GRAY	SILTY SHALE	BR	SEVERAL BEDDING PLANE BREAKS NOT MUCH H2O				
	0900	49												
	0915				49.5	M HARD	GRAY	SANDSTONE - TR SHALE INTERBEDS				0		

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: NX (9-10-04) START @ 40'

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT29

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT29
DATE: 9-10-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ*	Borehole**	Driller BZ**
	50				M HARD	GRAY	SANDSTONE	VBR			0		
								BR	51.7 → 51.8 LOW ∠ JNT (H2O) TR.				
									52.8 HORIZ JNT				
									TR WATER				
				54									
4.1/10	2	41%	10/10		M SOFT	GRAY	SHALE (SILTY)	BR			0		
	59												
1600									STILL DRILLING W/ LOTS OF DUST - IR		0		
									NO WATER				
									RUN (3) BR → VBR W/ SEVERAL				
				62±									
					M HARD	GRAY	SANDSTONE	BR	HORIZ/BEDDING PLANE JNTS/				
1.7/10	3	17%	10/10	68.7 ±					BREAKS TR OF H2O IN				
					M SOFT	GRAY	SHALE (SILTY)	BR	TIGHTLY SPACED JNTS - DUST		0		
									STILL COILES W/ DUST				
				68±		LT							
1034	69				M HARD	GRAY	SILTSTONE/ SANDSTONE (F.GR)	BR					
1050				70			TO 72± (SILTY)		70' HORIZ JNT		0		
							W/ V THIN SHALE INTERBEDS		71' " " TR H2O				
				72±					71.8 " "				
6.4/10	4	64%	10/10			GRAY	SANDSTONE	BR					
									73.1 LOW ∠ JNTS 73.5				
									74.5 H2O		0		

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: NX CORE IN ROCK
REAM TO 5 1/2" Φ

WELL 70-88

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT29

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT29
DATE: 9-10-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sample BZ	Borehole**	Drillers BZ**
	75					LT							
					M HARD	GRAY	SANDSTONE w/ THIN SHALE INTERBEDS	BR	75' HORIZ JNT TR WATER		0		
						TO 72'			76.1 76.4 TR H2O				
									76.9 HORIZ JNT H2O				
1115	79												
1235									78.7 LO ∠ JNT TR H2O		0		
					M HARD	GRAY	SANDSTONE - INTERBEDS W/ SHALE						
									82 LO ∠ JNT TR H2O				
									82.3 HORIZ JNT				
									82.9 " " TR H2O				
6/10	5	60%	10/10								0		
									TR H2O				
				86.5 ±					86.5 HORIZ JNT				
					M SOFT	GRAY	SHALE						
				88									
1300	89			89									
				89 BOTM							0		
							REAM TO 89						
							WELL @ 88 TO 70						
							SAND 68 TO 89						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT29

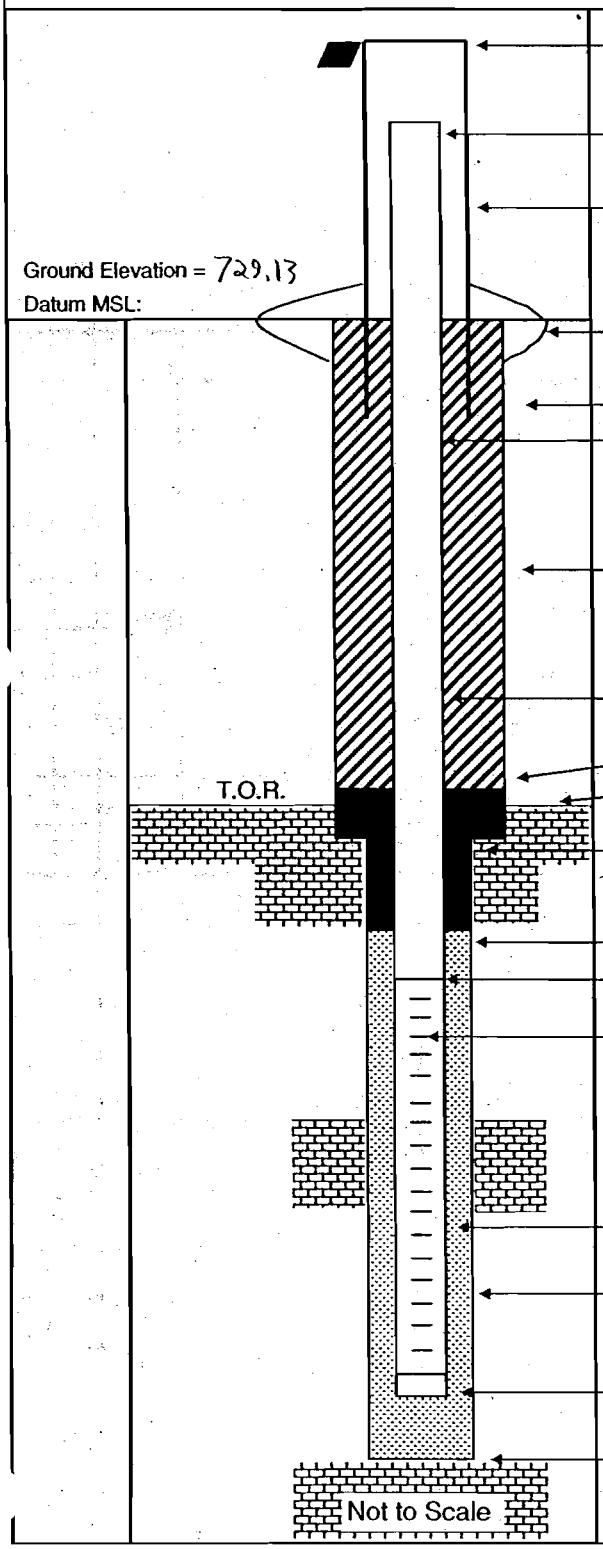
Tetra Tech NUS, Inc.

BEDROCK MONITORING WELL SHEET

WELL No.: 12MWT29

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT29
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	9-10-04
SITE:	SWMU-12	DRILLING METHOD:	HSA-ROT	NORTHING:	1312653.54
GEOLOGIST:	CONTI	DEV. METHOD:	Waterra	EASTING:	3026079.78



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 731.23

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal: 6"

I.D. and Depth of Permanent Casing: (if applicable) 39.5

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 10"

Type of Backfill: CEMENT/BENT GROUT

Elevation / Depth Top of Seal: 671.13 / 58'

Elevation / Depth Top of Bedrock: 722.13 / ≈7'

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 661.13 / 68

Elevation / Depth of Top of Screen: 659.13 / 70

Type of Screen: PVC

Slot Size x Length: 20 x 18'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock: Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 641.13 / 88

Elevation / Total Depth of Borehole: 640.13 / 89

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT30
DATE: 8/28/04 / 8/29/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sample BZ	Borehole**	Driller BZ
	0						USING 6 1/4" ID			0			
							HSA TO SET						
							TEMP 8"Ø CASING						
							≈ 9.5'						
	5									0			
							REAM WITH 8" BIT						
							THRU 8" CASING						
							TO ≈ ' THEN						
							SET 6"Ø STEEL						
							PERM CASING TO						
							39.5 FEET						
0900	10						SANDSTONE			0			
	15									0			
	20						SANDSTONE		≈18 → 23	0			
									SOME WATER				
									NOTED				
1000	25									0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: SEE ABOVE

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT30

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT30
DATE: 8/28/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ**	Borehole**	Driller BZ**
	25					GRAY BRN	SANDSTONE			0			
						TO							
	30					GRAY					0		
	35										0		
							TR SILTSTONE-						
							SHALE VIA CUTTINGS.						
8/28	40								SET PERM		0		
8/29							START TO REAM BELOW		CAS @ 39.5' BGS				
							CASING W/ 5½" BIT						
							AIR ROT.		42→43 POSSIBLE COAL				
						DK							
	45			±45		GRAY	SHALE		(From Cutting)		0		
	50										0		

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT30

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT30
DATE: 8-29-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sample BZ**	Borehole**	Driller BZ**
	50										0		
	55			55			SHALY				0		
	58						MORE SILTY @ 58'		DRY				
	60						SANDSTONE				0		
	65						SANDSTONE				0		
	70			70'							0		
1230	71						SHALY AT 71± SANDSTONE.		STILL DRILLING DRY. WAIT 1/2 HR @ 71 STILL DRY				
	75										0		

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT30

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550ATV

BORING No.: 12MWT30
DATE: 8/29/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sample-BZ	Borehole**	Driller-BZ**
	75												
							FINE SANDSTONE				0		
	80						SANDSTONE				0		
	85						SANDSTONE.				0		
	90						SANDSTONE (FINE)				0		
				TD ≈ 90.5									
							WELL 70 → 90						
							SAND 65 → 90.5						
							CHIPS TO 49						
	95												
	100												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT30

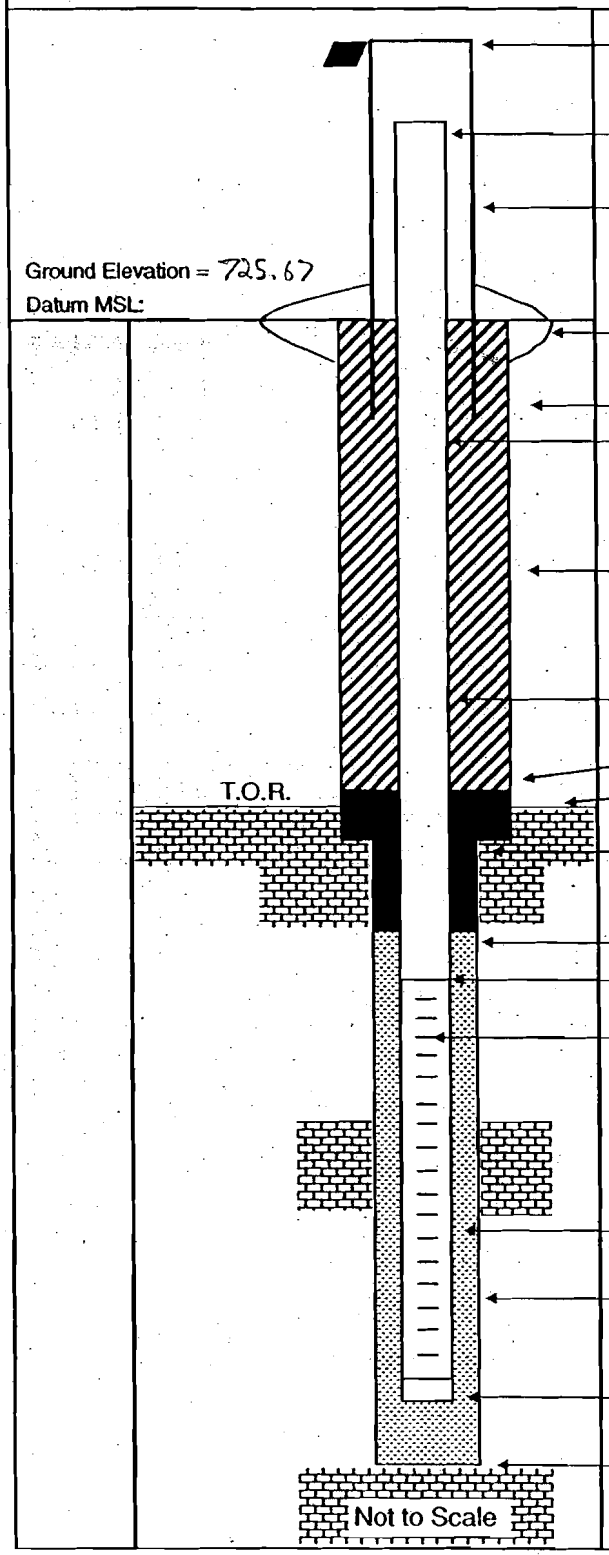
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT30

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT30
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/29/04
SITE:	SWMU-12	DRILLING METHOD:	HSA / AIR ROT	NORTHING:	1311604.34
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026576.32



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 727.59

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: 39.5'
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 10"

Type of Backfill: CEMENT/BENT GROUT

Elevation / Depth Top of Seal: 676.67 / 49

Elevation / Depth Top of Bedrock: 717.67 / ≈8'

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 660.67 / 65

Elevation / Depth of Top of Screen: 655.67 / 70

Type of Screen: PVC

Slot Size x Length: 20x20'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock:
Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 635.67 / 90

Elevation / Total Depth of Borehole: 635.17 / 90.5

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12 MWT 31
DATE: 8/29/04
GEOLOGIST: Charles C. Lancy III
DRILLER: Ken Boehmer

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1						See Log 12MWT15				Ø	Ø	Ø
	2						For Lithology From						
	3						Ø-25' bgs.						
	4												
	5										Ø	Ø	Ø
	6												
	7												
	8												
	9												
	10										Ø	Ø	Ø
	11												
	12												
	13												
	14												
	15										Ø	Ø	Ø
	16												
	17												
	18												
	19												
	20										Ø	Ø	Ø
	21												
	22												
	23												
	24												
	25										Ø	Ø	Ø

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Temporary Casing Set to 9.5' bgs.

Drilling Area Background (ppm): Ø

Converted to Well: Yes X No ____ Well I.D. #: 12MWT31

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12 MWT 31
DATE: 8/29/04 → 8/30/04
GEOLOGIST: Charles C. Lancy III
DRILLER: Ken Boehmer

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	26												
	27												
	28												
	29												
	30										0	0	0
	31												
	32												
	33												
	34												
	35										0	0	0
	36												
	37												
	38												
	39												
	40										0	0	0
	41				SOFT	Dark GRAY	Weathered Siltstone		V.B.R.	0	0	0	0
	42				"	"	"		"	0			
	43				"	"	"		"	0			
	44				Medium HARD	Light Gray	SANDSTONE W/ interbedded thin Siltstone layers,		BR. Dark Gray Banding	0			
C-1 3/10	45	30%	7.1/10'		"	"	"		"	0			
	46				"	"	"		"	0			
	47				"	"	"		"	0			
	48				"	"	"		"	0			
	49				"	"	"		"	0			
1745	50				"	"	"		"	0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Permanent Casing set to 40' bgs

Drilling Area Background (ppm): 0

Converted to Well: Yes X No ____ Well I.D. #: 12MWT31

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12 MWT 31
DATE: 8/30/04
GEOLOGIST: Charles C. Lanev III
DRILLER: Ken Boehmer

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
		51				SOFT	Light Gray	Weathered Shale		V.B.R.	Ø	Ø	Ø	Ø
		52				"	"	"		"	Ø			
		53				"	"	"		"	Ø			
						"	DARK GRAY	Weathered Mudstone w/ shale		"				
		54				MEDIUM HARD	GRAY	SILTSTONE		BR.	Ø			
C-2	Ø.3/10	55	30%	4.1/10'		"	"	SANDSTONE		"	Ø			
		56				"	"	"		"	Ø			
		57				"	"	"		"	Ø			
		58				"	"	"		"	Ø			
		59				"	"	"		"	Ø			
	182Ø	60				"	"	"		"	Ø			
		61				SOFT	"	MUDSTONE		"	Ø	Ø	Ø	Ø
		62				"	"	"		"	Ø			
		63				MEDIUM HARD	"	SANDSTONE		"	Ø			
		64				"	"	"		"	Ø			
C-3	Ø.75/10	65	7.5%	8.7/10'		"	"	"		"	Ø			
		66				"	"	"		"	Ø			
		67				"	"	"		"	Ø			
		68			68	"	"	"		"	Ø			
		69				"	"	"		"	Ø			
	194Ø	70				MEDIUM SOFT	"	SANDSTONE w/ trace fossils		V.B.R.	Ø			
		71				MEDIUM HARD	"	SANDSTONE w/ Shaly Siltstone INTERBEDDED		Black Horizontal Bands B.R.	Ø	Ø	Ø	Ø
		72				"	"	"		"	Ø			
		73				"	"	"		"	Ø			
		74				"	"	"		"	Ø			
C-4	2.2/10	75	22%	9.6/10'		"	"	"		"	Ø			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): Ø

Converted to Well: Yes X No ____ Well I.D. #: 12 MWT 31

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12MWT 31
DATE: 8/30/04
GEOLOGIST: Charles C. Lawey III
DRILLER: Ken Boehmer

Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	76				"	"	"		"	ϕ			
	77				"	"	"		"	ϕ			
	78				"	"	"		"	ϕ			
	79				"	"	"		"	ϕ			
1945	80				"	"	"		"	ϕ			
	81				"	"	SANDSTONE w/ interbedded Siltstone layers		"	ϕ	ϕ	ϕ	ϕ
	82				"	"	"		"	ϕ			
	83				SOFT	DARK GRAY	Weathered Shaley Siltstone, wet		"	ϕ			
	84				"	"	"		"	ϕ			
1.9/10	85	19%	9.2/10'		"	"	"		"	ϕ			
	86				"	"	"		"	ϕ			
	87				"	"	"		"	ϕ			
	88				"	"	"		"	ϕ			
	89			88'	"	"	"		"	ϕ			
2430	90				MEDIUM HARD	GRAY	SANDSTONE w/ interbedded Siltstone layers		"	ϕ			

C-5

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Hole Reamed to 90' bgs.

Drilling Area Background (ppm): ϕ

Converted to Well: Yes X No ____ Well I.D. #: 12MWT31

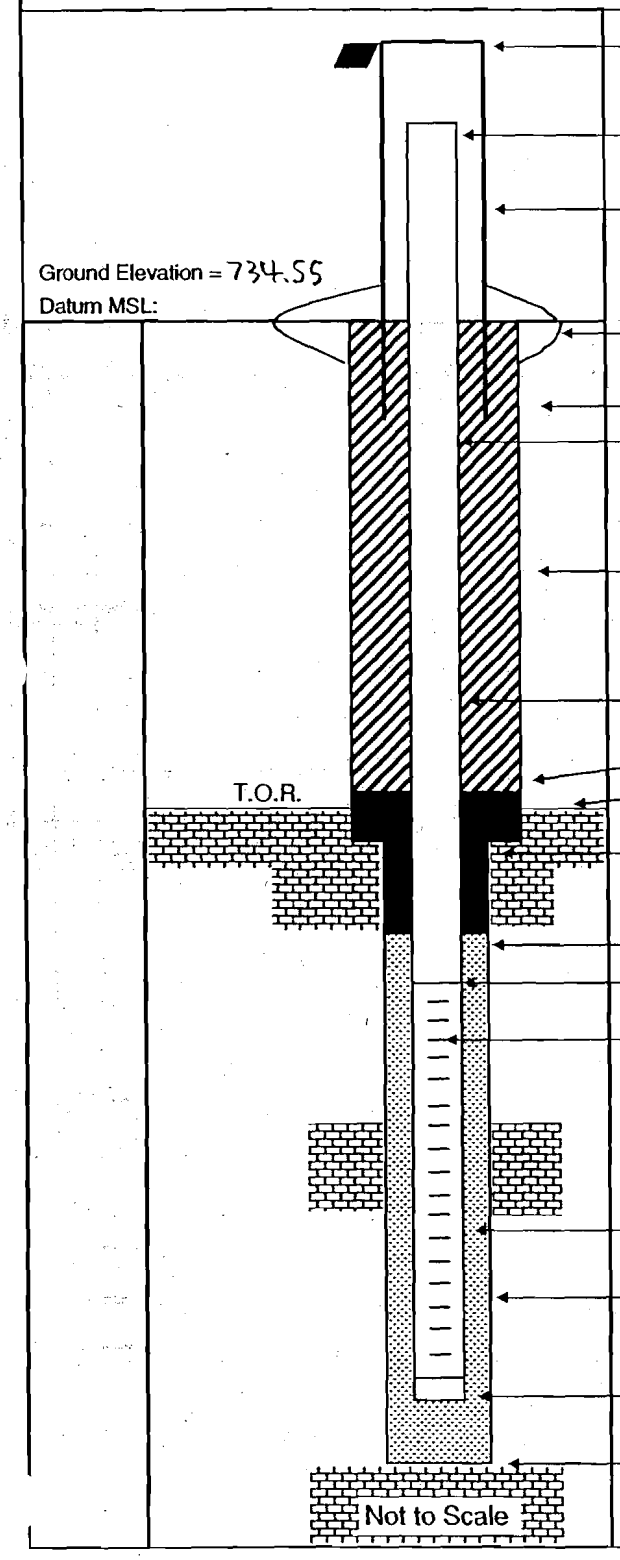
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT31

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT31
PROJECT No.:	N6878	DRILLER:	Ken Boehmer	DATE COMPLETED:	8/30/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	1312970.99
GEOLOGIST:	Charles C. Laney III	DEV. METHOD:	Waterra	EASTING:	3026872.87



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 736.75

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) 6" to 40.0'

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: [redacted] 10"

Type of Backfill: Cement Bent. Grout

Elevation / Depth Top of Seal: 679.55 / 55.0'

Elevation / Depth Top of Bedrock: 725.05 / 9.5'

Type of Seal: Bentonite Chips

Elevation / Depth of Top of Fine Sand: NA / N/A

Elevation / Depth of Top of Filter Pack: 669.55 / 65.0'

Elevation / Depth of Top of Screen: 666.55 / 68.0'

Type of Screen: PVC

Slot Size x Length: 20 SL x 10'

I.D. of Screen: 2"

Type of Filter Pack: Global #5 Quartz Sand

Diameter of Hole in Bedrock: Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 646.55 / 88.0'

Elevation / Total Depth of Borehole: 645.55 / 89.0'

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: TRUCK MOUNT B-59

BORING No.: 12 MWT 32
DATE: 8/29/04
GEOLOGIST: Charles C. Laney III
DRILLER: Ken Boehmer

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1						See Log 12 MWT 19				Ø	Ø	Ø
	2						for Lithology from						
	3						Ø - 26' bgs.						
	4												
	5										Ø	Ø	Ø
	6												
	7												
	8												
	9												
	10										Ø	Ø	Ø
	11												
	12												
	13												
	14												
	15										Ø	Ø	Ø
	16												
	17												
	18												
	19												
	20										Ø	Ø	Ø
	21												
	22												
	23												
	24												
	25										Ø	Ø	Ø

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Temp. Casing set to 10' bgs.

Drilling Area Background (ppm): Ø

Converted to Well: Yes X No ____ Well I.D. #: 12 MWT 32

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12 MWT 32
DATE: 8/29/04; 8/31 → 9/1/04
GEOLOGIST: Charles C. Lanier III
DRILLER: Ken Boehmer

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	26												
	27												
	28												
	29												
	30									0	0	0	0
	31												
	32												
	33												
	34												
	35										0	0	0
	36												
	37												
	38												
	39												
	40									0	0	0	0
	41				Medium Soft	Gray	Siltstone interbedded w/ sandstone		Black Horizontal Bands Br.	0			
	42				"	"	"		Has Appearance of Granite	0			
	43				"	"	"		"	0			
	44				"	"	"		"	0			
2.2/9	45	24%	7.3/9'		"	"	"		"	0			
	46				"	"	"		"	0			
	47				"	"	"		"	0			
	48				"	"	"		"	0			
2340	49				"	"	"		"	0			
	50				Soft	Light Gray	Siltstone		Br.	0	0	0	0

C-1

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Permanent casing set to 40' bgs

Drilling Area Background (ppm): 0

Converted to Well: Yes X No ____ Well I.D. #: 12MWT 32

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12 MWT 32
DATE: 8/31 → 9/1/04
GEOLOGIST: Charles C. Laney III
DRILLER: Ken Boehmer

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		51				"	"	"		"	Ø			
		52				"	"	"		"	Ø			
		53				"	"	"		"	Ø			
C-2	1.3/10	54	13%	6.6/10'		"	"	"		"	Ø			
		55				"	"	"		"	Ø			
		56				"	"	"		"	Ø			
		57				"	"	"		"	Ø			
		58				"	"	"		"	Ø			
	233Ø	59				Medium Hard	"	SANDSTONE		"	Ø			
		6Ø				"	"	SILTSTONE		"	Ø	Ø	Ø	Ø
		61				"	"	"		"	Ø			
		62				"	"	"		"	Ø			
		63				"	"	"		"	Ø			
		64				"	"	"		"	Ø			
C-3	3.5/10	65	35%	9.6/10'		"	GRAY	SANDSTONE INTERBEDDED WITH SHALY SILTSTONE (BLACK Horizontal & Vertical Bands)		BR. Almost Appears as Granite	Ø			
		66				"	"	"		"	Ø			
		67				"	"	"		"	Ø			
		68				"	"	"		"	Ø			
	ØØØØ	69				"	"	"		"	Ø			
		7Ø				"	Light to Dark GRAY	SANDSTONE Interbedded w/ Shaly Siltstone		"	Ø	Ø	Ø	Ø
		71				"	"	Shaly Siltstone		"	Ø			
		72				"	"	"		"	Ø			
		73				"	"	"		"	Ø			
C-4	2.7/10	74	27%	10/10'		"	"	"		"	Ø			
		75				"	"	SANDSTONE Interbedded w/Shaly SILTSTONE		"	Ø			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø

Remarks:

Converted to Well: Yes X No ____ Well I.D. #: 12MWT32

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: TRUCK MOUNT B-59

BORING No.: 12 MWT 32
DATE: 9/1/04
GEOLOGIST: Charles C. Lawey III
DRILLER: Ken Bochmer

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		76				"	"	"		"	ϕ			
		77				"	"	Shaly Siltstone		Some Banding	ϕ			
		78				"	"	"		"	ϕ			
	ϕϕ3ϕ	79			79'	"	"	"		"	ϕ			
		8ϕ				Medium Soft	Dark Gray	Shaly Siltstone (weathered)		BR. Some Fossils	ϕ	ϕ	ϕ	ϕ
		81				"	"	"		"	ϕ			
		82				"	"	"		"	ϕ			
		83				"	"	"		"	ϕ			
		84				"	"	"		"	ϕ			
C-5	1.2/10	85	12%	9.3/10'		"	"	"		"	ϕ			
		86				MED. HARD	"	SHALE		"	ϕ			
						"	"	SILTSTONE		"				
		87				"	"	SANDSTONE w/ small fractures		"	ϕ			
		88				"	"	"		"	ϕ			
	ϕ13ϕ	89				"	"	"		"	ϕ			
		9ϕ				"	GRAY	SANDSTONE		BR.	ϕ	ϕ	ϕ	ϕ
		91				"	"	"		"	ϕ			
		92				Medium Soft	Dark Gray	Weathered Shaly Siltstone		"	ϕ			
		93				"	"	"		"	ϕ			
		94				"	"	Shaly Siltstone		"	ϕ			
C-6	2.6/10	95	26%	5.4/10		"	"	"		"	ϕ			
		96				"	"	"		"	ϕ			
		97				"	"	"		"	ϕ			
		98				"	"	"		"	ϕ			
	173ϕ	99			99'	"	"	"		"	ϕ			
		1ϕϕ												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Hole Reamed to 100' bgs.

Drilling Area Background (ppm): ϕ

Converted to Well: Yes X No ____ Well I.D. #: 12 MWT 32

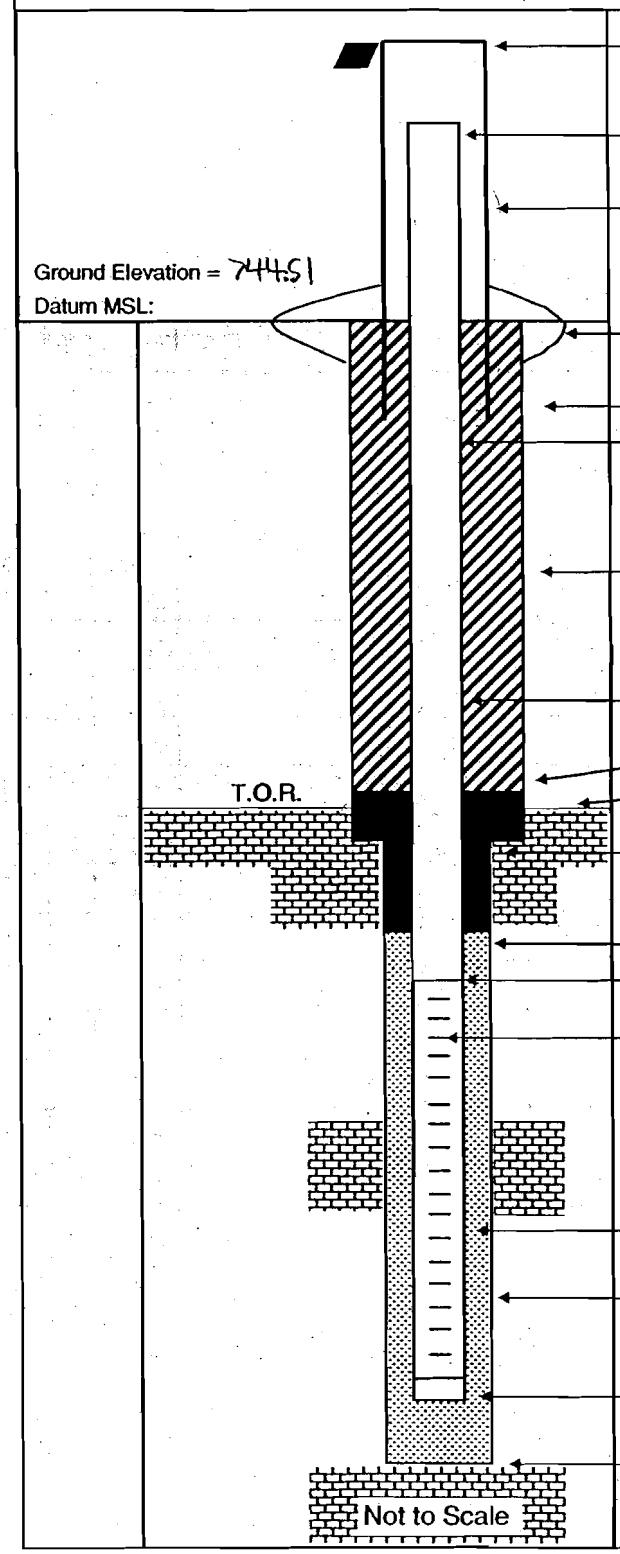
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT 32

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT 32
PROJECT No.:	N6878	DRILLER:	Ken Boehmer	DATE COMPLETED:	9/1/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/Rot	NORTHING:	1312015.49
GEOLOGIST:	CHARLES C. LAMEY III	DEV. METHOD:	Waterra	EASTING:	3027297.24



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 747.44

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) 6" to 40'

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 10"

Type of Backfill: Cement Bent. Grout

Elevation / Depth Top of Seal: 684.51 / 60'

Elevation / Depth Top of Bedrock: 734.51 / 10'

Type of Seal: Bentonite Chips

Elevation / Depth of Top of Fine Sand: NA / N/A

Elevation / Depth of Top of Filter Pack: 671.51 / 73'

Elevation / Depth of Top of Screen: 665.51 / 79'

Type of Screen: PVC

Slot Size x Length: 20SL X 20'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5 Quartz SAND

Diameter of Hole in Bedrock: Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 645.51 / 99'

Elevation / Total Depth of Borehole: 644.51 / 100'

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12 MWT 33
DATE: 8/31/04
GEOLOGIST: Charles C. Laney III
DRILLER: Tom Boehmer

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	1									Ø			
	2						See Log 12 MWT25			Ø			
	3						For Lithology From			Ø			
	4						Ø - 25' bgs.			Ø			
	5									Ø			
	6									Ø			
	7									Ø			
	8									Ø			
	9									Ø			
	10									Ø			
	11									Ø			
	12									Ø			
	13									Ø			
	14									Ø			
	15									Ø			
	16									Ø			
	17									Ø			
	18									Ø			
	19									Ø			
	20									Ø			
	21									Ø			
	22									Ø			
	23									Ø			
	24									Ø			
	25									Ø			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Temporary Casing Set To 10.5' bgs

Drilling Area Background (ppm): Ø

Converted to Well: Yes X No ____ Well I.D. #: 12MWT33

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12 MWT 33
DATE: 8/31/04
GEOLOGIST: Charles C. Lanky III
DRILLER: Tom Boehmer

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		26												
		27												
		28												
		29												
		30												
		31												
		32												
		33												
		34												
		35												
		36												
		37												
		38												
		39												
		40												
		41				MEDIUM HARD	GRAY	SANDSTONE		V. BR.	0			
		42				"	"	"			0			
		43				"	"	"			0			
						SOFT	BLACK	COAL		TRACE PYRITE				
		44				"	"	"			0			
C-1	59%/91	45	65%	91/91		"	"	"			0			
						MEDIUM HARD								
		46					GRAY	SANDSTONE			0			
		47				"	"	"			0			
		48				MEDIUM SOFT	DRK GRAY	CLAYSTONE			0			
9/2/04 →	0040	49				"	"	"			0			
		50				MEDIUM HARD	"	SANDSTONE INTERBED.		BLOCKY				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Permanent Casing Set to 35.5' bgs.

Drilling Area Background (ppm): 0

Converted to Well: Yes X No ____ Well I.D. #: 12MWT33

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12 MWT 33
DATE: 9/2/04
GEOLOGIST: Charles C. Laney III
DRILLER: Tom Boehmer

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		51				medium HARD	Dark Gray	SANDSTONE INTERBEDDED W/ SILTSTONE		BLOCKY A LOT OF BANDING	ϕ			
		52				"	"	"		"	ϕ			
		53				"	"	"		"	ϕ			
	8.4/10	54	84%	9.8/10		"	"	"		"	ϕ			
C-2		55				"	"	"		"	ϕ			
		56				"	"	"		"	ϕ			
		57				"	"	"		"	ϕ			
		58				"	"	"		"	ϕ			
	ϕnϕ	59				"	"	"		"	ϕ			
		6ϕ				"	"	SANDSTONE INTERBEDDED W/ SILTSTONE & SHALE		V.B.R. FROM 61-62'	ϕ			
		61				"	"	"		+ FROM 62.5-63'	ϕ			
		62				"	"	"		REST. BLOCKY A LOT OF BANDING	ϕ			
		63				"	"	"		"	ϕ			
	4.4/10	64	46%	9/10		"	"	"		"	ϕ			
C-3		65				"	"	"		"	ϕ			
		66				"	"	"		"	ϕ			
		67				"	"	"		"	ϕ			
		68				"	"	"		"	ϕ			
	ϕ145	69				"	"	"		"	ϕ			
		7ϕ				"	"	"		BLOCKY. A LOT OF BANDING	ϕ			
		71				"	"	"						
						SOFT	BLACK	COAL (70.7 → 72')		V.B.R.	ϕ			
		72				"	"	" "		"	ϕ			
		73				Medium Hard	Black	SILTSTONE		"	ϕ			
C-4	4.4/10	74	41%	9/10	74	"	Dark Gray	SANDSTONE INTERBEDDED W/ SILTSTONE		BLOCKY	ϕ			
		75				"	"	"		"	ϕ			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: C-2 Core fell into Hole once & had to Be Retrieved

Drilling Area Background (ppm): ϕ

Converted to Well: Yes X No ____ Well I.D. #: 12 MWT 33

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12MWT33
DATE: 9/2/04
GEOLOGIST: Charles C. Lover III
DRILLER: Tom Boehmer

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		76				Medium Hard	Dark Gray	SANDSTONE INTERBEDDED W/ SILTSTONE		Blocky	ϕ			
		77				"	"	"		"	ϕ			
		78				"	"	"		"	ϕ			
	ϕ210	79				"	"	"		"	ϕ			
		80				"	"	"		Blocky → Broken w/ Depth				
		81				"	"	"		Fractures appear water bearing	ϕ			
		82				"	"	"		"	ϕ			
		83				"	"	"		"	ϕ			
		84				"	"	"		"	ϕ			
C-5	4.2/10	85	42%/10	9.5/10		"	"	"		"	ϕ			
		86				"	"	"		"	ϕ			
		87				"	"	"		"	ϕ			
		88				"	"	"		"	ϕ			
	ϕ230	89				"	"	"		"	ϕ			
		90				"	"	"		"	ϕ			
		91				"	"	"		"	ϕ			
C-6	9.8/5	92	38%/0	4.8/5		"	"	"		"	ϕ			
		93				"	"	"		"	ϕ			
	ϕ340	94			94	"	"	"		"	ϕ			
		95												
								BORING TERMINATED						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: Hole Reamed to 95' bgs.

Drilling Area Background (ppm): ϕ

Converted to Well: Yes X No ____ Well I.D. #: 12MWT33

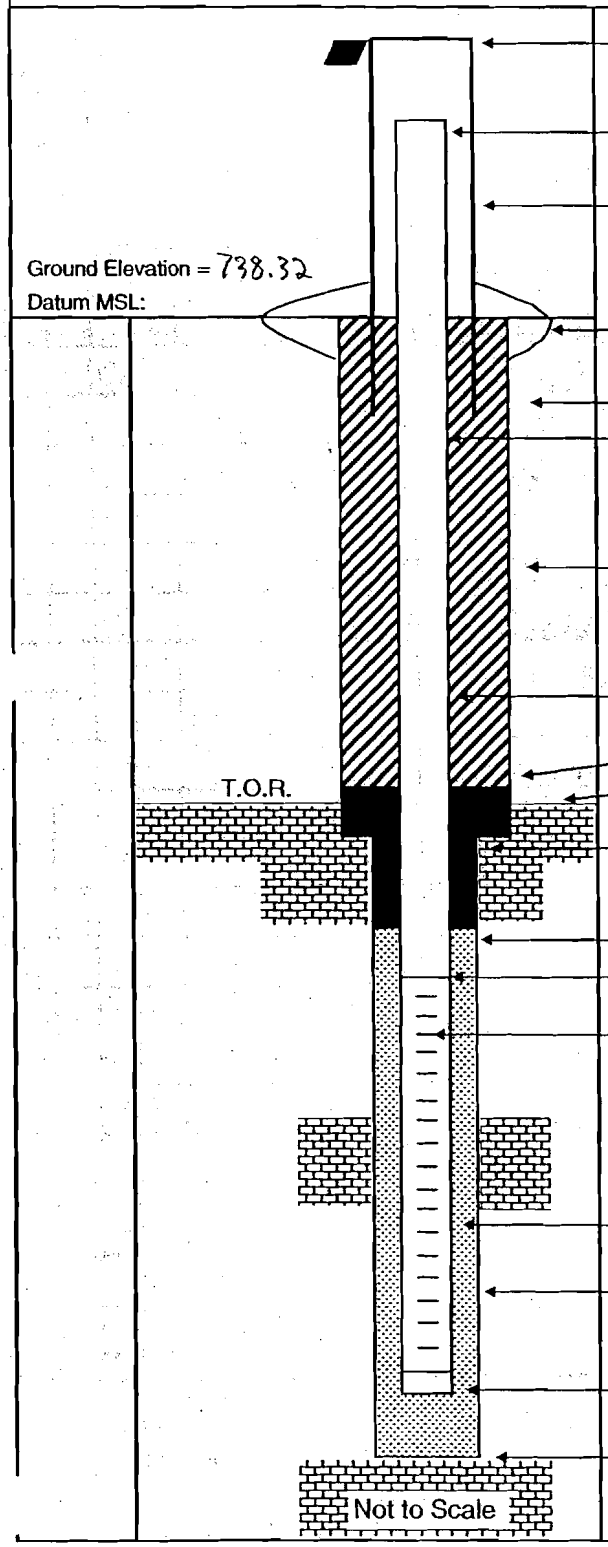
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT33

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT33
PROJECT No.:	N6878	DRILLER:	Ken Bochmer	DATE COMPLETED:	9/2/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	1313725.86
GEOLOGIST:	Charles C. Lanett III	DEV. METHOD:	Surge & Purge	EASTING:	3026481.26



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 740.49

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) 6" to 35.5'

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 10"

Type of Backfill: Cement Bentonite Grout

Elevation / Depth Top of Seal: 678.32 / 60'

Elevation / Depth Top of Bedrock: 727.82 / 10.5'

Type of Seal: Bentonite Chips

Elevation / Depth of Top of Fine Sand: NA / N/A

Elevation / Depth of Top of Filter Pack: 669.32 / 69'

Elevation / Depth of Top of Screen: 664.32 / 74'

Type of Screen: PVC

Slot Size x Length: 20 SL x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5 QUARTZ SAND

Diameter of Hole in Bedrock: Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 644.32 / 94'

Elevation / Total Depth of Borehole: 641.32 / 95'

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT34
DATE: 8/11/04 →
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ**	Borehole**	Driller BZ**
	0						FOR LITHOLOGY		THIS IS DEEP		0		
							TO 30' SEE LOG		WELL NEXT				
							12MWT24		TO 12MWT24				
							DRILL W/ 6¼" HSA						
	5						TO 9.5 TO MAKE				0		
							HOLE 10" Φ TO						
							SET TEMP 8" CASING		TO 9.5				
							THEN DRILL 8" Φ						
							AIR ROT TO ≈ 39.5						
	10						TO MAKE HOLE FOR				0		
							PERM 6" CASING						
							SET 6" CASING TO						
							39.5						
	15										0		
	20										0		
	25										0		

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT34

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV.

BORING No.: 12MWT34
DATE: 8/11/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	25												
							SET PERM CAS				0		
							TO 39.5						
							8" AIR ROT TO						
	30						39.5				0		
	35										0		
							START CORING @						
	40						40'				0		
1600					M HARD	GRAY	SANDSTONE w/ DARK INTERBEDS	BR	SEVERAL BEDDING PLANE BREAKS				
1.1/5	1	28%	5/5			BRN			42.1 42.3 TR H2O				
						GRAY			M SOFT TR 43.5 VBR. H2O				
1625	45			44.5±		DK	LAST 5" SHALE		TR H2O @ 45'		0		
					M SOFT	GRAY	SHALE	VBR	SEVERAL BEDDING PLANE BREAKS				
				47.0±									
8/5	2	16%	3.6/5		M HARD	GRAY	SANDSTONE	BR					
									49.5 → 49.7 VBR SHALY				
1645	50										0		

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: SET PERM CAS TO ≈ 39.5
NX CORE TO 90'
REAM TO 87 w/ 5 1/2" Ø

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT34

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT34
DATE: 8/12/04
GEOLOGIST: CONTI
DRILLER: WALSH

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole **	Driller BZ**
		50												
±	1655					M HARD	GRAY	SANDSTONE	BR	50.8 TIGHT 51.1 HORIZ		0		
										51.4 JNTS 51.5				
										52.3 HORIZ				
	3 7/8	3	46%	8/8	54					52.9 JNT				
		55				M SOFT	D GRAY	SHALE	VBR			0		
									BR	SHALE- SEVERAL HORIZ BEDDING				
									VBR	PLANE JNTS NO H2O — DRILL				
8/12	1745	58							TO	DRY.				
8/13	0845									SEVERAL HORIZ BEDDING				
		60							BR	PLANE BREAKS IN SHALE		0		
										NO NOTICEBLE H2O BEARING DRILLS DRY				
	2 4/10	4	24%	9.5/10	63.5									
		65				M HARD	GRAY	SANDSTONE	BR	64 JNT 64.5 "		0		
										65 " TIGHT				
	0915	68								SOME BEDDING PLANE BREAKS				
										HOLE DRILLING DRY.				
							TAN BRR	@70' SANDSTONE -	BR	69 JNT		0		
	3 4/5	5	68%	4.7/5				BECOMES MORE COARSE		71.7 } HORIZ JNT 72.3 }				
		73							VBR			0		
										RUN 6 SEVERAL WATER BEARING ZONES OBSERVED				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT34

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG:

BORING No.: 12MWT 34
DATE: 8/13/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	75							BR			0		
				76	M HARD	GRAY	SANDSTONE (FINER)		GRAYC 76.3 76.3 HORIZ JNT				
									77.5 HORIZ JNT				
						TAN			TAN BRNC 78.5				
	6					BRN							
3.5/10	80	38/0	10/10						79-79.4 VERT JNT		0		
									79.6-79.9 HIX W/ H2O JNT				
					M HARD	GRAY			GRAY AGAINC 81.5 81.5 VBR				
	83										0		
							NOTE: CORE WAS		WAS DRILLING				
							LOST AND BLOWN		DRY 83 TO 90				
							FROM HOLE WHILE TRYING TO FREE UP						
9/7	7	N/A	0/7	86			RODS, WHICH WERE STUCK IN HOLE.						
	90												
				90' BOTM OF CORE HOLE									
							REAM TO 87'						
							WELL 76-86						
							SAND 73-87						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT 34

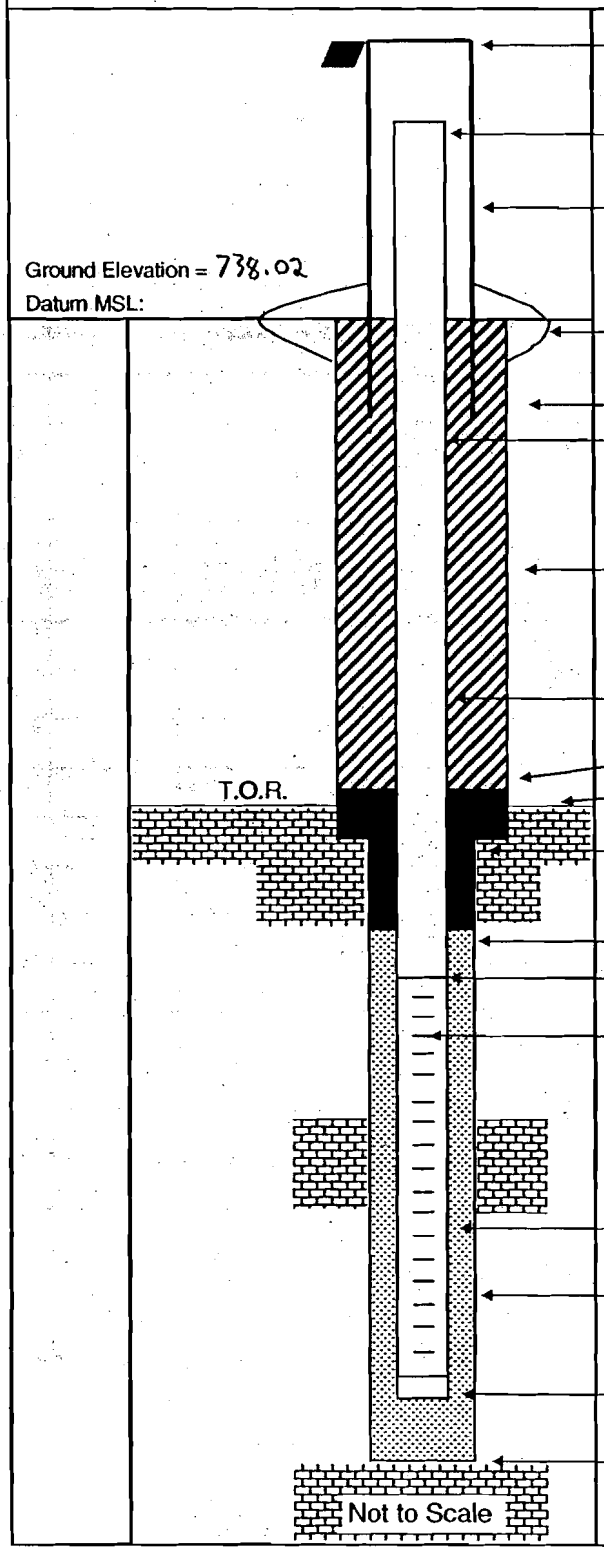
Tetra Tech NUS, Inc.

BEDROCK MONITORING WELL SHEET

WELL No.: 12MWT34

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT34
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/13/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/AIR ROT	NORTHING:	1310967.35
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3027183.73



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 740.52

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) 6"Φ TO 39.5

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 10"

Type of Backfill: CEMENT BENTONITE GROUT

Elevation / Depth Top of Seal: 675.02/ 63

Elevation / Depth Top of Bedrock: 727.02/ ≈11'

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 665.02/ 73

Elevation / Depth of Top of Screen: 662.02/ 76

Type of Screen: PVC

Slot Size x Length: 20 x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5 FILTER PACK

Diameter of Hole in Bedrock: Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 652.02/ 86

Elevation / Total Depth of Borehole: 651.02/ 87

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT35
DATE: 8/27/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
						MOTTLED							
S-1 e	0	3/4	1.5/2		STIFF	YELLOW GRAY	TOP 3" TOPSOIL SILTY CLAY -	CL	MOIST	0			
0820	2	4/4				BRN	CLAYEY SILT	ML		0			
S-2 e		4/3	1.3/2		M STIFF	GRAY BRN	SILTY CLAY - TR ROOTS	CL/ML	MOIST	0			
0825	4	4/3								0			
S-3 e		2/7	1.6/2							0			
0830	6	8/8		5.5± 6.0	LOOSE	ORANGE BRN	SILTY SAND - TR CLAY	SM CL	MOIST	0			
S-4 e		2/3	1.5/2		SOFT	GRAY	SILTY CLAY - IN SHOE TO CLAYEY SILT ROCK FRAG		↓ WET	0			
0833	8	5/5							TR OF H2O BUT	0			
S-5 e		1/1	1/2		SOFT	BRN GRAY	TR SAND		NOT SIG. AMT. MOIST → WET	0			
0838	10	2/6		≈10						0			
S-6 e		5/8	2/2		M DENSE	GRAY BRN	CLAYEY SAND	SC	MOIST	0			
0843	12	25/50		11.5±						0			
				11.5 ±	SOFT	TAN	WEATH SANDSTONE		START CORING	0			
0910					M HARD	GRAY BRN	SANDSTONE FRAGS	BR	≈ 0910	0			
				—	M SOFT			V BR	M SOFT @ 14' 14 - SOME H2O ≈ 14	0			
2 8/5	①	56%	4.8/5		M HARD			BR	& 14.7 HORIZ JNT	0			
0935				16					15.1 TIGHT JNT → 16.7 HORIZ JNT	0	TR H2O		
	17			17±					TR WATER	0			
0950					M SOFT	BRN	WEATHERED SHALY SANDSTONE INTERBEDDED W/DK GRAY SHALE	V BR		0			
						GRAY				0			
-4/5	②	8%	2-1/5							0			
				20.5	M	GRAY			POOR REC TOP	0			
1015	22				HARD	BRN	SANDSTONE	BR	3'± SOFT 21' JNT (TR H2O)	0			
1020				24					22 - M SOFT TR H2O	0			
1-4/5	③	28%	4.3/5	26	M HARD	BRN GRAY	SANDSTONE - INTERBEDDED W/SHALE TO 27'		(24-25 M SOFT SHALY) SEVERAL HORIZ JNTS TR H2O	0			
1055	27			27.0						0			

* When rock coring, enter rock brokeness. LAST 2FT (N.T.S. ON PAGE) TIGHTLY SPACED JNTS THRUOUT

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4" ID HSA/AUTO HAMMER - 2" SPOONS
SET TEMP CAS TO 12'
CORE (NX) 12 → 27. REAM W/ 5 1/2" BIT

WELL 16-26
SAND 13.5-27

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT35

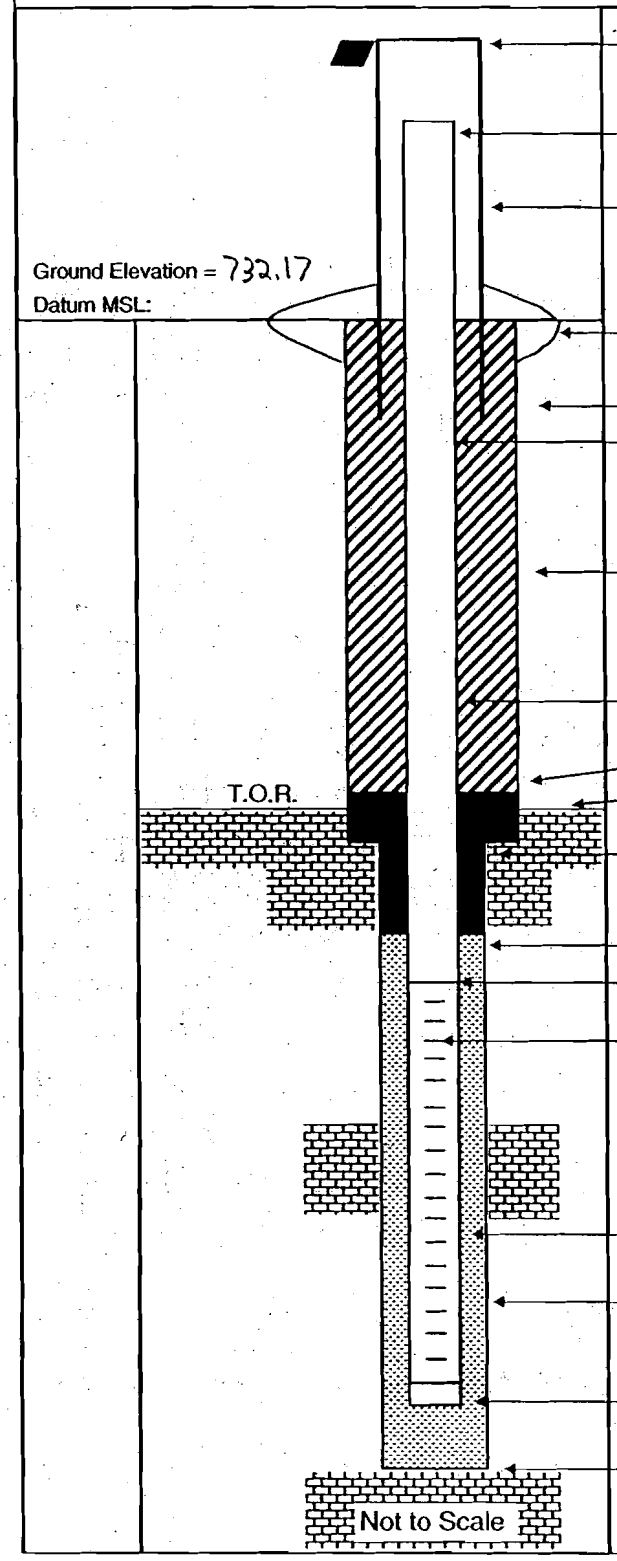
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT35

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT35
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/27/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	131271.38
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	302711.95



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 734.64

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TEMP TO 12'
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8½

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 729.17 / 3'

Elevation / Depth Top of Bedrock: 720.67 / 11.5

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 718.67 / 13.5

Elevation / Depth of Top of Screen: 716.17 / 16

Type of Screen: PVC

Slot Size x Length: 20 SL X 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock:
Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 706.17 / 26

Elevation / Total Depth of Borehole: 705.17 / 27

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: Truck Mount B-59

BORING No.: 12 MW T 36
DATE: 8/27/04
GEOLOGIST: Charles C. Laney III
DRILLER: Ken Bochmer

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ**	Borehole**	Driller BZ**
	S-1 @	1	20/15	1'		MEDIUM DENSE	ORG BRN	Gravels (0-6") CLAYEY SAND (6"-1')	SC	DRY	Ø	Ø	Ø	Ø
	Ø830	2	15/15			"	—	NO RECOVERY	—		—			
	S-2 @	3	10/12	1'		DENSE	ORG BRN	Silty CLAY w/ trace Red colored Rocks.	CL	DRY	Ø	Ø	Ø	Ø
	Ø835	4	35/12			"	—	NO RECOVERY	—		—			
	S-3 @	5	6/12	1.5'		"	ORG BRN	SANDY CLAY	CL	Trace MOIST	Ø	Ø	Ø	Ø
	Ø841	6	26/13			"	" / —	" " / NO RECOVERY	CL / —	Trace compacted SAND lenses	Ø			
	S-4 @	7	18 9Ø/4"	Ø.5'		VERY DENSE	ORG BRN MOTT. WHITE	SAND w/ trace compacted Sand lenses traces	SP	DRY	Ø	Ø	Ø	Ø
	Ø846	8				"	—	NO RECOVERY	—		—			
	S-5 @	9	26 9Ø/5"	1'		"	ORG BRN MOT. GRAY	SANDY CLAY Followed BY SANDSTONE	CL	DRY	Ø	Ø	Ø	Ø
	Ø8ØØ	1Ø				"	—	NO RECOVERY	—		—			
		11				MEDIUM HARD	GRAY	SANDSTONE		BL. w/ Fe Staining	Ø	Ø	Ø	Ø
		12				"	"	"		"	Ø			
C-1	1.6/5	13	32%/	3/5'		"	"	"		"	Ø			
		14				"	"	"		"	Ø			
		15			15	"	"	"		"	Ø			
		16				"	"	"		BR. w/ Fe Staining	Ø	Ø	Ø	Ø
		17				"	"	"		Fractures Have WET CLAY.	Ø			
C-2	1.83/5	18	37%/	4.5/5'		"	"	"		"	Ø			
		19				"	"	"		"	Ø			
		2Ø				"	"	"		"	Ø			
		21				"	"	"		"	Ø	Ø	Ø	Ø
		22				"	"	SANDSTONE INTERBED W/ Shaly Siltstone @ 21'8"		"	Ø			
C-3	1/5	23	29%/	4/5'		"	"	"		"	Ø			
		24				"	"	"		"	Ø			
		25			25	"	"	"		"	Ø			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø

Remarks: Grass/Gravel lot Surface
Temp. Casing Set to 10' bgs.
Hole Reamed To 26' bgs

Converted to Well: Yes X No ____ Well I.D. #: 12 MW T 36

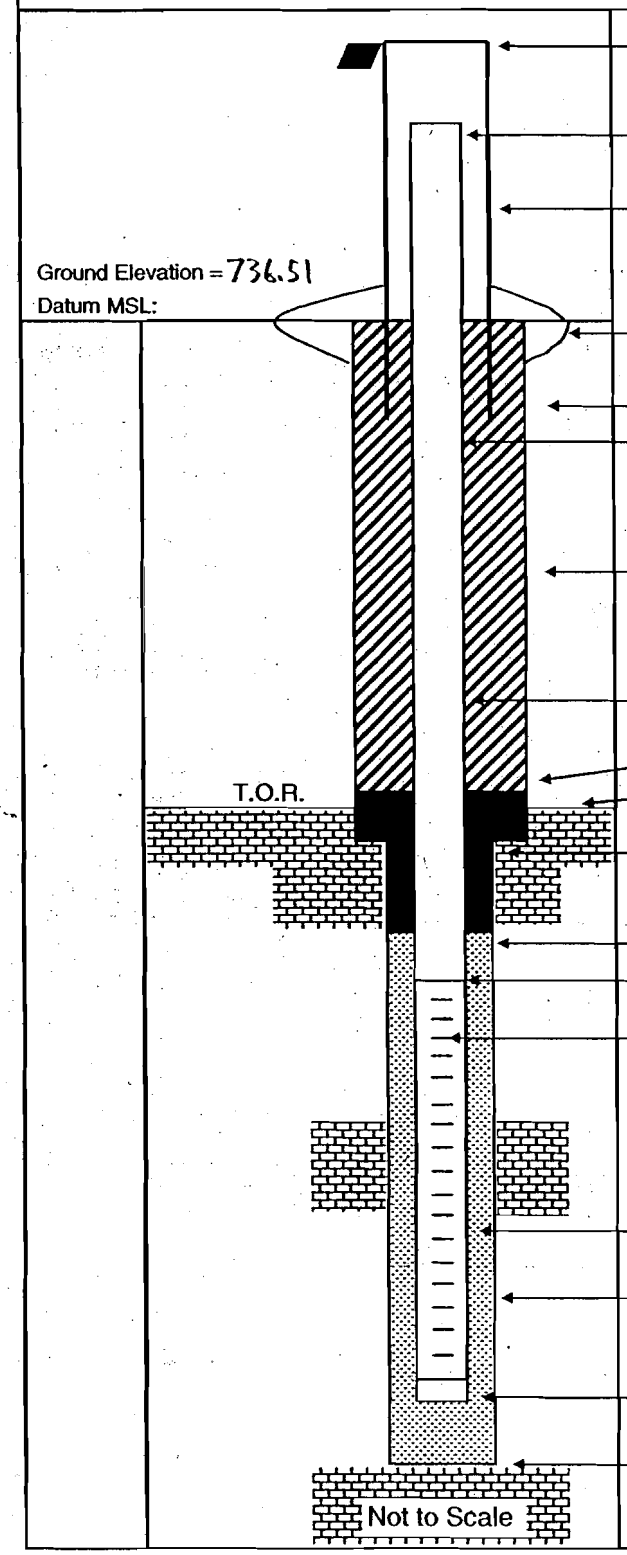
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT36

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT36
PROJECT No.:	N6878	DRILLER:	Ken Boehmer	DATE COMPLETED:	8/27/04
SITE:	SWMU-12	DRILLING METHOD:	HSA / ROT	NORTHING:	1312466.54
GEOLOGIST:	Charles C. Lancy III	DEV. METHOD:	Surge & Purge	EASTING:	3027186.16



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 738.63

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) 6" TEMP TO 10'

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8½ to 9'

Type of Backfill: CEMENT BENT GROUT

Elevation / Depth Top of Seal: 733.51 / 3'

Elevation / Depth Top of Bedrock: 727.51 / 9'

Type of Seal: Bentonite Chips

Elevation / Depth of Top of Fine Sand: NA / N/A

Elevation / Depth of Top of Filter Pack: 726.01 / 10.5'

Elevation / Depth of Top of Screen: 721.51 / 15'

Type of Screen: PVC

Slot Size x Length: 20 SL x 10'

I.D. of Screen: 2" CCL

Type of Filter Pack: GLOBAL #5 QUARTZ SAND

Diameter of Hole in Bedrock: Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 711.51 / 25'

Elevation / Total Depth of Borehole: 710.51 / 26'

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12 MWT37
DATE: 7-29-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole **	Driller BZ
S-1 @	0	2/2	1.6/2		STIFF	MOTTLED YELLOW	TOP 4" TOPSOIL CLAYEY SILT/SILTY CLAY	ML/CL	MOIST	0			
1337	2	4/7				GRAY BRN	TR ROOTS TR ROCK FRAGS			0			
S-2 @		7/28	1.0/2	2.5			SANDSTONE BOULDER		MOIST	0			
1343	4	34/7		3.5 4.0	M STIFF		SILT ? ?			0			
S-3 @		20/15	1.5/2		V DENSE	TAN GRAY	SAND AND SANDSTONE	SP/VBR	MOIST	0			
1350	6	52/56			V	BRN	FRAGMENTS			0			
S-4 @	7	49/50	1/1	7' REF	DENSE/M HARD	GRAY	WEATH SANDSTONE-TR THIN SHALE LENS	VBR	MOIST	0			
1356	8					LT			Ref x 7'- Kept sampling to get	0			
S-5 @	8.5	48/50	.4/.5			GRAY	SANDSTONE-TR THIN SHALE	VBR	deeper for setting MOIST casing	0			
1405	9.5	1/2"		9.5	M	GRAY			AUGERED TO 9.5'	0			
1430				10.5	SOFT		CLAYSTONE	BR VBR	NO SIGN OF ANY WATER TO 8'.	0			
				12	M SOFT	BRN GRAY	SANDSTONE W/SHALE LAMINATIONS	VBR	SET 6" CASING AT 9.5'	0			
.8/5.5	①	15%	4/5.5		M HARD	TAN BRN & GRAY	SANDSTONE		13.2-13.4 VERT JNT H2O STAINED	0			
1450	15			14				BR	SEVERAL BEDDING PLANE BREAKS	0			
1500					M SOFT		SANDSTONE W/SHALY SEAMS - DIFFICULT TO LOG DUE TO BROKENESS	VBR TO	SOME WATER IN HOLE (START OF RUN (2))	0			
.8/5	②	16%	4/5		M HARD		NO DISTINCT CONTACTS	BR	MORE WETNESS ≈ 18	0			
									SEVERAL BEDDING BREAKS FEW	0			
1513	20						LAST 6" VBR	VBR	HORIZ JNTS @ 17.7	0			
					M SOFT		HIGHLY WEATH SANDSTONE	VBR		0			
					TO		FEW SHALE SEAMS		22.2 HORIZ JNT WATER STAINED	0			
0/5	③	0%	4/5							0			
					M HARD				SOME WATER STAINS @ 24'	0			
1540	25			24						0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: HSA 4 1/4" ID / AUTO HAMMER
SET TEMP 6" CASING TO 9.5' NX 9.5 → 25'

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT37

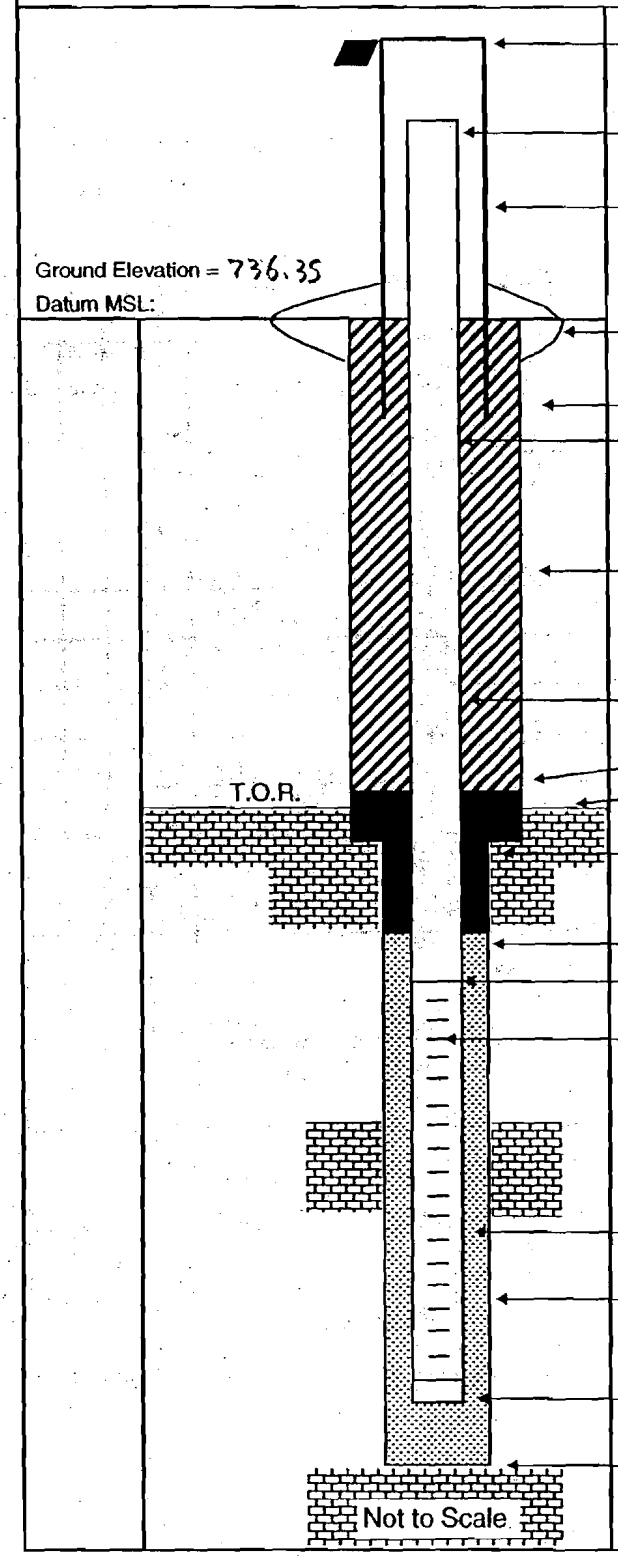
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT37

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT37
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	7-29-09
SITE:	SWMU-12	DRILLING METHOD:	HSA / ROT	NORTHING:	1311630.57
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3027496.41



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 738.77

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) TEMP TO 9.5

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2 TO 9'

Type of Backfill: CEMENT GROUT

Elevation / Depth Top of Seal: 730.35 / 6

Elevation / Depth Top of Bedrock: 729.35 / 7

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 725.35 / 11

Elevation / Depth of Top of Screen: 722.35 / 14

Type of Screen: PVC

Slot Size x Length: 20SL x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5 FILTER PACK

Diameter of Hole in Bedrock: Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 712.35 / 24

Elevation / Total Depth of Borehole: 711.35 / 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT38
DATE: 9-11-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ**	Borehole**	Driller BZ**
S-1 e	0	7/7	5/2		STIFF/	TAN	TOP 3" TOPSOIL CLAYEY SILT TO	ML	MOIST - POOR REC	0			
1305	2	8/11		2'	M DENSE	BRN	SANDY SILT - TR ROOTS		TR ROCK FRAG	0			
S-2 e		18/21	1.6/2		DENSE TO	TAN BRN	CLAYEY SAND - SOME	SC	MOIST	0			
1312	4	12/9		4'	M DENSE		ROCK FRAGS			0			
S-3 e		7/7	1.1/2		STIFF	GRAY BRN	SANDY CLAY - TR	SC	MOIST	0			
1316	6	11/16	.2/.2	6.2			ROCK FRAG		REF @ 6.2	0			
S-4 e	6.2	50/3"		11:21 TDR	M SOFT	BRN GRAY	WEATHERED SANDSTONE	VBR	DAMP	0			
1320										0			
										0			
1335	9.5		9.5		M HARD	TAN BRN	SANDSTONE	VBR		0			
								BR	10.3 HORIZ JNT H2O 11.0 " " "	0			
							(12.25' VUG)		11.8 " " "	0			
3.4/5.5	1	62%	5.3/5.5					BL	13.0 " " " 13.4 → 13.7	0			
				13.4 13.3 14	M SOFT	GRAY	SHALE SEAM 14.0 HORIZ JNT	BR	D GRAY SHALY SEAM	0			
1400	15						LAST .5' VBR	VBR	13.8 LO ∠ JNT - H2O	0			
1405					M HARD	TAN GRAY BRN	SANDSTONE	BR	15.7 CLAY FILLED JNT TR H2O	0			
								BL		0			
										0			
7.8/10	2	78%	10/10		M SOFT TO		19.2 → 19.4 CLAY SHALE		19.9 HORIZ JNT	0			
					M HARD	GRAY 20.8'	SANDSTONE - WITH V THIN BLACK SEAMS (STREAKS)		20.8 " " " TR H2O	0			
								BL	21.3 " "	0			
								BR		0			
				24					24.4 HORIZ JNT TR H2O	0			
1435	25									0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼" ID HSA w/ AUTO HAMMER - 2" SPOONS
SET TEMP CAS TO 9.5 FEET, NX CORE IN ROCK
REAM TO 5½ TO 25 - WELL 14-24, SAND 11 → 25

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT38

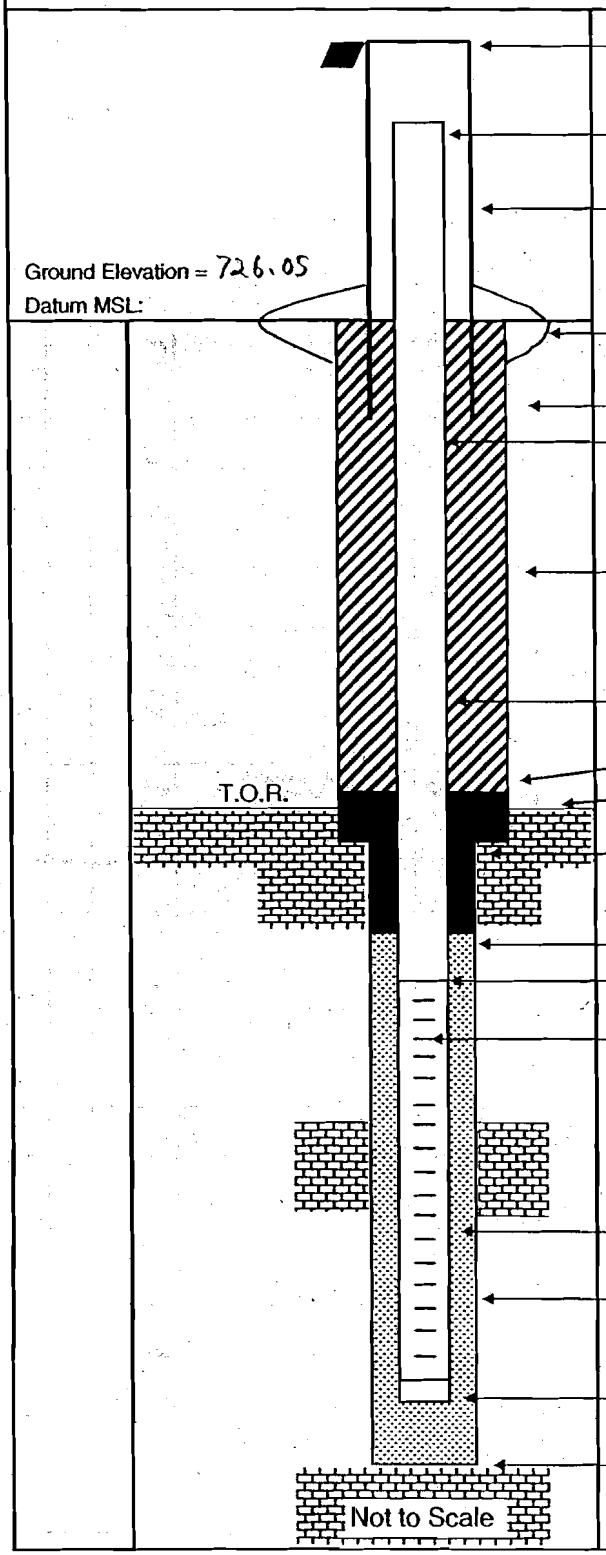
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT38

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT38
PROJECT No.:	N6878	DRILLER:		DATE COMPLETED:	9-11-04
SITE:	SWMU-12	DRILLING METHOD:		NORTHING:	1312353.89
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026531.17



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 728.03

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TEMP TO 9.5
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: /

Elevation / Depth Top of Bedrock: 719.85 / 6.2±

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 715.85 / 11

Elevation / Depth of Top of Screen: 712.85 / 14

Type of Screen: PVC

Slot Size x Length: 20 x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL II S

Diameter of Hole in Bedrock:
Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 702.85 / 24

Elevation / Total Depth of Borehole: 701.85 / 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT39
DATE: 7/30/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 e	0	5/4	1/2	-3			4" TOPSOIL ROAD GRAVEL FRAG			0			
0815	2	3/5			M STIFF	YELLOW BRN	CLAYEY SILT - TR	ML/CL	MOIST → DAMP	0			
S-2 e		3/4	1.2/2		STIFF	GRAY BRN	ROOTS - ROCK CLAYEY SILT - TR	ML	MOIST	0			
0818	4	5/5			M STIFF	GRAY ORANG BRN	SAND CLAYEY SILT - TR	ML	MOIST	0			
S-3 e		4/3	1.8/2	6	TO STIFF		ROOTS (MOTTLD)			0			
0822	6	4/4			M STIFF	GRAY BRN	SILTY CLAY - TR	CL	MOIST	0			
S-4 e		4/4	1.5/2				ROOTS (MOTTLD)			0			
0825	8	4/4								0			
S-5 e		5/4	1.8/2		M STIFF	BRN GRAY	SILTY CLAY - TR	CL	MOIST	0			
0828	10	4/5					GRAVEL (1PC.)		SUB ANG GRAV 1/4"	0			
S-6 e		3/3	1.4/2					CL	MOIST	0			
0832	12	3/5					TR ROCK FR		SANDSTONE FRAGMENT	0			
S-7 e		2/3	1.5/2		M STIFF	GRAY BRN	SILTY CLAY / CLAYEY	CL	MOIST	0			
0836	14	5/4				GRAY	SILT (MOTTLD)	ML		0			
S-8 e		1/2	1/2		M STIFF	ORANG BRN	SILTY CLAY	CL	MOIST	0			
0840	16	2/4					(MOTTLD)	ML		0			
S-9 e		4/6	1.3/2		M STIFF		Same	CL	MOIST	0			
0844	18	4/7		18'±			-TR ROCK FR		SANDSTONE FRAGMENT	0			
S-10 e	19.1	15/28	*5/1	19'±	M SOFT	TAN GRAY	WEATH SANDSTONE		MOIST REF@19'	0			
0850	± 20	50/2"	20	REFUSE	M SOFT	BRN	SANDSTONE		WENT AFTER MORE CASING.	0			
1005						GRAY	FEW SHALY	VBR	SOME BEDDING PLANE BREAKS	0			
							SILTSTONE SEAMS	BR	21.2, 21.4 HORIZ JNTS	0			
1.1/5	1	28%	4.5/5						21.7 H2O STAINED	0			
								VBR	AND WET	0			
1030	25				M HARD			BR	24.5 WET HORIZ JNT±	0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4"1/4 ID HSA TO 19' AUTO HAMMER
THE 6 1/4" Φ HSA TO 20
CORED THRU 6 1/4" CASING

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT39

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT39
DATE: 7-30-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	25			24									
1035					M SOFT	GRAY	HIGHLY WEATH SANDSTONE SHALY	VBR	MOIST	0			
									CAN HEAR WATER ENTER	0			
0/5	2	0%	1.5/5						HOLE: POOR REC	0			
									V. BROKEN MED/SOFT	0			
1058	30									0			
1310					M HARD	BRN	SANDSTONE - HIGHLY	BR	MOIST → WET	0			
							WEATH	VBR		0			
0/5	3	0%	2.7/5				(BOTM 1')		SEVERAL HORIZ BREAKS	0			
				34	M SOFT				LAST FEW FOOT	0			
1340	35								VERY BR	0			
				BOTM 35									
							REAM TO 35						
							WELL 34-24						
							SAND 35-20.5						
							CHIPS 15.5-20.5						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: REAM FROM 20 TO 35 w/ 5 1/2" R. BIT THRU 6 1/4" ID HSA - DID NOT USE 6" CAS DUE TO THREADING ISSUES.

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT39

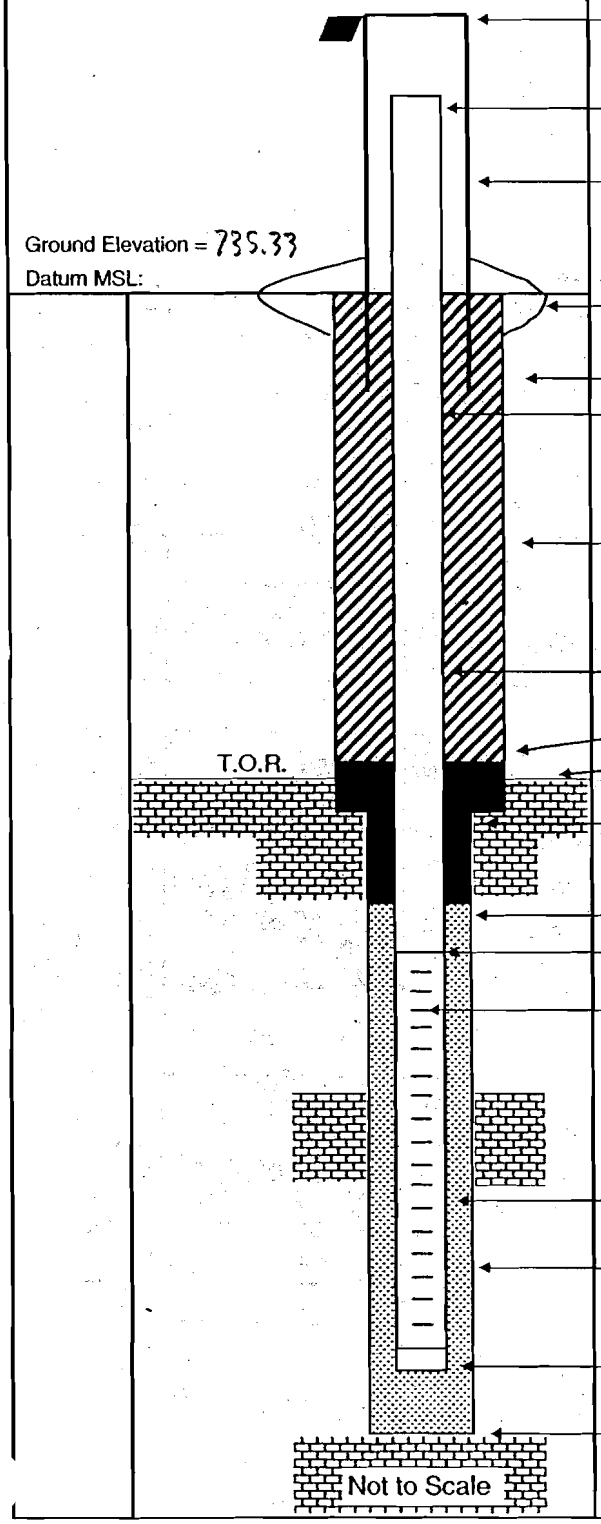
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT39

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT39
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	7 30 04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	1311015.63
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3027662.97



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 737.64

I.D. of Surface Casing: 2"

Type of Surface Casing: CONCRETE PAD

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) TEMP 6 1/4" ID HSA TO 20'

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 12"

Type of Backfill: CEMENT/BENTONITE GROUT

Elevation / Depth Top of Seal: 719.83 / 15.5

Elevation / Depth Top of Bedrock: 716.33 / 19.0

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 714.83 / 20.5

Elevation / Depth of Top of Screen: 711.33 / 24

Type of Screen: PVC

Slot Size x Length: 20 SL x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5 QUARTZ FILTER PACK

Diameter of Hole in Bedrock: Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 701.33 / 34

Elevation / Total Depth of Borehole: 700.33 / 35

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12 MWT 40
DATE: 8/12/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ**	Borehole**	Driller BZ**
S-1 e	0	3/3	1.5/2		STIFF	GRAY BRN	CLAYEY SILT - TR	ML	MOIST	0			
0830	2	5/5					ROOTS			0			
S-2 e		3/5	1/2		M STIFF		SILTY CLAY - CLAYEY	CL	MOIST	0			
0835	4	7/5					SILT - TR ROOTS	ML		0			
S-3 e		3/4	1.8/2		STIFF		CLAYEY SILT	ML	MOIST (FILL)	0			
0840	6	5/5		6	M STIFF		TO SILTY CLAY - TR	CL	?	0			
S-4 e		5/5	1.7/2		M STIFF	OLIVE GRAY	REDDISH SANDSTONE FRAGMENT SILTY CLAY - TR	CL	MOIST	0			
0845	8	6/6			TO SOFT		ROOTS AND ORG MATL			0			
S-5 e		3/2	1/2				SILTY CLAY - TR	CL	MOIST	0			
0850	10	3/3		10		MOTTLD	ROOTS			0			
S-6 e		3/4	1.5/2		STIFF	BRN GRAY	CLAYEY SILT / SILTY	CL	MOIST → WET	0			
0852	12	5/8			M STIFF		CLAY - TR ROOTS SAND - ROCK FRAGS	/ ML	LOOK NAT	0			
S-7 e		2/3	1.5/2		TO					0			
0858	14	8/16			STIFF		LAST C" MORE SAND	CL / ML	MOIST	0			
S-8 0902	14.5	18/55		14.5 15.0	M SOFT	BRN	SANDSTONE FRAG		15' REF	0			
0945				11 FT	M HARD	GRAY BRN	AND SILTY SAND SANDSTONE	VBR	DAMP MOIST → WET	0			
						BRN	VBR TO ≈ 16.0'	BR	SEVERAL HORIZ H2O BEARING	0			
1.4/5.5	①		5.3/5.5			GRAY	H2O BEARING		JOINTS - TIGHT TO MOD	0			
				18					TIGHTER SP JNTS 16.5	0			
1005	20								16.8 17.4 HORIZ JNTS	0			
1015				21.0				VBR	17.8 18.2 W TR H2O	0			
					M HARD	GRAY	SANDSTONE - SL	BR	19.0 MEAS ARE APROX	0			
2.7/5	②		4.8/5				CHANGE IN COLOR MORE TR DARK		21.4 → 21.6 VER SHALY SEAM - TR	0			
							SHALY / SILTY INTERBEDS		WATER 23.2 → 23.3 M SOFT	0			
1040	25								HORIZ JNT TR H2O @ 24 ±	0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4" ID HSA - AUTO HAMMER - 2" SPOONS
SET TEMP CASING TO 14.5' BGS.
NX CORE 14.5 TO REAM 5 1/2" TO

Converted to Well: Yes ✓ No _____ Well I.D. #: 12 MWT 40

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12 MWT40
DATE: 8/12/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	25												
1050					M HARD	GRAY	SANDSTONE -		CORE WAS	0			
									LOST WHILE TRYING TO	0			
NA	3		NA						FREE UP RODS WHICH WERE	0			
				28					STUCK TEMP IN HOLE	0			
1115	30			30'						0			
				BOTM									
							REAM TO 29'						
							WELL 18-28						
							SAND 15.5-29						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: 12 MWT40

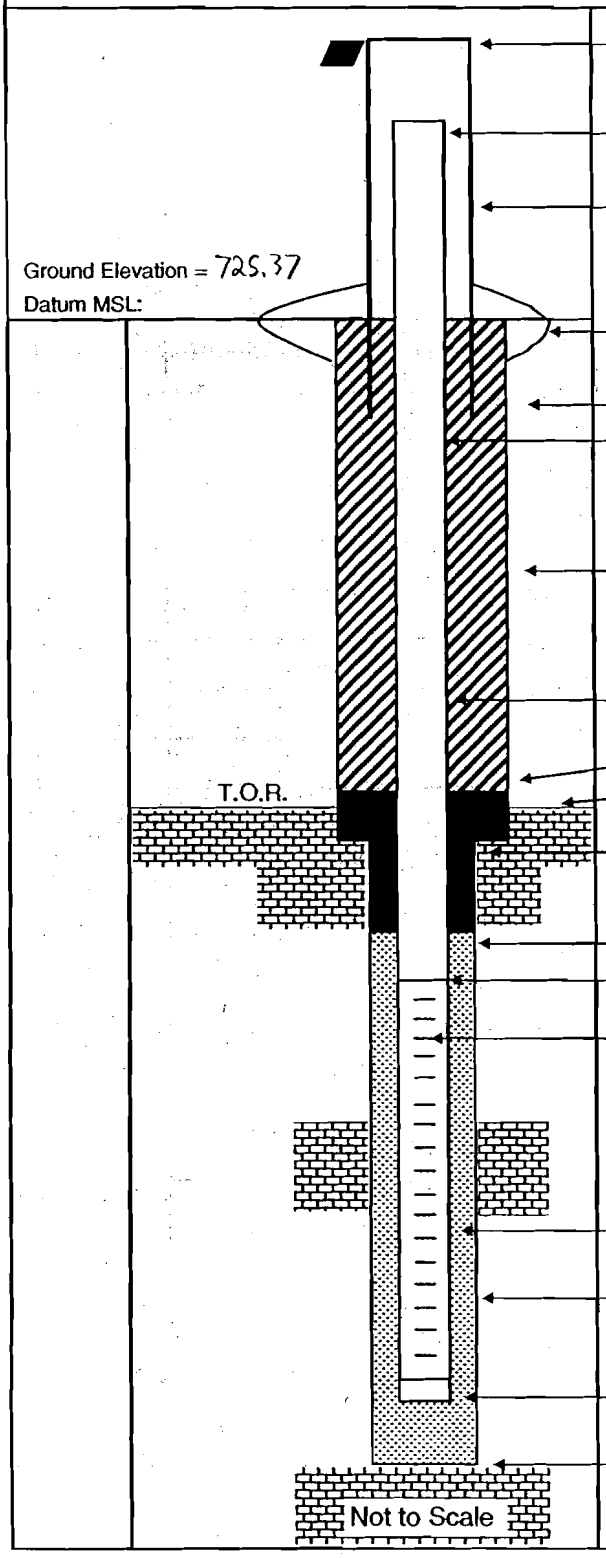
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT40

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT40
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	8/12/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	1310616.56
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3027037.67



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 727.56

I.D. of Surface Casing:

Type of Surface Casing: steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) TEMP TO 14.5

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2

Type of Backfill: CONC PAD

Elevation / Depth Top of Seal: 722.37 / 3'

Elevation / Depth Top of Bedrock: 710.37 / ≈15

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 709.87 / 15.5

Elevation / Depth of Top of Screen: 707.37 / 18

Type of Screen: PVC

Slot Size x Length: 20 x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5 FILTER PACK

Diameter of Hole in Bedrock: Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 697.37 / 28

Elevation / Total Depth of Borehole: 696.37 / 29

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT41
DATE: 10/27/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness*	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
S-1	0	2/2	1.6/2		M STIFF	YELLOW BRN	SILTY CLAY - CLAYEY	CL/ML	MOIST → WET	0			
@ 1050	2	3/3					SILT - TR ROCK FR TR ROOTS			0			
S-2 @		2/7	1.7/2	±3'						0			
1055	4	10/11			STIFF/M	BRN	SANDY SILT/SILTY SAND	SM	MOIST	0			
S-3 @		8/8	1.5/2		DENSE		SOME ROCK FRAG TR CLAY			0			
1100	6	10/11							MOIST	0			
S-4 @		6/6	.5/2		M DENSE		SAME AS ABOVE - TR RED BRN CLAY - SOME ROCK	SM	MOIST	0			
1103	8	7/13		8		MOTTLED				0			
S-5 @		5/6	2/2		STIFF	GRAY YELLOW	CLAYEY SILT TO SILTY CLAY - TR	ML	MOIST	0			
1106	10	9/11				BRN	ROCK FRAGS	CL		0			
S-6 @		5/8	1.8/2		STIFF		SAME AS ABOVE	CL	MOIST	0			
1110	12	11/9					BECOMES MORE SANDY AT BOTTOM	↓		0			
S-7 @		5/9	.5/2		VERY DENSE	TO	TO SOME ROCK FR	SM	± MOIST	0			
1113	14	46/15		13.5± 14.0		TAN	SANDSTONE FRAGS		↓ DAMP POOR REC	0			
S-8 @		5/9	1.5/2		V STIFF	BRN	HIGHLY WEATH ROCK		HIT FRAG @ 13.5 ±	0			
1117	16	20/17			TO SOFT		FRAGS - CLAYEY "SHALELIKE"		MOIST	0			
S-9 @		19/30	1.2/2	16.5	M SOFT	GRAY BRN	SANDY SHALE	BR	MOIST	0			
1122	17.5	50/5		17.5± WEIRE					REF @ 17.5	0			
									AUGER TO 19.5	0			
	20			20'±			WEATHERED		SET 6" CAS TO 19.5	0			
					M HARD	GRAY	SANDSTONE		LOST SOME CORE 20-21.5±	0			
							BECOMES CARBONACEOUS @ 22'±		21.8±	0			
				22.2									
•4/5	1	8%/0	3.4/5	22.7	SOFT	BLK	COAL	VBR	TR H2O	0			
					M SOFT TO	GRAY	SHALY SILTSTONE	BR	23-23.2 JNT 23.8 LO ∠ JNT	0			
	25				M HARD		BECOMES MORE SANDY LAST 6".		24.1 HORIZ JNT TR H2O	0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4" HSA TO 19.5 - USED 2" SPOONS w/ AUTO HAMMER
SET 6" CAS TO 19.5
NX CORE IN ROCK - REAM TO 5 1/2" ϕ

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT41

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT41
DATE: 10/27/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	25			24									
				26.2	M-HARD TO HARD	GRAY	LIMESTONE	VBR BR	26.4 HORIZ JNT 26.7 " " 26.8 LO ∠ JNT.	0 0			
.7/5	2	14%	4.8/5				V.SL CARCAREOUS		NOT MUCH WATER UNTIL 29'	0			
							27.5→28.5 4-HORIZ JNTS	VBR	29-30 - MARING WATER AT 29'± VBR 29→30	0 0			
	30								30.6 HORIZ JNT 31.8 JNT	0			
									32.1 HORIZ JNT 32.4 " "	0			
2.4/5	3	48%	5/5	33					33→ 34.2	0			
				34 34.2	M SOFT	GRAY	CLAYSTONE - SILTY	VBR		0			
	35				HARD	"	LIMESTONE	BR		0			
				35' BOTM					START TO MAKE H2O ≈ 29' DECIDE TO GO TO 34 TO MAKE WE HAVE H2O TO SAMPLE DRILL DRY TO 26'.				
							WELL 24-34 SAND 20-35						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT41

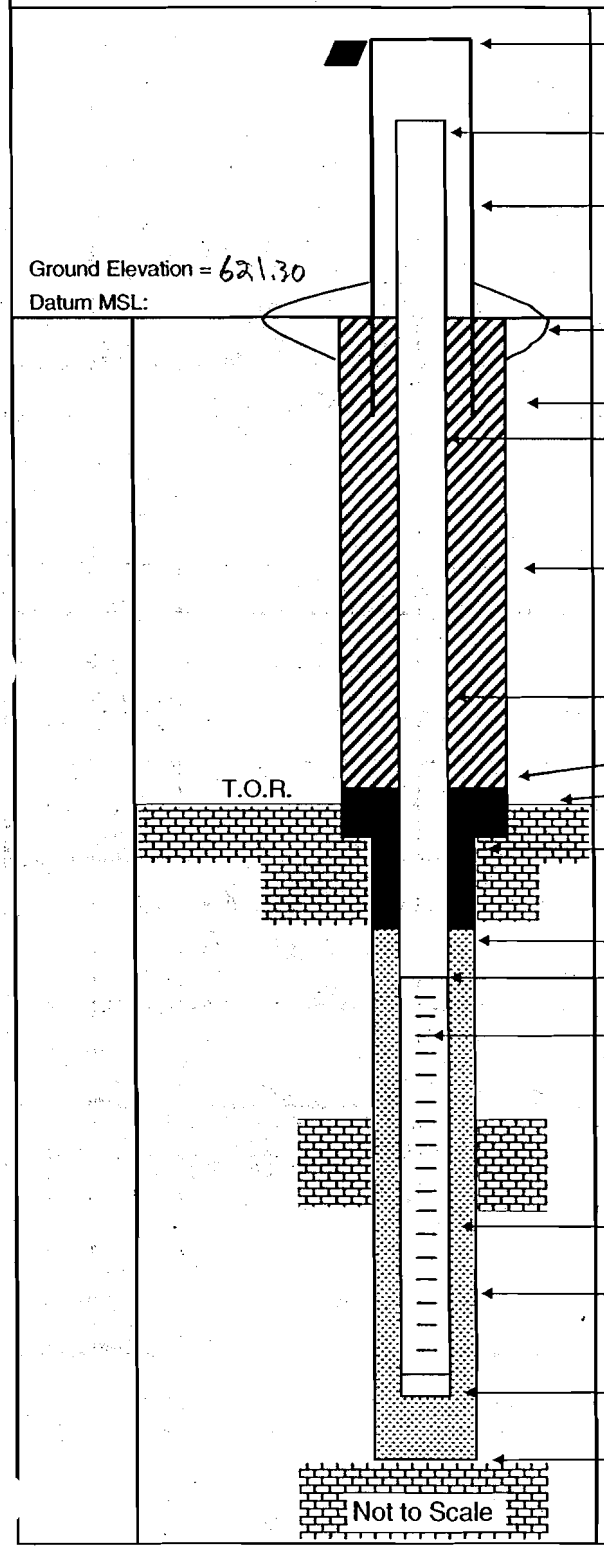
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT41

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT41
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	10/27/04
SITE:	SWMU-12	DRILLING METHOD:	HSA / A.R.	NORTHING:	1310642.00
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026376.75



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 621.18

I.D. of Surface Casing:

Type of Surface Casing:

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TEMP 6" TO 20'
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2"

Type of Backfill: BENTONITE PELLETS

Elevation / Depth Top of Seal: /

Elevation / Depth Top of Bedrock: 603.80 / 17.5

Type of Seal:

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 601.30 / 20

Elevation / Depth of Top of Screen: 597.30 / 24

Type of Screen: PVC

Slot Size x Length: 20 SL x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL II 5

Diameter of Hole in Bedrock:
Core / Ream: 5 1/2" ϕ

Elevation / Depth of Bottom of Screen: 587.30 / 34

Elevation / Total Depth of Borehole: 586.30 / 35

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT42
DATE: 9-1-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sample BZ	Borehole**	Driller BZ**
	0				M STIFF		SILT/CLAY	CL/ML	4¼" HSA TO FEET		0		
				2.5									
				HE 114	M SOFT	BRN	WEATHERED SANDSTONE		SET 6" TEMP 9.5 FEET				
	5								REAM 5½" TO 26 FEET		0		
	10										0		
				13									
	15					TO					0		
						GRAY	SANDSTONE		WELL 13-28 SAND 11-29 CHIPS TO 3				
	20								NOT MUCH		0		
							SANDSTONE		WATER OBSERVED DECIDE TO SET 15' SCREEN HERE				
	25										0		

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼" HSA TO 9.5
SET TEMP CAS @ 9.5
REAM TO 5½" TO 29

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT42

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT42
DATE: 9-1-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sample BZ	Borehole**	Driller BZ
	25												
					M HARD	GRAY	SANDSTONE				0		
				28									
	29												
				TD 29			(SILTY)				0		
							SCREEN 13-28						
							SAND 11-29						
							CHIPS TO 3'						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT42

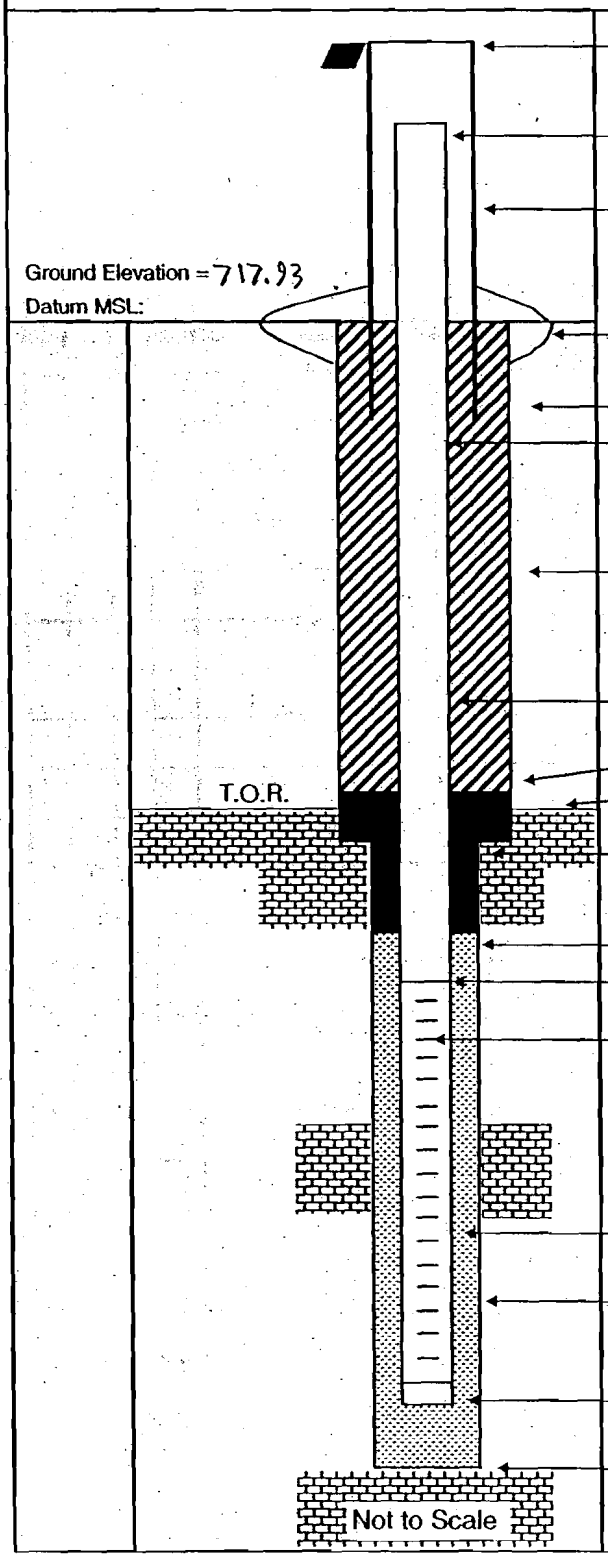
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT42

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT42
PROJECT No.:	N6878	DRILLER:		DATE COMPLETED:	9-1-04
SITE:	SWMU-12	DRILLING METHOD:	HSA/ROT	NORTHING:	1312364.70
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	302612 7.28



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 720.22

I.D. of Surface Casing:

Type of Surface Casing: Steel

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TEMP TO 9.5
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8½

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 714.93 / 3

Elevation / Depth Top of Bedrock: 715.43 / 2.5

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 706.93 / 11

Elevation / Depth of Top of Screen: 704.93 / 13

Type of Screen: PVC

Slot Size x Length: 20 x 15'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock:
Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 689.93 / 28

Elevation / Total Depth of Borehole: 688.93 / 29

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT43
DATE: 11-10-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ**	Borehole**	Driller BZ**
S-1 e	0	1/2	1.5/2		SOFT	BRN	CLAYEY SILT - TR ROOTS	ML	MOIST	0			
1500	2	2/2								0			
S-2 e		3/5	1.9/2	3'±		YELLOW	CLAYEY SILT-TR	ML	MOIST	0			
1505	4	5/5			SOFT	BRN	SAND AND ROCK FR	SM		0			
S-3 e		4/6	1.8/2		M STIFF		SANDY CLAY - CLAYEY	SC	MOIST	0			
1510	6	8/12		6'±			SAND - TR ROCK FRAG, BECOMES MOTTLED @ 5'			0			
S-4 e		11/12	2/2		DENSE M	MOTTLED ORANGE	SILTY F SAND - TR	SM	MOIST → DAMP	0			
1515	8	13/12				GRAY BRN	ROCK FRAGS - TR CLAY			0			
S-5 e		3/13	1.8/2	9'±						0			
1520	10	23/28			M SOFT	GRAY	WEATH SHALE		DAMP	0			
1535					M SOFT TO				TOP 2" POOR REC - WEATH	0			
				12'±						0			
0/5	1	0%/0	2.3/5		M HARD	BRN	F.G. SANDSTONE	VBR	TR H2O MOIST	0			
								TO		0			
1555	15							BR		0			
1615					M HARD	BRN & GRAY	SANDSTONE W/ SHALE/ SILTSTONE SEAMS		SEVERAL HORIZ BEDDING PLANE BREAKS,	0			
					M SOFT					0			
1.3/5	2	26%/6	4.7/5					TO	NOT MUCH H2O OBSERVED.	0			
								VBR	M SOFT (WHERE SHALY)	0			
11/10 1630	20									0			
11/11 1640					M HARD				SEVERAL HORIZ	0			
								BR	JNTS - NOT MUCH WATER	0			
7/5	3	14%/	3/5							0			
						TO GRAY	SEAMS BECOME THINNER	VBR	LAST 2 VBR POOR REC	0			
1700	25					@ 23'±				0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4" ID HSA - AUTO HAMMER - 2" SPOONS
SET TEMP STEEL 6" CAS TO
NX CORE IN ROCK - REAM TO 5 1/2" Ø

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT43

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT43
DATE: 11/12/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ**	Borehole**	Driller BZ**
11/11 11/12	25				M HARD	GRAY	INTERBEDDED SAND STONE AND SILTSTONE	BR	SEVERAL HORIZ JNTS - NOT MUCH WATER	0			
.5/5	4		3.4/5							0			
									CARBONACEOUS AT 28-29	0			
	30			30±						0			
				31±	M SOFT	GRAY	SILTY SHALE	VBR	SEVERAL BEDDING	0			
								BR	PLANE BREAKS NOT MUCH H2O	0			
.4/5	5		3.6/5					VBR		0			
										0			
	35							BR		0			
								VBR	VBR - DRY	0			
									SEVERAL	0			
									BEDDING PLANE BREAKS	0			
				38.5±					FEW LOX JNT				
				39.0±	SOFT	BLK	COAL	VBR		0			
1.9/10	6	19%	5.3/10		M SOFT	GRAY	SILTY CLAYSTONE /MUDSTONE	BR		0			
										0			
										0			
									PROB LOST CORE IN	0			
									THE CLAYSTONE ≈37.8 - NOT	0			
	45			45					MUCH H2O DRILLS DRY	0			
1105					M SOFT	GRAY	SHALE	VBR	SEVERAL	0			
								BR	HORIZ BEDDING PLANE	0			
									BREAKS NOT MUCH H2O	0			
1.9/10	7	19%	7.8/10						DRILLS DRY	0			
										0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT43

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT43
DATE: 11-12-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
	50												
					M SOFT	GRAY	SHALE (SILTY)	VBR		0			
										0			
										0			
								BR		0			
	55									0			
									SEVERAL	0			
									BEDDING PLANE	0			
									BREAKS IN	0			
									SHALE TO 59'	0			
									TR H2O - NOT MUCH	0			
				59 ±						0			
3/10	8	30%	9.4/10		M HARD	LT GRAY	SILTSTONE	VBR	60.8 > 61.6 VBR	0			
							(SANDY)	BR	SEVERAL HORIZ	0			
									BREAKS IN	0			
									SILTSTONE NOT	0			
									MUCH H2O	0			
	65			65						0			
							SILTSTONE	BR		0			
										0			
										0			
										0			
							GRADES INTO A			0			
2/10	9	20%	10/10				F.G.			0			
				71 ±				BR	SEVERAL HORIZ BREAKS	0			
					M HARD	GRAY	SANDSTONE = 71' ± (Gradational)		AND JNTS TR WATER	0			
									THRUOUT THE	0			
							SET WELL 65-80		RUN - TIGHTLY	0			
							SAND 60-81		SPACED TO	0			
	75						CHIPS TO 50			0			

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

80-81 REAM TD AT 81

Remarks: WILL REAM TO 81 ± w/ 5 1/2" Φ

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT43

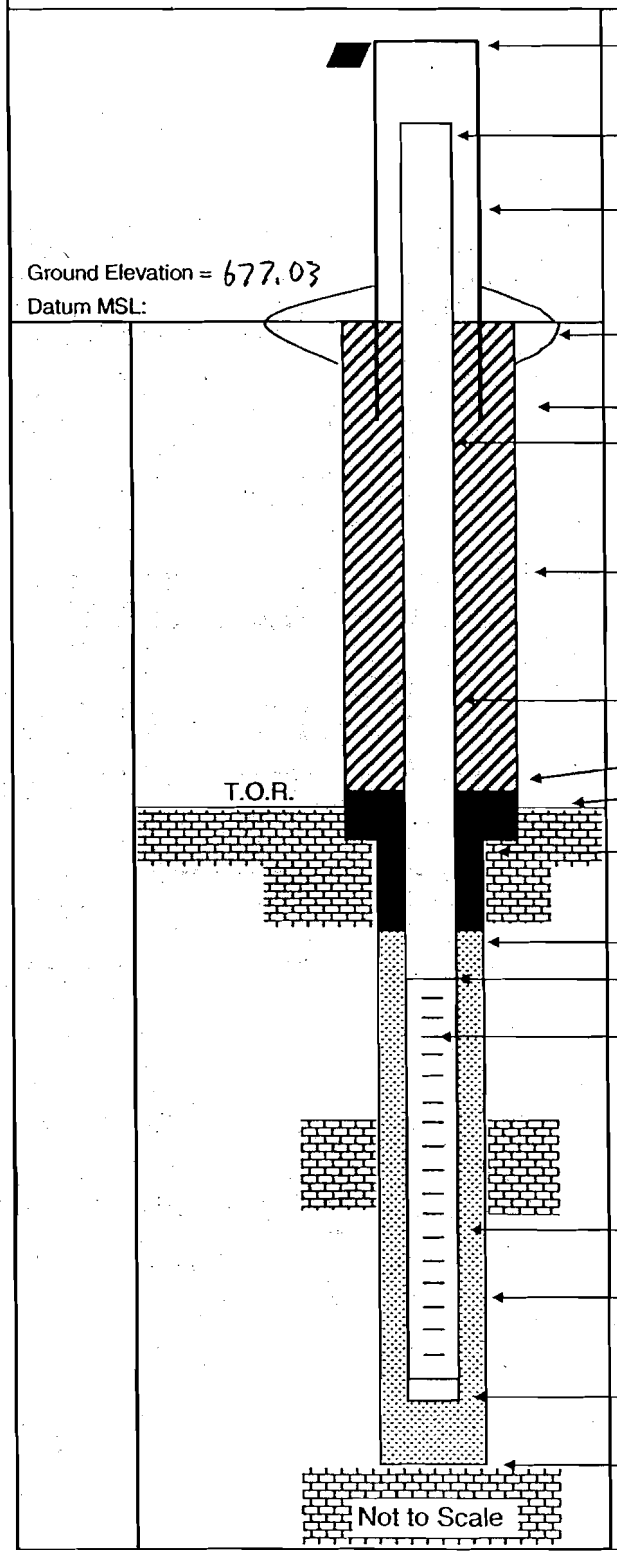
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT43

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT43
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	11/12/04
SITE:	SWMU-12	DRILLING METHOD:		NORTHING:	1310955.52
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026125.55



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 676.96

I.D. of Surface Casing:

Type of Surface Casing:

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8½"

Type of Backfill:

Elevation / Depth Top of Seal: /

Elevation / Depth Top of Bedrock: /

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 617.03 / 60

Elevation / Depth of Top of Screen: 612.03 / 65

Type of Screen: PVC

Slot Size x Length: 20SL x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock: Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 597.03 / 80

Elevation / Total Depth of Borehole: 596.03 / 81

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT44
DATE: 10/26/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ**	Borehole**	Driller BZ**
S-1 e	0	2/3	1.5/2		M STIFF	ORNG BRN	CLAYEY SILT - SOME	CL/ML	MOIST	0			
0950	2	4/6					ROCK FRAG - TR TR SAND ROOTS			0			
S-2 e		4/4	1/2		STIFF	BRN TO	MOTTLD CLAYEY SILT -	CL/ML	MOIST	0			
0955	4	6/6				GRAY BRN	SILTY CLAY - TR ROCK FRAG TR SAND			0			
S-3 e		4/7	2/2	5	STIFF	YELLOW BRN	CLAYEY SILT	CL/ML	MOIST	0			
1000	6	10/13				TO BRN	TO TR ROCK SANDY SILT FRAGS	SM		0			
S-4 e		11/14	2/2		STIFF	YELLOW	SANDY SILT - TR TO	SM	MOIST	0			
1003	8	19/20			/ DENSE	BRN	SOME ROCK FRAGS - TR CLAY			0			
S-5 e		11/14	2/2			BRN	SANDY SILT - TR TO	SM	MOIST	0			
1011	10	21/24		10			SOME ROCK FR TR CLAY		TR - REDDISH ROCK FRAGS	0			
S-6 e		11/9	2/2		STIFF	MOTTLD GRAY	CLAYEY SILT - TR	ML	MOIST	0			
1018	12	12/14				YELLOW BRN	ROCK FRAGS			0			
S-7 e		9/14	2/2		STIFF	MOTTLD BLK	CLAYEY SILT - SOME	ML	MOIST	0			
1028	14	14/17				YELLOW BRN	ROCK FRAG - TR SAND			0			
S-8 e		9/11	1.7/2		STIFF	RED	SAME AS ABOVE MORE	ML	MOIST	0			
1033	16	15/16				TO	LAYERED AT 15.5	SM		0			
S-9 e		14/18	2/2	17'±	V.STIFF	GRAY			GRADATIONAL CHANGE TO SHALE	0			
1040	18	34/49			M SOFT		CLAY SHALE TO		AT ±17. W/ SLICKENSIDES	0			
S-10 e	18.6	36/50/2"	*5/.6	18.6' REF			SANDY SHALE		AT 17.5' REF @ 18.6'±	0			
1052 1200	19.5		19.5	20'	M SOFT			NBR		0			
					M HARD	GRAY	SANDSTONE	BR	TR. H2O IN	0			
							(LAMINATED) JNTS ≈ 20.6, 21.3, 21.8		SOME OF THE SANDSTONE	0			
①	1.5/5.5	27%/0	4.7/5.5	23'			22.4 (HORIZ) w/ TR H2O		JOINTS VUGS ≈ 20.3	0			
					M SOFT	LT GRAY	CLAYSTONE			0			
1325	25									0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼" ID HSA W/ AUTO HAMMER
SET 6' TEMP ST CAS TO 19.5
NX CORE IN ROCK - REAM TO 5½" Ø

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT44

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT44
DATE: 10/26/04 - 10/27/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sample BZ	Borehole**	Driller BZ*
1330	25			25									
					M HARD	LT GRAY	CLAYEY SANDSTONE	BR	SEVERAL TIGHT HORIZ JNTS	0			
							SANDY CLAYSTONE		26.6→26.8 HI & 27.0→27.4 JNT	0			
1.5/5	2	80%	4.5/5						TR H_2O IN JNTS SEVERAL HORIZ	0			
				29'±					JNTS 28→30.	0			
10/26 1400	30						MORE SANDY @ 29' CLAYEY SANDSTONE			0			
10/27 0825					M HARD	GRAY	SANDSTONE (F. GR)	BR	30.6 HI & JNT 31.3 CLAY FILLED JNT	0			
										0			
1.3/5	3	26%	4.3/5						33- JNT 33.5 LO & JNT	0			
				34'±					TR WATER IN JNTS ≈ 2' WATER IN	0			
0840	35			35	HARD	LT GRAY	LIMESTONE (V.SL CALCAREOUS)	BR	HOLE AFTER CORING.	0			
				35.5 BOTM					WILL REAM TO ≈ 35.5				
							SET WELL 25-35						
							SAND 35.5 → 20						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT44

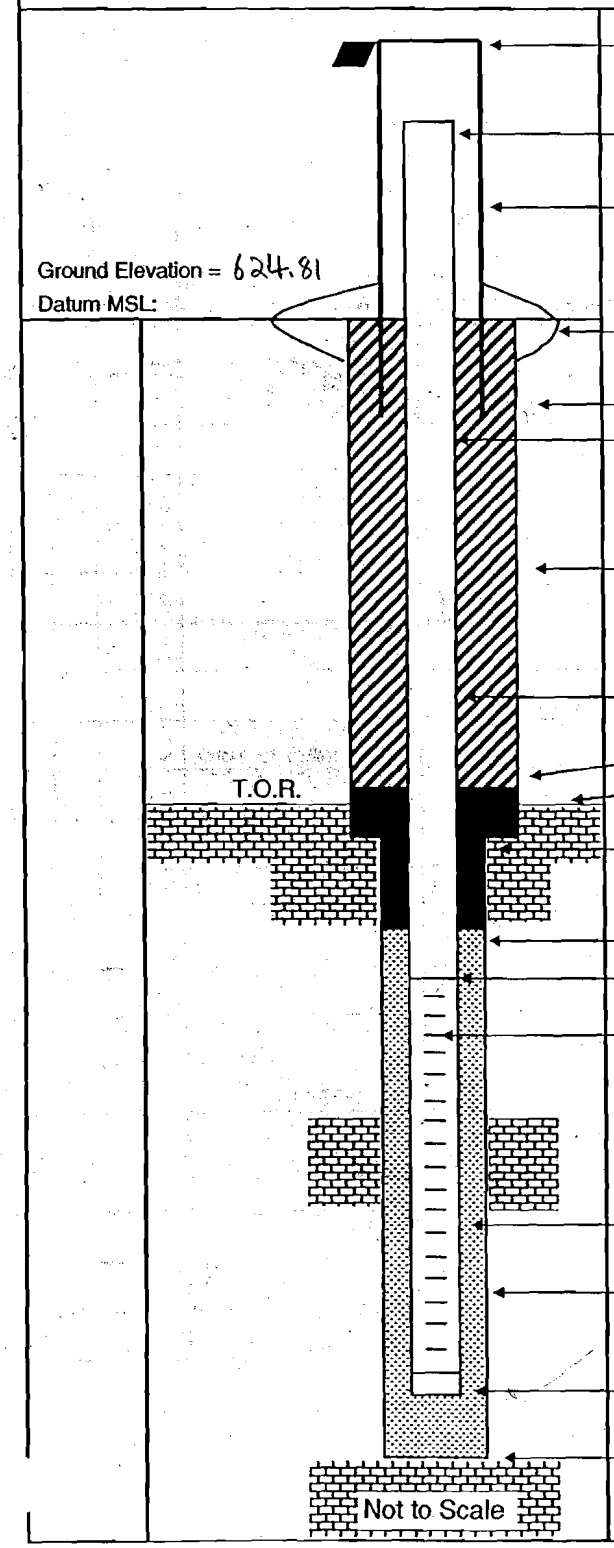
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT44

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT44
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	10/27/04
SITE:	SWMU-12	DRILLING METHOD:	HSA / AIR ROT	NORTHING:	1310276.64
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3026617.87



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 624.83

I.D. of Surface Casing:

Type of Surface Casing:

Type of Surface Seal:

I.D. and Depth of Permanent Casing: TEMP TO 19.5
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2

Type of Backfill:

Elevation / Depth Top of Seal: /

Elevation / Depth Top of Bedrock: 606.21 / 18.6

Type of Seal: BENTONITE PELLETS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 604.81 / 20

Elevation / Depth of Top of Screen: 599.81 / 25

Type of Screen: PVC

Slot Size x Length: 20 SL X 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL # 5

Diameter of Hole in Bedrock:
Core / Ream: 5 1/2

Elevation / Depth of Bottom of Screen: 589.81 / 35

Elevation / Total Depth of Borehole: 589.31 / 35.5

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT45
DATE: 10/29/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 e	0	2/2	1.5/2		LOOSE	MOTTLED GRAY	CLAYEY SAND-TR ROCK	SM	MOIST FILL	0			
1340	2	3/5				BRN			?	0			
S-2 e		6/5	1.6/2	3		RED BRN			UNDER RR?	0			
1345	4	6/6			M STIFF TO	TO BRN	SANDY CLAY-TR ROCK	SC	MOIST	0			
S-3 e		5/8	2/2			MOTTLED			LOOKS TOO HETEROGENIUS	0			
1350	6	26/41			STIFF	RED GRAY	SILTY CLAY-TR ROCK	CL/ML	TO BE NAT. MOIST	0			
S-4 o	6.3	50/3"	.2/.3	6.3±		BRN	FRAGS/CLAYEY SILT		REF @ 6.3'	0			
1356					M SOFT	GRAY	WEATH SANDSTONE			0			
										0			
						GRAY				0			
H2O	9.5				M HARD	TAN BRN	SANDSTONE	BR		0			
									LOST CORE IN TOP 2.5'	0			
							Fe STAINS THRU OUT RUN			0			
1.6/5.5	1	29%	3/5.5						13 HORIZ JNT Fe STAINED TR H2O	0			
				14					13.5 HORIZ JNT TR H2O	0			
1440	15					GRAY TAN			14.3 CLAY FILLED JNT ALL JNTS TIGHTLY	0			
1455					M HARD	BRN		BR	15.1 HORIZ JNT SP.	0			
								BL	15.5 " " TR H2O	0			
3/5	2	60%	5/5					BR		0			
							LAST 1' VBR-TR WATER.		18.6 HORIZ JNT TR H2O	0			
	20			19 COLOR CHANGE	M HARD	GRAY	SANDSTONE (SILTY)	VBR	ABOUT 1' WATER AT DEPTH 20'	0			
							INTERBEDDED W/ SHALY SILTSTONE	BR	20.3, 21.4 HORIZ JNTS	0			
									22.3, 23 TR WATER	0			
1.4/5	3	28%	5/5						TIGHTLY SP JNT	0			
							2"Φ WELL 14→24 SAND 10→25			0			
				24					≈ 1' H2O AT 25'	0			
	25								CAN HEAR H2O ENTERING BORE HOLE	0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4" Φ HSA w/ AUTO HAMMER AND 2" SPOON
SET CASING 6" ST TO 9.5
NX CORE IN ROCK, REAM TO 25

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT45

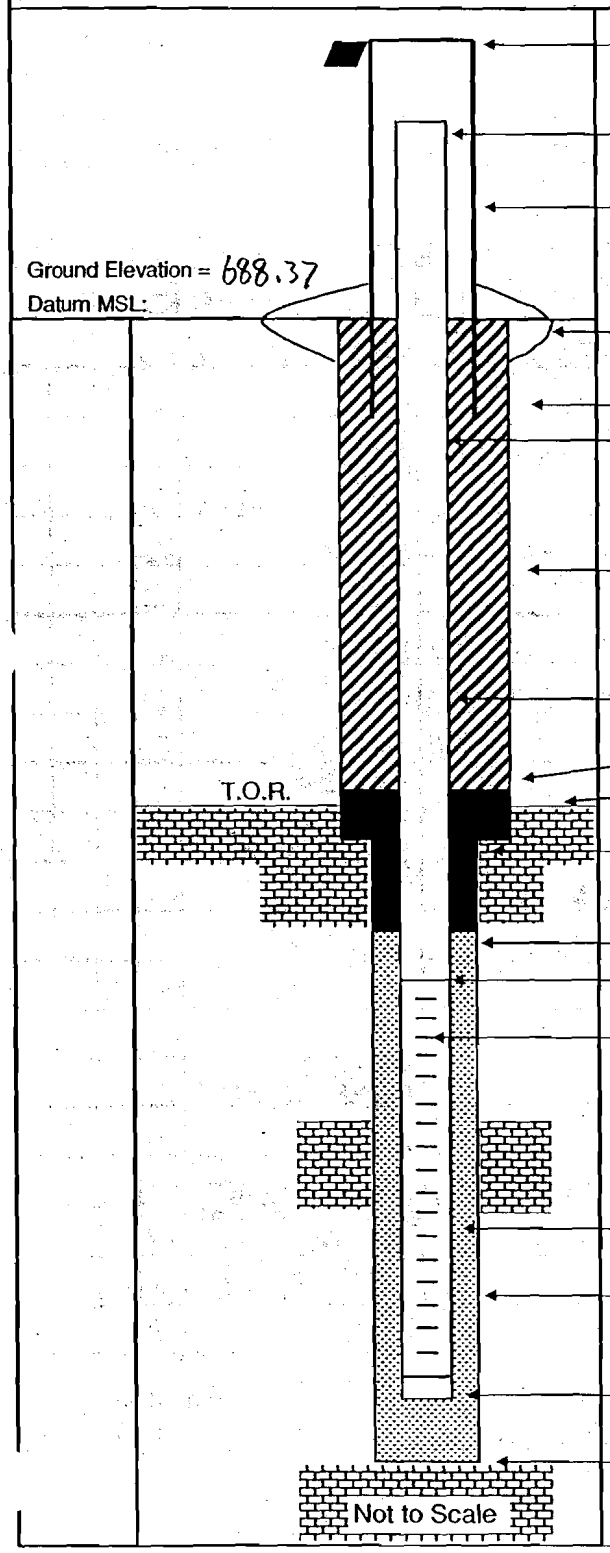
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT45

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT45
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	10/29/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/A.R.	NORTHING:	1313384.30
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3027614.01



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 688.28

I.D. of Surface Casing: _____

Type of Surface Casing: _____

Type of Surface Seal: _____

I.D. and Depth of Permanent Casing: TEMP 6" TO 9.5
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 685.37 / 3'

Elevation / Depth Top of Bedrock: 682.17 / 6.2

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 678.37 / 10

Elevation / Depth of Top of Screen: 674.37 / 14

Type of Screen: PVC

Slot Size x Length: 20 SL X 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL # 5

Diameter of Hole in Bedrock:
Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 664.37 / 24

Elevation / Total Depth of Borehole: 663.37 / 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12 MWT46
DATE: 10/30/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
						MOTTLED							
S-1 e	0	2/2	1.8/2		M STIFF	RED GRAY	SILTY CLAY/CLAYEY SILT	CL/ML	MOIST (FILL?)	0			
1135	2	3/3				BRN	TR ROCK - TR ROOTS			0			
S-2 e		8/8	1.5/2		STIFF	GRAY BRN	CLAYEY SILT - TR SAND	ML	MOIST (FILL?)	0			
1140	4	7/6		4±			TR ROCK FRAGS @ 3.5' TR ROOTS		?	0			
S-3 e		3/3	1/2		M STIFF		CLAYEY SAND/SANDY	SC	MOIST (FILL)	0			
1143	6	4/4					CLAY - TR ROCK FRAGS			0			
S-4 e		2/5	1.7/2			TAN BRN	SANDY CLAY - SOME	SC	MOIST? (FILL)	0			
1146	8	5/5		8±		GRAY	ROCK FR		STILL HETEROGENIOUS	0			
S-5 e		1/2	1/2		M STIFF	BRN	SANDY CLAY - SOME	SC	MOIST	0			
1150	10	3/8					ROCK FR - TR ROOTS			0			
S-6 e		11/12	1.7/2		STIFF		CLAYEY SILT - SOME	ML	MOIST	0			
1155	12	11/22					ROCK FR LAST 6" GRAY WEATH SANDSTONE ?			0			
					M HARD	TAN BRN	SANDSTONE	BR	MAY BE BOULDER.	—			
				14						—			
0	1		.4/4						ONLY REC ≈ 0.4' WAS PROBABLY A BOULDER.	—			
	16						NO REC - MAY NOT HAVE BEEN IN ROCK.			—			
0/5	2	0/0	0/5				BEDROCK			—			
										—			
									WATER IS ENTERING HOLE ≈ 20'±	—			
	21					BRN				—			
S-7 e		15/16	1.5/2		V STIFF	GRAY	SILTY CLAY/TO	CL	MOIST => WET	0			
1250	23	18/28					WEATHERED SHALE IN SHOE		SPOON & ~5' TOOLS WET - ≈4' WATER	0			
S-8 e		15/18	1.6/2	24					@ 1320 - DECIDE TO SET O.B WELL	0			
1300	24.5	50/.5		24.5 REF	M SOFT	BRN	WEATH SHALE		14-24	0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼" ID HSA - AUTO HAMMER - 2" SPOONS
SET 6" CAS TO 10'
REAM TO 5½" Φ TO 24.5 (OVERBURDEN WELL)

Converted to Well: Yes ✓ No ____ Well I.D. #: 12 MWT46

Tetra Tech NUS, Inc.

O.B.

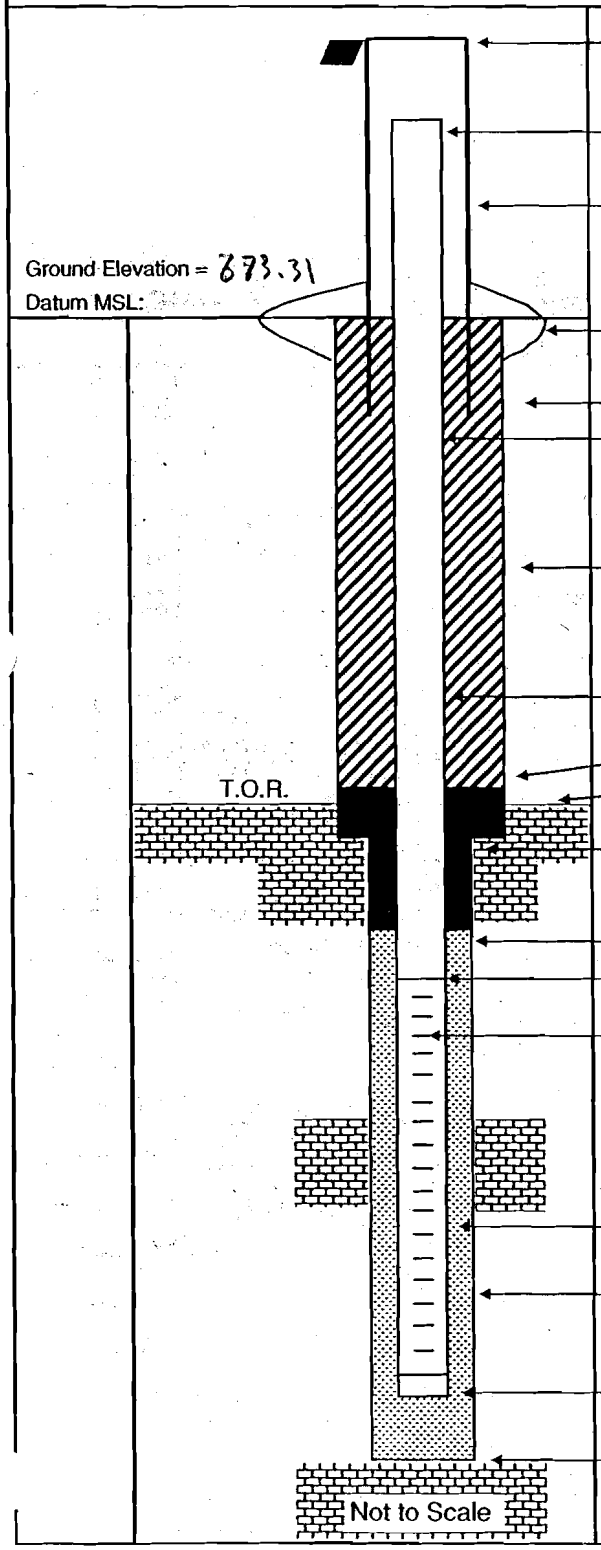
~~BEDROCK~~

WELL No.: 12MWT46

MONITORING WELL SHEET

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12 MWT46
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	10/30/04
SITE:	SWMU-12	DRILLING METHOD:	HSA/MR	NORTHING:	1312 828.63
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3027864.12



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 673.36

I.D. of Surface Casing: _____

Type of Surface Casing: _____

Type of Surface Seal: TEMP TO 10'

I.D. and Depth of Permanent Casing: (if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 670.31 / 3'

Elevation / Depth Top of Bedrock: 648.81 / 24.5

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 663.31 / 10

Elevation / Depth of Top of Screen: 659.31 / 14

Type of Screen: PVC

Slot Size x Length: 20 SL x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL # 5

Diameter of Hole in Bedrock: Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 649.31 / 24

Elevation / Total Depth of Borehole: 648.31 / 24.5

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG:

BORING No.: 12MWT47
DATE: 10/31/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 @	0	3/2	1.5/2		M STIFF	BRN GRY	SILTY CLAY-TR	CL	MOIST (FILL)	0			
0940	2	3/3			TO STIFF		ROCK, TR ROOTS	ML	?	0			
S-2 @		10/10	1.7/2		M STIFF	GRAY BRN	CLAYEY SILT-TR SAND		MOIST (FILL)	0			
0945	4	11/9			TO STIFF		TR ROCK FRAGS TO SOME ROCK	CL	?	0			
S-3 @		4/5	1.5/2		STIFF	BRN	CLAYEY SILT TO	ML	MOIST	0			
0950	6	8/9		6±		GRAY	WEATHERED SHALE FRAGS @ 6'±			0			
S-4 @		7/8	1.8/2		V STIFF		TO			0			
0955	8	21/50		7.5 / 8		ORANGE BRN	WEATHERED SANDSTONE		MOIST SOME Fe Stains	0			
S-5	8.2	50/3"	.2/.2	8.2 REFUSAL		TO GRAY	FRAGS		Last 6" ALSO Ref @ 8.2±	0			
	9.5				M-HARD	BRN	F.G. SANDSTONE	BR		0			
						GRAY				0			
						GRAY BRN	HOLE IS MAKING GOOD	VBR	11.5→11.8 VBR W/WATER	0			
.9/5.5	①	16%/0	4.5/5.5				H2O DURING DRILLING	BR	12.2→12.4 CLAY FILLED JNT W/H2O	0			
									13.1→13.4 VBR W/ WATER	0			
	15			14	M HARD		SANDSTONE		13.8 HORIZ JNT TR WATER	0			
								VBR		0			
								BR	16.3 } HORIZ JNTS 16.8 } Fe STAINED	0			
.7/5	②	14%/0	4.2/5							0			
								VBR	17.8 VBR TR H2O	0			
	20				M HARD					0			
								BR	20→25 SEVERAL TIGHTLY SP HORIZ	0			
									JNTS, CLAY FILLED W/ Fe STAINS	0			
1.5/5	③	38%/0	4.9/5				WELL 14-24	VBR	TR H2O THROUGHOUT & FRIABLE ≈ 23.5	0			
				24			SAND 10→25			0			
	25									0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼" ID HSA/W AUTO HAMMER (2" SPOONS)
SET TEMP CASING TO 9.5
REAM 5½"Φ TO 25

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT47

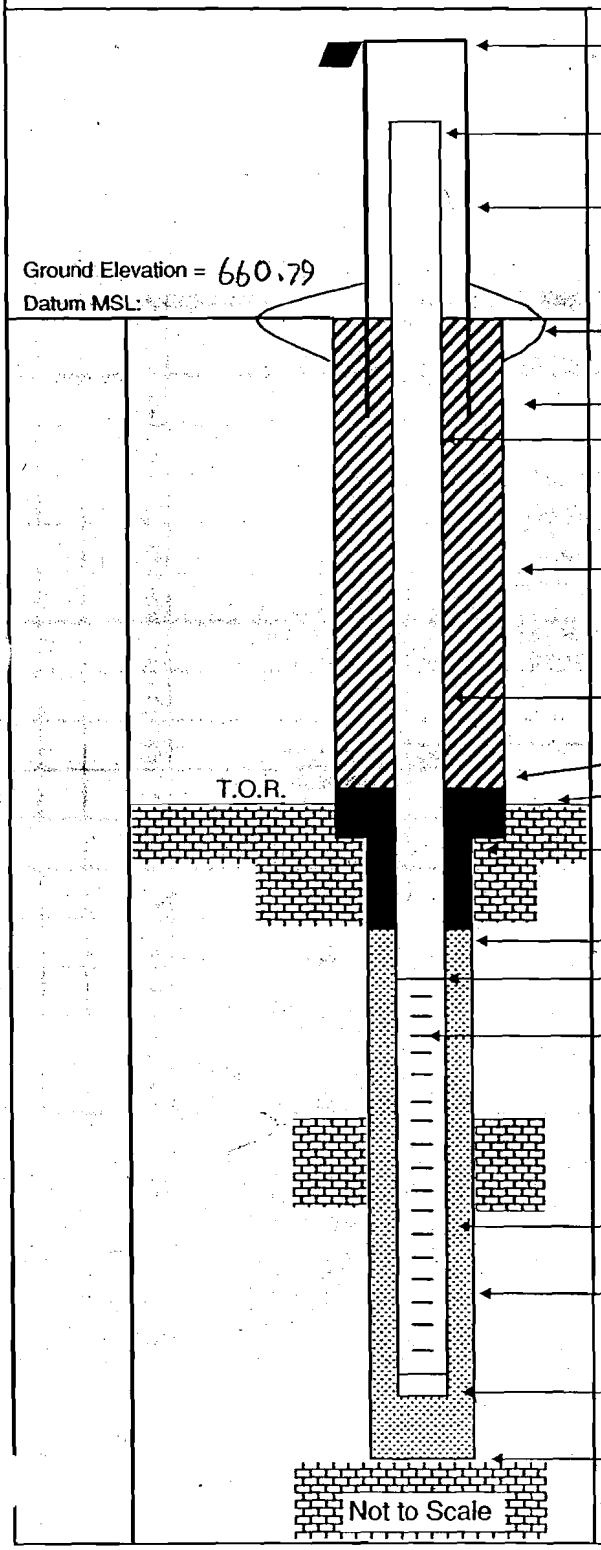
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT47

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT47
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	10/31/04
SITE:	SWMU-12	DRILLING METHOD:	HSA-AR	NORTHING:	1312455.99
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3028025.00



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 660.78

I.D. of Surface Casing:

Type of Surface Casing:

Type of Surface Seal: 6" ϕ TEMP

I.D. and Depth of Permanent Casing: TO 9.5
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8½"

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 657.791 3'

Elevation / Depth Top of Bedrock: 652.591 8.2

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 650.791 10

Elevation / Depth of Top of Screen: 646.791 14

Type of Screen: PVC

Slot Size x Length: 20 SL X 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock:
Core / Ream: 5½"

Elevation / Depth of Bottom of Screen: 636.791 24

Elevation / Total Depth of Borehole: 635.791 25

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT48
DATE: 11-9-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ**	Borehole**	Driller BZ**
S-1 e	0	3/3	1/2		M STIFF	BRN	SILTY CLAY TO	CL	MOIST? (FILL)	0			
0840	2	3/4					SANDY CLAY- SOME ROCK FRAGS	SC	1½" ROCK FRAG IN	0			
S-2 e		8/10	1.8/2		M STIFF	GRAY BRN	SANDY CLAY-TR	SC	SHOE MOIST ? (FILL)	0			
0845	4	12/15			M DENSE		ROCK/CLAYEY SAND			0			
S-3 e		6/7	2/2				SAME AS ABOVE		MOIST	0			
0850	6	14/19								0			
S-4 e		19/19	2/2	7'						0			
0855	8	45/49			V DENSE	GRAY BRN	SILTY SAND-TR CLAY TO WEATHERED	SM SC	MOIST	0			
							ROCK FRAGS @ 8'± ≈9 TOP OF ROCK			0			
	9.5			9 "E	M.	GRAY	SHALY W SANDSTONE INTERBEDS		TOP FEW FT	0			
					SOFT		INTERBEDDED SHALE AND SANDSTONE	VBR	LOST-VERY WEATH.	0			
										0			
6/5.5		11%/0	3.3/5.5	12.5	M HARD	GRAY BRN	SANDSTONE	BR	MOIST	0			
									≈13 VERT JNT TR H2O	0			
	15					TO			13.6, 13.7 HORIZ JNT TR H2O	0			
						BRN				0			
						GRAY			16.3 VBR & JNT.	0			
23/5			4.5/5						17.0 HORIZ JNT TR H2O	0			
				19		TO				0			
	20				M HARD	RED BRN		VBR	REDDISH AND VBR LAST 6"±	0			
						TO	MED GRAINED SANDSTONE	BL	21.1 → 23 VBR	0			
						GRAY BRN		VBR	W/SEVERAL HORIZ BEDDING	0			
2.5/5		50%/0	5/5					BR	PLANE JNTS W/TR H2O	0			
									NOT MAKING MUCH WATER	0			
	25								HOLE DRY @ 25' WILL GO TO 30'	0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼" Φ HSA W/ AUTO HAMMER & 2" SPOONS
SET 6" CAS TO 9.5 (TEMP)
NX CORE IN ROCK - REAM TO 5½" Φ.

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT48

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT48
DATE: 11-9-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sample BZ	Borehole**	Driller BZ**
	25				M HARD	BRN	SANDSTONE - MED GR	BR	POOR REC ?	0			
								VBR	SEVERAL HORIZ	0			
0/5	4	0/0	2.7/5						JNTS 26→28±	0			
									≈2' WATER IN HOLE	0			
	30			29					AFTER CORE.	0			
				30' TD									
							WELL 19-29						
							SAND 14-30						
							CHIPS TO 3'±						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks:

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT48

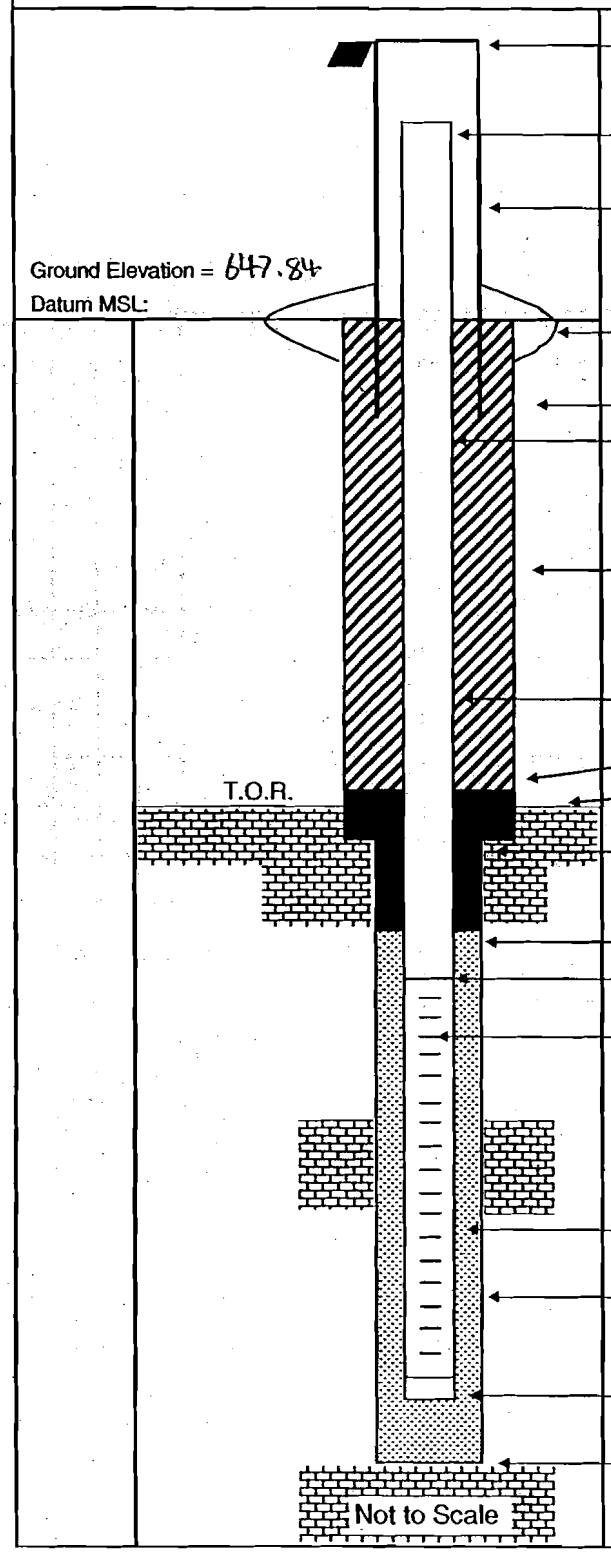
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT48

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT48
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	11-9-04
SITE:	SWMU-12	DRILLING METHOD:	HSA/A.R.	NORTHING:	1312052.61
GEOLOGIST:	CONTI	DEV. METHOD:	Surge & Purge	EASTING:	3028122.50



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 647.74

I.D. of Surface Casing: _____

Type of Surface Casing: _____

Type of Surface Seal: TEMP 6" STEEL TO 9.5

I.D. and Depth of Permanent Casing: (if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2"

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 644.84 / 3'

Elevation / Depth Top of Bedrock: 638.84 / 9'

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 633.84 / 14

Elevation / Depth of Top of Screen: 628.84 / 19

Type of Screen: PVC

Slot Size x Length: 20SL X 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock: Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 618.84 / 29

Elevation / Total Depth of Borehole: 617.84 / 30

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT 49
DATE: 11-9-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
S-1 @	0	12/50/2	1/1		M STIFF	BRN	SILTY CLAY-TR SAND	CL/ML	MOIST	0			
1440	1						& ROOTS TO GRAY SANDSTONE BOULDER		(FILL)?	0			
S-2 @		16/19	1.3/2		M SOFT		CLAYEY SILT-TR	ML	MOIST	0			
1445	4	10/5		4			SAND-SOME ROCK FRAGS.		(FILL)?	0			
S-3 @		3/4	1/2		DENSE	GRAY BRN	SILTY SAND-SOME	SM	MOIST	0			
1450	6	38/23					SANDSTONE FRAGS		? (FILL)	0			
S-4 @		23/14	1/2				SAME	SM	DAMP	0			
1455	8	10/12			V. DENSE	GRAY BRN	SILTY SAND-WATH			0			
S-5 @	9	16/50		9' ±		RED BRN	ROCK FRAG TO SANDSTONE		REF @ 9.0'	0			
1500					HARD	TAN GRAY	LIMESTONE	BR		0			
						BRN	SL. CALCAREOUS		DRILLED V DRY AND SLOW	0			
									13.5→13.7 HORIZ JNT	0			
5 1/6	1		6/6							0			
										0			
11/9	15								14.7 HORIZ JNT TR H2O	0			
11/10 0840					HARD		SL→MOD CALCAREOUS	BL		0			
									17.4 HORIZ JNT TR H2O	0			
9 8/5	2		5/5					BR		0			
				19				BL/BR	19± HORIZ JNT TR H2O	0			
0915	20							BL		0			
0935					HARD		SL→MOD CALCAREOUS	BR	25.8→25.9 HORIZ JNT-TR	0			
								BL	26.4 " " H2O "	0			
3/5	3		3.3/5							0			
									23.5 DRILLER NOTED 24.5 SOFT ZONE/ VOID	0			
1010	25									0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4 1/4" ID HSA / AUTO HAMMER / 2" SPOONS
SET 6" STEEL CAS TO 9' (TEMP)
NX IN ROCK - REAM TO 5 1/2"

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT 49

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT49
DATE: 11-10-04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole **	Driller BZ
1020	25				HARD		NO REC ≈ 2' LEFT		LIMESTONE TO	0			
							IN HOLE — WILL,		≈ 23 TO 24'	0			
9/5	4		0/5		↓		LAST 2 OR 3' EASIER		≈ 2' WATER IN HOLE	0			
				29	MED		DRILLING - WILL CHECK		AFTER CORING.	0			
1040	30				HARD		CUTTINGS - DURING		REAMING.	0			
				TD 30					WAS MORE SANDY @ 28-30				
									BASED ON CUTTINGS.				
							WELL 19-29						
							SAND 14-30						
							CHIPS TO 3'						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT49

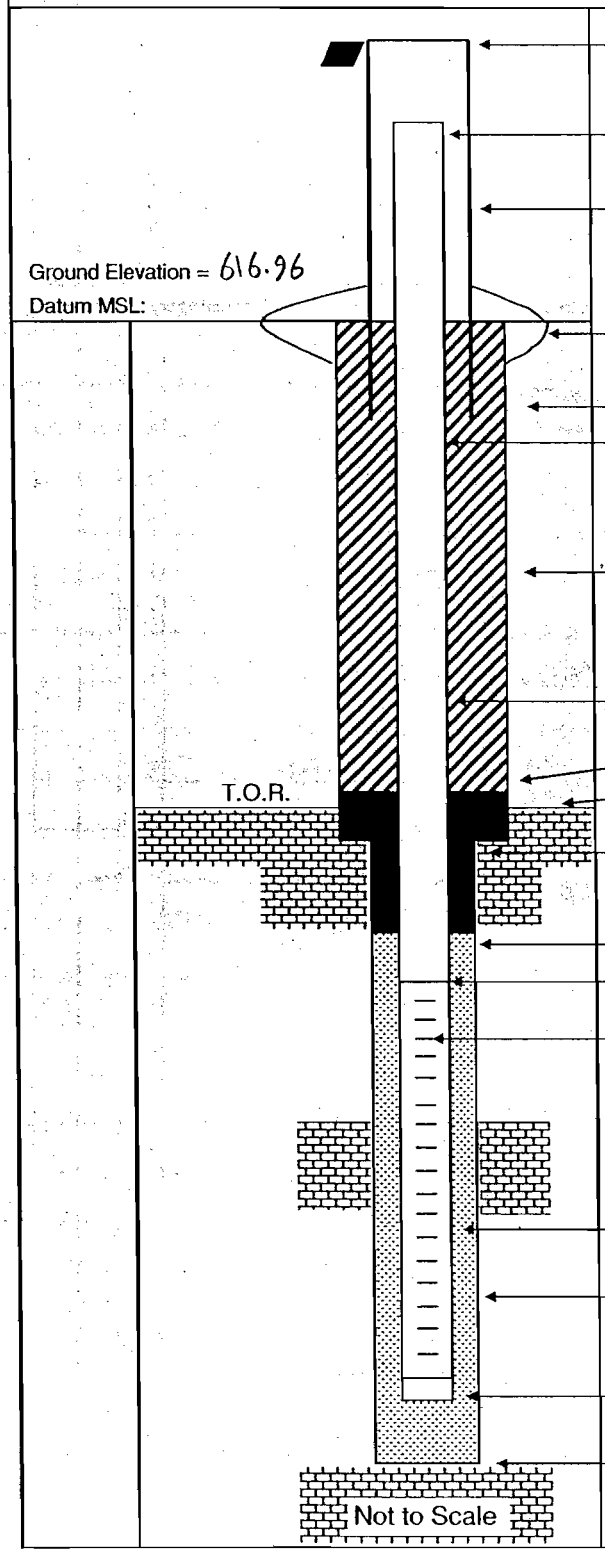
Tetra Tech NUS, Inc.

BEDROCK MONITORING WELL SHEET

WELL No.: 12MWT49

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT49
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	11-10-04
SITE:	SWMU-12	DRILLING METHOD:		NORTHING:	1310956.27
GEOLOGIST:	CONTI	DEV. METHOD:	N/A	EASTING:	3028138.17



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 616.84

I.D. of Surface Casing:

Type of Surface Casing:

Type of Surface Seal: 6" TEMP TO

I.D. and Depth of Permanent Casing: 9'
(if applicable)

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8 1/2

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 613.961 3'

Elevation / Depth Top of Bedrock: 607.961 9'±

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA

Elevation / Depth of Top of Filter Pack: 602.961 14

Elevation / Depth of Top of Screen: 597.961 19

Type of Screen: PVC

Slot Size x Length: 20SLX10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock: Core / Ream: 5 1/2"

Elevation / Depth of Bottom of Screen: 587.961 29

Elevation / Total Depth of Borehole: 586.961 30

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12MWT50
DATE: 10/28/04
GEOLOGIST: CONTI
DRILLER: WALSH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ*	Borehole**	Driller BZ**
S-1 e	0	2/2	1/2		STIFF	TAN BRN	SILTY CLAY AND	CL	MOIST NOTE:	0			
1250	2	2/2		2	M		ROCK FRAGS TR ROOTS		COULD BE	0			
S-2 e		26/8	1.5/2		DENSE	BRN	SANDY SILT AND	SM	MOIST FILL	0			
1255	4	9/10		4		MOTTLD	ROCK FRAGS		BENEATH RR	0			
S-3 e		5/4	2/2		V STIFF	YELLOW BRN	CLAYEY SILT	ML	MOIST TO	0			
1259	6	5/7					TR ROOTS TR ROCK		↓	0			
S-4 e		12/13	1.8/2		V STIFF	BRN	CLAYEY SILT-TR	ML	MOIST ?	0			
1305	8	18/18				MOTTLD	ROCK FRAGS			0			
S-5 e		6/9	1.7/2		V STIFF	GR BRN	SAME AS ABOVE	ML	MOIST	0			
1312	10	10/14								0			
S-6 e		11/12	1.2/2		STIFF	TO	SAME AS ABOVE-	ML	MOIST	0			
1320	12	12/13				BRN	MORE CLAY AT BOTM TO SILTY CLAY	CL		0			
S-7 e		5/9	2/2		STIFF	TO BRN	SILTY CLAY-CLAYEY		MOIST	0			
1328	14	12/14				GRAY	SILT-TR ROCK			0			
S-8 e		6/8	2/2		STIFF	MOTTLD ORANG	SILTY CLAY-TR	CL	MOIST	0			
1334	16	9/12	.5/1	16'		BRN	ROCK FRAG		LOOKS LIKE SOME Fe STAINS	0			
S-9 e		50/1"							16'1" REF	0			
1340										0			
	18.5		18.5							0			
							NO RECOVERY			0			
							RUN ① - HIT SOME			0			
							SOFT AREAS AND POSSIBLE			—			
							CLAY FILLED JOINTS			—			
0/6.5	①	∅	0/6.5							—			
										—			
	25									—			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 4¼" HSA & 2" SPOONS W/ AUTO HAMMER
SET 6" CASING TO
NX CORE IN ROCK - REAM TO 5½" Φ

Converted to Well: Yes ✓ No _____ Well I.D. #: 12MWT50

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE-SWMU-12
PROJECT NUMBER: N6878
DRILLING COMPANY: BOWSER MORNER
DRILLING RIG: CME 550 ATV

BORING No.: 12 MWT 50
DATE: 10/28/04
GEOLOGIST: CONTI
DRILLER: WALSH

	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ**	Borehole**	Driller BZ**
		25			24									
						M SOFT	GRAY	SHALY SILTSTONE/	BR	DRILLED DRY.	0			
								SILTY SHALE	BL		0			
	4.4/5	(2)	88%	5/5							0			
								LAST 6"			0			
10/28		30						CLAYSTONE	BR		0			
10/29	830					M SOFT		CLAYEY SILTSTONE	VBR		0			
									BR	FEW SOFT	0			
	0/5	(3)	0	3.5/5	33±					SEAMS ≈ 32'	0			
					34	M HARD	GRAY	SANDSTONE/CLAY		TR WATER	0			
	0900	35			35'			STONE	VBR	LAST 1' VBR	0			
					BOTM									
										HOLE HAD ≈ 5'				
										H2O AT 35' DEPTH				
								WELL 24-34						
								SAND 20-35						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 0930 START REAMING W/ 5 1/2" BIT
1000 DONE REAMING / PULL RODS - SET WELL AND SANDPACK
1030 PULL 2 SEC OF CASING.

Converted to Well: Yes ✓ No ____ Well I.D. #: 12MWT50

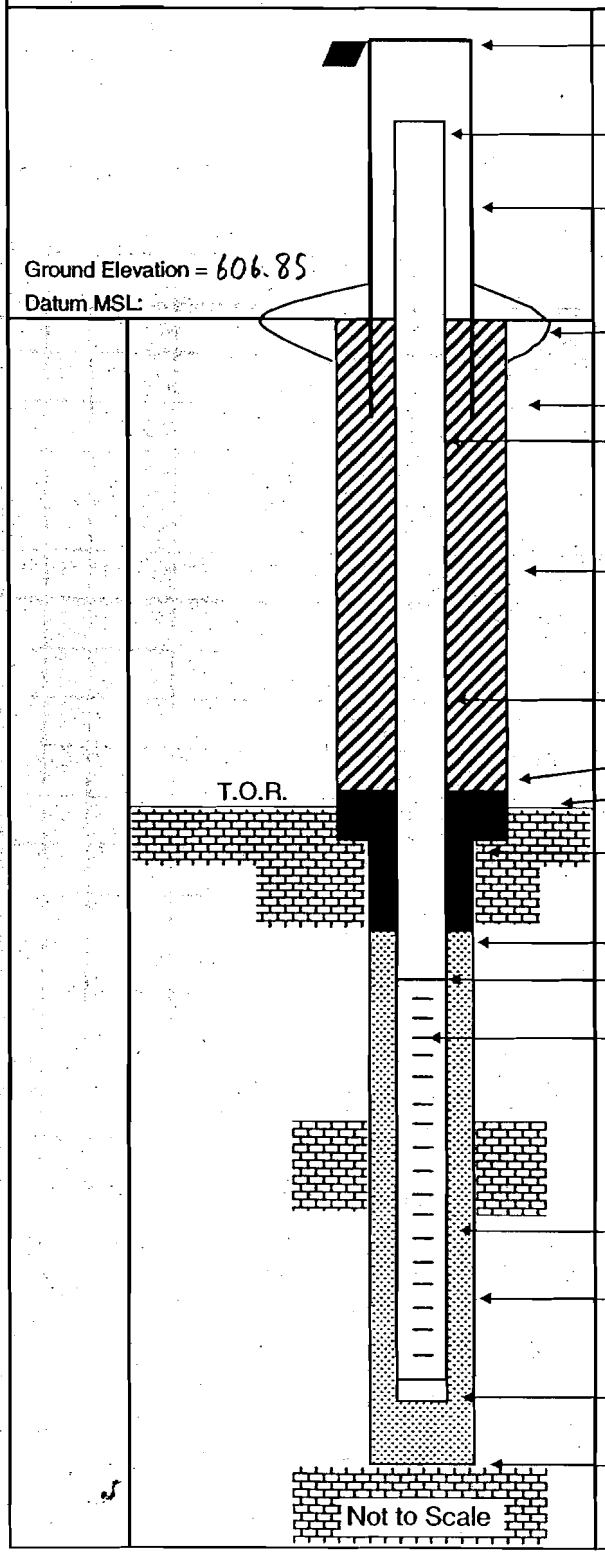
Tetra Tech NUS, Inc.

BEDROCK
MONITORING WELL SHEET

WELL No.: 12MWT50

PERMIT No:

PROJECT:	NSWC CRANE	DRILLING Co.:	BOWSER-MORNER	BORING No.:	12MWT50
PROJECT No.:	N6878	DRILLER:	WALSH	DATE COMPLETED:	10/29/04
SITE:	SWMU-12	DRILLING METHOD:	HSA - A.R.	NORTHING:	1310582.27
GEOLOGIST:	CONTI	DEV. METHOD:	N/A	EASTING:	3028100.87



Elevation of Top of Casing: NA

Stick Up of Casing Above Ground Surface: NA

Elevation of Top of Riser: 606.88

I.D. of Surface Casing:

Type of Surface Casing:

Type of Surface Seal:

I.D. and Depth of Permanent Casing: (if applicable) TEMP TO 18.5

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 8½"

Type of Backfill: BENTONITE CHIPS

Elevation / Depth Top of Seal: 600.85 / ±6'

Elevation / Depth Top of Bedrock: 590.85 / 16'±

Type of Seal: BENTONITE CHIPS

Elevation / Depth of Top of Fine Sand: NA / NA'

Elevation / Depth of Top of Filter Pack: 586.85 / 20

Elevation / Depth of Top of Screen: 582.85 / 24

Type of Screen: PVC

Slot Size x Length: 20 SL x 10'

I.D. of Screen: 2"

Type of Filter Pack: GLOBAL #5

Diameter of Hole in Bedrock: Core / Ream: 5½"Φ

Elevation / Depth of Bottom of Screen: 572.85 / 34

Elevation / Total Depth of Borehole: 571.85 / 35

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU 12
PROJECT NUMBER: N6878 CTO Ø357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe

BORING No.: 12 SB Ø1
DATE: 8/15/Ø4
GEOLOGIST: Charles C. Laney III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	Ø						Grass Cover						
1	1		5'		Loose	Light Brn / Brn	Topsoil (Ø-2") / Sandy Clay		CL	1.9	Ø	Ø	Ø
	2				Stiff	Brn	Silty Clay w/some Organic Material	CL		Ø.6			
	3				"	Dark Brn Mot. Gray	Silty Clay	CL		Ø.6			
	4				"	"	" "	CL		Ø.3			
	5				Loose / Soft	Red / Org Brn	Red compacted Sandstones (4'-4'2") / Silty Clay		CL	Ø.3			
2	6		4'		"	Dark Brn Mot Gray	" "	CL		1.5	Ø	Ø	Ø
	7				"	"	Silty Clay ~~w/compacted Sandstones~~	CL		1.5			
	8				" / Loose	" / "	~~Sandstones~~ " / Silty Clay w/ compacted		CL	Ø.7			
	9				" / "	" / "	Sand lenses / Silt, Pulverized		CL-ML	1.1			
	1Ø		←				REFUSAL			→			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 12SS Ø1ØØØ2 collected @ 15ØS
12SB Ø1Ø6Ø9 collected @ 152Ø

Drilling Area Background (ppm): Ø

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU 12
PROJECT NUMBER: N6878 CTO Ø357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe

BORING No.: 12SBØ2
DATE: 8/15/Ø4
GEOLOGIST: Charles C. Caney III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	Ø						GRASS COVER						
1	1		5'		STIFF	ORG BRN	TOPSOIL (Ø-2"). SANDY CLAY W/ROOTS	CL		Ø.9	Ø	Ø	Ø
	2				"	BRN	SILTY CLAY	CL		Ø.9			
	3				"	GRAY MOT. ORG. SOIL	" "	CL		Ø.9			
	4				"	"	" "	CL		Ø.9			
	5				"	"	" "	CL		Ø.9			
2	6		4'		"	ORG BRN MOT. GRAY	" "	CL		1.Ø	Ø	Ø	Ø
	7				"	"	" "	CL		1.Ø			
	8				"	"	" "	CL		1.Ø			
	9				"	GRAY	SILTY CLAY W/ ORGANIC MATERIAL AND TRACE SILTSTONE	CL	ZCL-RX	1.Ø			
	1Ø						REFUSAL						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø.8

Remarks: 12SSØ2ØØØ2 collected @ 1425
12SBØ2ØØØ8 collected @ 1432 along w/ 12FDØ815Ø4Ø3

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU 12
PROJECT NUMBER: N6878 CTO Ø357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe
BORING No.: 12SBØ3
DATE: 8/15/04
GEOLOGIST: Charles C. Lawey III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	Ø						Grass Cover						
1	1		5'		STIFF	BRN	Topsoil (Ø-2"). Sandy CLAY w/some Roots	CL		1.Ø	Ø	Ø	Ø
	2				SOFT	ORG BRN mot GRAY	Sandy CLAY w/some organic matter	CL		1.Ø			
	3				"	"	" "	CL		Ø.9			
	4				"	"	" "	CL		Ø.9			
	5				"	"	" "	CL		Ø.6			
2	6		2.5'		"	"	SILTY CLAY w/ some micas.	CL		Ø.5	Ø	Ø	Ø
	7				"	"	" "	CL		Ø.2			
	8				LOOSE	ORG BRN	SILT, Pulverized → ML						
							REFUSAL			Ø.2			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø

Remarks: 12SSØ3ØØ Ø2 collected @ 1348
12SBØ3 Ø6Ø8 collected along w/MS/MSD @ 1359

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU 12
PROJECT NUMBER: N6878 CTO Ø357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe

BORING No.: 12SBØ4
DATE: 8/15/Ø4
GEOLOGIST: Charles C. Lancy III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	Ø						Grass Cover						
1	1		5'		Loose	Brn	Topsoil (Ø-2"); Gravels (2-3")		} CL	ØØ3	Ø	Ø	Ø
					Stiff	Brn mott.	Sandy CLAY w/ Roots						
	2				"	Gray	Sandy CLAY w/ Roots	CL		ØØ6			
	3				"	"	" "	CL		ØØ6			
	4				"	"	SILTY CLAY w/ micas [redacted]	CL		ØØ9			
	5				"	"	SILTY CLAY w/micas + Black organic Material	CL		ØØ9			
2	6		5'		Soft	Orb Brn mott. Gray	SILTY CLAY w/micas, Soft.	CL		Ø	Ø	Ø	Ø
	7				"	"	" "	CL		Ø			
	8				"	"	" "	CL		Ø			
	9				Stiff	Lt. Brn Mot Gray	" , Firm	CL		Ø			
	1Ø				"	"	" "	CL		Ø			
3	11		2'		"	"	SILTY CLAY w/micas, Fragmented	CL		Ø	Ø	Ø	Ø
	12				"	"	" "		} CL-ML	Ø			
					Loose	"	SILT, w/micas						
	13						REFUSAL						
	14												
	15												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø

Remarks: 12SSØ4ØØØ2 collected @ 1Ø28.
12SBØ4Ø2Ø7 collected @ 1Ø37.
12SBØ4Ø712 collected @ 1Ø39.

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU 12
PROJECT NUMBER: N6878 CTO Ø357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe
BORING No.: 12SBØ5
DATE: 8/15/Ø4
GEOLOGIST: Charles C. Lanney III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	Ø						Grass Cover						
1	1		4'		Loose	BRN	Topsoil (Ø-2"). Silty Clay w/ Roots.	CL		1.3	Ø	Ø	Ø
	2				"	"	" "	CL		1.5			
	3				Soft	ORG. BRN. MOT. GRAY	Silty Clay	CL		2.1			
	4				"	"	" "		} CL	2.Ø			
						Gray	Silty Clay w/ Some organic material.						
	5						No Recovery			—			
2	6		4'		Stiff	ORG. BRN. MOT. GRAY	Silty Clay	CL		Ø.8	Ø	Ø	Ø
	7				"	"	" "	CL		Ø.8			
	8				"	"	" "	CL		Ø.8			
	9				"	"	" "		} CL-ML	Ø.8			
					Loose	Gray	Silt, Pulverized						
	1Ø						Refusal						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø

Remarks: 12SSØ5 ØØØ2 collected @
12SBØ5 Ø2Ø4 collected @ 1245 along w/ Dup: 12FDØ815Ø4-Ø2
12SBØ5 Ø5Ø9 collected @ 1248

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU 12
PROJECT NUMBER: N6878, CTO Ø357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe
BORING No.: 12SBØ6
DATE: 8/15/Ø4
GEOLOGIST: Charles C. Lanier III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	Ø						Grass Cover						
1	1		5'		Stiff	Brn	Topsoil (Ø-2"). Sandy CLAY w/Roots.	CL		Ø.6	Ø	Ø	Ø
	2				Stiff	Dk Brn	Sandy CLAY w/ Some large Gravels	CL		1.Ø			
	3				"	Gray mot Brn	Silty CLAY	CL		Ø.8			
	4				Loose / Stiff	Dk Org Brn / Gray	Silty CLAY w/ compacted sand lenses / Silty CLAY w/ organic material	CL		Ø.8			
	5				Stiff	Brn mot. Gray	Silty CLAY	CL		Ø.0			
2	6		4'		Stiff	Dk Brn mot. Gray	" "	CL		Ø	Ø	Ø	Ø
	7				"	"	" "	CL		Ø			
	8				"	"	" "	CL		Ø			
	9				" / Loose	" / Dk. Brn	" " / Silt, pulverized		CL-ML	Ø			
	1Ø						REFUSAL						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø

Remarks: 12SSØ6ØØØ2 collected @ 13Ø4
12SBØ6Ø2Ø5 collected @ 131Ø along with MS/MSD
12SBØ6Ø5Ø9 collected @ 1315

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU 12
PROJECT NUMBER: N6878 CTO Ø357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe
BORING No.: 12 SB Ø7
DATE: 8/15/Ø4
GEOLOGIST: Charles C. Lawer III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	Ø						Grass Cover						
1	1		4.5'		Loose	BRN GRAY / LIGHT BRN	Topsoil (Ø-2") Gravelly SAND (2-5") / SANDY CLAY w/Some Gravels		CL	Ø	Ø	Ø	Ø
	2				STIFF	MOT. GRAY	SANDY CLAY	CL		Ø			
	3				SOFT	GRAY	SILTY CLAY w/organic Material (wood)	CL		Ø			
	4				"	"	" "		CL	Ø			
					V. SOFT	ORG. BRN	SILTY CLAY						
	5				"	ORG. BRN	NO RECOVERY		CL	Ø			
2	6		5'		V. SOFT	ORG. BRN	SILTY CLAY		CL	Ø	Ø	Ø	Ø
					STIFF	ORG. BRN	SILTY CLAY w/organic material + micas						
	7				"	"	" "	CL		Ø			
	8				"	"	" "	CL		Ø			
	9				"	"	" "	CL		Ø			
	1Ø				"	"	" "		CL-ML	Ø			
					LOOSE		SILT, Pulverized						
							REFUSAL						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø

Remarks: 12SS Ø7 ØØ Ø2 Collected @ 1ØSS
12SB Ø7 Ø2 Ø6 Collected @ 11Ø1
12SB Ø7 Ø6 1Ø Collected @ 11Ø3

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE SWMU12
PROJECT NUMBER: N6878 CTO Ø357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe
BORING No.: 12 SB Ø8
DATE: 8/15/04
GEOLOGIST: Charles C. Laney III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	Ø						Grass Cover						
1	1		4'		Loose	BRN / DK. BRN. MOT. LT. GRAY	Topsoil (Ø-2") / Sandy CLAY w/micas	CL		Ø	Ø	Ø	Ø
	2				Stiff	DK. BRN MOT. LT. GRAY	Sandy CLAY w/micas	CL		Ø.2			
	3				Soft	"	Silty CLAY w/micas	CL		Ø.6			
	4				Stiff	"	Sandstone Fragments (3'-3'2") / Silty CLAY w/micas.	CL		Ø.3			
	5		←				No RECOVERY		→				
2	6		2'		Soft	DK. BRN. MOT. LT. GRAY	Silty CLAY w/micas.	CL		Ø.6	Ø	Ø	Ø
					"	"	" "						
	7				Loose	LT. GRAY	SANDSTONE FRAGMENTS, PULVERIZED	CL-Rx		Ø.6			
	8		←				REFUSAL		→				
	9												
	1Ø												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø.Ø

Remarks: 12 SS Ø8 ØØØ2 Collected @ Ø928
12 SB Ø8 Ø2Ø4 Collected @ Ø931
12 SB Ø8 Ø5Ø7 Collected @ Ø934

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU 12
PROJECT NUMBER: N6878 CTO Ø357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe
BORING No.: 12SBØ9
DATE: 8/15/Ø4
GEOLOGIST: Charles C. Laney III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	Ø						Grass Cover						
1	1		5'		Loose	Dark Gray / Orange	Topsoil (Ø-2") / Brn Mot. Lt. Gray Sandy Clay, w/	CL	Roots. Dry	1.Ø	Ø	Ø	Ø
	2				Stiff	Orange Brn. Mot. Lt. Gray	Sandy Clay w/micas, Dry.	CL		1.Ø			
	3				"	"	" "						
					"	"	Silty Clay w/micas		CL	1.Ø			
	4				Soft	"	Silty Clay w/micas, moist (3'->3'4")		CL				
					Stiff	"	Silty Clay w/micas, Dry			1.Ø			
	5				"	"	" "	CL		1.Ø			
2	6		3'		Loose	"	" "	CL	Very Fragmented	1.Ø	Ø	Ø	Ø
	7				"	"	" "	CL	"	1.Ø			
	8				"	"	" "	CL	"	1.Ø			
	9						REFUSAL						
	1Ø												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 1.Ø

Remarks: 12SSØ9ØØØ2 collected @ Ø9Ø2
12SBØ9Ø2ØS collected @ Ø9Ø8
12SBØ9ØSØ8 collected along w/MS/MSD @ Ø911

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU12
PROJECT NUMBER: N6878 CTO Ø357
DRILLING COMPANY: FFS
DRILLING RIG: Geoprobe
BORING No.: 12SB1Ø
DATE: 8/15/Ø4
GEOLOGIST: Charles C. Laney III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	Ø						Grass Cover						
1	1		5'		Loose	Lt. Gray / Org. Brn Mot.	Topsoil (Ø-2") / Lt. Gray Sandy CLAY	CL	DRY	1.2	Ø	Ø	Ø
	2				Med Stiff	Dk. Brn Mot. Lt. Gray	Sandy CLAY w/ some micas.	CL	" ; Very Fragmented	1.2			
	3				Stiff	"	" "	CL	" "	1.9			
	4				"	"	" "	CL	" "	2.1			
	5				"	"	" "	CL	" "	1.9			
2	6		3'		Loose	Lt. Gray Mot. Dk. Brn	Silty CLAY w/ micas.	CL	" "	1.1	Ø	Ø	Ø
	7				"	"	" "	CL	" "	1.1			
	8				"	"	" "	CL	" "	1.1			
	9				←		REFUSAL		→				
	1Ø												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 1.1

Remarks: 12SS1ØØØØ2 collected @ Ø831
12SB1ØØ2ØS collected @ Ø834
12SB1Ø Ø5Ø8 collected @ Ø838

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SUMU12
PROJECT NUMBER: N6878 CTO Ø357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe
BORING No.: 12 SB 11
DATE: 8/15/Ø4
GEOLOGIST: Charles C. Laney III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	Ø						Grass Cover						
1	1		5'		Loose	BRN	Topsoil (Ø-2")						
					STIFF	ORG. BRN	SANDY CLAY W/Roots + Asphalt FRAGMENTS	CL		ØØ.8	Ø	Ø	Ø
	2				"	MOTT. LT. GRAY	SANDY CLAY W/some micas.	CL		Ø.3			
	3				Loose	DK. RED	Fill Material (IRONSTONES)						
					STIFF	ORG. BRN	CLAY W/ Some micas + Grnds	CL		ØØ6			
	4				"	MOTT. GRAY	" "	CL		Ø.3			
	5				"	"	" "	CL		Ø.3			
2	6		1.5'		"	"	SILTY CLAY W/micas	CL		Ø	Ø	Ø	Ø
	7				Loose	"	SILT	ML					
							REFUSAL			Ø			
	8												
	9												
	1Ø												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø

Remarks: 12SS11ØØØ2 collected @ Ø945
12SB11Ø2Ø5 collected @ Ø952 along w/ Duplicate: 12FDØ815Ø4Ø1
12SB11Ø5Ø7 collected @ Ø954

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU12
PROJECT NUMBER: N6878, CTO 0357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe
BORING No.: 12SB12
DATE: 8/13/04
GEOLOGIST: Charles C. Laney III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						Grass Cover						
1	1		4'		Loose	BRN	Topsoil (0-2"), CLAY, SOFT, MOIST	CL		1.1	0	0	0
	2				Stiff	Lt. GRAY MOT. ORG. BRN	SILTY CLAY	CL		1.1			
	3				"	Lt. GRAY	" "	CL		0.8			
	4				"	Lt. BRN	" "	CL		0.0			
2	5		2'		"	Lt. GRAY MOT. ORG. BRN	" "	CL		0.4	0	0	0
	6				" "	" "	" " SILT STONE		CL-RA	0.4			
	7						REFUSAL						
	8												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 12SS12 00 02 collected @ 1555
12SB12 0204 collected @ 1607

Drilling Area Background (ppm): 0

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU 12
PROJECT NUMBER: N6878, CTO Ø357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe
BORING No.: 12SB13
DATE: 8/13/Ø4
GEOLOGIST: Charles C. Lower III
DRILLER: Josh Putton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	Ø						Grass Cover						
1	1		5'		Loose	BRN	Fine grained SAND	SP		1.7	Ø	Ø	Ø
	2				STIFF	ORG. BRN MOT. GRAY	CLAYEY SAND	SC		1.7			
	3				"	"	" "	SC		2.6			
	4				"	"	" "	SC		2.6			
	5				"	"	Silty CLAY w/some compacted SAND Lenses	CL		3.3			
2	6		1.5'		"	GRAY MOT. ORG. BRN	Silty CLAY	CL		Ø	Ø	Ø	Ø
	7				"	GRAY	Stone Fragments		→ RX	Ø			
							REFUSAL						
	8												
	9												
	1Ø												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø

Remarks: 12 SS 13ØØØ2 collected @ 141Ø
12SB13Ø2Ø4 collected @ 142Ø
12SB13Ø6Ø7 collected @ 1442

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU 12
PROJECT NUMBER: N6878 CTO 0357
DRILLING COMPANY: EFS
DRILLING RIG: GeoProbe
BORING No.: 12SB14
DATE: 8/13/04
GEOLOGIST: Charles C. Loney III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						Grass Cover						
1	1		4'		STIFF	DRK. BRN. MOT GRAY	CLAYEY SAND	SC		0.4	0	0	0
	2				"	"	SILTY CLAY w/ ORGANICS	CL	(Plant Fossils ?)	1.1			
	3				"	LT. GRAY	" "	CL	"	1.1			
	4				"	LT. GRAY / LT. GRAY MOT. DRK. BRN.	" "	CL	"	0.5			
2	5		3'		"	"	SILTY CLAY	CL		1.4	0	0	0
	6				"	"	" "	CL		1.4			
	7				"	DRK. GRAY	" " / SILTSTONE		} CL-Rx	1.4			
	8				←		REFUSAL		→				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 12SS14 0002 Collected @ 1521
12SB14 0204 Collected @ 1532
12SB14 0607 Collected @ 1540

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU 12
PROJECT NUMBER: N6878 CTO Ø357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe

BORING No.: 12SB15
DATE: 8/13/Ø4
GEOLOGIST: Charles C. Lanev III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	Ø						Grass Cover						
1	1		5'		STIFF	DRK BRN	SILTY CLAY W/ROOTS, WET.	CL		Ø.4	Ø	Ø	Ø
	2				"	LT GRAY MOT. ORG BRN	SANDY CLAY, DRY	CL		Ø.4			
	3				"	DRK ORG BRN	SILTY CLAY, DRY	CL		Ø.2			
	4				"	LT GRAY	" " "	CL		Ø.2			
	5				"	LT GRAY MOT. ORG BRN	" " "	CL		Ø.2			
2	6		1.5'		"	"	SILTY CLAY, DRY	CL		Ø	Ø	Ø	Ø
	7				"	GRAY	SILTSTONE → Rx			Ø			
							REFUSAL						
	8												
	9												
	1Ø												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø

Remarks: 12SS15ØØØ2 collected @ 1444
12SB15Ø2Ø4 collected @ 1455
12SB15Ø6Ø7 collected @ 15Ø4

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU12
PROJECT NUMBER: N6878 CTO Ø357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe
BORING No.: 12 SB 18
DATE: 8/15/Ø4
GEOLOGIST: Charles C. Lanney III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ**	Borehole**	Driller BZ**
	Ø						Grass Cover						
1	1		5'		Loose	Brown	Topsoil (Ø-2") . Sandy CLAY w/Roots.	CL		1.Ø	Ø	Ø	Ø
	2				Stiff	Org. Brn	Silty CLAY	CL		1.Ø			
	3				Hard	Red	Compacted Sand Fragments						
					Stiff	Org Brn	Mot-Gray Silty CLAY	CL		1.Ø			
	4				"	"	Silty CLAY	CL		1.Ø			
	5				"	"	" "	CL		1.Ø			
2	6		4'		"	"	" "	CL		1.5	Ø	Ø	Ø
	7				"	"	" "	CL		1.5			
	8				"	"	" "	CL		2.1			
	9				"	Gray Mot Orange	Silt / Siltstone		} ML-Rx	2.1			
	1Ø		←				REFUSAL		→				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 1.Ø

Remarks: 12SS18ØØØ2 collected @ 1655
12SB18Ø2Ø4 collected @ 17Ø1
12SB18Ø6Ø8 collected @ also w/ DUP-12FD Ø815Ø4Ø4

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU 12
PROJECT NUMBER: N6878, CTO Ø357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe
BORING No.: 12SB19
DATE: 8/15/Ø4
GEOLOGIST: Charles C. Laney III
DRILLER: Josh Duffow

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	Ø						Grass cover						
1	1		4'		Loose	Brn	Topsoil (Ø-2"). Sandy Clay w/ Roots	CL		1.2	Ø	Ø	Ø
	2				Loose	"	Silty Clay, Heavily Fractured	CL		1.2			
	3				"	Org. Brn	" "		? CL				
					Hard	Red	Compacted Sand Fragments			1.6			
	4				Loose	Org Brn	Silty Clay w/ Some Siltstone Fragments	CL		1.9			
	5						REFUSAL						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): Ø

Remarks: 1 ATTEMPTED BORING NEAR 12SB19 Resulted in Refusal @ 2'
12SS19ØØØ2 collected @ 1617 along w/MS/MSD
12SB19Ø2Ø4 collected @ 1693

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NSWC CRANE, SWMU 12
PROJECT NUMBER: N6878, CTO 0357
DRILLING COMPANY: EFS
DRILLING RIG: Geoprobe
BORING No.: 12SB20
DATE: 8/15/04
GEOLOGIST: Charles C. Lanier III
DRILLER: Josh Dutton

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0						Grass Cover						
1	1		5'		Loose	Brn	Topsoil (0-2") Silt w/ Roots	ML		1.5	0	0	0
	2				Stiff	Org Brn	Silty Clay	CL		1.5			
	3				"	"	" "	CL		0.5			
	4				"	"	" "	CL		0.5			
	5				"	Org Brn Mot. Gray	" "	CL		0.5			
2	6		3'		"	"	" "	CL		0.9	0	0	0
	7				"	"	" "	CL		0.9			
	8				"	" / Gray	" " / Siltstone		CL-Rx	0.9			
	9						REFUSAL						
	10												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0

Remarks: 12SS20 0002 collected @ 1550
12SB20 0204 collected @ 1557
12SB20 0608 collected @ 1600

Converted to Well: Yes ____ No X Well I.D. #: ____

APPENDIX B.1.2

SMWU 25 (DUMP SITE A)

BORING LOGS AND MONITORING WELL CONSTRUCTION DIAGRAMS

ROUND 2

BORING LOG
FIELD DATA

Project NWSC Groundwater Study Site Crane, IN Date 3 Oct. 1981
Location Highway 58 Dump Site A Job No. 441-G150.11GR21/22
Drill Rig Failing Inspector J. Dunbar Operator C. Drake Surface El 629.54 Boring No. WES-7-1-81

SAMPLE NUMBER	DATE TAKEN 1981	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	Hyd. Press	Cont	CLASSIFICATION AND REMARKS
1	3 Oct	0.0		0.0	0.5	0.0	1.05	3" Shelby	40	ST	Gravelly clay (CL): brown in color,
1A				0.5	1.0	1.05	1.25	Tube	40	Jar	soft to moderately stiff, dry, and
				1.0	1.5				100		contains 20% gravel fragments.
				1.5	2.0				160		
			4.0	2.0	2.5				300		Sample length: 1.25 ft
				0.0	5.0	—	—	7" Solid Auger		—	Cleanout
2	3 Oct	4.0		5.0	5.5	5.0	6.79	3"Fixed Pis-	40	ST	Clay (CL): brown to grey, stiff,
2A				5.5	6.0	6.79	6.97		60	Jar	and fairly uniform.
				6.0	6.5				120		
				6.5	7.0				180		Sample length: 1.97 ft
			8.0	7.0	7.5				240		
				5.0	10.0	—	—	7" Solid Auger		—	Cleanout

WES FORM JAN 74 819 EDITION OF NOV 1971 MAY BE USED *3" Fixed Piston Sampler = 3"F.P.S. Sheet 1 of 2 Sheets

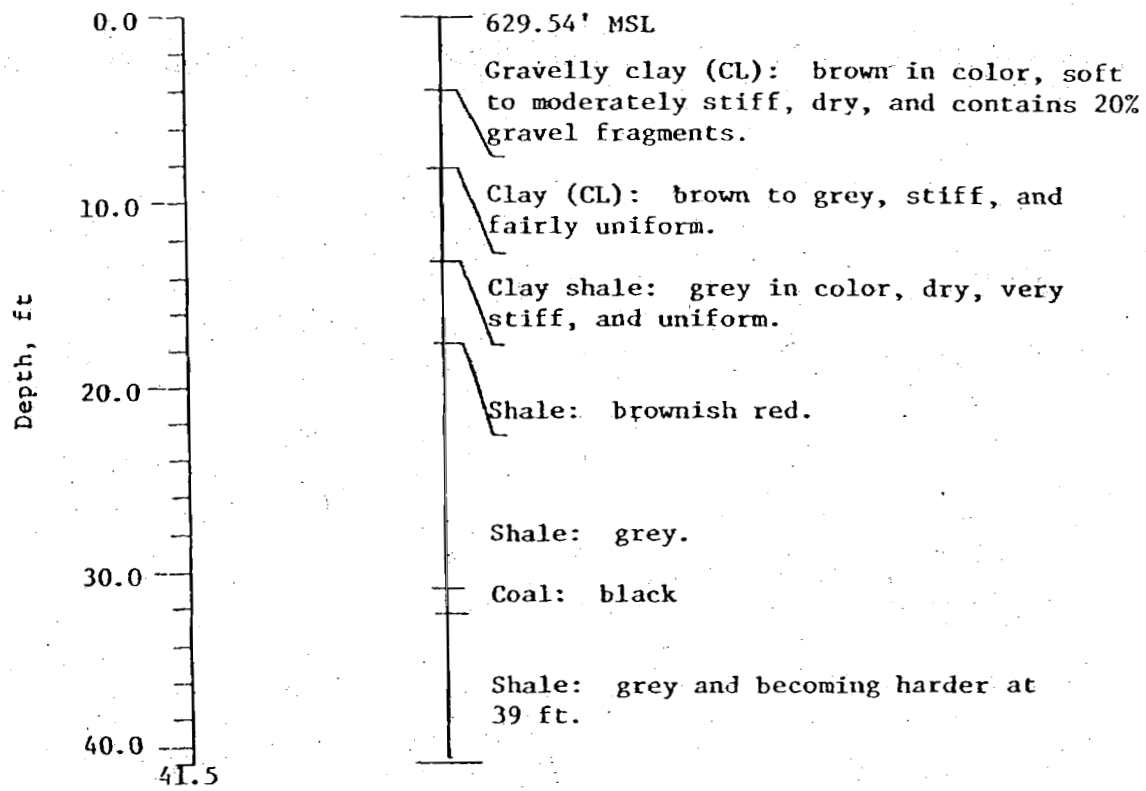
BORING LOG
FIELD DATA

Project _____ Site _____ Date _____
Location _____ Job No. _____
Drill Rig _____ Inspector _____ Operator _____ Surface El _____ Boring No. WES-7-1-81

SAMPLE NUMBER	DATE TAKEN 1981	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	Hyd. Press	Cont	CLASSIFICATION AND REMARKS
3	5 Oct	8.0		10.0	10.5	10.0	11.44	3" F.P.S.	160	ST	Clay shale: grey in color, dry,
3A				10.5	11.0	11.44	11.59		240	Jar	very stiff, and uniform.
				11.0	11.5				380		
				11.5	12.0				420		Sample length: 1.59 ft
				12.0	12.5				520		
			13.0	10.0	13.0	—	—	7" Solid Auger		—	Cleanout: auger required 600 psi,
											will go to rock bit
	5 Oct	13.0	17.5	13.0	41.5	—	—	5 5/8" Rock Bit		—	Shale: brownish red
		17.5	31.0								Shale: grey
											Encountered water between 30-31 ft
		31.0	32.2								Coal: black
		32.2	41.5								Shale: grey and becoming harder
											at 39 ft
											Installed well after blowing hole clear.

WES FORM JAN 74 819 EDITION OF NOV 1971 MAY BE USED

Sheet 2 of 2 Sheets

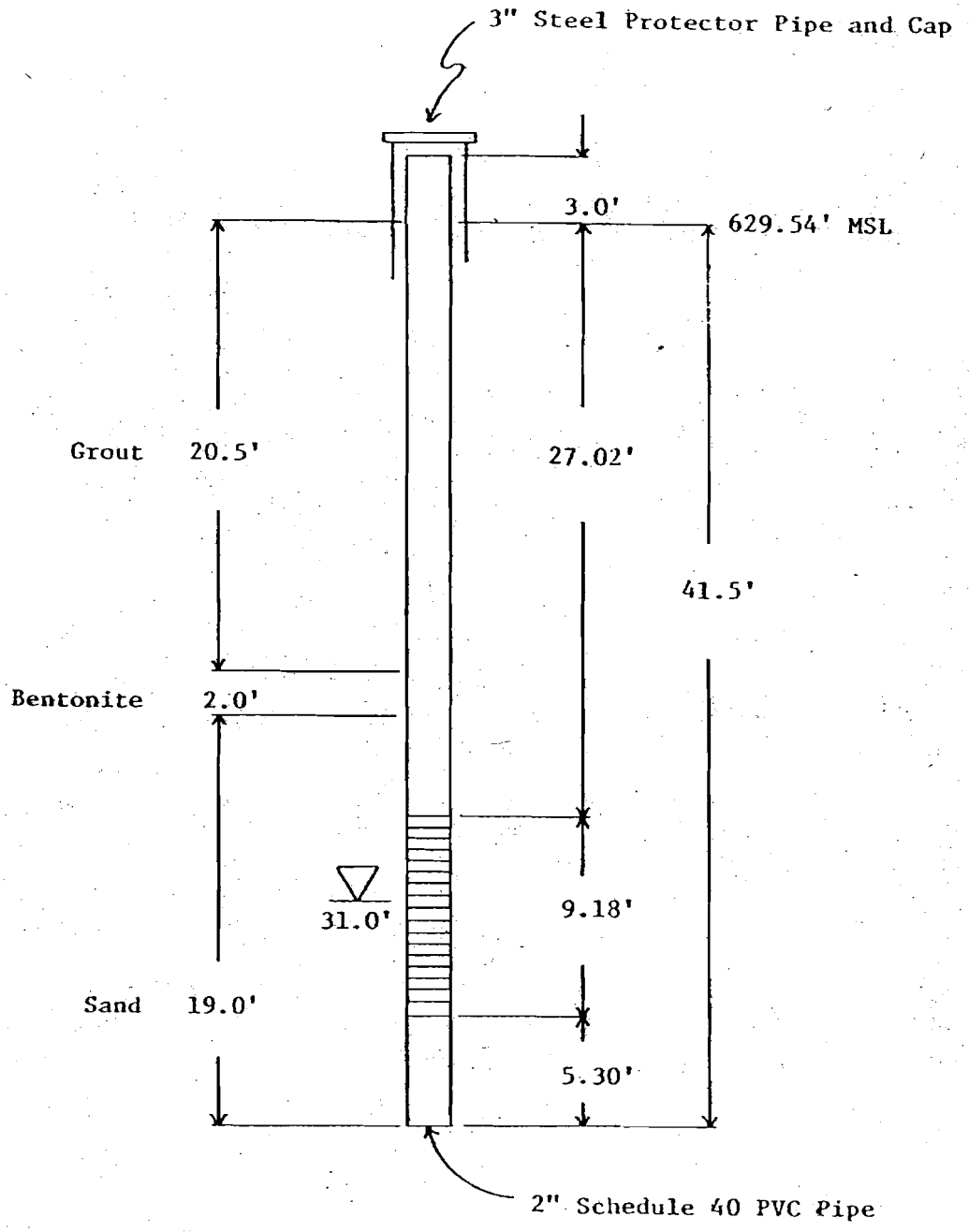


NWSC, Crane, Indiana

Highway 58 Dump Site A

Lithology

Boring Number: WES-7-1-81



Well screen

Water depth at time of drilling

NWSC, Crane, Indiana
Highway 58 Dump Site A
Well Completion
Boring Number: WES-7-1-81

BORING LOG
FIELD DATA

Project NWSC Groundwater Study Site Crane, IN Date 3 Oct. 1981
Location Highway 58 Dump Site A Job No. 441-G150.11GR21/22
Drill Rig Failing Inspector J. Dunbar Operator C. Drake Surface El 601.89 Boring No. WES-7-2-81

SAMPLE NUMBER	DATE TAKEN 1981	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	Hyd. Press	Cont	CLASSIFICATION AND REMARKS
1	3 Oct	0.0		0.0	0.5	0.0	1.55	3" Shelby Tube	0	ST	Gravelly clay (CL): brown in color,
1A				0.5	1.0	1.55	1.80		10		dry, stiff, and contains 10-15%
				1.0	1.5				150		sandstone gravel.
				1.5	2.0				250		
				2.0	2.5				360		Sample length: 1.7 ft
				0.0	5.0			7"Folding Auger			Cleanout
2	3 Oct			5.0	5.5	5.0	7.06	3"Fixed Piston Sampler	0	ST	Gravelly clay (CL): brownish grey
2A				5.5	6.0	7.06	7.21		0	Jar	in color, very stiff, dry, and con-
				6.0	6.5				40		tains 10-15%, fine to medium sand-
				6.5	7.0				220		stone gravel.
				7.0	7.4				400		Sample length: 2.21 ft
				5.0	10.0			7" Folding Auger			Cleanout

WES FORM JAN 74 819 EDITION OF NOV 1971 MAY BE USED

BORING LOG
FIELD DATA

Project _____ Site _____ Date _____
Location _____ Job No. _____
Drill Rig _____ Inspector _____ Operator _____ Surface El _____ Boring No. WES-7-2-81

SAMPLE NUMBER	DATE TAKEN 1981	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	Hyd. Press	Cont	CLASSIFICATION AND REMARKS
3A	3 Oct			10.0	10.5	10.5	11.5	3" F.P.S.	0	Jar	Gravelly clay (CL): same as in
				10.5	11.0				400		previous sample except 25-30% gravel.
			11.8	11.0	11.5				800		Tube bent on rock.
		11.8		10.0	11.8			7" Folding Auger			Cleanout: 800 psi on auger.
											For core log page 3.

WES FORM JAN 74 819 EDITION OF NOV 1971 MAY BE USED

Sheet 2 of 5 Sheets

Hole No. WES-7-2-81

DRILLING LOG	DIVISION U.S. Navy	INSTALLATION Crane, IN	SHEET 3 OF 5 SHEETS

1. PROJECT NWSC Groundwater Study	10. SIZE AND TYPE OF BIT 4 x 5-1/2 in. Diamond bit
2. LOCATION (Coordinates or Station) Highway 58 Dump Site A	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL
3. DRILLING AGENCY CEWES	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 1500
4. HOLE NO. (As shown on drawing title and file number) WES-7-2-81	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED zero; UNDISTURBED three
5. NAME OF DRILLER C. Drake	14. TOTAL NUMBER CORE BOXES zero
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN 11.8 ft	16. DATE HOLE: STARTED 3 Oct. 1981; COMPLETED 5 Oct. 1981
8. DEPTH DRILLED INTO ROCK 23.2 ft	17. ELEVATION TOP OF HOLE 601.89
9. TOTAL DEPTH OF HOLE 35.0 ft	18. TOTAL CORE RECOVERY FOR BORING 98.5%
	19. SIGNATURE OF INSPECTOR Joseph B. Dunbar

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
590.89	11.0		For overburden see page one and two.			3 Oct. 1981
589.89	12.0					AL - Run 1 Began 3:18 Rec 3.70' End 3:44 Loss - Time 26 min Gain - Drl time 26 min Hyd press 100psi
588.89	13.0					Water press - RPM 50-75 Drl Action Smooth ~~Water~~ rot Brownish red Remarks:
587.89	14.0		Gravelly clay shale: reddish brown in color, dry, very stiff, dense, weathered, and contains 20-30% fine to medium sized gravel.			Cored with air
586.89	15.0					5 Oct. 1981
			Run 1	100%	-	AL - Run 2 Began 8:59 Rec 4.0' End 9:17 Loss 0.45'
			Fractured black shale			Time 18 min Gain -
585.89	16.0		Fine-grained shaley sandstone from 16.0 to 16.5 ft			Drl time 18 min Hyd press 100psi Water press - RPM 50-75 Drl Action Smooth ~~Water~~ rot Dark grey
584.89	17.0		Shale: brown to orange brown, weathered, soft, dry, and contains interbedded limonite lenses.			Remarks -
583.89	18.0		Shale: dark grey and soft Limonite: orange brown, earthly texture, and crumbles easily.			AL - Run 3 Began 10:03 Rec 0.35' End 10:08 Loss -
582.89	19.0		Shale: dark grey and soft Shaley sandstone: dark grey and fine-grained			Time 5 min Gain - Drl time 5 min Hyd press 100psi Water press - RPM 50+ Drl Action Smooth ~~Water~~ rot Dark grey Remarks
581.89	20.0		Fractured black, soft shale Run 2	89.8%	-	Blocked off
			Run 3 Black shale	100%	-	
580.89	21.0					

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) PROJECT HOLE NO.

Hole No. WES-7-2.81

DRILLING LOG	DIVISION	INSTALLATION	SHEET 4 OF 5 SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE: STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE	19. SIGNATURE OF INSPECTOR

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
580.89	21.0					
579.89	22.0		Shale (50%) and sandstone (50%): light grey to dark grey in color, very soft to soft, and very irregular bedding. Sandstone and shale in irregular seams and lenses which are random in orientation and attitude.			AL. - Run 4 Began 10:37 Rec 4.65' End 10:59 Loss - Time 22 min Gain - Drl time 22 min Hyd press 100psi Water press - RPM 50-75 Drl Action Smooth Water ret -
578.89	23.0					
577.89	24.0					Remarks Encountered water at 25 ft-lost cuttings.
576.89	25.0		Run 4	100%	-	
575.89	26.0		Sandstone (80%) and shale (20%): light grey to dark grey, fine-grained sandstone, moderately hard, traces of organic matter, and thickness of black shale is between 1/16-1/4 in.			AL. - Run 5 Began 11:30 Rec 3.45' End 11:56 Loss - Time 26 min Gain - Drl time 26 min Hyd press 100psi Water press - RPM 50-75 Drl Action Smooth Water ret -
574.89	27.0					Remarks -
573.89	28.0					
			Run 5	100%	-	
572.89	29.0		Sandstone (85-90%) and shale (10-15%): same as above, breaks in shale seams, and 1-3% black coal between 1/16-1/8-in. thickness.			AL. - Run 6 Began 12:42 Rec 3.85' End 12:55 Loss - Time 13 min Gain - Drl time 13 min Hyd press 100psi Water press - RPM 50-75 Drl Action Smooth Water ret -
571.89	30.0					Remarks -
570.89	31.0		closed break			

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT | HOLE NO.

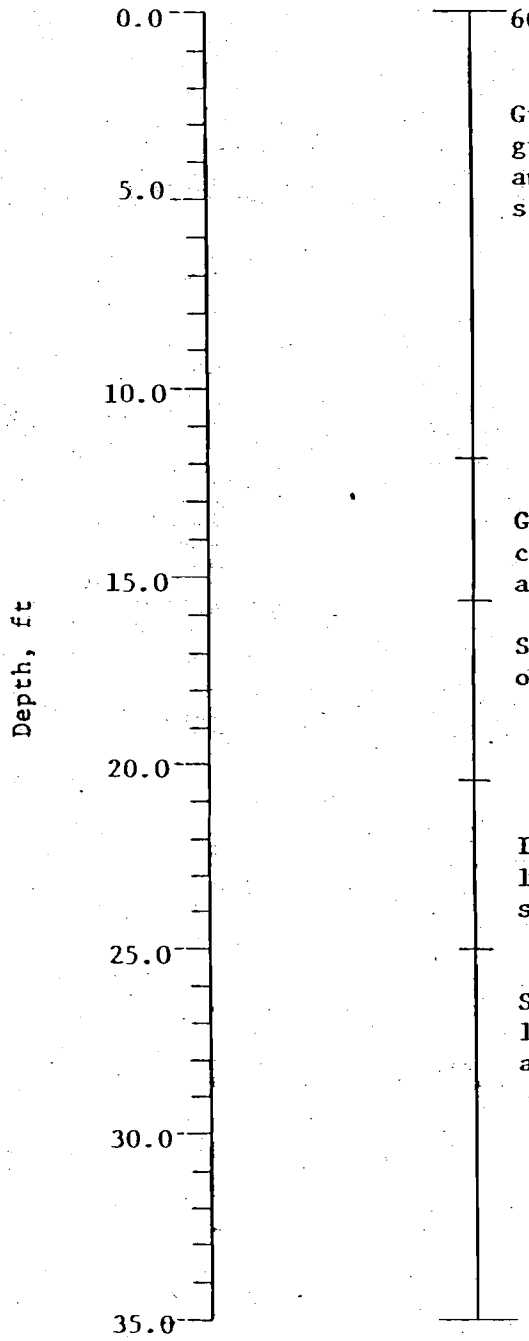
Hole No. WES-7-2-B1

DRILLING LOG	DIVISION	INSTALLATION	SHEET 5 OF 5 SHEETS
1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING %	
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	31.0		closed break			
	32.0		Run 6			
			Sandstone (90-95%) Shale (5-10%)			AL - Began 1:15 End 1:40 Time 25 min Drl time 25 min Hyd press 100psi Water press - RPM 50-75 Drl Action Smooth Water rot - Remarks -
	33.0		1/2 in coal lens			Run 7 Rec 2.7' Loss - Gain -
	34.0		1/2 in coal lens			
	35.0		Run 7	100%	-	
			Rinsed boring with water to remove mud and cuttings untill water cleared up. Jetted water from boring prior to installing well on 6 Oct. 81.			

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT | HOLE NO.



601.89' MSL

Gravelly clay (CL): brown to brownish grey in color, dry, stiff to very stiff, and contains 10-15% fine to medium sandstone gravel.

Gravelly clay shale: reddish brown in color, dry, very stiff, dense, weathered, and contains 20-30% fine to medium gravel.

Shale: brown to orange brown with zones of dark grey, soft, dry, and weathered.

Interbedded sandstone (50%) and shale (50%): light grey to dark grey and very soft to soft.

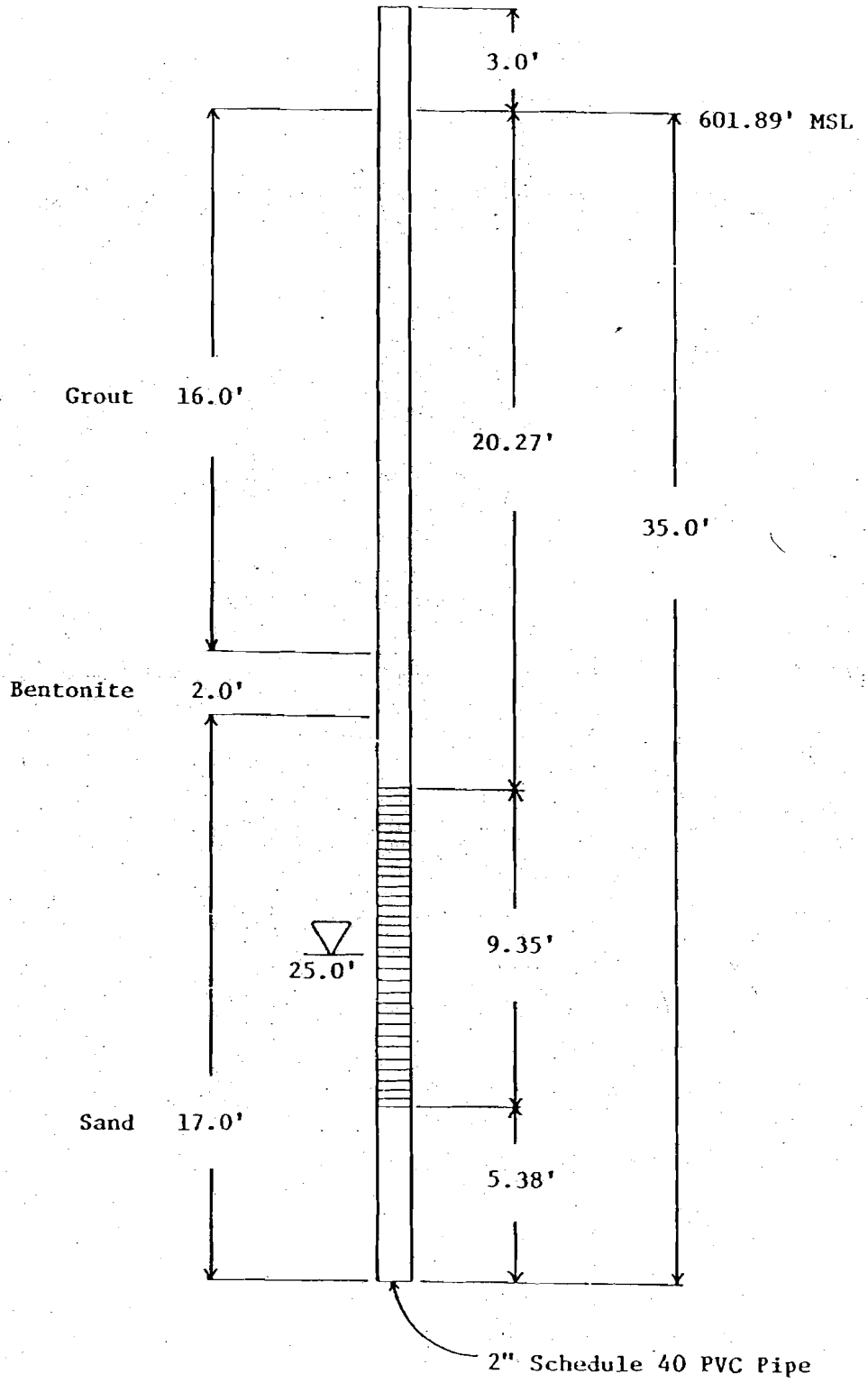
Sandstone (80%) and interbedded shale (20%): light grey to dark grey, soft to very soft, and contains 1-3% coal lenses.

NWSC, Crane, Indiana

Highway 58 Dump Site A

Lithology

Boring Number: WES-7-2-81



Well screen

Water depth at time of drilling

NWSC, Crane, Indiana
Highway 58 Dump Site A
Well Completion
Boring Number: WES-7-2-81

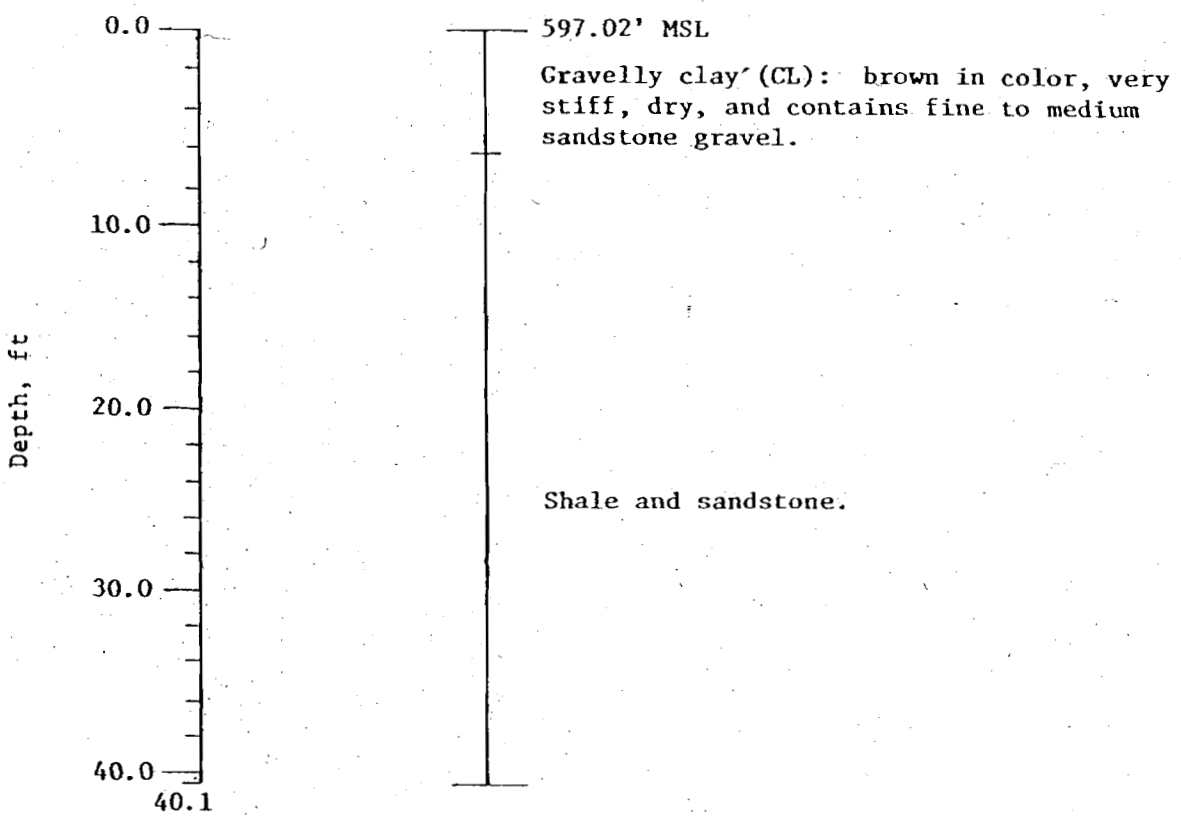
BORING LOG
FIELD DATA

Project NWSC Groundwater Study Site Crane, IN Date 6 Oct, 1981
Location Highway 58 Dump Site A Job No. 441-G150,11GR21/22
Drill Rig Failing Inspector J. Dunbar Operator C. Drake Surface El 597.02 Boring No. WES-7-3-81

SAMPLE NUMBER	DATE TAKEN 1981	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	Hyd. Press	Cont	CLASSIFICATION AND REMARKS
1	1 Oct	0.0		0.0	0.5	0.0	1.77	3" Shelby Tube	0	ST	Gravelly clay (CL): brown in color,
1A				0.5	1.0	1.77	1.97		0	Jar	very stiff, dry, and contains fine
				1.0	1.5				0		to medium sandstone gravel.
				1.5	2.0				150		Sample length: 1.97 ft
				2.0	2.5				280		
				0.0	5.0			7" Folding Auger			Cleanout
2				5.0	5.5	5.0	6.14	3"Fixed Piston Sampler	20	ST	Gravelly clay (CL): same as above.
2A	6 Oct			5.5	6.0	6.14	6.39		340	Jar	
				6.0	6.5				440		
				6.5	7.0				480		Sample length: 1.39 ft
			6.39	7.0	7.5				750		
	6 Oct	6.39	40.1	5.0	40.1			5 5/8" Rock Bit			Water encountered between 28-30 ft.
											Material drilled was shale and
											sandstone. Lost cuttings at 30 ft.

WES FORM JAN 74 819 EDITION OF NOV 1971 MAY BE USED

Sheet 1 of 1 Sheets

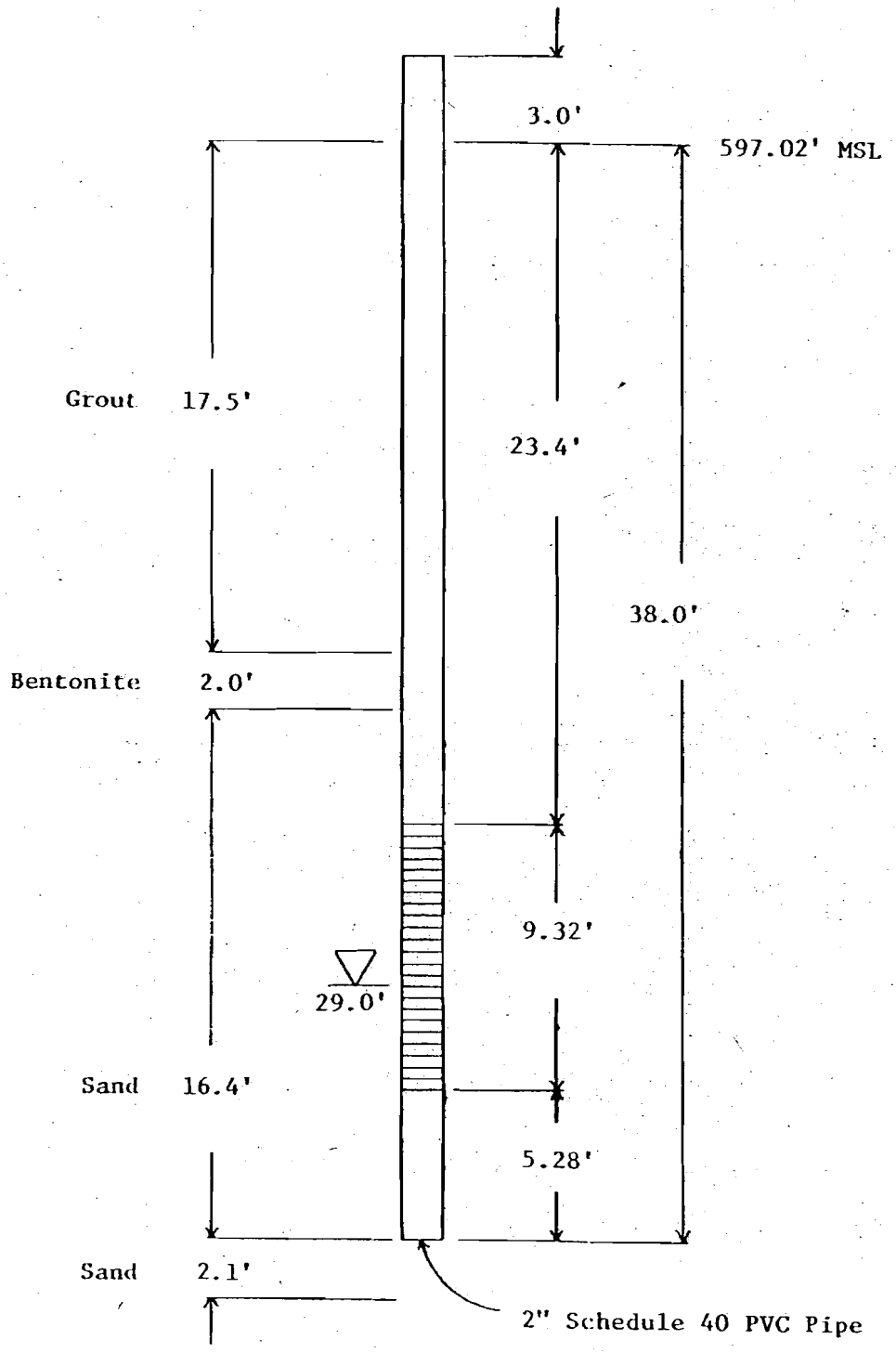


NWSC, Crane, Indiana

Highway 58 Dump Site A

Lithology

Boring Number: WES-7-3-81



Well screen

Water depth at time of drilling

NWSC, Crane, Indiana
Highway 58 Dump Site A
Well Completion
Boring Number: WES-7-3-81

BORING LOG
FIELD DATA

Project NWSC Groundwater Study Site Crane, IN Date 12 Oct. 1981
Location Highway 58 Dump Site A Job No. 441-G150.11GR21/22
Drill Rig Failing Inspector J. Dunbar Operator D. Taylor Surface El 595.80 Boring No WES-7-4-81

SAMPLE NUMBER	DATE TAKEN 1981	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	Hyd. Press	Cont	CLASSIFICATION AND REMARKS
	12 Oct	0.0	1.5	0.0	0.3			3" Shelby	500		Clay, coal, and fragments of bed-
											rock, material is fill.
	12 Oct	1.5	3.7	0.0	36.5			5 5/8" Rock	Bit		Sandstone: brown and soft
		3.7	6.3								Limestone: grey, fine-grained,
											and fossiliferous.
		6.3	11.7								Clay shale: reddish brown and soft
		11.7	21.5								Clay shale: dark brownish grey
											and soft
		21.5	23.7								Sandstone and interbedded shale:
											grey to brown and moderately hard.
		23.7	25.0								Shale: grey and soft
		25.0	29.3								Sandstone and shale: grey and
											moderately hard. Slight moisture
											at 29 ft.
		29.3	30.8								Limestone:
		30.8	39.5								Sandstone and shale

WES FORM JAN 74 819 EDITION OF NOV 1971 MAY BE USED

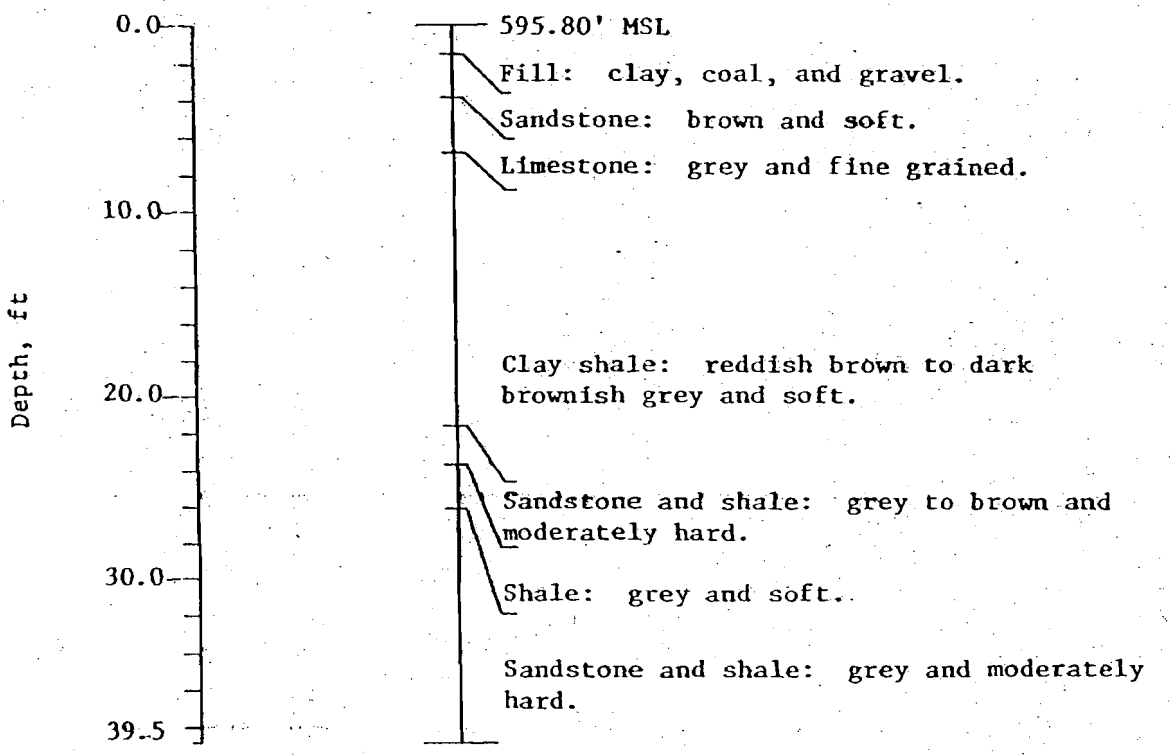
BORING LOG
FIELD DATA

Project _____ Site _____ Date _____
Location _____ Job No. _____
Drill Rig _____ Inspector _____ Operator _____ Surface El _____ Boring No. WES-7-4-81

SAMPLE NUMBER	DATE TAKEN	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER			CLASSIFICATION AND REMARKS
	12 Oct			36.5	39.5			5 5/8" Rock	Bit		Stopped st 36.5 ft and allowed
											water level to stabalize. Measured
											after 60 min and depth was 31.75 ft.
											Will drill to 39.0 ft, which should
											put boring 10 ft below where water
											starts.
											Installed well.

WES FORM JAN 74 819 EDITION OF NOV 1971 MAY BE USED

Sheet 2 of 2 Sheets

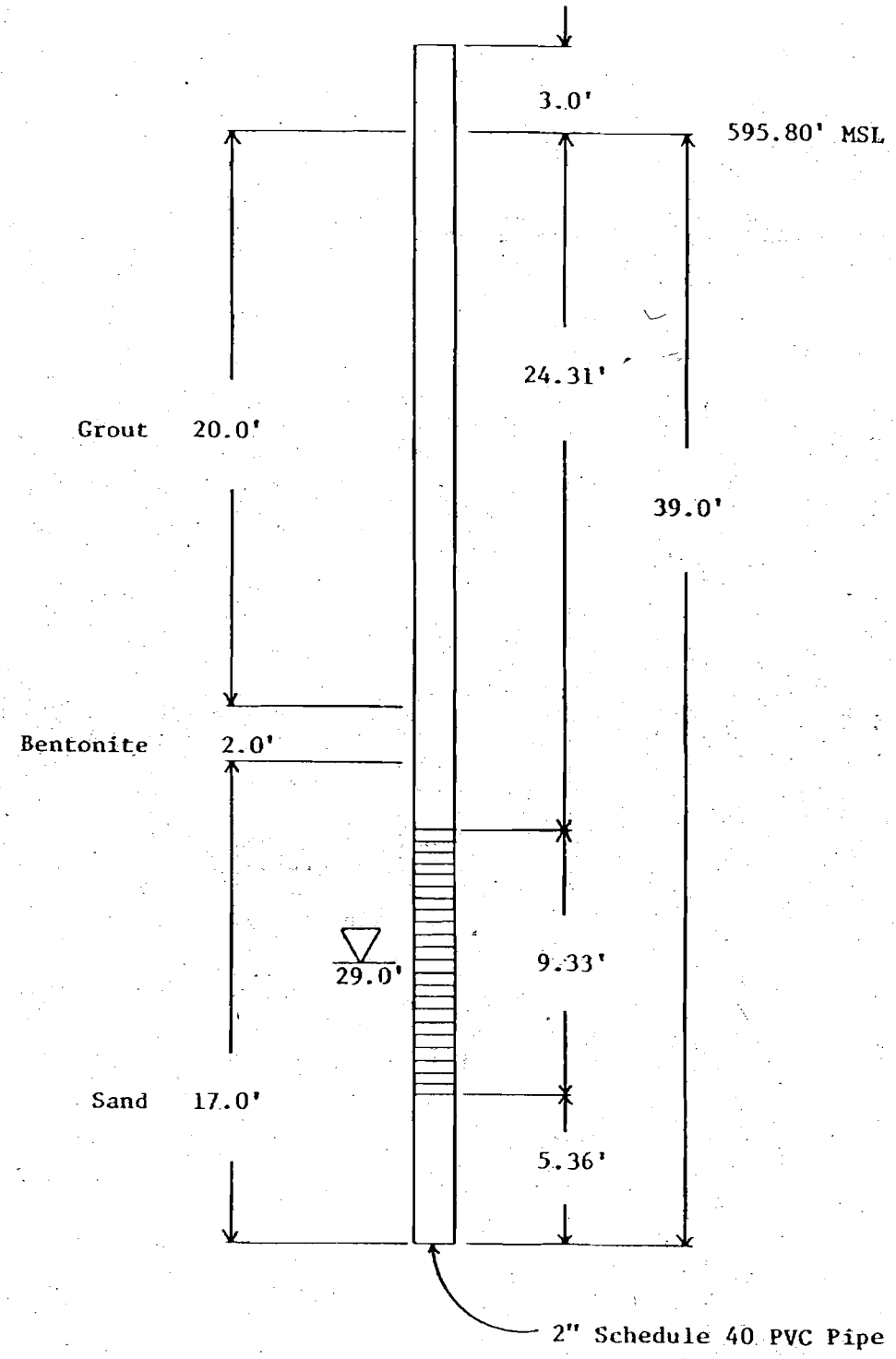


NWSC, Crane, Indiana

Highway 58 Dump Site A

Lithology

Boring Number: WES-7-4-81



Well screen

Water depth at time of drilling

NWSC, Crane, Indiana
Highway 58 Dump Site A
Well Completion
Boring Number: WES-7-4-81

BORING LOG
FIELD DATA

Project NWSC Groundwater Study Site Crane, IN Date 5 Nov. 1981
Location Highway 58 Dump Site A Job No. 441-G150.11GR21/22
Drill Rig Failing Inspector J. Dunbar Operator C. Drake Surface El 593.73 Boring No. WES-7-5-81

SAMPLE NUMBER	DATE TAKEN 1981	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	Hyd. Press	Cont	CLASSIFICATION AND REMARKS
1	5 Nov	0.0		0.0	0.5	0.0	0.95	3" Shelby Tube	0	ST	Clay (CL): dark brownish grey in
1A				0.5	1.0	0.95	1.18		0	Jar	color, slightly damp, soft, and low
				1.0	1.5				0		plasticity.
				1.5	2.0				0		Sample length: 1.18 ft
				2.0	2.5				0		
				0.0	5.0			7" Folding Auger			Cleanout
2	5 Nov			5.0	5.5	5.0	7.07	*3"Fixed Piston Sampler	0	ST	Clay (CL): brown in color, dry,
2A				5.5	6.0	7.07	7.37		0	Jar	very stiff, brittle, and low
				6.0	6.5				0		plasticity.
				6.5	7.0				0		Sample length: 2.37 ft
				7.0	7.39				30		
				5.0	10.0			7" Folding Auger			Cleanout: material is lighter in
											color from 9 ft.

WES FORM JAN 74 819 EDITION OF NOV 1971 MAY BE USED *3" Fixed Piston Sampler = 3" F.P.S. Sheet 1 of 3 Sheets

BORING LOG
FIELD DATA

Project _____ Site _____ Date _____
Location _____ Job No. _____
Drill Rig _____ Inspector _____ Operator _____ Surface El _____ Boring No. WES-7-5-81

SAMPLE NUMBER	DATE TAKEN 1981	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	Hyd. Press	Cont	CLASSIFICATION AND REMARKS
3	5 Nov			10.0	10.5	10.0	11.39	3" F.P.S.	0	ST	Clay (CL): brown in color, dry,
3A				10.5	11.0	11.39	11.57		0	Jar	stiff, brittle, and low plasticity
				11.0	11.5				0		
				11.5	12.0				30		
				12.0					500		Sample length: 1.57 ft
			13.28	10.0	15.0			7" Folding Auger			Cleanout; assumed stratum change
4	5 Nov	13.28		15.0	15.5	15.0	16.39	3" F.P.S.	0	ST	Sandy clay (CL): brown in color,
4A				15.5	16.0	16.39	16.59		0	Jar	slightly damp, moderately stiff,
				16.0	16.5				0		low plasticity, and contains 5-10%
				16.5	17.0				90		fine to medium grained sand.
			17.0	17.0	17.38				200		Sample length: 1.59 ft
		17.0	18.3	15.0	18.3			7" Folding Auger			Cleanout: from 17 to 18.3 ft,
											gravelly clay (CL)- brown and stiff.

WES FORM JAN 74 819 EDITION OF NOV 1971 MAY BE USED

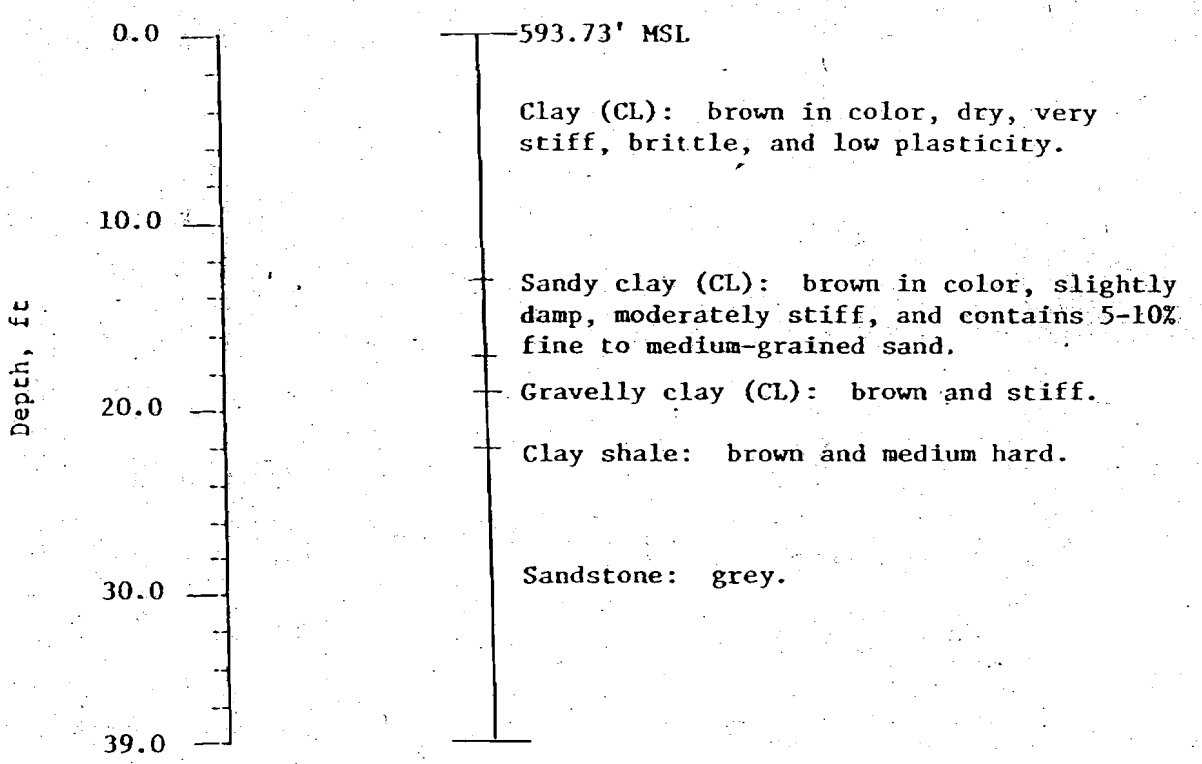
BORING LOG
FIELD DATA

Project _____ Site _____ Date _____
Location _____ Job No. _____
Drill Rig _____ Inspector _____ Operator _____ Surface El _____ Boring No. WES-7-5-81

SAMPLE NUMBER	DATE TAKEN 1981	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	Hyd. Press	Cont	CLASSIFICATION AND REMARKS
	5 Nov			18.3	22.0	—	—	5 5/8" Rock	Bit	—	Clay shale: brown and medium hard
				22.0	39.0						Sandstone: grey
											Water at 28.7 ft- drilled to 39 ft.
											Installed well.

WES FORM JAN 74 819 EDITION OF NOV 1971 MAY BE USED

Sheet 3 of 3 Sheets

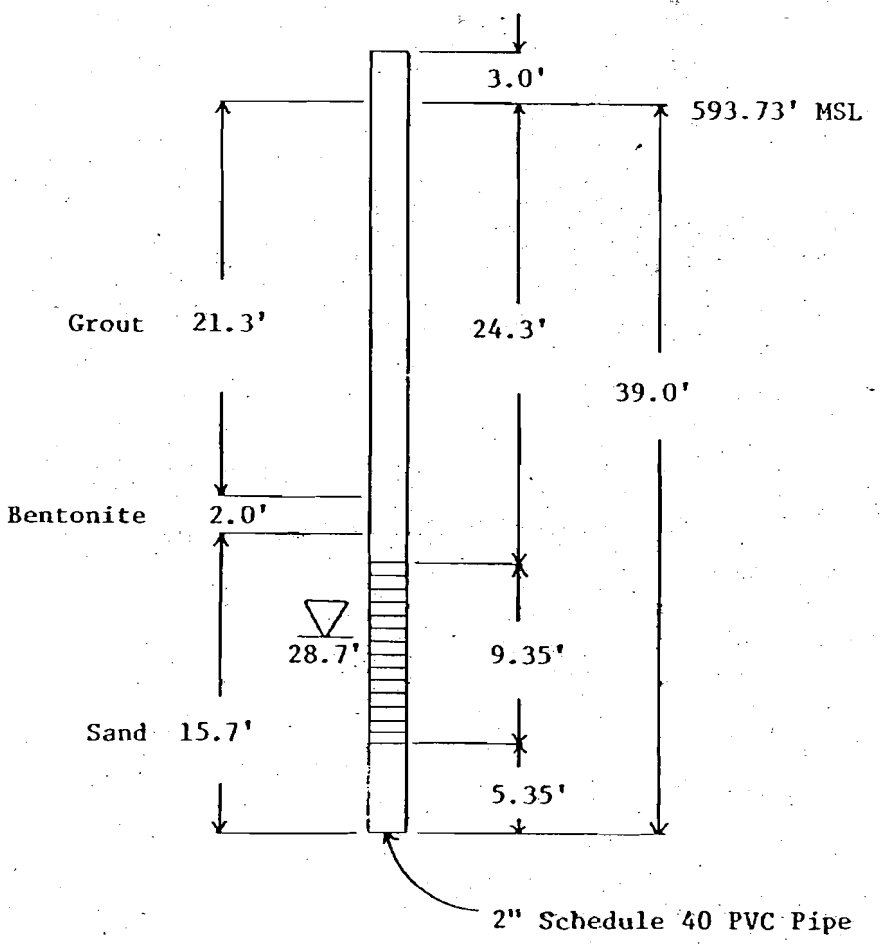


NWSC, Crane, Indiana

Highway 58 Dump Site A

Lithology

Boring Number: WES-7-5-81



Well screen

Water depth at time of drilling

NWSC, Crane, Indiana
Highway 58 Dump Site A
Well Completion
Boring Number: WES-7-5-81

APPENDIX B.2

SWMU 12

DIGGING PERMITS

DIGGING PERMIT
NSWC CRANE 11000/3 (REV. 8/02)

4562

REQUESTED BY	DATE
T... NUS, Inc/Ralph Basinski 412-921-8308	6/28/04
WORK REQUEST ON E/S NO.	
51017	Mine Fill "A" Area
...K WILL BE PERFORMED BY	**DATE (Start - on or about)**
Tetra Tech NUS, Inc.	

WORK DESCRIPTION

Soil samples at various locations at Mine Fill "A" area. Locations are inside fence, along fence, west side of Hwy 45, & 2 are under powerline right-of-way - Marked with wooden stakes with pink & orange flagging.

EQUIPMENT TYPE

☐ HAND TOOLS ☐ CORE DRILL ☐ TRENCHER ☐ BACKHOE ☐ HEAVY EQUIPMENT

Faxed 22 6/28/04

UNDERGROUND UTILITIES LOCATED IN WORK SITE

UTILITY	PRESENT	MARKED	NOT LOCATED	REMARKS
COMPRESSED AIR 22	N/A		Remark	J. Beasley per phone 7/8/04
HIGH VOLTAGE ELECTRICAL	NA			S.A. 7-6-04
FIRE ALARM 22	NA			WAM 6/30/04
GROUNDING 22	N/A			6-29/04 BR
Exp 7/19 3083 ...AL GAS 0406293076 3088	YES	YES		7/1/04 DEH
SECURITY ALARM 22	NA			WAM 6/30/04
SEWER	YES	YES	Remarked 8-4-04 mo	7-7-04
STEAM	N/A			6-29-04 RRT
TELEPHONE Faxed 6/28/03	N/A			7-6-04 HP
WATER	YES	YES	Remarked 8-4-04 mo	7-7-04
Remark Faxed 8/3/04 22 SECOND ELECTRICAL	yes	yes	yes 8-11-04 BR	6-29-04 B
Faxed 6/28/04 GENERAL DYNAMICS/NMCI	N/A	N/A		6-30-04

In addition to the general precautions for excavating where underground utilites are present, comply with the following:

* Exp 8/9 0407203229, 3230, 3232

Exp 8/23 0408033036, 0408033040, 0408033043 DEH 8-5-04

PERMIT HOLDER SIGNATURE	DATE
Tony Beal X	7/8/04
D... PERMIT APPROVED BY	**DATE**
Donna L. Pillman Donna L. Pillman	7/13/04 8/10/04

DISTRIBUTION:

ORIGINAL - Code 09Z5 File
YELLOW - Supv. At work site
PINK - Supplier

.000/3 (REV. 8/02) 4562

Tech NUS, Inc/Ralph Badinski 412-921-8308	DATE 6/28/04
REQUEST ON E/S NO. 21017	Mine Fill "A" Area
WORK WILL BE PERFORMED BY Tetra Tech NUS Inc.	DATE (Start - on or about)

WORK DESCRIPTION

Soil samples at various locations at Mine Fill "A" Area. Locations are inside fence, along fence, west side of Hwy 45, + 2 are under powerline right-of-way. Marked with wooden stakes with pink & orange flagging.

EQUIPMENT TYPE

☐ HAND TOOLS ☐ CORE DRILL ☐ TRENCHER ☐ BACKHOE ☐ HEAVY EQUIPMENT

Faxed ZZ 6/28/04

UNDERGROUND UTILITIES LOCATED IN WORK SITE

UTILITY	PRESENT	MARKED	~~NOT LOCATED~~	REMARKS
COMPRESSED AIR ZZ	N/A		Remark	J. Beasley per phone 7/8/04
HIGH VOLTAGE ELECTRICAL	NA			S.B. 7-6-04
FIRE ALARM ZZ	N/A			WAM 6/30/04
GROUNDING ZZ	N/A			6-29/04 BR
*Exp 7/19 3083 NATURAL GAS 0406293076 3088	YES	YES		7/1/04 DE
SECURITY ALARM ZZ	NA			WAM 6/30/04
*SEWER	YES	YES	8/12 mw Remarked 8-4-04 mo	7-7-04
STEAM	N/A			6-29-04 RRT
TELEPHONE Faxed 6/28/03	N/A			7-6-04 KP
*WATER	YES	YES	8/12 mw Remarked 8-4-04 mo	7-7-04
*Remark Faxed 8/3/04 SECOND ELECTRICAL ZZ	YES	YES	8/12/04 8/12/04 BR YES	6-29/04 B
Faxed 6/28/04 GENERAL DYNAMICS/NMCI	N/A	N/A		6-30-04

In addition to the general precautions for excavating where underground utilites are present, comply with the following:

*Exp 8/9 0407203229, 0407203230, 0407203232 DEH 7-22-04

Exp 8/23 0408033036, 0408033040, 0408033043 DEH 8-5-04

Exp 8/31 0408112925, 0408112930, 0408112935 DEH 8-12-04

PERMIT HOLDER SIGNATURE Tim Nash	DATE 7/8/04
DIGGING PERMIT APPROVED BY Donna L. Zollman Donna L. Zollman	DATE ~~7/9/04~~ ~~8/10/04~~ 8/12/04

DISTRIBUTION:

ORIGINAL - Code 09Z5 File
YELLOW - Supv. At work site
PINK - Permit requestor

DIGGING PERMIT
NSWC CRANE 11000/3 (REV. 8/02)

4562

REQUESTED BY: Tetra Tech NUS, Inc/Ralph Gasinski 412-921-8308
DATE: 6/28/04

WORK REQUEST ON E/S NO.: 151017 854-0280 T
Mine Fill "A" Area

WORK WILL BE PERFORMED BY: Tetra Tech NUS Inc. 412-551-2629 Stan
DATE (Start - on or about):

WORK DESCRIPTION: Soil samples at various locations at Mine Fill "A" Area. Locations are inside fence, along fence, west side of Hwy 45, & 2 are under powerline right-of-way. Marked with wooden stakes with pink & orange flagging.

EQUIPMENT TYPE
☐ HAND TOOLS ☐ CORE DRILL ☐ TRENCHER ☐ BACKHOE ☐ HEAVY EQUIPMENT

Faxed ZZ 6/28/04

UNDERGROUND UTILITIES LOCATED IN WORK SITE

UTILITY	PRESENT	MARKED	~~NOT LOCATED~~	REMARKS
COMPRESSED AIR ZZ	N/A		Remark	J. Beasley per phone 7/8/04
HIGH VOLTAGE ELECTRICAL	NA			S.P. 7-6-04
FIRE ALARM ZZ	NA			WAM 6/30/04
GROUNDING ZZ	N/A			6-29/04 BR
* Exp 7/14 3083 NATURAL GAS 0406293076 3088	YES	YES	Exp 8/16 0408272263	8/31/04 B.155 7/1/04 DEH
SECURITY ALARM ZZ	NA			WAM 6/30/04
* SEWER	YES	YES Remarked 8/27	8/12 mw Remarked 8-4-04 mo	7-7-04
STEAM	N/A			6-29-04 RRT
TELEPHONE Faxed 6/28/03	N/A			7-6-04
* WATER	YES	YES Remarked 8/27	8/12 mw Remarked 8-4-04 mo	7-7-04
* Remark Faxed 8/3/04 SECOND ELECTRICAL ZZ	YES	YES	8/12/04 8/11/04 YES BR	6-29/04 B
Faxed 6/28/04 GENERAL DYNAMICS/NMCI	N/A	N/A		6-30-04

In addition to the general precautions for excavating where underground utilites are present, comply with the following:

* Exp 8/9 0407203229, 0407203230, 0407203232 DEH 7-22-04
Exp 8/23 0408033036, 0408033040, 0408033043 DEH 8-5-04
Exp 8/31 0408112925, 0408112930, 0408112935 DEH 8-12-04
0408312644, 0408312650, 0408312661 Exp 9/20

PERMIT HOLDER SIGNATURE: Tim Rook
DATE: 7/8/04

DIGGING PERMIT APPROVED BY: Donna L. Zollman
DATE: ~~7/8/04~~ ~~8/10/04~~ ~~8/17/04~~ 8/31/04

DISTRIBUTION:
ORIGINAL - Code 09Z5 File
YELLOW - Supv. At work site
PINK - Permit requestor

DIGGING PERMIT
NSWC CRANE 11000/3 (REV. 8/02)

4648

REQUESTED BY: Terry Rojahn/ TETRATECH 412-921-8857	DATE: 10/18/04
WORK REQUEST ON E/S NO.: SWMU 12 - Minefill "A" area	
WORK WILL BE PERFORMED BY: Tetra Tech	DATE (Start - on or about): 10/25/04

WORK DESCRIPTION
Install ground water sampling wells outside Minefill "A" area. One locations for 6 well is along RR-1 on the east side & the other 3 locations are on the west side in the power line right-of-way. Areas are marked with wooden stakes with ribbons.

EQUIPMENT TYPE
☐ HAND TOOLS ☑ CORE DRILL ☐ TRENCHER ☐ BACKHOE ☐ HEAVY EQUIPMENT

UNDERGROUND UTILITIES LOCATED IN WORK SITE

UTILITY	PRESENT	MARKED	NOT LOCATED	REMARKS
COMPRESSED AIR	N/A			RHW 10/19/04
HIGH VOLTAGE ELECTRICAL	N/A			RHW 10/19/04
FIRE ALARM	N/A			RHW 10/19/04
GROUNDING	N/A			RHW 10/19/04
NATURAL GAS	N/A			RHW 10/19/04
SECURITY ALARM	N/A			RHW 10/19/04
SEWER	N/A			RHW 10/19/04
STEAM	N/A			RHW 10/19/04
TELEPHONE Faxed 10/19/04	N/A			10-22-04
WATER	N/A			RHW 10/19/04
SECOND ELECTRICAL	N/A			RHW 10/19/04
GENERAL DYNAMICS/NMCI	N/A			RHW 10/19/04

In addition to the general precautions for excavating where underground utilites are present, comply with the following:

PERMIT HOLDER SIGNATURE: [signature]	DATE: 10/25/04
DIGGING PERMIT APPROVED BY: Donna L. Zelman	DATE: 10/25/04

DISTRIBUTION:
ORIGINAL - Code 09Z5 File
YELLOW - Supv. At work site
PINK - Permit requestor

APPENDIX B.3

SWMU 12

MONITORING WELL MATERIALS CERTIFICATION OF CONFORMANCE

MONITORING WELL MATERIALS
CERTIFICATE OF CONFORMANCE

Well Designation: 12MW TO1 → TS1
Site Name: SWMU 12
Date Installed: SEPT → DEC 2004
Project Name: NSWC CRANE

Site Geologist: CONTI
Drilling Company: BOWSER-MORNER
Driller: J. WALSH
Project Number: N6878

Material	Brand/Description	Source/Supplier	Sample Collected ?
Well Casing	JOHNSON PVC 2"	GLOBAL WELL SUPPLIES	N
Well Screen	" " 10SLOT - 2"	"	N
End Cap	" PVC	"	N
Drilling Fluid	POTABLE WATER	BLGD 3245	Y
Drilling Fluid Additives	NA	—	—
Backfill Material	NA	—	—
Annular Filter Pack	GLOBAL FILTER PACK #5	GLOBAL WELL SUPPLIES	N
Bentonite Seal	CETCO PURE GOLD MED CHIPS	" " "	N
Annular Grout	PORTLAND CEMENT	" " "	N
Surface Cement	SAKRETE (CONCRETE MIX)	LOWES	N
Protective Casing	STEEL 6" SQUARE PIPE	GLOBAL WELL SUPPLIES	N
Paint	HIGHWAY YELLOW	LOWES	N
Rod Lubricant	NA	—	—
Compressor Oil	NA	—	—

To the best of my knowledge, I certify that the above described materials were used during installation of this monitoring well.

Signature of Site Geologist: S Conti

APPENDIX C

SWMU 12

SAMPLE LOG SHEETS AND OTHER FIELD FORMS

ROUND 1 AND ROUND 2

APPENDIX C.1

SWMU 12

SOIL SAMPLE LOG SHEETS

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SS01002
Sample Location: 12SB01
Sampled By: CCL/JG
C.O.C. No.: 0076

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 1505 Method: Disposable Trowel Monitor Reading (ppm): 1.9	0-2'	Brown	Sandy CLAY and SILTY CLAY w/ some organic Material,

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 (~~3~~) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Charles C. Gray III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB01069
Sample Location: 12SB01
Sampled By: CCL/JG
C.O.C. No.: 0076

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 1520 Method: Disposable Trowel Monitor Reading (ppm): 1.1	6-9'	Orange Brown Mottled Gray	Silty CLAY w/ Some compacted SAND lenses.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 ~~(3)~~ Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Charles C. Lyle III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SS02ØØØ2
Sample Location: 12SB Ø2
Sampled By: CLL / JG
C.O.C. No.: 0076

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: 1425 Method: Disposable Trowel Monitor Reading (ppm): Ø.9	Ø - 2'	Orange Brown To Brown	Sandy and Silty CLAY w/ Some roots.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Clark C. Gill III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12S BØ2Ø6Ø8
Sample Location: 12SB Ø2
Sampled By: CCL/JG
C.O.C. No.: 0076 & 0077

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: 1432 Method: Disposable Trowel Monitor Reading (ppm): 1.Ø	6-8'	Orange Brown Mottled Gray	Silty CLAY.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	1x2=2

OBSERVATIONS / NOTES:

Duplicate Sample obtained Here.

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.: 12 FDØ815Ø4Ø3

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SS03000 2
Sample Location: 12SB 03
Sampled By: CCL / JG
C.O.C. No.: 0075

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

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

GRAB SAMPLE DATA:

Date: 8/15/04	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1348	0 - 2'	Orange Brown Mottled Gray	Sandy CLAY w/ some organic matter & some roots.
Method: Disposable Trowel			
Monitor Reading (ppm): 1.0			

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Clark C. Lyle III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB03 06 08
Sample Location: 12SB 03
Sampled By: CLL/JG
C.O.C. No.: 0076

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 1354 Method: Disposable Trowel Monitor Reading (ppm): 0.5	6-8'	Orange Brown mottled Gray	Silty CLAY w/ Some micas.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	1x3=3

OBSERVATIONS / NOTES:

MS/MSD Collected Here

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Charles C. Fry III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12S S04002
Sample Location: 12SB 04
Sampled By: CCL / JG
C.O.C. No.: 0075

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 1028 Method: Disposable Trowel Monitor Reading (ppm): 0.6	0-2'	Brown mottled Gray	Sandy CLAY w/Roots.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Charles C. Ty III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB04D207
Sample Location: 12SB04
Sampled By: CCL/JG
C.O.C. No.: 0075

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 1037 Method: Disposable Trowel Monitor Reading (ppm): 0.9	2-7'	Brown mottled Gray	Silty CLAY w/ micas & some Black organic Material.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Clark C. Tyler III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB040712
Sample Location: 12SB04
Sampled By: CCL/JG
C.O.C. No.: 0075

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 1039 Method: Disposable Trowel Monitor Reading (ppm): 0	7-12'	Light Brown Mottled Gray	Silty CLAY w/ Some micas.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Chuck C. Ly III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SSØSØØØ2
Sample Location: 12SB ØS
Sampled By: CCL / JG
C.O.C. No.: 0075

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

GRAB SAMPLE DATA:

Date: 8/15/Ø4	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:	Ø-2'	Brown	Silty Clay w/ Roots.
Method: Disposable Trowel			
Monitor Reading (ppm): 1.5			

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Clark C. Griffith III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SBØ5Ø2Ø4
Sample Location: 12SB Ø5
Sampled By: CCL/JG
C.O.C. No.: 0075 & 0077

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: 1245 Method: Disposable Trowel Monitor Reading (ppm): 2.1	2-4'	Orange Brown Mottled Gray	Silty CLAY.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	1x2=2
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	1x2=2
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

Duplicate Sample Collected Here.

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.: 12FDØ815Ø4Ø2

Signature(s):

Charles C. Lay III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12S BØSØSØ9
Sample Location: 12SB ØS
Sampled By: CL/JG
C.O.C. No.: 0075

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: 1248 Method: Disposable Trowel Monitor Reading (ppm): Ø.8	5-9'	Orange Brown Mottled Gray	Silty CLAY.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Charles C. Lay III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SS06002
Sample Location: 12SB06
Sampled By: CCL/JG
C.O.C. No.: 0075

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 1304 Method: Disposable Trowel Monitor Reading (ppm): 1.0	0-2'	Brown To Orange Brown	Sandy CLAY w/ Roots,

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12S B06025
Sample Location: 12SB 06
Sampled By: CCL/JG
C.O.C. No.: 0075

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 1310 Method: Disposable Trowel Monitor Reading (ppm): 0.8	2-5'	Gray Mottled Brown	Silty CLAY w/ some organic matter + compacted Sand Lenses.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	1x3=3
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	1x3=3
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

MS/MSD Collected Here

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12S B06 05 09
Sample Location: 12SB 06
Sampled By: CCL / JG
C.O.C. No.: 0075

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 1315 Method: Disposable Trowel Monitor Reading (ppm): 0	5-9'	Orange Brown Mottled Gray	Silty CLAY.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12S S07ØØØ2
Sample Location: 12SB Ø7
Sampled By: CLL/JG
C.O.C. No.: 0075

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: 1ØSS Method: Disposable Trowel Monitor Reading (ppm): Ø	Ø-2'	Orange Brown mottled Gray	Sandy CLAY.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Charles C. Tyler III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB07Ø2Ø6
Sample Location: 12SB Ø7
Sampled By: CCL/JG
C.O.C. No.: 0075

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: 11Ø1 Method: Disposable Trowel Monitor Reading (ppm): Ø	2-6'	Orange Brown	Silty CLAY w/ some organic material.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Clark L. Ly III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SBØ7Ø6 1Ø
Sample Location: 12SB Ø7
Sampled By: CCL/JG
C.O.C. No.: 0075

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: 11Ø3 Method: Disposable Trowel Monitor Reading (ppm): Ø	6-1Ø'	Orange Brown	Silty CLAY w/ organic Material + micas.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Charles C. Lyle III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SSØ8ØØØ2
Sample Location: 12SB Ø8
Sampled By: CCL/JG
C.O.C. No.: 0070

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: Ø928 Method: Disposable Travel Monitor Reading (ppm): Ø.2	Ø-2'	Orange Brown Mottled Light Gray	Sandy CLAY w/micas.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Charles C. Tyler III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB08Φ2Φ4
Sample Location: 12SB Φ8
Sampled By: CCL/JG
C.O.C. No.: 0070

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Φ4 Time: Φ931 Method: Disposable Trowel Monitor Reading (ppm): Φ.6	2-4'	Orange Brown mottled Light Gray	Silty CLAY w/micas and Sandstone Fragments.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A.

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB08050 7
Sample Location: 12SB 08
Sampled By: CCL/JG
C.O.C. No.: 0070

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 0934 Method: Disposable Trowel Monitor Reading (ppm): 0.6	5-7'	Orange Brown Mottled Light Gray	Silty CLAY, w/micas,

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A.

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Charles C. Lyn III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SS 09002
Sample Location: 12SB 09
Sampled By: CCL/JG
C.O.C. No.: 0070

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 0902 Method: Disposable Trowel Monitor Reading (ppm): 1.0	0-2'	Orange Brown Mottled Light Gray	Sandy CLAY w/roots & micas,

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Charles C. Ly III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12S B09025
Sample Location: 12SB09
Sampled By: CCL/JG
C.O.C. No.: 0070

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 0908 Method: Disposable Trowel Monitor Reading (ppm): 1.0	2-5'	Orange Brown Mottled Lt. Gray	Silty CLAY w/micas.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Charles C. Ng III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SBØ9ØSØ8
Sample Location: 12SBØ9
Sampled By: CCL/JG
C.O.C. No.: 0070

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: Ø911 Method: Disposable Trowel Monitor Reading (ppm): 1.Ø	5-8'	Orange Brown Mottled Light Gray	Silty CLAY w/micas.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	1x3=3
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	1x3=3
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

MS/MSD collected Here

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Chuck C. Smith III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SS 10 00 02
Sample Location: 12SB 10
Sampled By: CCL/JG
C.O.C. No.: 0070

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 0831 Method: Disposable Trowel Monitor Reading (ppm): 1.2	0 - 2'	Orange Brown mottled Light Gray	Sandy CLAY w/ some micas.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB10025
Sample Location: 12SB10
Sampled By: CCL/JG
C.O.C. No.: 0070

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 0834 Method: Disposable Trowel Monitor Reading (ppm): 2.1	2-5'	Orange Brown Mottled Light Gray	Sandy CLAY w/ some MICAS.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Charles C. Lay III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB 1ØØSØ8
Sample Location: 12SB 1Ø
Sampled By: CLL/JG
C.O.C. No.: 0070

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: ØØ38 Method: Disposable Trowel Monitor Reading (ppm): 1.1	5-8'	Light Gray Mottled Orange Brown	Silty CLAY w/micas.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A.

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SS11ØØØ2
Sample Location: 12SB 11
Sampled By: CCL/JG
C.O.C. No.: Ø070

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: Ø945 Method: Disposable Trowel Monitor Reading (ppm): Ø.8	Ø-2'	Orange Brown Mottled Light Gray.	Sandy CLAY w/roots & micas.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Clark C. Ly III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB11Ø2Ø5
Sample Location: 12SB 11
Sampled By: CCL/JG
C.O.C. No.: 0070 ; 0077

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: Ø952 Method: Disposable Trowel Monitor Reading (ppm): Ø.6	2-5'	Orange Brown Mottled Gray	CLAY w/ Some MICAS.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	1x2=2
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	1x2=2
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

Duplicate Sample obtained Here.

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.: 12FDØ815Ø4Ø1

Signature(s):

Chris C. Ly III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12S B11Ø5Ø7
Sample Location: 12SB 11
Sampled By: CCL/JG
C.O.C. No.: 0070

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: Ø954 Method: Disposable Trowel Monitor Reading (ppm): Ø.3	5-7'	Orange Brown Mottled Gray	Silty CLAY w/micas.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A.

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Clark C. Ly III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SS12ØØØ2
Sample Location: 12SB 12
Sampled By: CCL / JG
C.O.C. No.: 0069

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/13/Ø4 Time: 1555 Method: Disposable Trowel Monitor Reading (ppm): 1.1	Ø-2'	Light Gray Mottled Orange Brown	Silty CLAY

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 (~~3~~) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Chris C. Lyle III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB12Ø2Ø4
Sample Location: 12SB12
Sampled By: CCL/JG
C.O.C. No.: 0069

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/13/Ø4 Time: 16Ø7 Method: Disposable Trowel Monitor Reading (ppm): Ø.8	2-4'	Light Gray TO Light Brown	Silty CLAY.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 (~~3~~) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SS13ΦΦΦ2
Sample Location: 12SB13
Sampled By: CCL/JG
C.O.C. No.: 0069

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/13/04 Time: 1410 Method: Disposable Trowel Monitor Reading (ppm): 1.7	Φ-2'	orange Brown Mottled Gray	Clayey SAND.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 ~~(3)~~ Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Mark C. Hyatt III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB B0204
Sample Location: 12SB 13
Sampled By: CCL/JG
C.O.C. No.: 0069

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/13/04 Time: 1420 Method: Disposable Trowel Monitor Reading (ppm): 2.6	2-4'	Orange Brown Mottled Gray	Clayey SAND.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 ~~(3)~~ Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Carlo C. Ty III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB13Ø6Ø7
Sample Location: 12SB13
Sampled By: CCL/JG
C.O.C. No.: 0069

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/13/04 Time: 1442 Method: Disposable Trowel Monitor Reading (ppm): Ø	6-7'	Gray	Silty CLAY & Siltstone Fragments.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 ~~(3)~~ Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Charles C. Ly III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SS14ØØØ2
Sample Location: 12SB 14
Sampled By: CCL/JG
C.O.C. No.: 0069

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/13/Ø4 Time: 1521 Method: Disposable Trowel Monitor Reading (ppm): 1.1	Ø - 2'	orange Brown Mottled Gray	Clayey SAND w/ some SILTY CLAY and organics.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Clark C. Ly III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB14Ø2Ø4
Sample Location: 12SB 14
Sampled By: CCL/JG
C.O.C. No.: 0069

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/13/04 Time: 1532 Method: Disposable Trowel Monitor Reading (ppm): 1.1	2-4'	Light Gray	Silty CLAY w/organics

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 (●) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB14Ø6Ø7
Sample Location: 12SB 14
Sampled By: CCL/JG
C.O.C. No.: 0069

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/13/Ø4 Time: 154Ø Method: Disposable Trowel Monitor Reading (ppm): 1.4	6-7'	Dark Gray	Silty CLAY w/ Siltstone.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 (~~3~~) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Clark C. Tyler III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SS15 ØØØ2
Sample Location: 12SB 15
Sampled By: CA / JG
C.O.C. No.: 0069

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/13/Ø4 Time: 1444 Method: Disposable Trowel Monitor Reading (ppm): Ø.4	Ø-2'	Brown with Light Gray Mottled Orange Brown	Silty and Sandy CLAYS with Some Roots.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 (~~3~~) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Charles C. Ely III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB15Ø2Ø4
Sample Location: 12SB 15
Sampled By: CCL/JG
C.O.C. No.: 0069

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

GRAB SAMPLE DATA:

Date: 8/13/04	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1455	2-4'	Dark orange Brown / Light Gray	Silty CLAY.
Method: Disposable Trowel			
Monitor Reading (ppm): Ø2			

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 (2) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Charles C. Ly III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB15Ø6Ø7
Sample Location: 12SB15
Sampled By: CCL/JG
C.O.C. No.: 0069

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/13/Ø4 Time: 15Ø4 Method: Disposable Trowel Monitor Reading (ppm): Ø	6-7'	Gray	Silty CLAY w/ siltstone.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 (~~3~~) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Clyde C. Lyle III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SS18ØØØ2
Sample Location: 12SB18
Sampled By: CCL/JG
C.O.C. No.: 0076

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: 1655 Method: Disposable Trowel Monitor Reading (ppm): 1.Ø	Ø-2'	Orange Brown	Sandy and Silty CLAY w/ Roots.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 (~~3~~) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB180204
Sample Location: 12SB 18
Sampled By: CCL / JG
C.O.C. No.: 0076

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 1701 Method: Disposable Trowel Monitor Reading (ppm): 1.0	2-4'	Orange Brown mottled Gray	Silty CLAY.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 (~~3~~) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A.

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB18Ø6Ø8
Sample Location: 12SB18
Sampled By: CCL/JG
C.O.C. No.: 0076 & 0077

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4	6-8'	Orange Brown mottled Gray	SILTY CLAY.
Time:			
Method: Disposable Trowel			
Monitor Reading (ppm): 2.1			

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	3x2=6
Volatiles SW-846 8015B	2 (~~3~~) Encore Samplers	Yes/No	2x2=4
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	2x2=4
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	1x2=2
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	1x2=2
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

Duplicate Sample Collected Here.

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.: 12FDØ815Ø4Ø4

Signature(s):

Chris C. Ty III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SS19ØØØ2
Sample Location: 12SB 19
Sampled By: CCL/JG
C.O.C. No.: 0076

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: 1617 Method: Disposable Trowel Monitor Reading (ppm): 1.2	Ø-2'	Brown	Sandy CLAY and Silty CLAY w/some Roots.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	3x3=9
Volatiles SW-846 8015B	2 (~~3~~) Encore Samplers	Yes/No	3x2=6
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	2x3=6
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	1x3=3
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	1x3=3
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	Ø
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	Ø

OBSERVATIONS / NOTES:

N/A. MS/MSD Collected Here.

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Clyde C. Lay III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB19Ø2Ø4
Sample Location: 12SB19
Sampled By: CCL / JG
C.O.C. No.: 0076

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 1643 Method: Disposable Trowel Monitor Reading (ppm): 1.9	2-4'	Orange Brown	Silty CLAY w/ Some Siltstone Fragments.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 (~~3~~) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Chuck C. Lyle III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SB2ØØØØ2
Sample Location: 12SB 2Ø
Sampled By: CCL/JG
C.O.C. No.: 0076

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: 155Ø Method: Disposable Trowel Monitor Reading (ppm): 1.5	Ø-2'	Brown To Orange Brown	Silt and Silty CLAY w/ some Roots.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 (3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Clarke C. Lyle III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12S82Ø2Ø4
Sample Location: 12SB 2Ø
Sampled By: CCL/JG
C.O.C. No.: 0076

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/Ø4 Time: 1557 Method: Disposable Trowel Monitor Reading (ppm): Ø.5	2-4'	Orange Brown	SILTY CLAY.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 (~~3~~) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Clark C. Gy III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SS210002
Sample Location: 12SB 21
Sampled By: Gorratt / Rojwan
C.O.C. No.: 0094

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-21-04 Time: 1107 Method: Dig trowel Monitor Reading (ppm): —	0-6"	Brown	Fine sand & silt w Black chips (dry)

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

Small, open grassy area surrounded on 3 sides by trees.

Conformation sample after test excavation

PHOTO #1 * Hot spot *

Collected mid slope

MAP:

~~See Figure 3-3~~

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SB20006 08
Sample Location: 12SB 20
Sampled By: CCL/JG
C.O.C. No.: 0076

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 8/15/04 Time: 1600 Method: Disposable Trowel Monitor Reading (ppm): 0.9	6-8'	orange Brown Mottled Gray	Silty CLAY,

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	2 (●) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

N/A

MAP:

See Figure 3-3

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Charles C. Fry III

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SS220002
Sample Location: 12SB 22
Sampled By: Gerdt / Rojahn
C.O.C. No.: 0094

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-21-04 Time: 1109 Method: trowel S.S. Monitor Reading (ppm): –	0-6"	BRN to OLANYISH BRN	Silt & fine sand w tr clay Some sm. black clumps (damp)

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SAME AS FOR 125521

PHOTO # 2 * Hot spot *

Collected on the Excavation Floor.

MAP:

~~See Figure 3-3~~

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12S S23000 2
Sample Location: 12SB 23
Sampled By: Goardt / Rojahn
C.O.C. No.: 0094

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-21-04 Time: 1115 Method: Dis trowel Monitor Reading (ppm): —	0-6"	BRN	Sandy Silt dry

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SAME AS FOR 12 S521

PHOTO #3

Collected mid slope

MAP:

~~See Figure 3-3~~

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SS240002
Sample Location: 12SB 24
Sampled By: T. Roland
C.O.C. No.: 0094

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 9-21-04 Time: 1119 Method: S.S. trowel Monitor Reading (ppm): —	0-6"	Yellow Brn	SANDY silt some clay

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Volatiles SW-846 8260B	(3) Encore Samplers	Yes/No	
Volatiles SW-846 8015B	(3) Encore Samplers	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(2) 4oz Jar	Yes/No	
Explosives SW-846 8330	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals SW-846 6020 & Mercury SW-846 7471A & CN	(1) 4oz Jar	Yes/No	
CEC, pH, TOC and Ammonia	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SAME AS FOR 12SS21

PHOTO # 4
PHOTOS 5 & 6 PANO-RAMA OF EXCAVATION.

Collected on EXCAVATION FLOOR

MAP:

~~See Figure 3-3~~

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

APPENDIX C.2

SWMU 12

SEDIMENT SAMPLE LOG SHEETS

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD010004
Sample Location: 12SW/SD 01
Sampled By: T. ROJAHN
C.O.C. No.: 0112

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/12/04 Time: 1510 Method: Dis Trowel Monitor Reading (ppm): –	0-4"	BRN	Sandy silt (saturated) some clay Roots & leaf litter

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Terry Rojahn

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number:	12SW/SD01	Date: 10/12/04	Time: 1445 SW 1510 SD	Sampler: T. Kojahn	
Photograph Number/Direction:	____Upstream	X SW Downstream	____East	____West	____North ____South
Predominant Surrounding Land Use:	Wooded	Open Field	Other		
Canopy Cover:	Open	Partly Open	Shaded		
Dicharge Pipe Present:	Yes	No @ INTAKE 4' Gal. PIPE			
Aquatic Vegetation Present:	Yes	No	Stream channelized:	Yes	No
Water flowing:	Yes	No	Not present		
Organisms Present:	Fish (in) NO	Other (insects, frogs, etc.): YES INSECT & FROG			
Water Width (ft): 2	Water Depth (ft): < 1"	Estimated Flow/Velocity: 1'/4 sec			
Channel Width (ft): 2	Channel Depth (ft): 1-2'				
Signs of flooding (circle all that apply)	Yes	No	Water marks on trees	Water-borne debris piles	Other:
Deep Pools Present (>2 feet):	Yes	No	If yes (approximate size)		
Sediment Substrate:	Bedrock	Boulder (>10 in)	Cobble (2.5-10 in)	Gravel (0.10-2.5 in)	
(Circle all that apply)	Sand	Silt	Clay	Muck	
	Debris	Detritus	Concrete	Iron deposits STEAM HOUSE RUNOFF	
Sediment Odors:	Normal	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils:	Absent	Slight	Moderate	Profuse	
Water Odors:	Normal	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils:	None	Droplets	Sheen		
Turbidity:	Clear	Slightly Turbid	Turbid w/ organic mat.	Opaque	

Other Comments/Observations: PHOTO(S) 1015

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD 020004
Sample Location: 12SW/SD 02
Sampled By: T. ROSAHN
C.O.C. No.: 0112

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/12/04 Time: 1725 Method: D.'s TROWEL Monitor Reading (ppm):	0-4"	GREYISH BRN	SANDY SILT w/ CLAY w/ Roots VERY moist

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	(Yes)	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	(Yes)/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/(No)	
AVS/SEM	(1) 4oz Jar	Yes/(No)	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/(No)	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ty Rosahn

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number:	125D020004	**Date:**	10/12/04	**Time:**	1425	**Sampler:** T. Rovahn
Photograph Number/Direction:	____Upstream	x Downstream (SW)	____East	____West	____North	____South
Predominant Surrounding Land Use:	(Wooded)	Open Field	Other			
Canopy Cover:	Open	Partly Open	(Shaded)			
Dicharge Pipe Present:	(Yes)	No	Intake of 3' Galvanized Pipe			
Aquatic Vegetation Present:	Yes	(No)	**Stream channelized:**	(Yes)	No	
Water flowing:	Yes	(No)	Not present			
Organisms Present:	Fish (in)	No	Other (insects, frogs, etc.):	No		
Water Width (ft):	NA	**Water Depth (ft):**	NA	**Estimated Flow/Velocity:**	NA	
Channel Width (ft):	4'	**Channel Depth (ft):**	1'			
Signs of flooding (circle all that apply)	Yes	(No)	Water marks on trees	Water-borne debris piles	Other:	
Deep Pools Present (>2 feet):	Yes	(No)	If yes (approximate size)			
Sediment Substrate:	Bedrock	(Boulder (>10 in))	(Cobble (2.5-10 in))	Gravel (0.10-2.5 in)		
(Circle all that apply)	(Sand)	(Silt)	(Clay)	Muck		
	(Debris)	Detritus	Concrete	Iron deposits		
Sediment Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic	
Sediment Oils:	(Absent)	Slight	Moderate	Profuse		
Water Odors:	Normal NA	Sewage	Petroleum	Chemical	Anaerobic	
Water Surface Oils:	None NA	Droplets	Sheen			
Turbidity:	Clear NA	Slightly Turbid	Turbid	Opaque		

Other Comments/Observations: Photos 1013 & 1014; Debris RR ties

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD 030004
Sample Location: 12SW/SD 03
Sampled By: T. ROSAHN
C.O.C. No.: 012

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/12/04 Time: 1400 Method: Dig. Trowel Monitor Reading (ppm):	0-4"	BROWN	SANDY SILT W/ CLAY W/ Roots VERY moist

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(TA) (2) ~~(1)~~ 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number:	125003 0004	**Date:**	10/12/04	**Time:**	1400	**Sampler:** Terry Rojahn
Photograph Number/Direction:	____Upstream	X Downstream (SW)	____East	____West	____North	____South
Predominant Surrounding Land Use:	Wooded	Open Field	Other	Grassy		
Canopy Cover:	Open	Partly Open	Shaded			
Dicharge Pipe Present:	Yes	No	Intake 18" Galvanized			
Aquatic Vegetation Present:	Yes	No	Aq. Grass	**Stream channelized:**	Yes	No
Water flowing:	Yes	No	Not present			
Organisms Present:	Fish (in)	No	Other (insects, frogs, etc.):	No		
Water Width (ft):	—	**Water Depth (ft):**	—	**Estimated Flow/Velocity:**	—	
Channel Width (ft):	—	**Channel Depth (ft):**	—	See notes		
Signs of flooding (circle all that apply)	Yes	No	Water marks on trees	Water-borne debris piles	Other:	
Deep Pools Present (>2 feet):	Yes	No	If yes (approximate size)			
Sediment Substrate:	Bedrock	Boulder (>10 in)	Cobble (2.5-10 in)	Gravel (0.10-2.5 in)		
(Circle all that apply)	Sand	Silt	Clay	Muck		
	Debris	Detritus	Concrete	Iron deposits		
Sediment Odors:	Normal	Sewage	Petroleum	Chemical	Anaerobic	
Sediment Oils:	Absent	Slight	Moderate	Profuse		
Water Odors:	Normal NA	Sewage	Petroleum	Chemical	Anaerobic	
Water Surface Oils:	None NA	Droplets	Sheen			
Turbidity:	Clear NA	Slightly Turbid	Turbid	Opaque		

Other Comments/Observations: Photo # 1012, diversion ditch along the road feeds into culvert

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD 040004
Sample Location: 12SW/SD 04
Sampled By: T. ROJAHN
C.O.C. No.: 012

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/12/04			
Time: 1140	0-4"	Greyish Brn	Sandy Silt w/ Pea Size Gravel
Method: Dis Trowel			
Monitor Reading (ppm): –			

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 12SW/5004 Date: 10/12/04 Time: 1135 SW / 1140 SD Sampler: T. Rojahn

Photograph Number/Direction: X Upstream ___ Downstream ___ East ___ West X North ___ South

Predominant Surrounding Land Use: Wooded Open Field Other

Canopy Cover: Open Partly Open Shaded

Dicharge Pipe Present: Yes No

Aquatic Vegetation Present: Yes No Leaf litter | Stream channelized: Yes No

Water flowing: Yes No Not present

Organisms Present: Fish (in) NO Other (insects, frogs, etc.): NO

Water Width (ft): 1-2' | Water Depth (ft): < 1" | Estimated Flow/Velocity: 75 < 10gpm / Wade if necessary 1'/5sec

Channel Width (ft): 10 | Channel Depth (ft): 1-2.5'

Signs of flooding (circle all that apply) Yes No Water marks on trees Water-borne debris piles Other:

Deep Pools Present (>2 feet): Yes No If yes (approximate size)

Sediment Substrate: (Circle all that apply)

Bedrock	Boulder (>10 in)	Cobble (2.5-10 in)	Gravel (0.10-2.5 in)	
Sand	Silt	Clay	Muck	
Debris	Detritus	Concrete	Iron deposits	

Sediment Odors:	Normal	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils:	Absent	Slight	Moderate	Profuse	
Water Odors:	Normal	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils:	None	Droplets	Sheen		
Turbidity:	Clear	Slightly Turbid	Turbid	Opaque	

Other Comments/Observations: Photo # 10 11

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD050004
Sample Location: 12SW/SD 05
Sampled By: T. ROJAHN
C.O.C. No.: 0112

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/12/04 Time: 1110 Method: Dis Trowel Monitor Reading (ppm): —	0-4"	Yellow BRN	Sandy Silt w/ PEA size gravel

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Tony Rojahn

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: RSD050004	Date: 10/12/04	Time: 1110	Sampler: T. Rojahn		
Photograph Number/Direction: X Upstream	Downstream	East	West	X North	South
Predominant Surrounding Land Use: Wooded	Open Field	Other			
Canopy Cover: Open	Partly Open	Shaded			
Dicharge Pipe Present: Yes	No	UP STREAM NEAR ROAD			
Aquatic Vegetation Present: Yes	No	LEAF LITTER	Stream channelized: Yes	No	
Water flowing: Yes	No	Not present			
Organisms Present: Fish (in)	NO	Other (insects, frogs, etc.):			
Water Width (ft): NA	Water Depth (ft): NA	Estimated Flow/Velocity: NA			
Channel Width (ft): 9.5'	Channel Depth (ft): 2.5'				
Signs of flooding (circle all that apply) Yes	No	Water marks on trees	Water-borne debris piles	Other:	
Deep Pools Present (>2 feet): Yes	No	If yes (approximate size)			
Sediment Substrate: Bedrock	Boulder (>10 in)	Cobble (2.5-10 in)	Gravel (0.10-2.5 in)		
(Circle all that apply) Sand	Silt	Clay	Muck		
Debris	Detritus	Concrete	Iron deposits		
Sediment Odors: Normal	Sewage	Petroleum	Chemical	Anaerobic	
Sediment Oils: Absent	Slight	Moderate	Profuse		
Water Odors: Normal NA	Sewage	Petroleum	Chemical	Anaerobic	
Water Surface Oils: None NA	Droplets	Sheen			
Turbidity: Clear NA	Slightly Turbid	Turbid	Opaque		

Other Comments/Observations: PHOTO # 1010; LEFT OF CLIP BOARD IS SAMPLE LOCATION

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD060004
Sample Location: 12SW/SD 06
Sampled By: T. ROJAHN
C.O.C. No.: 0112

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10-12-04 Time: 1015 Method: Dis. trowel Monitor Reading (ppm): —	0-4"	YELLOW BROWN	SANDY SILT MOIST SOME ORGANIC MAT (leaf roots etc)

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number:	125D06	Date: 10/12/04	Time: 1015	Sampler: T. Rojahn	
Photograph Number/Direction:	✓ NE Upstream	Downstream	East	West	North / South
Predominant Surrounding Land Use:	Wooded	Open Field	Other		
Canopy Cover:	Open	Partly Open	Shaded		
Dicharge Pipe Present:	Yes	No	upstream @ Road		
Aquatic Vegetation Present:	Yes	No	Stream channelized:	Yes	No
Water flowing:	Yes	No	Not present		
Organisms Present:	Fish (in)	Other (insects, frogs, etc.):			
Water Width (ft):	—	Water Depth (ft):	—	Estimated Flow/Velocity:	—
Channel Width (ft):	3.5'	Channel Depth (ft):	1.5'		
Signs of flooding (circle all that apply)	Yes	No	Water marks on trees	Water-borne debris piles	Other:
Deep Pools Present (>2 feet):	Yes	No	If yes (approximate size)		
Sediment Substrate:	Bedrock	Boulder (>10 in)	Cobble (2.5-10 in)	Gravel (0.10-2.5 in)	
(Circle all that apply)	Sand	Silt	Clay	Muck	
	Debris	Detritus	Concrete	Iron deposits	
Sediment Odors:	Normal	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils:	Absent	Slight	Moderate	Profuse	
Water Odors:	Normal N/A	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils:	None N/A	Droplets	Sheen		
Turbidity:	Clear N/A	Slightly Turbid	Turbid	Opaque	

Other Comments/Observations: PHOTO #1009 (Note trowel); organic mat. present (Roots leaf mat. etc.)

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD070004
Sample Location: 12SW/SD07
Sampled By: SJC/JG
C.O.C. No.: 0106

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/11/04 Time: 1445 Method: DIS TROWEL Monitor Reading (ppm):	0-4	BRN	SANDY SILT MOIST

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(3) (1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(3) (1) 4oz Jar	Yes/No	
AVS/SEM	(3) (1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(3) (1) 4oz Jar	Yes/No	
	(12) ~~4~~ TOTAL MS/MD + DUP		

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD

Duplicate ID No.: 12FD101104-02

Signature(s): S. Conti

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: ~~125W~~ 125D070004	Date: 10/11/04	Time: 1445	Sampler: SJC/JG	
Photograph Number/Direction: V 45°NE Upstream	~~Downstream~~	East	West	North / South
Predominant Surrounding Land Use: (Wooded)	Open Field	Other		
Canopy Cover: (Open) TO → (Partly Open)	Shaded			
Dicharge Pipe Present: Yes	(No)			
Aquatic Vegetation Present: Yes	(No)	* Stream channelized: (Yes)	No	
Water flowing: Yes	(No)	(Not present)		
Organisms Present: Fish (in) —	Other (insects, frogs, etc.): —			
Water Width (ft): NA	Water Depth (ft): NA	Estimated Flow/Velocity: NA		
Channel Width (ft): 4' TO 5'	Channel Depth (ft): 2'			
Signs of flooding (circle all that apply) Yes	(No)	Water marks on trees	Water-borne debris piles	Other:
Deep Pools Present (>2 feet): Yes	(No)	If yes (approximate size)		
Sediment Substrate: Bedrock	(Boulder (>10 in))	Cobble (2.5-10 in)	(Gravel (0.10-2.5 in))	
(Circle all that apply) (Sand)	(Silt)	Clay	Muck	
Debris	Detritus	Concrete	Iron deposits	
Sediment Odors (Normal)	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils: (Absent)	Slight	Moderate	Profuse	
Water Odors: Normal NA	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils: None NA	Droplets	Sheen		
Turbidity: Clear NA	Slightly Turbid	Turbid	Opaque	

Other Comments/Observations: NEAR PROPOSED WELL T41 – NEAR POWER LINE OPENING.
* SMALL GULLY THAT APPEARS TO CATCH SURFACE RUN OFF

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD080004
Sample Location: 12SW/SD08
Sampled By: SJC/JG
C.O.C. No.: 0106

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/11/04 Time: 1410 Method: DIS TROWELL Monitor Reading (ppm):	0-4"	BRN	SILTY SAND TR F GRAVEL DAMP-MOIST

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

13 SW/SD 26 STAKE ≈ 15' DS

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): S. Conte

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number:	12SD080004	**Date:** 10/11/04	**Time:** 1410	**Sampler:** SJC/JG	
Photograph Number/Direction:	✓ Upstream 322° NW	Downstream	East	West	North / South
Predominant Surrounding Land Use:	(Wooded)	Open Field	Other		
Canopy Cover:	Open	(Partly Open)	Shaded		
Dicharge Pipe Present:	Yes	(No)			
Aquatic Vegetation Present:	Yes	(No)	**Stream channelized:**	(Yes)	No
Water flowing:	Yes	(No)	(Not present)		
Organisms Present:	Fish (in) —	Other (insects, frogs, etc.): —			
Water Width (ft):	NA	**Water Depth (ft):** NA	**Estimated Flow/Velocity:**	NA	
Channel Width (ft):	7'	**Channel Depth (ft):** 1.5'			
Signs of flooding (circle all that apply)	(Yes)	No	Water marks on trees	(Water-borne debris piles)	Other:
Deep Pools Present (>2 feet):	Yes	(No)	If yes (approximate size)		
Sediment Substrate:	Bedrock	(Boulder (>10 in))	(Cobble (2.5-10 in))	(Gravel (0.10-2.5 in))	
(Circle all that apply)	(Sand)	(Silt)	Clay	Muck	
	Debris	Detritus	Concrete	Iron deposits	
Sediment Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils:	(Absent)	Slight	Moderate	Profuse	
Water Odors:	Normal NA	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils:	None NA	Droplets	Sheen		
Turbidity:	Clear NA	Slightly Turbid	Turbid	Opaque	

Other Comments/Observations: NEAR STAICE OF 13SW/SD 26 WHICH IS ≈ 15' DS.

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD090004
Sample Location: 12SW/SD04-
Sampled By: SJC/JG
C.O.C. No.: 0106

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/11/04 Time: 1425 Method: DIS TROWEL Monitor Reading (ppm):	0-4	BRN	SILTY F/C SAND - TR F GRAVEL DAMP → MOIST

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	
	3 JARS		

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SJ Conte

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

2 of 2

Sample Number:	12SD090004	Date: 10/11/04	Time: 1425	Sampler: JG/SJC	
Photograph Number/Direction:	✓ Upstream (40° NE)	Downstream	East	West	North / South
Predominant Surrounding Land Use:	(Wooded)	Open Field	Other		
Canopy Cover:	Open	(Partly Open)	Shaded		
Dicharge Pipe Present:	Yes	(No)			
Aquatic Vegetation Present:	Yes	(No)	Stream channelized:	(Yes)	No
Water flowing:	Yes	(No)	(Not present)		
Organisms Present:	Fish (in) —	Other (insects, frogs, etc.): —			
Water Width (ft): NA	Water Depth (ft): NA	Estimated Flow/Velocity: NA			
Channel Width (ft): 15'±	Channel Depth (ft): 2'TO3'	BOTH SIDES			
Signs of flooding (circle all that apply)	(Yes)	No	Water marks on trees	(Water-borne debris piles)	Other:
Deep Pools Present (>2 feet):	Yes	(No)	If yes (approximate size)		
Sediment Substrate:	Bedrock	(Boulder (>10 in))	(Cobble) (2.5-10 in)	(Gravel) (0.10-2.5 in)	
(Circle all that apply)	(Sand)	(Silt)	Clay	Muck	
	Debris	Detritus	Concrete	Iron deposits	
Sediment Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils:	(Absent)	Slight	Moderate	Profuse	
Water Odors:	Normal NA	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils:	None NA	Droplets	Sheen		
Turbidity:	Clear NA	Slightly Turbid	Turbid	Opaque	

Other Comments/Observations: NEAR STAKE 13SW/SD 27 ?

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD100004
Sample Location: 12SW/SD 10
Sampled By: SJC/JG
C.O.C. No.: 0106

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/11/04 Time: 1320 Method: DIS TROWEL Monitor Reading (ppm): —	0-4"	BROWN	F/C SILTY SAND - SOME GRAVEL MOIST

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	
	3 TOTAL		

OBSERVATIONS / NOTES:

SEE SUPPLEMENTA SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

SJ Conti

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

2 of 2

Sample Number:	12SD100004	**Date:**	10/11/04	**Time:**	1320	**Sampler:** JG/SJC
Photograph Number/Direction:	✓ Upstream (340° N)	Downstream	East	West	North	South
Predominant Surrounding Land Use:	(Wooded)	Open Field	Other			
Canopy Cover:	Open	(Partly Open)	Shaded			
Dicharge Pipe Present:	Yes	(No)	SQUARE CONC CULVERT 6'H x 8'W 30' DS OF LOC			
Aquatic Vegetation Present:	Yes	(No)	**Stream channelized:**	(Yes)	No	
Water flowing:	Yes	(No)	(Not present)			
Organisms Present:	Fish (in) —	Other (insects, frogs, etc.): —				
Water Width (ft):	NA	**Water Depth (ft):**	NA	**Estimated Flow/Velocity:**	NA	
Channel Width (ft):	17'±	**Channel Depth (ft):**	→	E ≈ 2'/W' 3' TO 4'		
Signs of flooding (circle all that apply)	(Yes)	No	Water marks on trees	(Water-borne debris piles)	Other:	
Deep Pools Present (>2 feet):	Yes	(No)	If yes (approximate size)			
Sediment Substrate:	Bedrock	(Boulder (>10 in))	(Cobble (2.5-10 in))	(Gravel (0.10-2.5 in))		
(Circle all that apply)	(Sand)	(Silt)	Clay	Muck		
	Debris	Detritus	Concrete	Iron deposits		
Sediment Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic	
Sediment Oils:	(Absent)	Slight	Moderate	Profuse		
Water Odors:	Normal NA	Sewage	Petroleum	Chemical	Anaerobic	
Water Surface Oils:	None NA	Droplets	Sheen			
Turbidity:	Clear NA	Slightly Turbid	Turbid	Opaque		

Other Comments/Observations: _____

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD110004
Sample Location: 12SW/SD 11
Sampled By: SJC/JG
C.O.C. No.: 0112

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/12/04 Time: 1030 Method: DISTROWEL Monitor Reading (ppm):	0-4"	BRN	SILTY F/C SAND WET → SATURATED

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): J Conti

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

2 of 2

Sample Number:	12 SD 11 E 12 SW 1101	Date: 10/12/04	Time: 1020	Sampler: SJC/JG		
Photograph Number/Direction:	✓ 20° N Upstream	Downstream	East	West	North	South
Predominant Surrounding Land Use:	(Wooded)	Open Field	Other			
Canopy Cover:	Open	(Partly Open)	Shaded			
Dicharge Pipe Present:	Yes	(No)				
Aquatic Vegetation Present:	Yes	(No)	Stream channelized:	(Yes)	No	
Water flowing:	Yes	(No)	Not present	SMALL PONDED AREA		
Organisms Present:	(Fish (in))	1" LONG ~~NO~~	Other (insects, frogs, etc.):	NO		
Water Width (ft):	3'x7'	Water Depth (ft):	0.5'	Estimated Flow/Velocity:	NA	
Channel Width (ft):	9'	Channel Depth (ft): →	3' WEST	5' EAST SIDE		
Signs of flooding (circle all that apply)	(Yes)	No	Water marks on trees	(Water-borne debris piles)	Other:	
Deep Pools Present (>2 feet):	Yes	(No)	If yes (approximate size)			
Sediment Substrate:	Bedrock	(Boulder (>10 in))	(Cobble (2.5-10 in))	(Gravel (0.10-2.5 in))		
(Circle all that apply)	(Sand)	(Silt)	(Clay)	Muck		
	(Debris) PAPER	Detritus	Concrete	Iron deposits		
Sediment Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic	
Sediment Oils:	(Absent)	Slight	Moderate	Profuse		
Water Odors:	~~Normal~~	(Sewage) LIGHT ?	Petroleum	Chemical	Anaerobic	
Water Surface Oils:	(None)	Droplets	Sheen			
Turbidity:	Clear	(Slightly Turbid)	Turbid	Opaque		

Other Comments/Observations: STREAM CHANNEL IS ESSENTIALLY DRY - SMALL PONDED AREA AT LOCATION SHOWN ON PROPOSED LOC MAP - SO WE TOOK SW SAMPLE.

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD120004
Sample Location: 12SW/SD12
Sampled By: SJC/JG
C.O.C. No.: 0119

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/13/04 Time: 1040 Method: DISTROWEL Monitor Reading (ppm): —	0 - 4'	GRAY BROWN	SANDY SILT TR CLAY SATURATED

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number:	125012 $ 12SW7201	Date: 10/13/09	Time: 1030	Sampler: JG / SJC	
Photograph Number/Direction:	✓ Upstream	230 SW Downstream	East	West	North / South
Predominant Surrounding Land Use:	(Wooded)	Open Field	Other		
Canopy Cover:	Open	(Partly Open)	Shaded		
Dicharge Pipe Present:	(Yes)	No			
Aquatic Vegetation Present:	Yes	(No)	Stream channelized:	(Yes)	No
Water flowing:	Yes	(No)	Not present	PONDED JUST BELOW DIS. PIPE	
Organisms Present:	Fish (in) NO	Other (insects, frogs, etc.): No			
Water Width (ft):	5'	Water Depth (ft): 1'	Estimated Flow/Velocity:	NA	
Channel Width (ft):	10' x 7'	Channel Depth (ft): 4'			
Signs of flooding (circle all that apply)	(Yes)	No	Water marks on trees	(Water-borne debris piles)	Other:
Deep Pools Present (>2 feet):	Yes	(No)	If yes (approximate size)		
Sediment Substrate:	(Bedrock)	(Boulder (>10 in))	(Cobble (2.5-10 in))	(Gravel (0.10-2.5 in))	
(Circle all that apply)	(Sand)	(Silt)	Clay	Muck	
	(Debris) METAL	Detritus	Concrete	Iron deposits	
Sediment Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils:	(Absent)	Slight	Moderate	Profuse	
Water Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils:	(None)	Droplets	Sheen		
Turbidity:	Clear	(Slightly Turbid)	Turbid	Opaque	

Other Comments/Observations: CMP 24" PIPE UNDER RR.

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD130004
Sample Location: 12SW/SD13
Sampled By: SJC/JG
C.O.C. No.: 0119

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/13/04 Time: 1440 Method: DIS TROWEL Monitor Reading (ppm): —	0-4"	BRN	SILT F/C SAND - TR F GRAVEL MOIST → WET

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	
	(3) TOTAL		

OBSERVATIONS / NOTES:

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): SJ Conte

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number:	12SD13~~04~~ 12SW1301	Date:	10/13/04	Time:	1425	Sampler: JG/SJC
Photograph Number/Direction:	✓ Upstream 270° W	Downstream	East	West	North	South
Predominant Surrounding Land Use:	(Wooded)	Open Field	Other			
Canopy Cover:	Open	(Partly Open)	Shaded			
Dicharge Pipe Present:	Yes	(No)				
Aquatic Vegetation Present:	Yes	(No)	Stream channelized:	(Yes)	No	
Water flowing:	Yes	(No)	Not present	V. SMALL POOL OF WATER		
Organisms Present:	Fish (in) NO	Other (insects, frogs, etc.): NO				
Water Width (ft): 0.5	Water Depth (ft): 0.3'	Estimated Flow/Velocity: —				
Channel Width (ft): 15'	Channel Depth (ft): ≈ 3'					
Signs of flooding (circle all that apply)	(Yes)	No	Water marks on trees	(Water-borne debris piles)	Other:	
Deep Pools Present (>2 feet):	Yes	(No)	If yes (approximate size)			
Sediment Substrate:	Bedrock	(Boulder (>10 in))	(Cobble (2.5-10 in))	(Gravel (0.10-2.5 in))		
(Circle all that apply)	(Sand)	(Silt)	Clay	Muck		
	(Debris) WOOD PAPER	Detritus	Concrete	Iron deposits		
Sediment Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic	
Sediment Oils:	(Absent)	Slight	Moderate	Profuse		
Water Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic	
Water Surface Oils:	(None)	Droplets	Sheen			
Turbidity:	Clear	(Slightly Turbid)	Turbid	Opaque		

Other Comments/Observations: SMALL POOL ≈ 1' X 0.5

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Diversion Ditches

Sample ID No.: 12SD 140004
Sample Location: 12SW/SD 14
Sampled By: T. ROSAHN
C.O.C. No.: 0119

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10-13-04 Time: 1200 Method: Dis Trowel Monitor Reading (ppm): —	0-4	BRN	Sandy Silt (Damp) Roots & Rock Frags

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 125014	**Date:** 10/13/99	**Time:** 1200	**Sampler:** T. ROJAHN			
Photograph Number/Direction:	Upstream	X Downstream	X East	West	North	South
Predominant Surrounding Land Use:	Wooded	Open Field	Other Maintained Grass			
Canopy Cover:	(Open)	Partly Open	Shaded			
Dicharge Pipe Present:	(Yes)	No	2' Galvanized Pipe			
Aquatic Vegetation Present:	Yes	(No)	**Stream channelized:**	Yes	No	
Water flowing:	Yes	(No)	Not present			
Organisms Present:	Fish (in)	NO	Other (insects, frogs, etc.):	Worms		
Water Width (ft): —	**Water Depth (ft):** —	**Estimated Flow/Velocity:** —				
Channel Width (ft): 2'	**Channel Depth (ft):** 3'					
Signs of flooding (circle all that apply)	Yes	(No)	Water marks on trees	Water-borne debris piles	Other:	
Deep Pools Present (>2 feet):	Yes	(No)	If yes (approximate size)			
Sediment Substrate:	Bedrock	Boulder (>10 in)	(Cobble (2.5-10 in))	(Gravel (0.10-2.5 in))		
(Circle all that apply)	(Sand)	(Silt)	Clay	Muck		
	Debris	Detritus	Concrete	Iron deposits		
Sediment Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic	
Sediment Oils:	(Absent)	Slight	Moderate	Profuse		
Water Odors:	Normal NA	Sewage	Petroleum	Chemical	Anaerobic	
Water Surface Oils:	None NA	Droplets	Sheen			
Turbidity:	Clear NA	Slightly Turbid	Turbid	Opaque		

Other Comments/Observations: PHOTO #1021 Diversion Ditches

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SD150004
Sample Location: 12SW/SD15
Sampled By: T. Rojahn
C.O.C. No.: 0119

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

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/13/04 Time: 1045 Method: Dig Trowel Monitor Reading (ppm): —	0-4"	BROWN	Silty Clay tr. sand Moist roots & veg. mat Gravel (Rock Frags.)

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

Moved in side MFA fence next to Monitoring well T35

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ty Rojahn

Zoo 2

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 125015	Date: 10/13/04	Time: 1045	Sampler: T. Rosahn			
Photograph Number/Direction: ____ Upstream	X Downstream (NE)	____ East	____ West	____ North	____ South	
Predominant Surrounding Land Use:	Wooded	Open Field	Other Maintained Grass			
Canopy Cover:	(Open)	Partly Open	Shaded			
Dicharge Pipe Present:	(Yes)	No	1.5' Galvanized Pipe			
Aquatic Vegetation Present:	Yes	(No)	Stream channelized:	Yes	No	
Water flowing:	Yes	(No)	Not present			
Organisms Present:	Fish (in) NO	Other (insects, frogs, etc.):				
Water Width (ft): NO	Water Depth (ft): NO	Estimated Flow/Velocity: NA				
Channel Width (ft): 3	Channel Depth (ft): 3					
Signs of flooding (circle all that apply)	Yes	(No)	Water marks on trees	Water-borne debris piles	Other:	
Deep Pools Present (>2 feet):	Yes	(No)	If yes (approximate size)			
Sediment Substrate:	Bedrock	Boulder (>10 in)	Cobble (2.5-10 in)	(Gravel (0.10-2.5 in))		
(Circle all that apply)	(Sand)	(Silt)	(Clay)	Muck	Rock Fragments	
	Debris	Detritus	Concrete	Iron deposits		
Sediment Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic	
Sediment Oils:	(Absent)	Slight	Moderate	Profuse		
Water Odors:	Normal NA	Sewage	Petroleum	Chemical	Anaerobic	
Water Surface Oils:	None NA	Droplets	Sheen			
Turbidity:	Clear NA	Slightly Turbid	Turbid	Opaque		

Other Comments/Observations: PHOTO # 1018 Diversion Ditch
Receives surface run off from parking lot

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD 160004
Sample Location: 12SW/SD 16
Sampled By: SJC/JG
C.O.C. No.: 0119

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/13/04 Time: 1355 Method: DISTROWELL Monitor Reading (ppm):	0 - 4"	BRN	TAN BRN SANDY SIG/SILTY F SAND WET → SATURATED

COMPOSITE SAMPLE DATA:

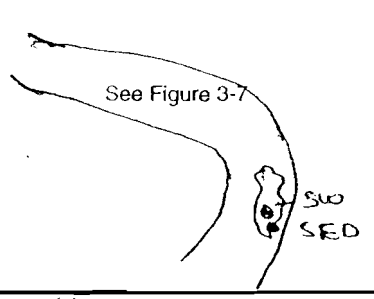
Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
NA	NA	NA	NA	NA
Method:				
NA				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): SJ Conte

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number:	125D16 & 12SW1601	**Date:**	10/13/04	**Time:**	1345	**Sampler:** SJC/JG
Photograph Number/Direction:	✓ Upstream (357°N)	Downstream	East	West	North	South
Predominant Surrounding Land Use:	(Wooded)	Open Field	Other			
Canopy Cover:	Open	(Partly Open)	Shaded			
Dicharge Pipe Present:	Yes	(No)				
Aquatic Vegetation Present:	Yes	(No)	**Stream channelized:**	(Yes)	No	
Water flowing:	(Yes)	(No)	Not present	SMALL FLOW THRU ROCKS POOLED WHERE SAMPLE TAKEN		
Organisms Present:	Fish (in) 2"	Other (insects, frogs, etc.):	~~3.4'~~ 3.5'			
Water Width (ft):	4'	**Water Depth (ft):**	~~3'~~	**Estimated Flow/Velocity:**	NA	
Channel Width (ft):	20	**Channel Depth (ft):**	5'			
Signs of flooding (circle all that apply)	Yes	No	Water marks on trees	Water-borne debris piles	Other:	
Deep Pools Present (>2 feet):	Yes	No	If yes (approximate size)			
Sediment Substrate:	Bedrock	(Boulder) (>10 in)	(Cobble) (2.5-10 in)	(Gravel) (0.10-2.5 in)		
(Circle all that apply)	(Sand)	(Silt)	(Clay)	Muck		
	(Debris)	Detritus	Concrete	Iron deposits		
Sediment Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic	
Sediment Oils:	(Absent)	Slight	Moderate	Profuse		
Water Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic	
Water Surface Oils:	(None)	Droplets	Sheen			
Turbidity:	(Clear)	Slightly Turbid	Turbid	Opaque		

Other Comments/Observations: _____

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD17 0004
Sample Location: 12SW/SD 17
Sampled By: SJC/JG
C.O.C. No.: 0119

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/13/04 Time: 1325 Method: DIS TROWEL Monitor Reading (ppm):	0-4"	BRN	SILTY F/C SAND MOIST

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	(Yes)	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	(Yes)/No	
Metals, Mercury,CEC, pH, and TOC	~~(1)~~ 4oz Jar	Yes/(No)	
AVS/SEM	~~(1)~~ 4oz Jar	Yes/(No)	
Semivolatiles: SW-846 8270C, 8151A & SIM	~~(1)~~ 4oz Jar	Yes/(No)	

OBSERVATIONS / NOTES:

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): J Conti

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

2 of 2

Sample Number: 125D170004	Date: 10/13/04	Time: 1325	Sampler: SJC/JG			
Photograph Number/Direction: ✓ 325 NW Upstream	Downstream	East	West	North	South	
Predominant Surrounding Land Use: (Wooded)	Open Field	Other				
Canopy Cover: Open	(Partly Open)	Shaded				
Dicharge Pipe Present: Yes	(No)					
Aquatic Vegetation Present: Yes	(No)	Stream channelized: (Yes)	No			
Water flowing: Yes	(No)	(Not present)				
Organisms Present: Fish (in) worm	Other (insects, frogs, etc.):					
Water Width (ft): NA	Water Depth (ft): NA	Estimated Flow/Velocity: NA				
Channel Width (ft): 12'	Channel Depth (ft): 3.5→4'					
Signs of flooding (circle all that apply) (Yes)	No	Water marks on trees	(Water-borne debris piles)	Other:		
Deep Pools Present (>2 feet): Yes	(No)	If yes (approximate size)				
Sediment Substrate:	Bedrock	(Boulder (>10 in))	(Cobble (2.5-10 in))	(Gravel (0.10-2.5 in))		
(Circle all that apply)	(Sand)	(Silt)	Clay	Muck		
	(Debris) METAL PIPE	Detritus	Concrete	Iron deposits		
Sediment Odors: (Normal)	Sewage	Petroleum	Chemical	Anaerobic		
Sediment Oils: (Absent)	Slight	Moderate	Profuse			
Water Odors: Normal NA	Sewage	Petroleum	Chemical	Anaerobic		
Water Surface Oils: None NA	Droplets	Sheen				
Turbidity: Clear NA	Slightly Turbid	Turbid	Opaque			

Other Comments/Observations: _____

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Diversion Ditch

Sample ID No.: 12SD 18 0004
Sample Location: 12SW/SD 18
Sampled By: T. Rosahn
C.O.C. No.: 0119

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/13/04 Time: 1100 Method: Dis. Trowel Monitor Reading (ppm):	0-4"	BRN	Silty Clay Tr Sand Rock Frags very moist w/roots

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 125D180004 **Date:** 10/13/04 **Time:** 1100 **Sampler:** T. Rosann

Photograph Number/Direction: ___ Upstream X Downstream X East ___ West ___ North ___ South

Predominant Surrounding Land Use: Wooded Open Field Other Maintained Grass

Canopy Cover: (Open) Partly Open Shaded

Dicharge Pipe Present: (Yes) No 1.5' Galvanized Pipe

Aquatic Vegetation Present: Yes (No) **Stream channelized:** Yes No

Water flowing: Yes (No) Not present

Organisms Present: Fish (in) Other (insects, frogs, etc.):

Water Width (ft): — **Water Depth (ft):** — **Estimated Flow/Velocity:** NA

Channel Width (ft): 3' **Channel Depth (ft):** 2.5'

Signs of flooding (circle all that apply) Yes (No) Water marks on trees Water-borne debris piles Other:

Deep Pools Present (>2 feet): Yes (No) If yes (approximate size)

Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) (Gravel (0.10-2.5 in))

(Circle all that apply) (Sand) (Silt) (Clay) Muck Rock Frags

Debris Detritus Concrete Iron deposits

Sediment Odors: (Normal) Sewage Petroleum Chemical Anaerobic

Sediment Oils: (Absent) Slight Moderate Profuse

Water Odors: Normal NA Sewage Petroleum Chemical Anaerobic

Water Surface Oils: None NA Droplets Sheen

Turbidity: Clear NA Slightly Turbid Turbid Opaque

Other Comments/Observations: PHOTO #1019 Diversion Ditch

Receives surface run off from parking lot

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD190004
Sample Location: 12SW/SD19
Sampled By: SJC/JG
C.O.C. No.: 0112

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/12/04			
Time: 1400			
Method: DIS TROWEL	0-4"	BRN	SILTY F/C SAND DAMP → MOIST
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	
	3 TOTAL		

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

SJ Conte

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number:	125D19 0004	**Date:** 10/12/04	**Time:** 1400	**Sampler:** JG/SJC	
Photograph Number/Direction:	✓ Upstream 256° W	____ Downstream	____ East	____ West	____ North ____ South
Predominant Surrounding Land Use:	(Wooded)	Open Field	Other		
Canopy Cover:	Open	(Partly Open)	Shaded		
Dicharge Pipe Present:	Yes	(No)			
Aquatic Vegetation Present:	Yes	(No)	**Stream channelized:**	(Yes)	No
Water flowing:	Yes	(No)	(Not present)		
Organisms Present:	Fish (in) WORMS	Other (insects, frogs, etc.):			
Water Width (ft):	NA	**Water Depth (ft):** NA	**Estimated Flow/Velocity:** NA		
Channel Width (ft):	4'	**Channel Depth (ft):** 1'			
Signs of flooding (circle all that apply)	(Yes)	No	Water marks on trees	(Water-borne debris piles)	Other:
Deep Pools Present (>2 feet):	Yes	(No)	If yes (approximate size)		
Sediment Substrate:	Bedrock	(Boulder (>10 in))	(Cobble (2.5-10 in))	(Gravel) (0.10-2.5 in)	
(Circle all that apply)	(Sand)	(Silt)	Clay	Muck	
	Debris	Detritus	Concrete	Iron deposits	
Sediment Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils:	(Absent)	Slight	Moderate	Profuse	
Water Odors:	Normal NA	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils:	None NA	Droplets	Sheen		
Turbidity:	Clear NA	Slightly Turbid	Turbid	Opaque	

Other Comments/Observations: _____

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD 20 0004
Sample Location: 12SW/SD 20
Sampled By: T. ROJAHN
C.O.C. No.: 0119

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/13/04 Time: 1130 Method: Dis Trowel Monitor Reading (ppm): —	0-4"	BRN	Silty Sand To Clay (V. Moist) Rock Fragments & Veg Matterial Roots Etc.

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Terry Rojahn

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

2 OF 2

Sample Number: 125020004	**Date:** 10/13/04	**Time:** 1130	**Sampler:** T. ROJAHN			
Photograph Number/Direction: ____ Upstream	X Downstream	X East	____ West	____ North	____ South	
Predominant Surrounding Land Use: Wooded	Open Field	Other Maintained Grass				
Canopy Cover: (Open)	Partly Open	Shaded				
Dicharge Pipe Present: (Yes)	No					
Aquatic Vegetation Present: Yes	(No)	**Stream channelized:** Yes	No			
Water flowing: Yes	(No)	Not present				
Organisms Present: Fish (in)	Other (insects, frogs, etc.):					
Water Width (ft): —	**Water Depth (ft):** —	**Estimated Flow/Velocity:** —				
Channel Width (ft): 2	**Channel Depth (ft):** 4					
Signs of flooding (circle all that apply) Yes	No	Water marks on trees	Water-borne debris piles	Other:		
Deep Pools Present (>2 feet): Yes	No	If yes (approximate size)				
Sediment Substrate: Bedrock	Boulder (>10 in)	(Cobble (2.5-10 in))	(Gravel (0.10-2.5 in))			
(Circle all that apply) (Sand)	(Silt)	(Clay)	Muck			
Debris	Detritus	Concrete	Iron deposits			
Sediment Odors: (Normal)	Sewage	Petroleum	Chemical	Anaerobic		
Sediment Oils: (Absent)	Slight	Moderate	Profuse			
Water Odors: Normal NA	Sewage	Petroleum	Chemical	Anaerobic		
Water Surface Oils: None NA	Droplets	Sheen				
Turbidity: Clear NA	Slightly Turbid	Turbid	Opaque			

Other Comments/Observations: PHOTO # 1020 DIVERSION DITCH

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD210004
Sample Location: 12SW/SD 24
Sampled By: SJC / JG
C.O.C. No.: 011 2

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/12/04 Time: 1340 Method: DIS TROWEL Monitor Reading (ppm): —	0-4'	BRN	SILTY F/M SAND - TR F GRAVEL MOIST

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): SJ Conte

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 12SD21 0004	**Date:** 10/12/04	**Time:** 1340	**Sampler:** SJC/JG	
Photograph Number/Direction: ✓ Upstream (318 NW)	Downstream	East	West	North / South
Predominant Surrounding Land Use: (Wooded)	Open Field	Other		
Canopy Cover: Open	(Partly Open)	Shaded		
Dicharge Pipe Present: Yes	(No)			
Aquatic Vegetation Present: Yes	(No)	**Stream channelized:** (Yes)	No	
Water flowing: Yes	(No)	(Not present)		
Organisms Present: Fish (in)	WORM CENTIPEDE	Other (insects, frogs, etc.):		
Water Width (ft): NA	**Water Depth (ft):** NA	**Estimated Flow/Velocity:** NA		
Channel Width (ft): 5'	**Channel Depth (ft):** 1' TO 2'	—		
Signs of flooding (circle all that apply) (Yes)	No	Water marks on trees	(Water-borne debris piles)	Other:
Deep Pools Present (>2 feet): Yes	(No)	If yes (approximate size)		
Sediment Substrate: Bedrock	(Boulder (>10 in))	(Cobble (2.5-10 in))	(Gravel (0.10-2.5 in))	
(Circle all that apply) (Sand)	(Silt)	Clay	Muck	
Debris	Detritus	Concrete	Iron deposits	
Sediment Odors: (Normal)	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils: (Absent)	Slight	Moderate	Profuse	
Water Odors: Normal NA	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils: None NA	Droplets	Sheen		
Turbidity: Clear NA	Slightly Turbid	Turbid	Opaque	

Other Comments/Observations: _____

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD220004
Sample Location: 12SW/SD22
Sampled By: SJC/JG
C.O.C. No.: 0112

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/12/04 Time: 1330 Method: DIS TROWEL Monitor Reading (ppm): —	0 - 4"	BRN	SILTY SAND (F/C) TR F GRAVEL

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	
	3 JARS TOTAL		

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): SJ Conti

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

2 of 2

Sample Number:	12SD220004	**Date:** 10/12/04	**Time:** 1330	**Sampler:** JG/SJC	
Photograph Number/Direction:	✓ Upstream (80°E)	Downstream	East	West	North / South
Predominant Surrounding Land Use:	(Wooded)	Open Field	Other		
Canopy Cover:	Open	(Partly Open)	Shaded		
Dicharge Pipe Present:	Yes	(No)			
Aquatic Vegetation Present:	Yes	(No)	**Stream channelized:**	(Yes)	No
Water flowing:	Yes	(No)	(Not present)		
Organisms Present:	Fish (in) worm	Other (insects, frogs, etc.):			
Water Width (ft):	NA	**Water Depth (ft):** NA	**Estimated Flow/Velocity:** NA		
Channel Width (ft):	7'±	**Channel Depth (ft):** 2' TO 3'			
Signs of flooding (circle all that apply)	Yes	(No)	Water marks on trees	Water-borne debris piles	Other:
Deep Pools Present (>2 feet):	Yes	(No)	If yes (approximate size)		
Sediment Substrate:	Bedrock	(Boulder (>10 in))	(Cobble (2.5-10 in))	(Gravel (0.10-2.5 in))	
(Circle all that apply)	(Sand)	(Silt)	Clay	Muck	
	Debris	Detritus	Concrete	Iron deposits	
Sediment Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils	(Absent)	Slight	Moderate	Profuse	
Water Odors:	Normal NA	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils:	None NA	Droplets	Sheen		
Turbidity:	Clear NA	Slightly Turbid	Turbid	Opaque	

Other Comments/Observations: _____

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD230004
Sample Location: 12SW/SD 23
Sampled By: SJC/JG
C.O.C. No.: 0119

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/13/04 Time: 0910 Method: DIS TREWELL Monitor Reading (ppm): —	0-4"	BRN	SILTY F/C SAND WET→SATURATED

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	~~Yes/No~~	
AVS/SEM	(1) 4oz Jar	~~Yes/No~~	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	~~Yes/No~~	

OBSERVATIONS / NOTES:

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): S. Conti

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number:	12SD23 & 12SW2301	Date: 10/13/04	Time: 0900	Sampler: JG/SJC	
Photograph Number/Direction:	✓ 2°N Upstream	Downstream	East	West	North / South
Predominant Surrounding Land Use:	(Wooded)	Open Field	Other		
Canopy Cover:	Open	(Partly Open)	Shaded		
Dicharge Pipe Present:	Yes	(No)			
Aquatic Vegetation Present:	Yes	(No)	Stream channelized:	(Yes)	No
Water flowing:	(Yes)	No	Not present		
Organisms Present:	Fish (in) FISH 2 TO 3" FROG	Other (insects, frogs, etc.):	(.4, .7, .3) AVE DEPTHS		
Water Width (ft):	5'	Water Depth (ft): .7'	Estimated Flow/Velocity:		
Channel Width (ft):	9'	Channel Depth (ft): →	7' W TO 3.04' E	STEEP ON W FLAT ON E	
Signs of flooding (circle all that apply)	(Yes)	No	Water marks on trees	(Water-borne debris piles)	Other:
Deep Pools Present (>2 feet):	Yes	(No)	If yes (approximate size)		
Sediment Substrate:	(Bedrock)	(Boulder (>10 in))	(Cobble (2.5-10 in))	(Gravel) (0.10-2.5 in)	
(Circle all that apply)	(Sand)	Silt	Clay	Muck	
	(Debris)	Detritus	(Concrete)	Iron deposits	
Sediment Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils:	(Absent)	Slight	Moderate	Profuse	
Water Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils:	(None)	Droplets	Sheen		
Turbidity:	(Clear)	Slightly Turbid	Turbid	Opaque	

Other Comments/Observations: NEAR DRMO – METAL, PCS CONC. DEBRIS DS OF LOCATION 23. SEVERAL LG MILITARY SHELLS AT DRMO W/ ROX LABEL.

← STREAM 10' →

17 SEC, 22 SEC

18 SEC TO GO 10' – NOT ENOUGH ROOM FOR 20'.

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD240004
Sample Location: 12SW/SD24
Sampled By: SJC/JG
C.O.C. No.: 0106

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/11/04 Time: 1130 Method: DIS TROWEL Monitor Reading (ppm):	0-4"	BRN	SILTY SAND-TR GRAVEL MOIST

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

SJ Conti

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 12SD24 0004	**Date:** 10/11/04	**Time:** 1130	**Sampler:** JG/SJC	
Photograph Number/Direction: ✓ N 345 Upstream	Downstream	East	West	North / South
Predominant Surrounding Land Use: (Wooded)	Open Field	Other		
Canopy Cover: Open	(Partly Open)	Shaded		
Dicharge Pipe Present: Yes	(No)			
Aquatic Vegetation Present: Yes	(No)	**Stream channelized:** (Yes)	No	
Water flowing: Yes	(No)	(Not present)		
Organisms Present: Fish (in) —	Other (insects, frogs, etc.): —			
Water Width (ft): NA	**Water Depth (ft):** NA	**Estimated Flow/Velocity:** NA		
Channel Width (ft): 15'	**Channel Depth (ft):**	EAST 7' WEST 3' TO 4' ±		
Signs of flooding (circle all that apply) (Yes)	No	(Water marks on trees)	(Water-borne debris piles)	Other:
Deep Pools Present (>2 feet): Yes	(No)	If yes (approximate size)		
Sediment Substrate: Bedrock	(Boulder (>10 in))	(Cobble (2.5-10 in))	(Gravel (0.10-2.5 in))	
(Circle all that apply) (Sand)	(Silt)	Clay	Muck	
(Debris) METAL	Detritus	Concrete	Iron deposits	
Sediment Odors: (Normal)	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils: (Absent)	Slight	Moderate	Profuse	
Water Odors: Normal NA	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils: None NA	Droplets	Sheen		
Turbidity: Clear NA	Slightly Turbid	Turbid	Opaque	

Other Comments/Observations: PCS METAL, OLD BATTERY, MISC DEBRIS IN THIS CHANNEL

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD 250004
Sample Location: 12SW/SD 25
Sampled By: SJC/JG
C.O.C. No.: 0106

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/11/04 Time: 0950 Method: DIS TROWEL Monitor Reading (ppm):	0-4"	BRN	SILTY F/C SAND SATURATED

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

SJ Conti

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

2 of 2

Sample Number: 12SB250004	Date: 10/11/04	Time:	Sampler: SJC/JG	
Photograph Number/Direction: ~~Upstream~~ W SJC	✓ Downstream W	East	West	North / South
Predominant Surrounding Land Use: (Wooded)	Open Field	Other		
Canopy Cover: Open	(Partly Open)	Shaded		
Dicharge Pipe Present: (Yes)	No	DS ≈ 30' 6" Φ CORR PLASTIC FROM NEW CONSTRUCTION		
Aquatic Vegetation Present: Yes	(No)	Stream channelized: (Yes)	No	
Water flowing: Yes	(No)	Not present		
Organisms Present: Fish (in) FISH 2"	Other (insects, frogs, etc.): WATER BUGS			
Water Width (ft): 25→ ≈ 30'	Water Depth (ft): 2.5	Estimated Flow/Velocity: NOT FLOWING		
Channel Width (ft): 40'	Channel Depth (ft): →	SOUTH ≈ 6 TO 7'	NORTH 4' TO 6'	
Signs of flooding (circle all that apply) (Yes)	No	Water marks on trees	(Water-borne debris piles)	Other: EROSION OF BR OUTCROP 200' DS
Deep Pools Present (>2 feet): (Yes)	No	If yes (approximate size) ≈ 2.5'		
Sediment Substrate: (Bedrock)	Boulder (>10 in)	(Cobble (2.5-10 in))	(Gravel (0.10-2.5 in))	
(Circle all that apply) (Sand)	(Silt)	(Clay)	Muck	
(Debris)	Detritus	(Concrete) FROM OLD BRIDGE ?	Iron deposits	
Sediment Odors: (Normal)	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils: (Absent)	Slight	Moderate	Profuse	
Water Odors: (Normal)	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils: None	Droplets	(Sheen) LIGHT		
Turbidity: (Clear)	Slightly Turbid	Turbid	Opaque	

Other Comments/Observations: _____

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD260004
Sample Location: 12SW/SD26
Sampled By: SJC / JG
C.O.C. No.: 0106

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/11/04 Time: 1110 Method: DIS TROWEL Monitor Reading (ppm): —	0-4	BRN	SAND AND GRAVEL MOIST

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	~~Yes/No~~	
AVS/SEM	(1) 4oz Jar	~~Yes/No~~	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	~~Yes/No~~	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

S. Conti

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 12SD260004	**Date:** 10/11/04	**Time:** 1110	**Sampler:** JG/SJC	
Photograph Number/Direction: ✓ 130° SE Upstream	Downstream	East	West	North / South
Predominant Surrounding Land Use: (Wooded)	Open Field	Other		
Canopy Cover: Open	(Partly Open)	Shaded		
Dicharge Pipe Present: Yes	(No)			
Aquatic Vegetation Present: Yes	(No)	**Stream channelized:** (Yes)	No	
Water flowing: Yes	(No)	(Not present)		
Organisms Present: Fish (in) NA	Other (insects, frogs, etc.): NA			
Water Width (ft): NA	**Water Depth (ft):** NA	**Estimated Flow/Velocity:** NA		
Channel Width (ft): 4'	**Channel Depth (ft):** 4'			
Signs of flooding (circle all that apply) Yes	(No)	Water marks on trees	Water-borne debris piles	Other:
Deep Pools Present (>2 feet): Yes	(No)	If yes (approximate size)		
Sediment Substrate: Bedrock	Boulder (>10 in)	(Cobble (2.5-10 in))	(Gravel (0.10-2.5 in))	
(Circle all that apply) Sand	(Silt)	Clay	Muck	
Debris	Detritus	Concrete	Iron deposits	
Sediment Odors: (Normal)	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils: (Absent)	Slight	Moderate	Profuse	
Water Odors: Normal NA	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils: None NA	Droplets	Sheen		
Turbidity: Clear NA	Slightly Turbid	Turbid	Opaque	

Other Comments/Observations: _____

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD270004
Sample Location: 12SW/SD 27
Sampled By: SJC/JG
C.O.C. No.: D112

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/12/04 Time: 0930 Method: DISTROWELL Monitor Reading (ppm): —	0-4"	BRN	SILTY SAND - TR GRAVEL SATURATED

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury, CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

EJ Conti

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

2 of 2

Sample Number:	125D27E 125W2701	Date: 10/12/04	Time: 0920	Sampler: JG/SJC	
Photograph Number/Direction:	✓ Upstream 25° NE	Downstream	East	West	North / South
Predominant Surrounding Land Use:	(Wooded)	Open Field	Other		
Canopy Cover:	(Open)	Partly Open	Shaded		
Dicharge Pipe Present:	Yes	(No)			
Aquatic Vegetation Present:	Yes	(No)	Stream channelized:	(Yes)	No
Water flowing:	~~Yes~~	(No)	Not present	SLIGHT FLOW DS BUT NO FLOW AT SAMPLING POINT	
Organisms Present:	Fish (in) Fish 2"-3"	Other (insects, frogs, etc.): FROGS			
Water Width (ft): 12	Water Depth (ft): 1.5	Estimated Flow/Velocity:			
Channel Width (ft): 18'	Channel Depth (ft): →	W = 3' E = 5'			
Signs of flooding (circle all that apply)	(Yes)	No	Water marks on trees	(Water-borne debris piles)	Other:
Deep Pools Present (>2 feet):	~~Yes~~	(No)	If yes (approximate size)		
Sediment Substrate:	Bedrock	(Boulder (>10 in))	(Cobble (2.5-10 in))	(Gravel (0.10-2.5 in))	
(Circle all that apply)	(Sand)	(Silt)	(Clay)	Muck	
	(Debris) GLASS ETC	Detritus	Concrete	Iron deposits	
Sediment Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic
Sediment Oils:	(Absent)	Slight	Moderate	Profuse	
Water Odors:	(Normal)	Sewage	Petroleum	Chemical	Anaerobic
Water Surface Oils:	(None)	Droplets	Sheen		
Turbidity:	(Clear)	Slightly Turbid	Turbid	Opaque	

Other Comments/Observations: _____

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD 28 0009
Sample Location: 12SW/SD 28
Sampled By: T. Kojaku
C.O.C. No.: 0123

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10-14-04 Time: 1540 Method: Dig Trowel Monitor Reading (ppm):	0-4"	Brn	Sandy Silt Moist Leaf Mat Rock Frags

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 125028 0004 **Date:** 10/14/04 **Time:** 1540 **Sampler:** T. Rojahn

Photograph Number/Direction: X Upstream (NW) ____ Downstream ____ East ____ West ____ North ____ South

Predominant Surrounding Land Use: Wooded Open Field Other

Canopy Cover: Open Partly Open (Shaded)

Dicharge Pipe Present: Yes (No)

Aquatic Vegetation Present: Yes (No) **Stream channelized:** Yes No

Water flowing: Yes (No) Not present

Organisms Present: Fish (in) NO Other (insects, frogs, etc.): WORMS

Water Width (ft): NA **Water Depth (ft):** NA **Estimated Flow/Velocity:** —

Channel Width (ft): 7 **Channel Depth (ft):** 2

Signs of flooding (circle all that apply) Yes (No) Water marks on trees Water-borne debris piles Other:

Deep Pools Present (>2 feet): Yes (No) If yes (approximate size)

Sediment Substrate: Bedrock (Boulder (>10 in)) (Cobble (2.5-10 in)) (Gravel (0.10-2.5 in))
(Circle all that apply) (Sand) (Silt) Clay Muck
Debris Detritus Concrete Iron deposits

Sediment Odors: (Normal) Sewage Petroleum Chemical Anaerobic

Sediment Oils: (Absent) Slight Moderate Profuse

Water Odors: Normal NA Sewage Petroleum Chemical Anaerobic

Water Surface Oils: None NA Droplets Sheen

Turbidity: Clear NA Slightly Turbid Turbid Opaque

Other Comments/Observations: PHOTOS 1029 & 1030 (DARK PHOTOS)
DRY STREAM BED

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD 29 0004
Sample Location: 12SW/SD 29
Sampled By: T. Rosahn
C.O.C. No.: 0119

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10-13-04 Time: 0935 Method: Dis Trowel Monitor Reading (ppm): —	0-4"	BRN	Sandy Silt (Saturated) Roots & Gravel

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Terry Rosahn

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 125029	**Date:** 10/13/04	**Time:** 0935	**Sampler:** T. Rojahn			
Photograph Number/Direction: X Upstream	(19) Downstream	___ East	___ West	X North	___ South	
Predominant Surrounding Land Use: Wooded	(Open Field)	Other NEXT to RR tracks				
Canopy Cover: (Open)	Partly Open	Shaded				
Dicharge Pipe Present: Yes	(No)					
Aquatic Vegetation Present: Yes	(No)	**Stream channelized:** Yes	No NA			
Water flowing: Yes	(No)	Not present				
Organisms Present: Fish (in)	NA	Other (insects, frogs, etc.):				
Water Width (ft): NA	**Water Depth (ft):** NA	**Estimated Flow/Velocity:** NA				
Channel Width (ft): 2.5'	**Channel Depth (ft):** 1.5 in	RR side				
Signs of flooding (circle all that apply) Yes	(No)	Water marks on trees	Water-borne debris piles	Other:		
Deep Pools Present (>2 feet): Yes	(No)	If yes (approximate size)				
Sediment Substrate: Bedrock	Boulder (>10 in)	Cobble (2.5-10 in)	Gravel (0.10-2.5 in)			
(Circle all that apply) (Sand)	(Silt)	(Clay)	Muck			
Debris	Detritus	Concrete	Iron deposits			
Sediment Odors: (Normal)	Sewage	Petroleum	Chemical	Anaerobic		
Sediment Oils: (Absent)	Slight	Moderate	Profuse			
Water Odors: Normal NA	Sewage	Petroleum	Chemical	Anaerobic		
Water Surface Oils: None NA	Droplets	Sheen				
Turbidity: Clear NA	Slightly Turbid	Turbid	Opaque			

Other Comments/Observations: PHOTO # 1016 Diversion Ditch

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12SD30 0004
Sample Location: 12SW/SD 30
Sampled By: T.ROJAHN
C.O.C. No.: 0119

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

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 10/13/04 Time: 1000 Method: Dis trowel Monitor Reading (ppm): —	0-4"	BKN	SANDY SILT Tr. Clay some gravel Very moist worms, roots etc

COMPOSITE SAMPLE DATA:

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

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives & Miscellaneous Explosives SW-846 8330	(1) 4oz Jar	Yes	
Metals SW-846 6020 & Mercury SW-846 7471A	(1) 4oz Jar	Yes/No	
Metals, Mercury,CEC, pH, and TOC	(1) 4oz Jar	Yes/No	
AVS/SEM	(1) 4oz Jar	Yes/No	
Semivolatiles: SW-846 8270C, 8151A & SIM	(1) 4oz Jar	Yes/No	

OBSERVATIONS / NOTES:

SEE SUPPLEMENTAL SHEET

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
YES	12FD10130401

Signature(s):

SUPPLEMENTAL SURFACE WATER/SEDIMENT SAMPLE DOCUMENTATION SHEET
NSWC CRANE, INDIANA

Sample Number: 125030 **Date:** 10/13/04 **Time:** 1000 **Sampler:** T. Rojahn

Photograph Number/Direction: X NW Upstream ____ Downstream ____ East ____ West ____ North ____ South

Predominant Surrounding Land Use: Wooded Open Field Other Grassy Maintained

Canopy Cover: (Open) Partly Open Shaded

Dicharge Pipe Present: (Yes) No 1.5' Galvanized Pipe

Aquatic Vegetation Present: Yes (No) **Stream channelized:** Yes No

Water flowing: Yes (No) Not present

Organisms Present: Fish (in) NO Other (insects, frogs, etc.): Worms

Water Width (ft): NA **Water Depth (ft):** NA **Estimated Flow/Velocity:** NA

Channel Width (ft): 2' **Channel Depth (ft):** 2'

Signs of flooding (circle all that apply) Yes (No) Water marks on trees Water-borne debris piles Other:

Deep Pools Present (>2 feet): Yes (No) If yes (approximate size)

Sediment Substrate: Bedrock Boulder (>10 in) Cobble (2.5-10 in) (Gravel (0.10-2.5 in))

(Circle all that apply) (Sand) (Silt) (Clay) Muck

Debris Detritus Concrete Iron deposits

Sediment Odors: (Normal) Sewage Petroleum Chemical Anaerobic

Sediment Oils: (Absent) Slight Moderate Profuse

Water Odors: Normal NA Sewage Petroleum Chemical Anaerobic

Water Surface Oils: None NA Droplets Sheen

Turbidity: Clear NA Slightly Turbid Turbid Opaque

Other Comments/Observations: PHOTO #1017 ; Diversion Ditch

APPENDIX C.3.1

SWMU 12

SURFACE WATER SAMPLE LOG SHEETS ROUND 1

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 0101
Sample Location: 12SW/SD 01
Sampled By: T. ROJAHN
C.O.C. No.:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/12/04								
Time: 1445								
Depth: 1"	Cloudy	7.68	0.239	16.30	29	460	+43.8	—
Method: Direct (4-2 Jar)								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	2 X (2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT 0101 -F

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW —
Sample Location: 12SW/SD02
Sampled By: T. ROJAHN
C.O.C. No.: —

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/12/04								
Time: —								
Depth: —								
Method: —								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

MAP

NO SAMPLE - DRY

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 0201
Sample Location: 12SW/SD 02
Sampled By: T. Hosman
C.O.C. No.: 0127

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10-28-04 Time: 1490 Depth: 2" Method: Direct	Yellow tint	7.46	0.744	15.97	25.5	8.12	70.9	—

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 0201 -F
(T2)

Flow > 5 < 10 gpm

MAP

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ty Hosman

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Diversion Ditch
[] QA Sample Type:

Sample ID No.: 12SW —
Sample Location: 12SW/SD03
Sampled By: T. Rojahn
C.O.C. No.: —

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/12/04								
Time: —								
Depth: —								
Method: —								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

MAP:

NO SAMPLE - DRY

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: SEEP
[] QA Sample Type:

Sample ID No.: 12SW 0301
Sample Location: 12SW/SD 03
Sampled By: T. ROSAHN
C.O.C. No.: 0127

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10-28-04 Time: 1630 Depth: SURFACE Method: Direct	Clear	7.62	0.260	16.10	30.1	9.14	+56.2	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	4 x (2) L Glass Amber	Yes No
Semivolatiles: SIM	4°C	4 x (2) L Glass Amber	Yes No
Semivolatiles SW-846 8151A	4°C	4 x (2) L Glass Amber	Yes No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12G~~WT~~ SW 0301 -F

1/4" x 1' (6sec/ft)
0.02' x 1' x 0.16 = .0032 x 449 = 1.4gpm
Water coming from ground mounded area

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
YES	12FD10280401

SVOCS ONLY

Signature(s): Terry Rosahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 0401
Sample Location: 12SW/SD 04
Sampled By: T. Rolahn
C.O.C. No.: 0110

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10-12-04 Time: 1135 Depth: 3" MID Method: Direct	CLEAR	7.63	0.204	13.07	13	7.16	+46.5	—

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES

Filtered Sample Collected Yes[X] No[] 12GWT 0401 -F

Sample collected in a pool up stream of sed. location

MAP

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ty Lynk

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW –
Sample Location: 12SW/SD 05
Sampled By:
C.O.C. No.:

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/12/04								
Time: –								
Depth: –								
Method: –								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

MAP

NO SAMPLE - DRY

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
–	–

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 0501
Sample Location: 12SW/SD 05
Sampled By: T. Rosahn
C.O.C. No.: 0127

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10-28-04								
Time: 1508								
Depth: Surface	Yellow Tint	7.87	0.603	16.00	15.9	9.09	67.4	—
Method: Direct								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 0501 -F
TC
Flow 10 - 15 gpm

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW --
Sample Location: 12SW/SD 06
Sampled By: T. ROJAHN
C.O.C. No.: —

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/12/04								
Time: —								
Depth: —								
Method: —								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

MAP:

NO SAMPLE DAY

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ty Rojahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 0601
Sample Location: 12SW/SD 06
Sampled By: T. Ryan
C.O.C. No.: 0127

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10-28-04								
Time: 1355								
Depth: 2"	Sl cloudy	7.26	0.450	15.34	97.5	9.21	+ 89.4	—
Method: Direct								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 0601 -F
TR

Small Pool

~5gpm Flow

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Ty Ryan

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW —
Sample Location: 12SW/SD07
Sampled By: SJC/JG
C.O.C. No.: —

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/11/04 Time: 1445 Depth: 0-4" SJC Method: ~~DIS TROWEL~~ SJC	—	—	—	—	—	—	—	—

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	~~Yes~~
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	~~Yes~~
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

MAP:

NO SAMPLE DRY

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): SJ Conti

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW0701
Sample Location: 12SW/SD 07
Sampled By: T. ROJAHN
C.O.C. No.: 0129 & 0130

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 11/1/04								
Time: 1245								
Depth: SURFACE	Yellow Tint	8.50	0.031	16.54	88.7	11.55	38.2	—
Method: Direct								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12~~GWT~~SW 0701 (F2) -F

Rain EVENT collection
710 < 20 gpm
VERY Hard slope
LEAF COVERED

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW —
Sample Location: 12SW/SD08
Sampled By: SJC/JG
C.O.C. No.: —

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/11/04								
Time: 1410								
Depth: —	—	—	—	—	—	—	—	—
Method: —								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	~~Yes~~
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	~~Yes~~
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/ NOTES

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

MAP

NO SAMPLE - DRY

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

SJ Conte

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 0801
Sample Location: 12SW/SD 08
Sampled By: T. KOJANN
C.O.C. No.: 0126

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10-27-04 Time: 1440 Depth: SURFACE Method: DIRECT	CLEAR	7.62	0.240	15.21	30.9	9.78	+55.8	—

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 0801 -F

FLOW:
1/2" x 8" (2 sec/ft)
NARROW FLAT
0.04' x 0.67' x 0.5' x 449 = 6gpm

MAP

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW —
Sample Location: 12SW/SD09
Sampled By: SJC/JG
C.O.C. No.: —

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

Date: 10/11/04 Time: 1425	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Depth: — Method: —	—	—	—	—	—	—	—	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	~~Yes~~
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	~~Yes~~
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

MAP:

NO SAMPLE - DRY

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): SJConti

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 09 01
Sample Location: 12SW/SD 09
Sampled By: T. ROJAHN
C.O.C. No.: 0126

[■] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (^{0}C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10-27-04								
Time: 1455								
Depth: SURFACE								
Method: Direct	CLEAR	7.41	0.299	15.72	17.1	10.28	+67.7	—

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 09 01 -F

FLOW:

1½" x 2.5' (2sec/ft)

0.125 x 2.5 x 0.5 x 449 = 70 gpm

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW —
Sample Location: 12SW/SD 10
Sampled By: SJC/JG
C.O.C. No.: —

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/11/04								
Time: 1320								
Depth: —	—	—	—	—	—	—	—	—
Method: —								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	~~Yes~~
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	~~Yes~~
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[X] No[] ~~12GWT~~ F

MAP:

NO SAMPLE - DRY.

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): SJ Conti

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 1001
Sample Location: 12SW/SD 10
Sampled By: T. Rosahn
C.O.C. No.: 0126

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10-27-04 Time: 1400 Depth: SURFACE Method: DIRECT	CLEAR	7.55	0.261	15.63	7.27	10.58	+62.3	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 1001 -F

Flow

8' x 0.08' (2sec/ft)

8' x 0.08 x 0.5 x 449 = 144gpm

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ty Rogh

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW1101
Sample Location: 12SW/SD11
Sampled By: JG/SJC
C.O.C. No.: 0110

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/12/04								
Time: 1020								
Depth: 0-2"	LT BROWN CLOUDY	6.98	.427	12.13	82.6	1.19	169.6	—
Method: DIR FILL								

SAMPLE COLLECTION INFORMATION

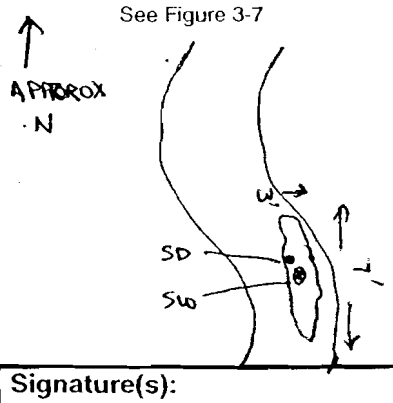
Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	4 ~~(2)~~ L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	~~(2)~~ L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	~~(2)~~ L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	~~(2)~~ L Glass Amber	Yes/No
		(7) TOTAL	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT_____-F
12SW1101-F

MAP:

See Figure 3-7



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): J. Conti

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW1201
Sample Location: 12SW/SD 12
Sampled By: SSC/JG
C.O.C. No.: 0120

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/13/04 Time: 1030 Depth: 0-2" Method: DIR FILL	CLEAR	7.54	.196	14.42	15	13.11	210.8	—

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	4 ~~(1)~~ L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	~~Yes~~/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

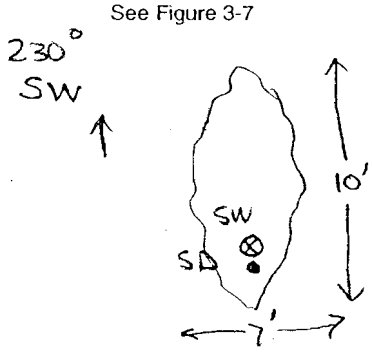
OBSERVATIONS / NOTES

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

12SW1201-F

MAP

See Figure 3-7



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW1301
Sample Location: 12SW/SD 13
Sampled By: SJC/JG
C.O.C. No.: 0120

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/13/04								
Time: 1425								
Depth: 0-1"	LT BRN	7.20	170	14.45	9.8	5.63	54.4	—
Method: DIR FILL								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	(Yes)
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	(Yes)
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	(Yes)
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	(Yes)
Semivolatiles SW-846 8270C	4°C	~~(2) L~~ Glass Amber	Yes/(No)
Semivolatiles: SIM	4°C	~~(2) L~~ Glass Amber	Yes/(No)
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/(No)

OBSERVATIONS/NOTES

Filtered Sample Collected Yes[X] No[]

~~12GWT~~ ~~F~~

12SW1301-F

MAP

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): S. Conti

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Diversion Ditch
[] QA Sample Type:

Sample ID No.: 12SW —
Sample Location: 12SW/SD 14
Sampled By: T. Rojahn
C.O.C. No.: —

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/13/04								
Time: —								
Depth: —								
Method: —								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

MAP

NO SAMPLE - DRY

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Diversion Ditches
[] QA Sample Type:

Sample ID No.: 12SW 1401
Sample Location: 12SW/SD 14
Sampled By: T. ROJAHN
C.O.C. No.: 0129

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 11/1/04 Time: 1055 Depth: Direct Method: SURFACE	Yellow tint - cloudy	7.69	0.860	15.07	137	10.26	+52.3	–

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 1401 -F

Collected @ intersection ~~D.D. of A~~ TS of three Drainage Ditchs From N, S, & W

Sample during Rain EVENT

MAP

See Figure 3-7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ty Rojahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: DIVERSION DITCH
[] QA Sample Type:

Sample ID No.: 12SW —
Sample Location: 12SW/SD 15
Sampled By: T. ROAHN
C.O.C. No.: —

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10-13-04								
Time: —								
Depth: —								
Method: —								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

MAP:

NO SAMPLE - DRY

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Roahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: Diversion Ditch
[] QA Sample Type:

Sample ID No.: 12SW 1501
Sample Location: 12SW/SD 15
Sampled By: T. Rojahn
C.O.C. No.: 0130

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 11/1/04 Time: 1320 Depth: Surface Method: Direct	Clear	8.04	0.155	16.99	49.0	10.93	+396	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 1501 -F

Rain Event collection
5-10 gpm

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW1601
Sample Location: 12SW/SD16
Sampled By: SJC/JG
C.O.C. No.: 0120

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type: REPLACE BATTERY

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/13/04								
Time: 1345								
Depth: 0-2"	CLEAR	BATTERY 7.36	286 DEAD	*	5.1	8.86	38.9	—
Method: DIRECT FILL								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	~~(2)~~ L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	~~(2)~~ L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	~~(2)~~ L Glass Amber	Yes/No
		(5) TOTAL	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] ~~12GWT~~ ~~F~~
12SW1601-F

* Meter Malfuntion

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s): SJ Conti

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW—
Sample Location: 12SW/SD 17
Sampled By: SJC/JG
C.O.C. No.: —

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/13/04								
Time: 1325								
Depth: —	—	—	—	—	—	—	—	—
Method: —								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	~~Yes~~
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	~~Yes~~
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

MAP:

NO SAMPLE – DRY

See Figure 3-7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

SJ Conti

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 1701
Sample Location: 12SW/SD 17
Sampled By: T. Rosahl
C.O.C. No.: 0128

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10-29-04 Time: 1420 Depth: Surface Method: Direct	Clear	7.44	0.334	17.69	5.41	5.59	52.4	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 1701 -F
Flow: over Rocks / boldars
75 < 10

1' wide 2-3" deep 10sec/ft.

0.2 × 1' × 0.1' × 449 = 9gpm

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: DIVERSION DITCH
[] QA Sample Type:

Sample ID No.: 12SW —
Sample Location: 12SW/SD 18
Sampled By: T. ROJAHN
C.O.C. No.: —

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/13/04								
Time: —								
Depth: —								
Method: —								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

MAP:

NO SAMPLE - DRY

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Diversion Ditch
[] QA Sample Type:

Sample ID No.: 12SW1801
Sample Location: 12SW/SD18
Sampled By: T. ROSAHN
C.O.C. No.: 0130

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

SAMPLING DATA

Date: 11/1/04 Time: 1335 Depth: SURFACE Method: Direct	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
	CLEAR	7.81	0.227	16.30	7.63	9.78	+42.9	—

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 1801 -F (TR)

RAIN EVENT 5-10 gal

MAP

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rosahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW—
Sample Location: 12SW/SD 19
Sampled By: SJC/JG
C.O.C. No.: —

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

Date: 10/12/04	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Time: 1400								
Depth: —								
Method: —	—	—	—	—	—	—	—	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	~~Yes~~
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	~~Yes~~
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] ~~12GWT~~ —E

NO SAMPLE – DRY

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): SJ Conte

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 1901
Sample Location: 12SW/SD 19
Sampled By: T. ROJAHN
C.O.C. No.: 0127

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10-29-04 Time: 1250 Depth: SURFACE Method: Direct	Clear	7.43	0.161	16.23	10.37	6.45	63.9	—

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 1901 -F
TR

PONDED
2" x 10" x 2'

MAP

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: DIVERSION DITCH
[] QA Sample Type:

Sample ID No.: 12SW —
Sample Location: 12SW/SD20
Sampled By: T. ROJAHN
C.O.C. No.: —

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/13/04								
Time: —								
Depth: —								
Method: —								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals,SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

MAP

NO SAMPLE - DRY

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Troy Rojahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 2001
Sample Location: 12SW/SD 20
Sampled By: T. ROSAHN
C.O.C. No.: 0129

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10-30-04 Time: 1030 Depth: SURFACE Method: Peristaltic	Clear	7.35	0.400	19.39	23.9	5.68	+63.0	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ see 2001 -F

Flow from 2 directions
>1<5

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
Yes	12FD1030040 1 E-F

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW—
Sample Location: 12SW/SD21
Sampled By: SJC/JG
C.O.C. No.: —

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/12/04								
Time: 1340								
Depth: —	—	—	—	—	—	—	—	—
Method: —								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	~~Yes~~
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	~~Yes~~
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

MAP

NO SAMPLE - DRY.

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): S. Conte

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 2101
Sample Location: 12SW/SD 21
Sampled By: T. LOJAHN
C.O.C. No.: 0128

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other: PONDED AREA
[] QA Sample Type:

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

SAMPLING DATA

Date: 10-29-04	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Time: 1340								
Depth: SURFACE	CLEAR	7.19	0.150	16.32	7.22	6.29	+60.0	—
Method: Direct								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES

Filtered Sample Collected Yes[X] No[]

12~~GWT~~ SW 2101 -F
(TR)

PONDED

3½" x 2' x 4'

MAP

See Figure 3-7

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW —
Sample Location: 12SW/SD 22
Sampled By: SJC / JG
C.O.C. No.:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/12/04								
Time: 1325								
Depth: —	—	—	—	—	—	—	—	—
Method: —								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	~~Yes~~
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	~~Yes~~
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] ~~12GWT~~ ~~F~~

MAP:

NO SAMPLE - DRY

See Figure 3-7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

S. Conti

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 2201
Sample Location: 12SW/SD 22
Sampled By: T. ROJAHN
C.O.C. No.: 0127

[X] Stream / Seep
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10-29-04								
Time: 1320								
Depth: SURFACE	CLEAR	7.37	0.204	16.38	3.05	4.75	59.8	—
Method: Direct								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 2201 -F
(FA)

Flow < 1 gal

MAP

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 2301
Sample Location: 12SW/SD 23
Sampled By: SJC/JG
C.O.C. No.: 0120

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/13/04								
Time: 0900								
Depth: 0-3"	CLEAR	6.81	.331	13.93	4.6	11.17	264.6	—
Method: DIRECT FILL								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	4 ~~(2)~~ L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	~~Yes/No~~
Semivolatiles: SIM	4°C	(2) L Glass Amber	~~Yes/No~~
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	~~Yes/No~~
		7 TOTAL	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] ~~12GWT~~ ~~F~~

12SW2301-F

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): SJ Conti

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW —
Sample Location: 12SW/SD24
Sampled By: SJC/JG
C.O.C. No.:

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/11/04								
Time: 1130								
Depth: —	—	—	—	—	—	—	—	—
Method: —								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	~~Yes~~
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	~~Yes~~
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	~~Yes/No~~
Semivolatiles: SIM	4°C	(2) L Glass Amber	~~Yes/No~~
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	~~Yes/No~~

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT ~~F~~

MAP

NO SAMPLE - DRY

See Figure 3-7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): SJConti

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 2401
Sample Location: 12SW/SD 24
Sampled By: T. KUSAHN
C.O.C. No.: 0126

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10-27-04 Time: 1306 Depth: 2" Method: Direct	CLEAR	7.55	0.276	15.66	18.3	11.74	61.8	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 2401 -F (TE)

Flow
2½" x 3' (1sec/ft)
0.2 x 3' x 1 x 449 = 269 gpm

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Kusahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW2501
Sample Location: 12SW/SD25
Sampled By: SJC/JG
C.O.C. No.: 0107

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/11/04								
Time: 0920								
Depth:								
Method: DIRECT FILL	CLEAR	6.92	282	12.58	2.4	8.89	260.5	—

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(8) × (2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(4) (1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(4) ~~(1) L HDPE~~	~~Yes~~ YES
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(4) (1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	~~(2) L~~ Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	~~(2) L~~ Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[X] No[] ~~12GWI~~ ~~F~~
12SW2501-F

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD

Duplicate ID No.: 12FD10110401

Signature(s): S. Conti

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW —
Sample Location: 12SW/SD 26
Sampled By: SJC/JG
C.O.C. No.: —

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/11/04								
Time: 1110								
Depth: —								
Method: —	—	—	—	—	—	—	—	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] ~~12GWT~~ — F

MAP:

NO SAMPLE – DRY

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): SJ Conti

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 2601
Sample Location: 12SW/SD 26
Sampled By: T. ROJAHN
C.O.C. No.: 0126

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10-27-04 Time: 1230 Depth: SURFACE Method: Direct	CLEAR	7.54	0.195	15.26	23.9	11.38	+65.4	—

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 2601 -F
TR

Flow
2" x 2' (2 sec/ft)
0.17' x 2' x 0.5' x 449 = 76 gpm

MAP

See Figure 3-7

Circle if Applicable:

MS/MSD ✓ | Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 2701
Sample Location: 12SW/SD 27
Sampled By: JG SJC
C.O.C. No.: 0110

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/12/04 Time: 0920 Depth: 0-2" Method: DIR Fill	CLEAR	6.81	267	13.55	3.34	7.44	266.2	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(4) (2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	~~(2)~~ L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	~~(2)~~ L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	~~(2)~~ L Glass Amber	Yes/No
		(7) TOTAL	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT_____-F
12SW27-F

MAP:

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): S. Conti

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW2801
Sample Location: 12SW/SD28
Sampled By: T. Kovanh
C.O.C. No.: 0129

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA

Date: 10-30-04	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Time: 0940								
Depth: M10	CLEAR	7.25	0.235	16.55	3.84	6.36	119.4	—
Method: Direct								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES

Filtered Sample Collected Yes[X] No[] 12G~~WT~~ SW 2801 -F

Collected From A Pool 3-8" DEEP
3' Wide
5' Long

Flow From Pool 7 L 5 gpm

MAP

See Figure 3-7

Circle if Applicable:

MS/MSD Duplicate ID No.:

Signature(s):

Ty Logal

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: Diversion Ditch
[] QA Sample Type:

Sample ID No.: 12SW—
Sample Location: 12SW/SD 29
Sampled By: T. ROJAHN
C.O.C. No.: —

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/13/04								
Time: —								
Depth: —								
Method: —								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

MAP

NO SAMPLE - DRY

See Figure 3-7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Next to RA Drainage Ditch
[] QA Sample Type:

Sample ID No.: 12SW 2901
Sample Location: 12SW/SD 29
Sampled By: T. Rojahn
C.O.C. No.: 0129

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 11/1/04 (TR)								
Time: 1015								
Depth: M/D								
Method: Direct	Clear	7.65	0.201	14.88	29.8	11.59	+51.9	—

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 2901 -F (TR)

Drainage Ditch
Next to Tracks
>1 <25 ppm
Sampled in a pool
~3" deep x 6" x 1.5'
Sample collected
during Rain Event

MAP

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: Drainage Ditch
[] QA Sample Type:

Sample ID No.: 12SW 3001
Sample Location: 12SW/SD 30
Sampled By: T. ROJALIN
C.O.C. No.: 0129

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 11/01/04								
Time: 0955								
Depth: SURFACE	Sl. cloudy	7.54	0.372	16.05	121	11.02	+50.2	–
Method: Direct								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES

Filtered Sample Collected Yes[X] No[] 12~~GWT~~ SW 3001 -F
(12)

Ponded @ culvert
1/2" x 8" x 1'
0.04' x 0.67 x 1 x 449 = 12gpm
Sample collected during Rain Event

MAP

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): T. Rojalin

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: DIVERSION Ditch
[] QA Sample Type:

Sample ID No.: 12SW —
Sample Location: 12SW/SD 30
Sampled By: T. ROJAHN
C.O.C. No.: —

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

SAMPLING DATA

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	ORP (mV)	Other NA
Date: 10/13/04								
Time: —								
Depth: —								
Method: —								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 & Misc. Explosives	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (asN) EPA 353.2 & Ammonia (asN) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Semivolatiles SW-846 8270C	4°C	(2) L Glass Amber	Yes/No
Semivolatiles: SIM	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846 8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES

Filtered Sample Collected Yes[X] No[] 12GWT_____-F

MAP

NO SAMPLE - DRY

See Figure 3-7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rojahn

APPENDIX C.3.2

SWMU 12

SURFACE WATER SAMPLE LOG SHEETS ROUND 2

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Culvert / Diversion ditch
[] QA Sample Type:

Sample ID No.: 12SW 01 02
Sample Location: 12SW/SD 02
Sampled By: JG / TK
C.O.C. No.: 3711

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3-7-05 Time: 1000 Depth: SURFACE Method: DIRECT	Cloudy	7.28	0.156	17.37	150	1257	92.6	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 ~~(2)~~ L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 ~~(2)~~ L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	1 ~~(1)~~ L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 ~~(1)~~ L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[ ] No[ ] 12SW 01 02 -F

Receives hot water from steam house

~~B~~ (Tr)

Flow - 3-5 gpm

MAP:

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s): Troy Rogal

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 0202
Sample Location: 12SW/SD 02
Sampled By: JG / TR
C.O.C. No.: 3709 & 3710

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

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3-6-05								
Time: 1445								
Depth: SURFACE	sl. cloudy	7.03	0.230	8.12	120	3.08	+112	
Method: DIRECT								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	1 (1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

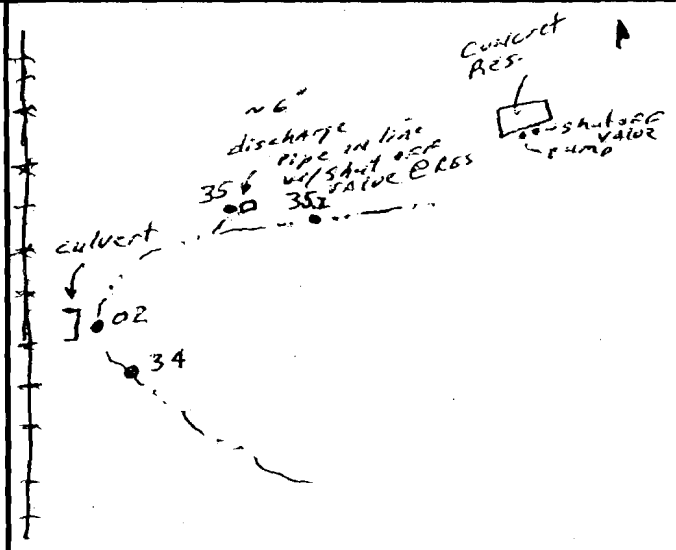
OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 0202 -F

PHOTO # 1156
FACING downstream

Flow 1-3gpm

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	12FD 03060502

Signature(s): Terry Rozal

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Culvert / drainage diversion ditch
[] QA Sample Type:

Sample ID No.: 12SW 0302
Sample Location: 12SW/SD 03
Sampled By: Goodlett / Rojas
C.O.C. No.: 3711

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

SAMPLING DATA:

Date: 3-7-05	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 0810								
Depth: Surface	Clear	7.33	.144	6.41	14.3	11.79	123.6	
Method: Peristaltic								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	MS/MSD	Container Requirements	DUP	Collected
Explosives SW-846 8330	4°C ✓	3	(2) L Glass Amber	~~2~~	Yes/No
Miscellaneous Explosives	4°C ✓	3	(2) L Glass Amber	~~2~~	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3 ✓	3	(1) L HDPE		Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3 ✓	3	(1) L HDPE		Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4 ✓		(1) L HDPE		Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4 ✓	3	(1) L HDPE		Yes/No
Semivolatiles SW-846-8270C	4°C ✓	3	(2) L Glass Amber	2	Yes/No
Selected Ion Monitoring	4°C ✓	3	(2) L Glass Amber	1	Yes/No
Semivolatiles SW-846-8151A	4°C	3	(2) L Glass Amber	1	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 0302 -F

Ponded - no flow

See Rd 1 photo

SVOCs & Selected Ion

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
Yes	12FD0307051

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 04 02
Sample Location: 12SW/SD
Sampled By: JG/TL
C.O.C. No.: 3709

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3-6-05 Time: 1350 Depth: SURFACE Method: DIRECT	Clear	7.48	0.126	8.95	6.8	4.21	116	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	1 (1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 0402 -F

PHOTO # 1151

Flow 5-10 gpm

MAP:

Steam House up grade

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Tej Rajpal

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 0502
Sample Location: 12SW/SD 05
Sampled By: JG/TK
C.O.C. No.: 3708 & 3709

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/6/05								
Time: 1340								
Depth: SURFACE								
Method: DIRECT	Clear	7.07	0.185	7.43	7.2	3.78	+131	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	FD	Rout	Container Requirements	Collected
Explosives SW-846 8330	4°C	1	1	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1	1	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	1	1	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	1	1	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	1	1	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1	1	(1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C			(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C			(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C			(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 0502 -F

PHOTO #1150

Flow 3-5 gpm

MAP:

Circle if Applicable:

MS/MSD —

Duplicate ID No.: 12FD030605 01

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 0602
Sample Location: 12SW/SD 06
Sampled By: JG/TK
C.O.C. No.: 3708

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/6/05 Time: 1005 Depth: SURFACE Method: DIRECT	CLEAR	6.76	0.145	4.09	8.4	3.58	+179	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 0602 -F

PHOTO # 1147

Flow: <1 gpm

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rogers

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW ~~07~~ NA (TA)
Sample Location: 12SW/SD 07
Sampled By: NA
C.O.C. No.: —

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

SAMPLING DATA:

Date: 3-6-05	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: NA	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Depth: ↓								
Method: ↓								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	(1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[ ] No[ ] 12SW NA -F

DRY stream bed
@ 0955 3/6/05

MAP:

NO SAMPLE

Circle if Applicable:

MS/MSD —
Duplicate ID No.: —

Signature(s): Ty Lopez

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 0802
Sample Location: 12SW/SD 08
Sampled By: JG / TK
C.O.C. No.: 3708

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/6/05 Time: 0918 Depth: SURFACE Method: DIRECT	CLEAR	6.41	0.113	3.35	4.1	5.87	194	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 2 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[✓] No[ ] 12SW 0802 -F

PHOTO 1145

Flow 1-3 gpm

MAP:

Circle if Applicable:

MS/MSD Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 0902
Sample Location: 12SW/SD 09
Sampled By: JG/TR
C.O.C. No.: 3708

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

Date: 3-6-05	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 0925								
Depth: surface	Clear	6.59	0.095	2.85	2.7	4.64	+189	—
Method: Direct								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[ ] No[ ] 12SW 0902 -F

PHOTO # 1146

2 SEC/FT

FLOW: 0.15' X 3' X 0.5 X 449 = 101 gpm

Depths
0
3.5"
3.5"
2"
0
} 1.8" or 0.15'

MAP:

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Tey Kopale

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 1002
Sample Location: 12SW/SD 10
Sampled By: JG / TK
C.O.C. No.: 3707 & 3708

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/6/05 Time: 0830 Depth: SURFACE Method: DIRECT	CLEAR	6.13	.143	3.07	2.7	4.99	+ 226	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	3 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	3 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	3 (1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	3 (1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	3 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 1002 -F

PHOTO 1144

FLOW:

0.02 x 9' x 1 x 449 = 81 gpm

1 sec/ft

MAP:

Circle if Applicable:

MS/MSD: YES

Duplicate ID No.: —

Signature(s): [signature]

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 1102
Sample Location: 12SW/SD 11
Sampled By: JG / TR
C.O.C. No.: 3707

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/5/5 Time: 0907 Depth: SURFACE Method: DIRECT	CLEAR	6.63	0.107	4.89	5.56	2.45	76	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	~~(1)~~ L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 { ~~(1)~~ L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 1102 -F

PHOTO ~~1129~~ 1130

Flow:
0.2' x 2' x 0.5 x 449 = 90gpm

2 SEC / Ft

0
.1"
.45"
.45"
0
} 0.2

MAP:

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Terry Kozel

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 1202
Sample Location: 12SW/SD 12
Sampled By: JG/TK
C.O.C. No.: 3707

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/5/05 Time: 1435 Depth: SURFACE Method: Direct	Clear	7.39	0.121	6.75	6.4	2.75	+79	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 ~~(2)~~ L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 ~~(2)~~ L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	1 L ~~(1)~~ L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	~~(1)~~ L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 1202 -F

PHOTO # 1140

FLOW: 5-10 gpm

MAP:

DEEP POOL
Collection pt.
Iron Depot on Rocks
Slight SHEEN
15' From ~2' GALVANIZED
Discharge Pipe

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 1302
Sample Location: 12SW/SD 13
Sampled By: JG / TK
C.O.C. No.: 3707

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/5/05 Time: 1415 Depth: SURFACE Method: DIRECT	CLEAR	7.53	0.111	6.23	6.2	2.54	+118	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	(1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 1302 -F

PHOTO # 1139

FLOW: 2 SEC/FT
0.06 x 2' x 0.5 x 449 = 27 gpm

0
1"
1.5"
1"
0
} 0.7" or 0.06'

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s): T. Agnel

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Diversion Ditch Culvert
[] QA Sample Type:

Sample ID No.: 12SW1402
Sample Location: 12SW/SD14
Sampled By: T. Reilah
C.O.C. No.: 3711

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/07/05								
Time: 0805								
Depth: SURFACE	V.SL. cloudy	5.99	0.301	8.60	59	4.33	241	—
Method: DIRECT								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 1402 -F

PONDED
NO FLOW

SEE ROUND 1
PHOTO

MAP:

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ty Reilah

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Culvert / Diversion Ditch
[] QA Sample Type:

Sample ID No.: 12SW ~~15~~ 72 —
Sample Location: 12SW/SD 15
Sampled By: T. Rojahn
C.O.C. No.: —

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

SAMPLING DATA:

Date: / Time:	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Depth: / Method:								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	(1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[ ] No[X] 12SW —-F

MAP:

No SAMPLES
@ this Location
Location DRY
@ 0830 Hrs
3-07-05

Circle if Applicable:

MS/MSD —
Duplicate ID No.: —

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 1602
Sample Location: 12SW/SD 16
Sampled By: JG / TR
C.O.C. No.: 3706

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/5/05 Time: 1333 Depth: SURFACE Method: DIRECT	CLEAR	7.73	0.204	6.52	3.5	2.09	+100	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	1 (1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 1602 -F

PHOTO # 1135

1 sec/ft

0.18 x 6' x 1 x 449 = 485 gpm

0
3"
5"
3"
0
} 2.2" or 0.18'

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
✓	—

Signature(s): Ty Rogers

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 1702
Sample Location: 12SW/SD 17
Sampled By: JG/TK
C.O.C. No.: 3707

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/5/05 Time: 1344 Depth: SURFACE Method: Direct	Clear	8.00	0.099	5.69	6.9	2.76	+89	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 ~~(2)~~ L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 ~~(2)~~ L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	~~(1)~~ L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 ~~(1)~~ L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 1702 -F

PHOTO #
1136 - 1138
↳ 6' PIPE

FLOW 1-3 gpm

MAP:

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Tey Agnel

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Culvert / Diversion Ditch
[] QA Sample Type:

Sample ID No.: 12SW 1802
Sample Location: 12SW/SD 18
Sampled By: TROJAHN
C.O.C. No.: 3711

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/07/05 Time: 0835 Depth: SURFACE Method: DIRECT	S1 Cloudy	6.69	0.253	7.49	71	5.64		+186

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[ ] No[ ] 12SW 1802 -F

PONDED NO FLOW
SEE ROUND 1 PHOTO

MAP:

Circle if Applicable:

MS/MSD —
Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW (DRY)
Sample Location: 12SW/SD 19
Sampled By: JG / TR
C.O.C. No.: —

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3-5-05								
Time: NA								
Depth:	NA							
Method:								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	(1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[ ] No[X] 12SW—-F

ROUND 2

DRY STREAM!

@ 1255 3/5/05

MAP:

NO SAMPLE

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s): Terry Rogers

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Culvert / Drainage Ditch
[] QA Sample Type:

Sample ID No.: 12SW 20 02
Sample Location: 12SW/SD 20
Sampled By: T. ROSAHN
C.O.C. No.: 3711

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/7/05								
Time: 0855								
Depth: SURFACE	SL Cloudy	7.20	0.233	8.09	77	10.60	166	—
Method: Direct								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	1 (1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 20 02 -F

Flow 1.2 gpm

See Round 1 PHOTO

MAP:

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW DRY
Sample Location: 12SW/SD 21
Sampled By: JG / TR
C.O.C. No.: —

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

SAMPLING DATA:

Date: 3-5-05	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: NA								
Depth: ↓	NA							→
Method: ↓								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	(1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[ ] No[X] 12SW — -F

DRY STREAM!
@ 1245 3/5/05

MAP:

NO SAMPLE

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

[signature]

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW (DRY)
Sample Location: 12SW/SD 22
Sampled By: JG / TR
C.O.C. No.: —

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3-5-05								
Time: NA								
Depth:	NA							
Method:								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	(1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[ ] No[x] 12SW — -F

ROUND 2

DRY STREAM!

@ 1250 3-5-05

MAP:

DRY

NO SAMPLES

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Terry Regal

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 2302
Sample Location: 12SW/SD 23
Sampled By: JG/TK
C.O.C. No.: 3706

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/5/05 Time: 1225 Depth: SURFACE Method: Direct	CLEAR	7.36	0.154	6.10	3.5	2.92	+113	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 2302 -F

PHOTO # 1134

FLOW:

0.2' x 4' x 0.5 x 449 = 180 gpm
2 sec/ft

0
3"
6"
9"
0
} 2.4" or 0.2'

MAP:

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Terry Bryant

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW2402
Sample Location: 12SW/SD24
Sampled By: JG/TR
C.O.C. No.: 3706

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/5/05 Time: 1020 Depth: SURFACE Method: DIRECT	CLEAR	7.10	0.140	5.59	3.10	2.79	+126	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 ~~(2)~~ L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 ~~(2)~~ L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	~~(1)~~ L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 { ~~(1)~~ L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 2402 -F

PHOTO. 1133

Depths { 0, .33', .50', .33', 0 } 0.23

TR ~~1sec~~ 1SEC/FT

0.23 X 2.75' X 1 X 449 = 286gpm

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Tey Rogal

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 2502
Sample Location: 12SW/SD 25
Sampled By: JG / TK
C.O.C. No.: 3706

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/5/05 Time: 0958 Depth: SURFACE Method: DIRECT	CLEAR	7.13	0.078	5.25	3.76	2.97	+116	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 2502 -F

PHOTO # 1132 (BRIDGE)

FLOW

1.5 x 24' x 0.33 x 449 = 5,334 gpm

3 sec / ft

depth
0
2.5'
2.5' x } 1.5'
2.5'
0

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 2602
Sample Location: 12SW/SD 26
Sampled By: JG / TK
C.O.C. No.: 3706

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/5/05 Time: 0945 Depth: SURFACE Method: DIRECT	Clear	6.87	0.127	4.71	8.06	2.87	+118	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 2602 -F

PHOTO 1131

FLOW 0.02' x 0.75' x 0.5 x 449 = 3.4 gpm
2 SEC/ft

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 2702
Sample Location: 12SW/SD 27
Sampled By: JG / TR
C.O.C. No.: 3706

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3-5-05								
Time: 0850								
Depth: SURFACE								
Method: DIRECT	CLEAR	6.76	0.092	5.21	9.15	1.95	113	–

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	(1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 2702 -F

PHOTO # 1128

0.5' x 17' x 1 x 449 = 3817 gpm

1 SEC / FT

MAP:

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Tey Rogal

2 x 4"
2 x 6"
2 x 10"
40

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 2802
Sample Location: 12SW/SD 28
Sampled By: Goerdt/Rojahn
C.O.C. No.: 3708

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3-6-05								
Time: 1045								
Depth: Surface								
Method: Direct	Clear	6.8 ~~5.55~~	0.95	5.55	4.2	3.91	174.7	

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	1 (1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 2802 -F

1.5 gpm

photo # 1148

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Diversion Ditch
[] QA Sample Type:

Sample ID No.: 12SW —
Sample Location: 12SW/SD 29
Sampled By: T. ROJAHN
C.O.C. No.: —

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

SAMPLING DATA:

Date: / Time: / Depth: / Method:	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	(1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[ ] No[X] 12SW — -F

MAP:

Dry Location
No Sample
@ 0920 Hrs
3/07/05

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[X] Other: Culvert / Diversion Ditch
[] QA Sample Type:

Sample ID No.: 12SW —
Sample Location: 12SW/SD 30
Sampled By: T. ROJAHN
C.O.C. No.: —

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date:								
Time:								
Depth:								
Method:								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	(1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[ ] No[X] 12SW — -F

MAP:

DRY location
No Sample
0800 Hrs
3-07-05

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): T. Rojahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 31021 (TX)
Sample Location: 12SW/SD 31
Sampled By: JG / TX
C.O.C. No.: 3707

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/5/05 Time: 1450 Depth: SURFACE Method: Direct	Clear	7.46	0.081	7.35	40	3.55	98	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 3101 -F

PHOTO 1141

Flow 1-5 gpm

MAP:

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): [signature]

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 3201
Sample Location: 12SW/SD 32
Sampled By: JG/TR
C.O.C. No.: 3707

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/3/05 Time: 1500 Depth: SURFACE Method: Direct	Clear	6.94	0.143	6.81	10	3.75	49	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 3201 -F

PHOTO # 1142

Flow 3-5 gpm

MAP:

CRAYFISH & NEWT

IRON DEPOT ON ROCKS

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Tony Royal

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

Sample ID No.: 12SW 3301
Sample Location: 12SW/SD 33
Sampled By: JG / TM
C.O.C. No.: 3708

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/6/05 Time: 1110 Depth: SURFACE Method: Direct	Clear	6.68	0.119	5.28	5.9	3.88	+99	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 3301 -F

FLOW - 5-10 gpm

PHOTO # 1149

MAP:

Good size Pool & confluence 10'x15'

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Tony Rizzo

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

Sample ID No.: 12SW 3401
Sample Location: 12SW/SD 34
Sampled By: JG/TK
C.O.C. No.: 3709

[X] Stream
[] Spring
[] Pond
[] Lake
[] Other:
[] QA Sample Type:

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3-6-05 Time: 1500 Depth: SURFACE Method: DIRECT	SL Cloudy	7.18	0.404	10.04	130	3.52	+141	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[✓] No[ ] 12SW 3401 -F

PHOTO # 1157

~~3-5 gpm~~ TK

Flow ~ 1 gpm

MAP:

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Terry Rogers

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[X] ~~Stream~~ TR
[] Spring
[] Pond
[] Lake
[X] Other: Culvert Pipe
[] QA Sample Type:

Sample ID No.: 12SW 3501
Sample Location: 12SW/SD 35
Sampled By: JG / TR
C.O.C. No.: 3709

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

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3/6/05 Time: 1510 Depth: SURFACE Method: DIRECT	BRN	7.39	0.218	9.10	>1000	3.32	+107	—

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	1 (1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	(1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 3501 -F

PHOTO #s - 1158 & 1159
Corresponding photos -
1152 - 1155 & 1161

Flow = trapped in pipe (~6" DIA)

MAP:

Down Grade of RES in line w/ valve (shut off)

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Diversion Ditch
[] QA Sample Type:

Sample ID No.: 12SW 3601
Sample Location: 12SW/SD 36
Sampled By: JG/TM
C.O.C. No.: 3709

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

SAMPLING DATA:

Date: 3/6/05	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1515								
Depth: Surface	Clear	7.45	0.125	9.80	14	5.33	+110	—
Method: Direct								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Ammonia (as N) EPA 350.1	4°C/H2SO4	1 (1) L HDPE	Yes/No
Semivolatiles SW-846-8270C	4°C	(2) L Glass Amber	Yes/No
Selected Ion Monitoring	4°C	(2) L Glass Amber	Yes/No
Semivolatiles SW-846-8151A	4°C	(2) L Glass Amber	Yes/No

OBSERVATIONS/NOTES:

Filtered Sample Collected Yes[X] No[ ] 12SW 3601 -F

PHOTO 1160 & 1161 w/SW35 on left side

Flow 1-2 gpm

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ty Kopale

APPENDIX C.4.1

SWMU 12

GROUND WATER SAMPLE LOG SHEETS ROUND 1

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 0101
Sample Location: 12MWT 01
Sampled By: T. ROJAHN
C.O.C. No.: 0092
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9/11/04								
Time: 1518								
Method: SAME	CLEAR	5.34	1.394	17.95	3.76	0.93	+ 1000	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9/11/04								
Method: Peristaltic								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 37.80								
Static Water Level (WL): 10.02								
One Casing Volume(gal/L): 17.1								
Start Purge (hrs): 1250								
End Purge (hrs): 1515								
Total Purge Time (min): 145								
Total Vol. Purged (gal/L): 17.1								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	No
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

Pump intake @ 32.8

27.78' x 0.163 = 4.5 gal or 17.1 L

Circle if Applicable:

MS/MSD —

Duplicate ID No.: FD09110401

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT01
DATE: 9/11/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1250	10.02	0	–	–	–	–	–	–	–	Start Purge
1300	10.06	1200	120	5.42	1.476	159	2.74	20.10	+58	V. Sl Cloudy
1310	10.06	2100	90	5.12	1.457	41.1	1.79	19.95	78	CLEAR
1320	10.06	3300	120	4.76	1.454	35.6	1.56	19.98	87	CLEAR
1330	10.06	4500	120	4.54	1.438	22.5	1.43	20.04	95	CLEAR
1340	10.06	5700	120	4.48	1.424	12.1	1.30	20.22	102	CLEAR
1350	10.06	6900	120	4.77	1.424	8.12	1.34	20.10	115	CLEAR
1400	10.06	8100	120	4.74	1.415	7.07	1.29	19.66	120	CLEAR
1410	10.06	9300	120	4.71	1.410	6.19	1.25	19.36	123	CLEAR
1420	10.06	10500	120	4.72	1.415	4.97	1.20	19.27	125	CLEAR
1430	10.06	11700	120	4.93	1.409	4.00	1.16	19.03	117	CLEAR
1440	10.06	12900	120	5.06	1.413	3.67	1.12	18.83	112	CLEAR
1450	10.06	14100	120	5.22	1.403	5.75	1.10	18.44	104	CLEAR
1500	10.06	15300	120	5.31	1.403	4.34	1.00	18.25	101	CLEAR
1510	10.06	16500	120	5.33	1.399	4.12	1.01	18.11	100	CLEAR
1515	10.06	17100	120	5.34	1.394	3.76	0.99	17.95	100	CLEAR
1518	—	—	—	—	—	—	—	—	—	SAMPLE TIME

Water Quality Meter (SN) 0160134 AB
Control Box type (SN) 419
Turbidity Meter (SN) 4650-4300

Pump Intake 32.8

SIGNATURE(S): [illegible]

PAGE 2 OF 2

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: TERRY ROJAHN
Field Analyst: T. ROJAHN
Field Form Checked as per QA/QC Checklist (initials): TRR

Sample ID No.: 12GWT 0101
Sample Location: 12MWT 01
Duplicate: ☒
Blank: ☐

SAMPLING DATA:

Date: 9/11/04	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Time: 1518	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	CLEAR	5.34	1.394	17.95	3.76	0.99	—	+100

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI MDS 650

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 0.02/0.02 ppm

Range Used:	Range	Method	Concentration ppm
☑	0 to 1 ppm	K-7510	0.02/0.02
☐	1 to 12 ppm	K-7512	

Analysis Time: 1520/1522

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: <10/<10 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	Pink
☑	50 to 500 ppm	K-9815	Pink
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1534/1539

Filtered: ☐

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 275/290 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-1910	
☑	100 to 1000 ppm	K-1920	275/290
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1549/1553

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-8 __ Range: 0 - 3.00 mg/L
Program/Module: 500nm 33

Concentration: >3.3/>3.3 ppm

Analysis Time: 1611/1615

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0/0.0 ppm

Analysis Time: 1608/1610

Notes:

No wells have had H_2S. didn't run dup.

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 0101
Project No.:	N6878	Sample Location:	12MWT 01
Sampled By:	T. ROJAHN	Duplicate:	☐
Field Analyst:	T. ROJAHN	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-8 90 Range: 0 - 0.70 mg/L Concentration: 0.01 / 0.02 ppm

Program/Module: 610nm 93 Analysis Time: 1624 / 1635 Filtered: ☐

Notes:

Nitrite (NO_2^--N):

Concentration: 0.004 / 0.002 ppm

Equipment: DR-850 DR-8 90 Range: 0 - 0.350 mg/L Analysis Time: 1544 / 1601 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}):

Concentration: 18.8 / 17.8 ppm

Equipment: DR-850 DR-8 90 Range: 0 - 20.0 mg/L Analysis Time: 1643 / 1648 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT0201
Sample Location: 12MWT 02
Sampled By: T. ROJAHN
C.O.C. No.: 0092
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9/12/04								
Time: 1035								
Method: PERISTALTIC	CLEAR	3.78	0.288	17.95	0.99	0.84	+151	---

PURGE DATA:

Date: 9/12/04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: PERISTALTIC								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 30.87								
Static Water Level (WL): 8.83								
One Casing Volume(gal/L) 13.6								
Start Purge (hrs): 0808								
End Purge (hrs): 1033								
Total Purge Time (min): 145								
Total Vol. Purged (gal/L) 16								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	3X (2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	3X (2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	3X (1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	No
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	3X (1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	3X (2) 40ml Vials	YES

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

Pump intake @ 25.9'

22.04' x 0.163 = 3.6 gal or 13.6 L

Circle if Applicable:

MS/MSD YES

Duplicate ID No.: —

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT02
DATE: 9/12/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0808	8.83	0	-	-	-	-	-	-	-	START PURGE
0818	8.91	1400	140.0	6.67	0.444	33.7	2.87	17.01	+20	CLEAR
0828	8.91	2400	100	6.33	0.410	33.5	1.56	17.21	39	CLEAR
0838	8.91	3400	100	5.90	0.363	19.3	1.28	17.11	68	CLEAR
0848	8.91	4400	100	5.34	0.315	8.10	1.15	17.20	100	CLEAR
0858	8.93	5500	110	5.24	0.309	6.20	1.09	17.25	107	CLEAR
0908	8.91	6600	110	5.11	0.300	6.16	1.00	17.25	111	CLEAR
0918	8.90	7700	110	5.01	0.292	5.11	0.95	17.22	113	CLEAR
0928	8.90	8800	110	4.85	0.287	5.03	0.93	17.31	113	CLEAR
0938	8.90	9900	110	4.68	0.283	4.59	0.91	17.39	115	CLEAR
0948	8.89	11000	110	4.58	0.283	3.47	0.89	17.55	118	CLEAR
0958	8.89	12100	110	4.48	0.285	2.78	0.88	17.82	120	CLEAR
1008	8.89	13200	110	4.37	0.287	2.46	0.86	17.88	125	CLEAR
1013	8.89	13750	110	4.30	0.287	2.12	0.85	17.85	128	CLEAR
1018	8.89	14300	110	4.14	0.287	1.49	0.85	17.96	137	CLEAR
1023	8.89	14850	110	3.85	0.287	1.27	0.84	17.90	148	CLEAR
1028	8.89	15400	110	3.83	0.287	1.21	0.84	17.87	150	CLEAR
1033	8.89	15950	110	3.78	0.288	0.99	0.84	17.95	151	CLEAR
1035	—	—	—	—	—	—	—	—	—	START SAMPLING

Water Quality Meter (SN) 01C0134 AB
Control Box type (SN) 419
Turbidity Meter (SN) 4650 - 4300

Pump Intake 25.9'

SIGNATURE(S): Terry Lopez

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: T. ROSAHN
Field Analyst: T.R.
Field Form Checked as per QA/QC Checklist (initials): TKL

Sample ID No.: 12GWT 0201
Sample Location: 12MWT 02
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 9/12/04								
Time: 1035	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	CLEAR	3.78	0.288	17.95	0.99	0.84	—	+151

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 650 MDS

Reference Electrode (circle one) Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 0.7 ppm

Range Used:	Range	Method	Concentration ppm
☑	0 to 1 ppm	K-7510	0.7
☐	1 to 12 ppm	K-7512	

Analysis Time: 1047

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: <10 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	Pink
☑	50 to 500 ppm	K-9815	Pink
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1057

Filtered: ☐

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 165 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-1910	
☑	100 to 1000 ppm	K-1920	165
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1102

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-890 Range: 0 - 3.00 mg/L
Program/Module: 500nm 33

Concentration: >3.30 ppm

Analysis Time: 1109

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 1112

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 0201
Project No.:	N6878	Sample Location:	12MWT 02
Sampled By:	T. ROJAHN	Duplicate:	☐
Field Analyst:	TR	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-890 Range: 0 - 0.70 mg/L Concentration: 0.00 ppm

Program/Module: 610nm 93 Analysis Time: 1123 Filtered: ☐

Notes:

Nitrite (NO_2^--N): Concentration: 0.006 ppm

Equipment: DR-850 DR-890 Range: 0 - 0.350 mg/L Analysis Time: 1105 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}): Concentration: 1.3 ppm

Equipment: DR-850 DR-890 Range: 0 - 20.0 mg/L Analysis Time: 1129 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 0301
Sample Location: 12MWT 03
Sampled By: T. ROJAHN
C.O.C. No.: 0100
Type of Sample:
[X] Low Concentration
[] High Concentration

9/27 CLEAR

4.47 ON 9/27

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9/27/04								
Time: 1053								
Method: SAME	CLOUDY	7.25	1.638	14.58	303	2.66	+13.9	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9/26/04								
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 27.8								
Static Water Level (WL): 16.30								
One Casing Volume(gal/L): 7.1								
Start Purge (hrs): 1612								
End Purge (hrs): 1854								
Total Purge Time (min): 162								
Total Vol. Purged (gal/L): 23.1								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

11.5 x 0.163 = 1.9 gal or 7.1L

Pump intake @ 22.8

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT03
DATE: 9/26/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1612	16.30	—	—	—	—	—	—	—	—	Start PURGE
1622	17.24	1100	110	7.07	1.808	23.2	2.37	17.19	+19.0	CLEAR
1632	17.65	2000	100	7.10	1.806	17.9	2.50	16.99	20.7	CLEAR
1642	18.06	3100	100	7.11	1.800	13.1	2.63	16.80	22.9	CLEAR
1652	18.60	4200	110	7.11	1.782	11.3	2.66	16.76	22.6	CLEAR
1702	19.11	5300	110	7.10	1.741	10.1	2.60	16.61	21.8	CLEAR
1712	19.63	6400	110	7.10	1.710	10.6	2.50	16.68	20.9	CLEAR
1722	20.24	7500	110	7.13	1.709	11.0	2.46	16.60	19.9	CLEAR
1732	20.55	8500	100	7.13	1.733	11.7	2.46	16.82	18.6	CLEAR
1742	20.90	9300	80	7.13	1.766	11.2	2.47	17.08	17.4	CLEAR
1752	21.20	10100	80	7.15	1.788	11.2	2.51	16.82	15.8	CLEAR
**	due to time & water level not stabilizing - will attempt to dry well out & sample tomorrow									
1802	21.89	12100	200	7.29	1.752	10.1	2.56	15.48	16.2	CLEAR
1812	22.90	14100	200	7.31	1.794	28	2.55	15.48	15.0	CLEAR
1822	23.95	16100	200	7.31	1.755	27	2.64	15.28	15.3	CLEAR
1832	25.11	18100	200	7.25	1.588	64	2.72	15.03	16.1	CLEAR - V.Sl. cloudy
1842	26.55	20100	200	7.26	1.609	162	3.10	14.72	16.7	~~CLEAR~~ TN CLOUDY
1852	27.50	23100	300	7.25	1.638	303	2.66	14.58	13.9	CLOUDY
1854	DRY	—	—	—	—	—	—	—	—	DRY END PURGE

Water Quality Meter (SN) 01C0134 AB
Control Box type (SN) 419
Turbidity Meter (SN) 3592-3502

Pump Intake 22.8 - Lowered Tubing to dry out

SIGNATURE(S): Terry Rogers

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT0401
Sample Location: 12MWT 04
Sampled By: SJC
C.O.C. No.: 0101
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9/28/04								
Time: 1040								
Method: PERISTALTIC	CLEAR	6.73	1428	16.00	3	.64	27.3	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9/28/04								
Method: PERISTALTIC								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2"Φ PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.70								
Static Water Level (WL): 14.28								
One Casing Volume(gal/L): 8 L								
Start Purge (hrs): 0900								
End Purge (hrs): 1040								
Total Purge Time (min): 100								
Total Vol. Purged (gal/L) 11								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	6 (2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	6 (2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	3 (1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	~~(1) L HDPE~~	—
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	3 (1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	
		18 Total Containers	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

Pump intake @ ~5' OFF BOTM

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s): SJ Conte

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878

WELL ID.: 12MWT04 (1 VOL = 8L ±)
DATE: 9/28/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~ L	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0900	14.28	—	—	—	—	—	—	—	—	INITIAL
0910	14.55	2	~200	7.55	1140	—	2.95	15.70	25.6	
0920	14.50	3	~100	6.55	1373	6	1.12	16.19	31.1	CLEAR
0930	14.50	4	100	6.73	1436	6	.77	16.56	26.9	"
0940	14.50	5	100	6.59	1438	6	.71	16.54	26.4	"
0950	14.51	6	100	7.54	1442	3	.70	16.49	11.9	"
1000	14.52	7	100	7.21	1424	3	.65	16.21	16.4	"
1010	14.53	8	100	6.74	1433	3	.64	16.28	22.9	"
1020	14.53	9	100	6.81	1435	3	.65	16.16	21.0	"
1030	14.53	10	100	6.82	1435	3	.62	16.07	20.3	"
1040	14.53	11	100	6.73	1428	3	.64	16.00	27.3	"

Sample @ 1040 HRS

Water Quality Meter (SN) 01C0979
Control Box type (SN) NA
Turbidity Meter (SN) LAMOTTE 4650 4300

Pump Intake ~ 5' OFF BOTTOM

SIGNATURE(S): SJ Conti

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: Conti
Field Analyst: Goerdt
Field Form Checked as per QA/QC Checklist (initials): TR

Sample ID No.: 12GWT 0401
Sample Location: 12MWT 04
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

Date: 9-28-04 / Time: 1040	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	ORP (Eh) (+/- mv)
Method: peristaltic	clear	6.73	1.428	16.00	3.0	.64	—	27.3

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: _____

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 1 ppm

Range Used:	Range	Method	Concentration ppm
☑	0 to 1 ppm	K-7510	1
☑	1 to 12 ppm	K-7512	1

Analysis Time: 1058

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: 140 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-9810	
☑	50 to 500 ppm	K-9815	140
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1103

Filtered: ☐

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: < 10 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-1910	<10
☑	100 to 1000 ppm	K-1920	
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1110

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 (DR-890) Range: 0 - 3.00 mg/L
Program/Module: 500nm 33

Concentration: > 3.30 ppm

Analysis Time: 1117

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other: _____

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 1122

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 0401
Project No.:	N6878	Sample Location:	12MWT 04
Sampled By:	Conti	Duplicate:	☐
Field Analyst:	Goerdt	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-890 Range: 0 - 0.70 mg/L Concentration: 0.0 ppm

Program/Module: 610nm 93 Analysis Time: 1132 Filtered: ☐

Notes:

Nitrite (NO_2^--N): Concentration: 0.0 ppm

Equipment: DR-850 DR-890 Range: 0 - 0.350 mg/L Analysis Time: 1107 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}): Concentration: 22.0 ppm

Equipment: DR-850 DR-890 Range: 0 - 20.0 mg/L Analysis Time: 1138 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interferenice treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 0501
Sample Location: 12MWT 05
Sampled By: T. ROJAHN
C.O.C. No.: 0093
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9/14/04	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1532								
Method: SAME	CLEAR	3.65	0.510	17.10	0.50	2.03	+295	---

PURGE DATA:

Date: 9/14/04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: PERISTALTIC								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.75								
Static Water Level (WL): 9.02								
One Casing Volume(gal/L) 10.9								
Start Purge (hrs): 1345								
End Purge (hrs): 1530								
Total Purge Time (min): 105								
Total Vol. Purged (gal/L) 14.7								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

Pump intake @ 21.8

17.73' x 0.163 = 2.9 gal or 10.9 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT05
DATE: 9/14/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1345	9.02	0	–	–	–	–	–	–	–	Start PURGE
1355	9.18	1400	140	4.40	0.523	3.4	1.95	17.46	+186	CLEAR
1405	9.21	2800	140	4.26	0.516	1.4	1.81	17.20	215	CLEAR
1415	9.21	4200	140	4.23	0.517	0.55	1.82	17.43	215	CLEAR
1425	9.21	5600	140	4.15	0.516	0.43	1.91	17.52	220	CLEAR
1435	9.21	7000	140	4.11	0.516	0.55	1.98	17.57	223	CLEAR
1445	9.21	8400	140	4.08	0.514	2.0	2.04	17.40	228	CLEAR
1455	9.21	9800	140	4.03	0.513	0.80	2.03	17.39	237	CLEAR
1505	9.21	11200	140	3.89	0.511	0.95	2.10	17.18	261	CLEAR
1510	9.21	11900	140	3.84	0.510	1.6	2.06	17.17	271	CLEAR
1515	9.21	12600	140	3.80	0.510	1.7	2.09	17.01	278	CLEAR
1520	9.21	13300	140	3.72	0.510	0.7	2.02	17.12	288	CLEAR
1525	9.21	14000	140	3.70	0.510	1.4	2.03	17.10	291	CLEAR
1530	9.21	14700	140	3.65	0.510	0.50	2.03	17.10	295	CLEAR
1532	–	–	–	–	–	–	–	–	–	SAMPLE TIME

Water Quality Meter (SN) 0160134 AB
Control Box type (SN) 419
Turbidity Meter (SN) 4650-4300

Pump Intake 21.8

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 0601
Sample Location: 12MWT 06
Sampled By: T. ROJAHN
C.O.C. No.: 0093
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-14-04	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 0930	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: SAME	CLEAR	5.85	0.282	17.35	0.75	5.67	+ 65	---

PURGE DATA:

Date: 9-14-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 25.80								
Static Water Level (WL): 9.19								
One Casing Volume(gal/L) 10.2								
Start Purge (hrs): 0757								
End Purge (hrs): 0927								
Total Purge Time (min): 90								
Total Vol. Purged (gal/L) 10.8								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

Pump intake @ 20.8

16.61' x 0.163 = 2.7 gal or 10.2 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT06
DATE: 9/14/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0757	9.19	0	120	–	–	–	–	–	–	START PURGE
0807	9.69	1200	120	5.93	0.287	8.2	6.65	17.47	+61	CLEAR
0817	9.79	2400	120	5.91	0.285	6.8	6.27	17.29	64	CLEAR
0827	9.86	3600	120	5.90	0.285	4.6	5.85	17.14	66	CLEAR
0837	9.88	4800	120	5.88	0.285	2.5	6.20	17.20	66	CLEAR
0847	9.88	6000	120	5.87	0.285	1.5	5.96	17.34	66	CLEAR
0857	9.88	7200	120	5.86	0.285	1.0	5.93	17.32	66	CLEAR
0907	9.88	8400	120	5.86	0.294	0.60	5.69	17.34	66	CLEAR
0917	9.89	9600	120	5.85	0.283	0.85	5.69	17.26	66	CLEAR
0927	9.90	10800	120	5.85	0.282	0.75	5.67	17.35	65	CLEAR
0930	–	–	–	–	–	–	–	–	–	START SAMPLING

Water Quality Meter (SN) 01C0134 AB
Control Box type (SN) 419
Turbidity Meter (SN) 4650-4300

Pump Intake 20.8

SIGNATURE(S): Terry Ryll

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: T. ROJAHN
Field Analyst: T.R.
Field Form Checked as per QA/QC Checklist (initials): TRR

Sample ID No.: 12GWT 0601
Sample Location: 12MWT 06
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 9-14-04								
Time: 0930	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	Clear	5.85	0.282	17.35	0.75	5.67	–	+65

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 650MDS

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 3.5 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☑	1 to 12 ppm	K-7512	3.5

Analysis Time: 0930

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: <10 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	Pink
☑	50 to 500 ppm	K-9815	
☐	100 to 1000 ppm	K-9820	

Analysis Time: 0938

Filtered: ☐

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 200 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-1910	
☑	100 to 1000 ppm	K-1920	200
☐	250 to 2500 ppm	K-1925	

Analysis Time: 0942

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-8 90 Range: 0 - 3.00 mg/L
Program/Module: 500nm 33

Concentration: 0.00 ppm

Analysis Time: 0954

Notes:

Filtered: ☐

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 1028

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 0601
Project No.:	N6878	Sample Location:	12MWT 06
Sampled By:	TIROJAH	Duplicate:	☐
Field Analyst:	TR	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-8 90 Range: 0 - 0.70 mg/L Concentration: 0.00 ppm

Program/Module: 610nm 93 Analysis Time: 10.05 Filtered: ☐

Notes:

Nitrite (NO_2^--N): Concentration: 0.022 ppm

Equipment: DR-850 DR-8 90 Range: 0 - 0.350 mg/L Analysis Time: 0946 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}): Concentration: 0.0 ppm

Equipment: DR-850 DR-8 90 Range: 0 - 20.0 mg/L Analysis Time: 1012 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT0701
Sample Location: 12MWT07
Sampled By: T. ROJAHN
C.O.C. No.: 0089
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9/9/04	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1540	(Visual)	(S. U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/L)	(mV)	NA
Method: SAME	CLEAR	2.66	4.497	20.41	9.08	6.07	370	---

PURGE DATA:

Date: 9/09/04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.80								
Static Water Level (WL): 11.52								
One Casing Volume(gal/L) 9.4								
Start Purge (hrs): 1245								
End Purge (hrs): 1535								
Total Purge Time (min): 170								
Total Vol. Purged (gal/L) 13.9								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	No
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

Pump intake @ 21.8'

15.28' x 0.163 = 2.5 gal or 9.4 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT07
DATE: 9/09/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1245	11.52	0	–	–	–	–	–	–	–	START PURGE
1255	12.60	1100	110	2.81	4.385	52.7	6.97	19.11	346	V. SL. CLOUDY
1305	13.20	1900	80	2.53	4.350	19.0	6.73	19.26	364	CLEAR
1315	13.50	2800	90	2.53	4.370	14.5	6.75	19.38	362	CLEAR
1325	13.88	3700	90	2.51	4.409	17.3	6.67	19.98	357	CLEAR
1335	13.99	4500	80	2.51	4.358	22.0	6.65	19.63	360	CLEAR
1345	14.20	5300	80	2.44	4.357	21.5	6.70	19.50	374	CLEAR
1355	14.33	6100	80	2.35	4.381	20.9	6.56	19.86	378	CLEAR
1405	14.51	6900	80	2.43	4.362	19.0	6.42	19.76	375	CLEAR
1415	14.60	7700	80	2.48	4.358	17.1	6.37	20.07	375	CLEAR
1425	14.70	8500	80	2.53	4.353	14.6	6.31	20.48	373	CLEAR
1435	14.82	9300	80	2.57	4.348	14.8	6.38	19.85	372	CLEAR
1445	14.95	10100	80	2.60	4.341	14.7	6.42	19.30	372	CLEAR
1455	15.11	11100	100	2.59	4.366	12.1	6.29	19.53	372	CLEAR
1505	15.10	11800	70	2.63	4.399	11.1	6.26	19.83	373	CLEAR
1515	15.09	12500	70	2.70	4.445	12.3	6.15	19.98	370	CLEAR
1525	15.08	13200	70	2.66	4.443	11.3	6.17	20.15	370	CLEAR
1535	15.09	13900	70	2.66	4.497	9.08	6.07	20.41	370	CLEAR
1540	–	–	–	–	–	–	–	–	–	Start Sampling

Water Quality Meter (SN) 01C0134 AB
Control Box type (SN) 419
Turbidity Meter (SN) 4650-4300

Pump Intake 21.8'

SIGNATURE(S): Terry Rojas

PAGE 2 OF 2

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 0701
Project No.:	N6878	Sample Location:	12MWT 07
Sampled By:	T. ROJAHN	Duplicate:	☐
Field Analyst:	T. ROJAHN	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):	TKR		

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 9/9/04								
Time: 1540	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	CLEAR	2.66	4.497	20.41	9.08	6.07	—	+370

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 650MDS

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 6 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☑	1 to 12 ppm	K-7512	6

Analysis Time: 1549

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: <10 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	Pink
☑	50 to 500 ppm	K-9815	Pink
☑	100 to 1000 ppm	K-9820	Pink

Analysis Time: 1602

Filtered: ☐

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 600 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-1910	
☑	100 to 1000 ppm	K-1920	600
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1613

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-8 _ _ Range: 0 - 3.00 mg/L

Program/Module: 500nm 33

Concentration: >3.3 ppm

Analysis Time: 1621

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 1635

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 0701
Project No.:	N6878	Sample Location:	12MWT 07
Sampled By:	T. ROJAHN	Duplicate:	☐
Field Analyst:	"	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-8 90 Range: 0 - 0.70 mg/L Concentration: 0.00 ppm

Program/Module: 610nm 93 Analysis Time: 1633 Filtered: ☐

Notes:

Nitrite (NO_2^--N): Concentration: 0.010 ppm

Equipment: DR-850 DR-8 90 Range: 0 - 0.350 mg/L Analysis Time: 1608 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}): Concentration: 18.1 ppm

Equipment: DR-850 DR-8 90 Range: 0 - 20.0 mg/L Analysis Time: 1643 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 0801
Sample Location: 12MWT 08
Sampled By: Gordt
C.O.C. No.: 0088
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 8-30-04	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1223	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: peristaltic	Clear	4.64	.415	18.57	5.17	2.81	318.9	---

PURGE DATA:

Date: 8-30-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 25.80								
Static Water Level (WL): 11.46								
One Casing Volume(gal/L) 8.6								
Start Purge (hrs): 0850								
End Purge (hrs): 1220								
Total Purge Time (min): 210								
Total Vol. Purged (gal/L) 18.2								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 13GWT_____-F

Pump intake @ 20'

25.80
11.46
14.34(.163) = 2.34 gal
= 8.6 L

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

~~854-0280~~ 95

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT08
DATE: 8-30-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~ L	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0850	11.46	–	–	–	–	–	–	–	–	Start purge
0900	11.98	1.5	150	4.61	.398	5.52	3.22	17.97	319.4	clear
0910	12.34	2.4	90	4.62	.462	5.09	3.26	18.34	309.8	"
0920	12.51	3.3	90	4.60	.403	4.73	3.05	18.35	302.9	"
0930	12.77	4.2	90	4.62	.401	4.18	2.98	18.33	298.4	"
0940	12.92	5.1	90	4.62	.400	3.04	2.97	18.42	295.5	"
0950	12.55	6.0	90	4.65	.410	3.53	2.99	19.34	292.3	adjusting pump
1000	12.88	6.8	80	4.64	.401	3.21	3.02	18.48	296.4	clear
1010	12.93	7.6	80	4.66	.406	3.93	3.01	18.91	295.5	"
1020	13.11	8.4	80	4.65	.403	2.42	3.01	18.56	296.2	"
1030	13.27	9.2	80	4.64	.404	2.17	2.99	18.51	297.3	"
1040	13.42	10.0	80	4.65	.405	3.30	2.94	18.71	278.8	"
1050	13.45	10.8	80	4.65	.406	3.24	2.93	18.64	299.8	"
1100	13.44	11.6	80	4.64	.406	~~2.93~~	2.93	18.77	301.3	"
1110	13.48	12.4	80	4.65	.408	3.48	2.92	18.98	304.4	"
1120	13.53	13.2	80	4.64	.408	4.10	2.92	19.03	306.2	"
1130	13.57	14.0	80	4.63	.416	4.61	2.83	19.35	312.4	"
1140	13.58	14.8	80	4.62	.419	5.16	2.81	19.65	314.1	"
1150	13.63	15.6	80	4.62	.415	–	2.81	19.15	317.4	"
1200	13.65	16.4	80	4.62	.412	4.89	2.80	19.01	317.8	"
1210	13.66	17.3	80	4.62	.412	5.21	2.83	18.85	316.3	"
1220	13.65	18.2	80	4.64	.415	5.17	2.81	18.57	318.9	stop purge

Water Quality Meter (SN) 99K 0055
Control Box type (SN) NA
Turbidity Meter (SN) 4650 4300
SIGNATURE(S): [signature]

Pump Intake 21'

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 0901
Sample Location: 12MWT 09
Sampled By: T. ROJAHN
C.O.C. No.: 0089
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9/10/04								
Time: 1200								
Method: SAME	CLEAR	5.04	0.403	19.78	6.99	4.61	+140	--

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9/10/04								
Method: Peristaltic								
Monitor Reading (ppm): -								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.76								
Static Water Level (WL): 12.71								
One Casing Volume(gal/L): 8.7								
Start Purge (hrs): 1018								
End Purge (hrs): 1158								
Total Purge Time (min): 100								
Total Vol. Purged (gal/L): 8.9								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

Pump intake @ 21.8'

14.05' x 0.163 = 2.3 gal/or 8.7L

Circle if Applicable:

MS/MSD Duplicate ID No.:

Signature(s): Tony Rojahn

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT09
DATE: 9/10/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1018	12.71	0	–	–	–	–	–	–	–	START PURGE
1028	13.28	1200	120	5.17	0.428	16.6	5.68	17.40	147	CLEAR
1038	13.48	2100	90	5.08	0.430	13.3	5.08	17.97	148	CLEAR
1048	13.85	2800	70	5.13	0.427	11.7	4.88	17.81	141	CLEAR
1058	13.95	3600	80	5.13	0.430	9.10	5.06	18.54	134	CLEAR
1108	14.02	4400	80	5.13	0.435	7.72	5.27	18.97	126	CLEAR
1118	14.25	5400	100	4.95	0.419	5.35	4.62	18.30	142	CLEAR
1128	14.12	6300	90	4.92	0.410	6.70	4.57	18.63	147	CLEAR
1138	14.13	7300	100	5.09	0.384	9.53	4.60	17.86	140	CLEAR
1148	13.96	8100	80	5.07	0.402	8.48	4.55	19.16	138	CLEAR
1158	13.91	8900	80	5.04	0.403	6.99	4.61	18.78	140	CLEAR
1200	–	–	–	–	–	–	–	–	–	START SAMPLING

Water Quality Meter (SN) 0160134 A8
Control Box type (SN) 419
Turbidity Meter (SN) 4650-4300

Pump Intake 21.8'

SIGNATURE(S): Terry [illegible]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: T. ROJAHN
Field Analyst: T. ROJAHN
Field Form Checked as per QA/QC Checklist (initials): TLR

Sample ID No.: 12GWT 0901
Sample Location: 12MWT09
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 9/10/04								
Time: 1200	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	CLEAR	5.04	0.403	18.78	6.99	4.61	—	+ 140

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 650 MDS

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 3.5 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☑	1 to 12 ppm	K-7512	

Analysis Time: 1208

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: <10 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	Pink
☑	50 to 500 ppm	K-9815	Pink
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1219

Filtered: ☐

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 170 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-1910	
☑	100 to 1000 ppm	K-1920	170
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1229

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-890 Range: 0 - 3.00 mg/L
Program/Module: 500nm 33

Concentration: 0.24 ppm

Analysis Time: 1236

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:
Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm
Analysis Time: 1238

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT0901
Project No.:	N6878	Sample Location:	12MWT09
Sampled By:	T. Rojahn	Duplicate:	☐
Field Analyst:	T. Rojahn	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-8 90 Range: 0 - 0.70 mg/L Concentration: 0.01 ppm

Program/Module: 610nm 93 Analysis Time: 1247 Filtered: ☐

Notes:

Nitrite (NO_2^--N): Concentration: 0.007 ppm

Equipment: DR-850 DR-8 90 Range: 0 - 0.350 mg/L Analysis Time: 1224 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}): Concentration: 0.3 ppm

Equipment: DR-850 DR-8 20 Range: 0 - 20.0 mg/L Analysis Time: 1255 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 1001
Sample Location: 12MWT 10
Sampled By: T. ROJAHN
C.O.C. No.: 0099
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 163 (7th) 9/25/04	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1635								
Method: SAME	CLEAR	4.64	0.724	17.5°	4.1	4.78	+149	—

PURGE DATA:

Date: 9/25/04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.81								
Static Water Level (WL): 14.93								
One Casing Volume(gal/L): 7.3								
Start Purge (hrs): 1232								
End Purge (hrs): 1632								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 16.9								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 12GWT_____-F

11.88 x 0.163 = 1.94 gal or 7.3L

Pump intake @ 21.80

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT 10
DATE: 9/25/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1232	14.93	—	—	—	—	—	—	—	—	START PURGE
1242	16.70	1300	130	5.38	0.727	4.1	4.29	16.81	+87.8	CLEAR
1252	17.19	2200	90	5.17	0.728	4.7	4.64	17.22	100	CLEAR
1302	17.50	3100	90	5.08	0.733	4.3	4.70	17.53	102	CLEAR
1312	17.77	3800	70	4.99	0.739	4.9	4.72	17.95	107	CLEAR
1322	17.96	4500	70	4.95	0.735	4.4	4.68	18.08	113	CLEAR
1332	18.11	5200	70	4.92	0.732	3.2	4.64	18.05	118	CLEAR
1342	18.32	6000	80	4.89	0.724	2.5	4.52	18.09	121	CLEAR
1352	18.55	6800	80	4.85	0.718	2.0	4.41	18.10	123	CLEAR
1402	18.80	7600	80	4.81	0.717	2.1	4.29	18.18	124	CLEAR
1412	18.97	8400	80	4.78	0.717	2.6	4.35	17.87	128	CLEAR
1422	19.10	9200	80	4.76	0.716	2.8	4.41	17.62	131	CLEAR
1432	19.29	10000	80	4.71	0.720	3.1	4.41	17.81	135	CLEAR
1442	19.49	10700	70	4.67	0.724	0.05	4.43	17.70	138	CLEAR
1452	19.69	11400	70	4.64	0.722	0.03	4.39	17.64	139	CLEAR
1502	19.92	12200	80	4.62	0.722	0.05	4.41	17.74	143	CLEAR
1512	20.06	12900	70	4.55	0.727	2.1	4.49	18.00	145	CLEAR LOWER PUMP INTAKE
1522	20.19	13400	50	4.57	0.729	2.3	4.55	18.06	143	CLEAR
1532	20.33	13900	50	4.57	0.730	2.2	4.56	18.00	147	CLEAR
1542	20.54	14400	50	4.54	0.728	2.5	4.55	17.98	151	CLEAR
1552	20.71	14900	50	4.56	0.726	2.8	4.71	17.75	151	CLEAR
1602	20.85	15400	50	4.56	0.726	3.5	4.61	17.77	152	CLEAR
1612	20.99	15900	50	4.56	0.728	4.5	4.65	17.82	151	CLEAR
1622	21.10	16400	50	4.59	0.728	4.1	4.70	17.78	150	CLEAR
1632	21.20	16900	50	4.64	0.724	4.1	4.78	17.50	149	CLEAR
1635	—	—	—	—	—	—	—	—	—	SAMPLE TIME

Water Quality Meter (SN): 01C0134 AB
Control Box type (SN): 419
Turbidity Meter (SN): 1760 - 1800

Pump Intake: 21.8 LOWER TO 23.8'

SIGNATURE(S): [signature]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 1101
Sample Location: 12MWT 11
Sampled By: T. ROJAHN
C.O.C. No.: 0092
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9/13/04								
Time: 1153								
Method: Peristaltic	CLEAR	3.08	0.299	20.89	0.50	1.63	+190	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9/13/04								
Method: PERISTALTIC								
Monitor Reading (ppm): -								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.40								
Static Water Level (WL): 14.73								
One Casing Volume(gal/L): 7.2								
Start Purge (hrs): 0845								
End Purge (hrs): 1150								
Total Purge Time (min): 185								
Total Vol. Purged (gal/L): 12.2								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	No
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

Pump intake @ 21.4'

11.67 x 0.163 = 1.9 gal or 7.2 L

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Tey Rojahn

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT11
DATE: 9/13/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0845	14.73	0	-	-	-	-	-	-	-	START PURGE
0855	15.53	1000	100	5.82	0.386	45	5.22	17.84	+72	CLEAR
0905	15.92	2000	100	5.46	0.322	8.7	4.94	17.91	80	CLEAR
0915	15.88	2650	65	5.28	0.319	6.9	4.95	19.12	78	CLEAR
0925	15.88	3300	65	4.94	0.300	5.5	4.59	19.67	83	CLEAR
0935	15.88	3900	60	4.75	0.302	5.3	3.94	20.22	87	CLEAR
0945	15.88	4500	60	4.54	0.301	5.1	3.43	20.84	95	CLEAR
0955	15.90	5000	50	4.41	0.294	2.8	3.02	20.43	98	CLEAR
1005	15.96	5500	50	4.36	0.300	2.8	2.49	20.35	98	CLEAR
1015	15.95	6000	50	4.41	0.293	4.8	2.23	19.53	95	CLEAR (Pump Stopped)
1025	16.24	6900	90	4.48	0.287	9.0	2.01	18.84	93	CLEAR
1035	16.07	7400	50	4.40	0.301	12	1.92	20.14	95	CLEAR
1045	16.30	8200	80	4.32	0.289	2.9	1.88	19.27	101	CLEAR
1055	16.34	8900	70	4.14	0.293	3.0	1.72	20.04	108	CLEAR
1105	16.33	9500	60	3.82	0.295	1.62	1.71	20.39	129	CLEAR
1115	16.30	10100	60	3.45	0.297	1.03	1.70	20.58	153	CLEAR
1125	16.30	10700	60	3.43	0.298	0.55	1.70	20.64	162	CLEAR
1135	16.30	11100	40	3.26	0.298	0.57	1.66	20.47	174	CLEAR
1140	16.36	11400	60	3.16	0.295	0.50	1.65	20.35	182	CLEAR
1145	16.38	11800	80	3.13	0.296	0.15	1.64	20.43	185	CLEAR
1150	16.39	12200	80	3.08	0.299	0.50	1.63	20.89	190	CLEAR
1153	—	—	—	—	—	—	—	—	—	START SAMPLING

Water Quality Meter (SN) 01C0 134 AB
Control Box type (SN) 419
Turbidity Meter (SN) 4650 - 4300

Pump Intake 21.4'

SIGNATURE(S): Troy Hogan

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 1101
Project No.:	N6878	Sample Location:	12MWT 11
Sampled By:	T. Rojahn	Duplicate:	☐
Field Analyst:	TR	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):			

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 9/13/04								
Time: 1153	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	CLEAR	3.08	0.299	20.89	0.50	1.63	–	+190

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 650 MOS

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 1 ppm

Range Used:	Range	Method	Concentration ppm
☑	0 to 1 ppm	K-7510	>1
☑	1 to 12 ppm	K-7512	1

Analysis Time: 1205

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: <10 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	Pink
☑	50 to 500 ppm	K-9815	Pink
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1212

Filtered: ☐

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 210 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-1910	
☑	100 to 1000 ppm	K-1920	210
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1219

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-890 Range: 0 - 3.00 mg/L

Program/Module: 500nm 33

Concentration: 0.67 ppm

Analysis Time: 1224

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 1244

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT
Project No.:	N6878	Sample Location:	12MWT
Sampled By:	T. Rajaw	Duplicate:	☐
Field Analyst:	TR	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-890 Range: 0 - 0.70 mg/L Concentration: 0.00 ppm

Program/Module: 610nm 93 Analysis Time: 1234 Filtered: ☐

Notes:

Nitrite (NO_2^--N):

Concentration: 0.022 ppm

Equipment: DR-850 DR-890 Range: 0 - 0.350 mg/L Analysis Time: 1217 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}):

Concentration: 5.3 ppm

Equipment: DR-850 DR-890 Range: 0 - 20.0 mg/L Analysis Time: 1241 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 1201
Sample Location: 12MWT 12
Sampled By: T. ROJAHN
C.O.C. No.: 0093
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9/14/04								
Time: 1223								
Method: SAME	CLEAR	6.12	0.683	18.58	0.35	0.97	+72	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9/14/03								
Method: Peristaltic								
Monitor Reading (ppm): –								
Well Casing Diameter & Material Type: 2" ϕ PVC	See Low Flow Purge Data Sheets							
Total Well Depth (TD): 26.4								
Static Water Level (WL): 12.5								
One Casing Volume(gal/L): 8.6								
Start Purge (hrs): 1050								
End Purge (hrs): 1220								
Total Purge Time (min): 90								
Total Vol. Purged (gal/L): 10								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

Pump intake @ 21.4

26.4
−12.5
13.9 × 0.163 = 2.3 gal or 8.6 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT12
DATE: 9-14-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1050	12.50	0	—	—	—	—	—	—	—	START PURGE
1100	12.79	1300	130	6.46	0.709	35	3.16	17.66	+44	CLEAR
1110	12.79	2300	100	6.35	0.688	25	1.64	17.45	50	CLEAR
1120	12.82	3400	110	6.34	0.661	19	1.36	17.68	52	CLEAR
1130	12.85	4500	110	6.32	0.658	9.8	1.23	17.71	54	CLEAR
1140	12.88	5600	110	6.30	0.660	4.5	1.09	17.75	56	CLEAR
1150	12.88	6700	110	6.27	0.687	1.9	1.08	18.15	58	CLEAR
1200	12.86	7800	110	6.21	0.674	1.1	1.05	18.50	62	CLEAR
1210	12.88	8900	110	6.15	0.679	0.85	1.00	18.77	66	CLEAR
1215	12.88	9450	110	6.11	0.685	0.85	1.01	18.90	70	CLEAR
1220	12.88	10000	110	6.12	0.683	0.35	0.97	18.58	72	CLEAR
1223	—	—	—	—	—	—	—	—	—	START SAMPLING

Water Quality Meter (SN) 01C0 134 48
Control Box type (SN) 419
Turbidity Meter (SN) 4650-4300

Pump Intake 21.4

SIGNATURE(S): Terry Rogers

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: Terry Rojahn
Field Analyst: TR
Field Form Checked as per QA/QC Checklist (initials): TR

Sample ID No.: 12GWT 1201
Sample Location: 12MWT 12
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 9/14/04								
Time: 1223	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	CLEAR	6.12	0.683	19.58	0.35	0.97	–	+72

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)
Electrode Make & Model: YSI 650 MDS
Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:
Equipment: Chemetrics Test Kit
Concentration: 1 ppm

Range Used:	Range	Method	Concentration ppm
☑	0 to 1 ppm	K-7510	1
☑	1 to 12 ppm	K-7512	1

Analysis Time: 1227

Notes:

Alkalinity:
Equipment: Chemetrics Test Kit
Concentration: 100 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	100
☑	50 to 500 ppm	K-9815	100
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1234
Filtered: ☐

Notes:

Carbon Dioxide:
Equipment: Chemetrics Test Kit
Concentration: 185 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-1910	
☑	100 to 1000 ppm	K-1920	✓ 185
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1238

Notes:

Ferrous Iron (Fe^{2+}):
Equipment: DR-850 DR-8 90 Range: 0 - 3.00 mg/L
Program/Module: 500nm 33
Concentration: 0.02 ppm
Analysis Time: 1252
Filtered: ☐
Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L
Equipment: HS-C Other:
Exceeded 5.0 mg/L range on color chart: ☐
Concentration: 0.0 ppm
Analysis Time: 1251
Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 1201
Project No.:	N6878	Sample Location:	12MWT 12
Sampled By:	TK	Duplicate:	☐
Field Analyst:	TK	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-8 90 Range: 0 - 0.70 mg/L Concentration: 0.00 ppm

Program/Module: 610nm 93 Analysis Time: 1259 Filtered: ☐

Notes:

Nitrite (NO_2^--N):

Concentration: 0.019 ppm

Equipment: DR-850 DR-8 90 Range: 0 - 0.350 mg/L Analysis Time: 1244 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}):

Concentration: 0.5 ppm

Equipment: DR-850 DR-8 90 Range: 0 - 20.0 mg/L Analysis Time: 1306 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☐

Correct measurement units are cited in the SAMPLING DATA block: ☐

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☐

Mulitplication is correct for each *Multiplier* table: ☐

Final calulated concentration is within the appropriate *Range Used* block: ☐

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☐

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☐

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☐

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 1301
Sample Location: 12MWT 13
Sampled By: Goerdt
C.O.C. No.: 0088
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 8-30-04								
Time: 1601								
Method: peristaltic	Clear	3.85	.300	21.96	7.16	0.45	425.8	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 8-30-04								
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC	See Low Flow Purge Data Sheets							
Total Well Depth (TD): 22.83								
Static Water Level (WL): 5.74								
One Casing Volume(gal/L): 10.3								
Start Purge (hrs): 1347								
End Purge (hrs): 1557								
Total Purge Time (min): 130								
Total Vol. Purged (gal/L): 10.8								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	No
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT 1 -F

Pump intake @ 18'

22.83
5.74
17.09 (.163) = 2.79 gal
= 10.31 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT13
DATE: 8-30-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1347	5.74	–	–	–	–	–	–	–	–	Start purge
1357	6.12	1.4	140	4.05	.302	–	.83	21.53	328.3	–
1407	6.20	2.0	60	4.05	.307	11.6	.72	22.57	332.8	clear
1417	6.22	2.8	80	4.02	.308	10.2	.59	22.71	348.4	
1427	~~6.00~~ 6.3	3.6	80	3.93	.306	14.1	.53	22.55	372.9	
1437	6.31	4.4	80	3.95	.302	17.3	.54	21.72	388.3	
1447	6.30	5.2	80	4.07	.325	11.4	.55	22.60	389.7	
1457	6.30	6.0	80	3.88	.304	9.79	.57	22.29	408.8	
1507	6.30	6.8	80	3.94	.299	9.87	.51	21.72	410.9	
1517	6.32	7.6	80	3.93	.294	9.91	.48	20.88	412.1	
1527	6.31	8.4	80	3.91	.299	11.1	.44	21.72	414.5	
1537	6.31	9.2	80	3.90	.298	10.41	.45	21.69	419.8	
1547	6.34	10.0	80	3.86	.299	11.8	.45	21.62	426.0	
1557	6.33	10.8	80	3.85	.300	7.16	.45	21.96	425.8	end purge

Water Quality Meter (SN) 99K0055
Control Box type (SN) NA
Turbidity Meter (SN) 4650 4300

Pump Intake 18'

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 1401
Sample Location: 12MWT 14
Sampled By: Gordon
C.O.C. No.: 0100
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: See below	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: "								
Method: peristaltic	Brown	4.98	2.385	18.45	>1000	6.06	249.3	---

PURGE DATA:

Date: 9-24-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" pvc			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 27.80								
Static Water Level (WL): 24.32								
One Casing Volume(gal/L) 2.2								
Start Purge (hrs): 1002								
End Purge (hrs): 1056								
Total Purge Time (min): 54								
Total Vol. Purged (gal/L) 4.75								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements			Collected
Explosives SW-846 8330	4°C	9-25-04	1 (2) L Glass Amber	0835	Yes
Micellaneous Explosives SW-846 8330	4°C	9-25-04	1 (2) L Glass Amber	0835	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	9-26-04	(1) L HDPE	0830	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	9-27-04	(1) L HDPE	0910	Yes
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	9-26-04	(1) L HDPE	0830	Yes
Total Organic Carbon	4°C/H_3PO_4		(2) 40ml Vials		

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT 1401 -F

Pump intake @ Bottom of well

9/26/04 WL= 26.18

27.80
24.32
3.48 (.163) = 0.57 gal
= 2.15 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT14
DATE: 9-24-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1002	24.32	–	–	–	–	–	–	–	–	Start purge
1012	24.80	0.75	75	5.17	2.436	850	5.55	19.45	247.9	lt brown
1022	25.42	1.75	100	5.29	2.232	330	5.78	18.93	215.6	"
1032	25.96	2.55	80	5.32	2.167	>1000	5.73	20.02	221.7	brown
1042	26.59	3.65	110	5.80	2.212	>1000	5.25	18.43	243.0	well WL not
1052	27.26	4.75	110	4.98	2.385	>1000	6.06	18.45	249.3	stabilizing so
1056		well		Dry		(end purge)				will dry it out.

Water Quality Meter (SN) 99K0055
Control Box type (SN) NA
Turbidity Meter (SN) 4650 4300

Pump Intake 27.80'

SIGNATURE(S): [illegible]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: Goeydt
Field Analyst: Goeydt
Field Form Checked as per QA/QC Checklist (initials): TL

Sample ID No.: 12GWT 1401
Sample Location: 12MWT 14
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 9/25/04 / 9/26/04					9-25-04			
Time: 0835	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	brown	4.98	2.385	18.45	250	6.06	—	249.3

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: 650 MDS

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 0.5 ppm

Range Used:	Range	Method	Concentration ppm
☑	0 to 1 ppm	K-7510	0.5
☐	1 to 12 ppm	K-7512	

Analysis Time: 0902 09/25/04

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: ~~30~~ 19 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	~~30~~ 19
☐	50 to 500 ppm	K-9815	
☐	100 to 1000 ppm	K-9820	

Analysis Time: ~~0837~~ 0938 09/27/04

Filtered: ☑

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 250 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-1910	
☑	100 to 1000 ppm	K-1920	250
☐	250 to 2500 ppm	K-1925	

Analysis Time: 0907 09/25/04

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-890 Range: 0 - 3.00 mg/L
Program/Module: 500nm 33

Concentration: 3.30 ppm 09/27/04

Analysis Time: 0944

Filtered: ☑

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 0921 09/25/04

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 1401
Project No.:	N6878	Sample Location:	12MWT 14
Sampled By:	Goerdt	Duplicate:	☐
Field Analyst:	Goerdt	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-890 Range: 0 - 0.70 mg/L Concentration: 0.16 ppm

Program/Module: 610nm 93 Analysis Time: 0953 Filtered: ☑ 9/27/04

Notes:

Nitrite (NO_2^--N):

Concentration: ~~0.002~~ ppm 0.0

Equipment: DR-850 DR-890 Range: 0 - 0.350 mg/L Analysis Time: ~~0857~~ 0934 Filtered: ☑ 9/27/04

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}):

Concentration: 22.0 ppm

Equipment: DR-850 DR-890 Range: 0 - 20.0 mg/L Analysis Time: 1002 Filtered: ☑ 9/27/04

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT1501
Sample Location: 12MWT15
Sampled By: SJC
C.O.C. No.: 0099
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-27-04	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1320	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: PERISTALTIC	CLEAR	5.99	2015	19.20	4	1.99	49.5	---

PURGE DATA:

Date: 9-27-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: PERISTALTIC								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.90								
Static Water Level (WL): 16.25								
One Casing Volume (gal/L): 1.8	or 6.8 L							
Start Purge (hrs): 0920								
End Purge (hrs): 1320								
Total Purge Time (~~min~~): 4 HRS								
Total Vol. Purged (gal/L) 23.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes ✓
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes ✓
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes ✓
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	—
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes ✓
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	—
		—	
		(6) TOTAL CONTAINERS	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] 13GWT_____-F

Pump intake @ _____

≈ 1' From Botm

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): SJ Conte

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878

WELL ID.: 12MWT15
DATE: 9-27-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (~~mL/Min.~~ L)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0920	16.25			—	—	—	—	—	—	
0930	17.40	1	100	6.11	1818	8	1.34	17.95	82.1	CLEAR
0940	17.96	2	100	6.07	1822	8	1.23	18.06	76	"
0950	18.50	3	100	6.06	1821	8	1.21	18.29	70.8	"
1000	19.00	4	100	6.07	1807	4	1.21	18.02	65.9	"
1010	19.47	5	100	6.06	1849	3	1.26	18.11	60.7	"
1020	19.92	6	100	6.04	1885	3	1.34	18.15	57.5	"
1030	20.33	7	100	6.05	1906	3	1.39	18.15	55.4	"
1040	20.75	8	100	6.10	1961	3	1.50	18.30	50.6	"
1050	21.10	9	100	6.07	1978	3	1.56	18.45	50.8	"
1100	21.45	10	100	6.03	2005	3	1.63	18.41	50.2	"
1110	21.65	11	100	6.00	2030	4	1.69	18.59	49.9	"
1120	21.88	12	100	5.98	2038	4	1.79	18.61	50.3	"
1130	22.10	13	100	5.99	2051	5	1.84	18.63	49.7	"
1140	22.33	14	100	5.97	2054	5	1.91	18.69	49.9	"
1150	22.55	15	100	5.97	2067	5	1.95	18.77	49.7	"
1200	22.75	16	100	5.97	2066	3	2.00	18.74	49.1	"
1210	22.98	17	100	5.98	2050	3	2.01	18.56	49.1	"
1220	23.16	18	100	5.96	2053	4	1.99	18.80	47.8	"
1230	23.38	19	100	5.92	2038	4	2.05	18.70	49.2	"
1240	23.55	19.9	90	5.92	2039	4	1.99	18.90	49.1	
1250	23.68	20.8	90	5.95	2040	4	1.97	19.20	48.5	"
1300	23.80	21.7	90	6.00	2033	3	2.04	19.26	47.1	"
1310	23.91	22.6	90	6.00	2021	4	2.01	19.13	50.0	"
1320	24.02	23.5	90	5.99	2015	4	1.99	19.20	49.5	"

Water Quality Meter (SN) 01C0134
Control Box type (SN) NA
Turbidity Meter (SN) 4650 4300 LAMOTTE

Pump Intake

SIGNATURE(S): SJ Conti

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 1601
Sample Location: 12MWT16
Sampled By: T. ROJAHN
C.O.C. No.: 0092
Type of Sample:
[X] Low Concentration
[] High Concentration

CLEAR 9/12

8.00 -

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9/12/04								
Time: 1410								
Method: Peristaltic	Cloudy	6.05	0.616	15.52	512	4.79	54	---

9/11 READING

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9/11/04								
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.85								
Static Water Level (WL): 20.61								
One Casing Volume(gal/L): 3.9								
Start Purge (hrs): 1720								
End Purge (hrs): 1835								
Total Purge Time (min): 75								
Total Vol. Purged (gal/L) 8.7								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(1) ~~(2)~~ L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(1) ~~(2)~~ L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	YES
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 13GWT 1601 -F

Pump intake @ 26'

6.24 x 0.163 = 1.0 gal or 3.9 L

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT16
DATE: 9/11/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1720	20.61	0	—	—	—	—	—	—	—	Start Purge
1730	21.33	1200	120	6.31	0.596	15.7	5.73	16.34	62	CLEAR
1740	22.10	2400	120	6.09	0.467	21.4	4.52	15.87	63	CLEAR
1750	22.88	3600	120	6.12	0.440	67.2	4.34	15.81	58	V. Sl. Cloudy
1800	23.58	4800	120	6.19	0.462	152	4.40	15.86	55	Sl. Cloudy
1810	24.35	6000	120	6.26	0.503	245	4.65	15.80	52	CLOUDY
1820	24.99	7200	120	6.25	0.535	400	4.92	15.63	53	CLOUDY
1830	25.68	8200	100	6.05	0.616	512	4.79	15.52	54	CLOUDY
1835	DRY	8700	100	—	—	—	—	—	—	DRY

Water Quality Meter (SN) 0100134 A8
Control Box type (SN) 419
Turbidity Meter (SN) 4650 - 4300

Pump Intake 26' WELL will dry out
BASED on DEV. INFO.

SIGNATURE(S): [illegible]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE

Project No.: N6878

Sampled By: T. ROJAHN

Field Analyst: TR

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

Sample ID No.: 12GWT 1601

Sample Location: 12MWT 16

Duplicate: ☐

Blank: ☐

9/12 CLEAR

8.00 @ start 9/12
50.6 @ END

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 9/12/04								
Time: 1410	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	Cloudy	6.05	0.616	15.52	512	4.79	– (T4)	+~~16~~ 54 ← 9/11 Readings

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 650 MDS

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 2.5 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☑	1 to 12 ppm	K-7512	2.5

Analysis Time: 1422

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: 80 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	70
☑	50 to 500 ppm	K-9815	90
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1429

Filtered: ☐

Notes: Turbidity low @ time of Analysis

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 190 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-1910	
☑	100 to 1000 ppm	K-1920	190
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1440

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-8 90 Range: 0 - 3.00 mg/L

Program/Module: 500nm 33

Concentration: 0.63 ppm

Analysis Time: 1453

Filtered: ☑

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 1525

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 1601
Project No.:	N6878	Sample Location:	12MWT 16
Sampled By:	T. ROSAHL	Duplicate:	☐
Field Analyst:	JK	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-8 90 Range: 0 - 0.70 mg/L Concentration: 0.01 ppm

Program/Module: 610nm 93 Analysis Time: 1502 Filtered: ☑

Notes:

Nitrite (NO_2^--N): Concentration: 0.032 ppm

Equipment: DR-850 DR-8 90 Range: 0 - 0.350 mg/L Analysis Time: 1434 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes: Turb Low For Analysis

Manganese (Mn^{2+}): Concentration: 4.1 ppm

Equipment: DR-850 DR-8 90 Range: 0 - 20.0 mg/L Analysis Time: 1510 Filtered: ☑

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 1701 E-F
Sample Location: 12MWT 17
Sampled By: TERRY ROJAHN
C.O.C. No.: 0092
Type of Sample:
[X] Low Concentration
[] High Concentration

Turbidity changing Sl. Cloudy - Clear 327 to 42.6 ← 9/11

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9/11/04								
Time: 1010								
Method: SAME	Cloudy	5.43	1.212	19.24	226	6.05	+ 144	--- ← 9/10 Readings

PURGE DATA:

Date: 9/10/04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 27.70								
Static Water Level (WL): 22.58								
One Casing Volume(gal/L) 3.2								
Start Purge (hrs): 1345								
End Purge (hrs): 1433								
Total Purge Time (min): 58								
Total Vol. Purged (gal/L) 4.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(1) ~~(2)~~ L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(1) ~~(2)~~ L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	YES
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 13GWT 1701 -F

Pump intake @ _____

5.12' x 0.163 = 0.8 gal or 3.2 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT17
DATE: 9/10/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1345	22.58	0	–	–	–	–	–	–	–	START PURGE
1355	23.80	1200	120	5.98	0.958	48.3	6.82	17.86	103	CLEAR
1405	24.52	1900	70	5.91	0.921	153	6.65	18.80	117	SL CLOUDY
1415	25.26	2600	70	5.85	0.963	398	6.48	19.30	125	CLOUDY
1425	25.91	3300	70	5.80	1.059	479	6.31	19.40	129	CLOUDY
1435	26.85	4000	70	5.43	1.212	226	6.05	19.24	144	CLOUDY
1433	DRY	4450	–	–	–	–	–	–	–	END PURGE

Water Quality Meter (SN) 01C0134 AB
Control Box type (SN) 419
Turbidity Meter (SN) 4650 - 4300

Pump Intake 27' (WELL WILL DRY OUT) BASED ON DEV. INFO.

SIGNATURE(S): [illegible]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: T. ROJAHN
Field Analyst: T. ROJAHN
Field Form Checked as per QA/QC Checklist (initials): TRR

Sample ID No.: 12GWT 1701
Sample Location: 12MWT 17
Duplicate: ☐
Blank: 327- ☐

CLEAR - Cloudy V.S.I. 9/11
48.6 on 9/11

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	ORP (Eh) (+/- mv)
Date: 9/11/04								
Time: 1010								
Method: Peristaltic	Cloudy	5.43	1.212	19.24	226	6.05	NA	+144 ← 9/10 Reading:

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI MDS

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 4.75 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☑	1 to 12 ppm	K-7512	4.75

Analysis Time: 1013

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: 35 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	Green @ 35
☑	50 to 500 ppm	K-9815	Pink
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1055

Filtered: ☑

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 190 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-1910	
☑	100 to 1000 ppm	K-1920	190
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1024

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-8 90 Range: 0 - 3.00 mg/L
Program/Module: 500nm 33

Concentration: 0.33 ppm

Analysis Time: 1103

Filtered: ☑

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 1031

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 1701
Project No.:	N6878	Sample Location:	12MWT17
Sampled By:	T. ROJAHN	Duplicate:	☐
Field Analyst:	T. ROJAHN	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-8 96 Range: 0 - 0.70 mg/L Concentration: 0.00 ppm

Program/Module: 610nm 93 Analysis Time: 1112 Filtered: ☑

Notes:

Nitrite (NO_2^--N): Concentration: 0.006 ppm

Equipment: DR-850 DR-8 98 Range: 0 - 0.350 mg/L Analysis Time: 1035 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: Reagent Blank Correction: ☐

Notes: Turb. low @ time of Analysis

Manganese (Mn^{2+}): Concentration: 1.4 ppm

Equipment: DR-850 DR-8 90 Range: 0 - 20.0 mg/L Analysis Time: 1119 Filtered: ☑

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 1801
Sample Location: 12MWT 18
Sampled By: T. ROJAHN
C.O.C. No.: 0099
Type of Sample:
[X] Low Concentration
[] High Concentration

2.3 prior to Collecting Metals on 9/26

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9/26/04								
Time: 0839								
Method: SAME	CLEAR	4.95	2.472	17.00	15 9/25	2.38	+ 41.0	---

PURGE DATA:

Date: 9/25/04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: PERISTALTIC								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 28.00								
Static Water Level (WL): 21.53								
One Casing Volume (gal/L):								
Start Purge (hrs): 0900								
End Purge (hrs): 1138								
Total Purge Time (min): 158								
Total Vol. Purged (gal/L): 12.7								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

Pump intake @ 25' LOWERED Tubing

28.00
21.53
6.47
x 0.163
1941
3882
647
1.05461

1.05461
1.05941 or 4L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rojah

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT18
DATE: 9/25/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0900	21.53 ~~28.00 TOC~~	–	–	–	–	–	–	–	–	Start PURGE
0910	22.35	1200	120	5.40	2.391	4.4	3.05	17.40	40.1	CLEAR
0920	22.64	2200	100	5.51	2.310	4.4	2.78	17.45	37.6	CLEAR
0930	23.10	3200	100	5.86	2.050	5.0	2.60	17.48	32.0	CLEAR
0940	23.40	4100	90	5.94	1.989	4.4	2.36	17.98	28.4	CLEAR
0950	23.68	4900	80	5.91	2.070	3.2	2.17	18.12	26.9	CLEAR
1000	23.85	5500	60	5.78	2.155	2.9	2.01	18.18	27.2	CLEAR
1010	24.20	6300	80	5.61	2.244	2.5	2.00	18.03	25.5	CLEAR
1020	24.49	7100	80	5.46	2.310	2.8	1.98	18.01	27.6	CLEAR
1030	24.80	7800	70	5.34	2.372	4.5	1.96	18.27	29.1	CLEAR
1040	24.95	8500	70	5.23	2.440	7.6	1.88	18.87	30.0	CLEAR (Lowered tubing)
1050	25.16	9100	60	5.21	2.468	7.0	1.94	18.72	30.5	CLEAR
1100	25.37	9700	60	5.15	2.498	7.3	1.96	18.85	32.2	CLEAR
1110	25.56	10300	60	5.04	2.550	7.3	1.90	19.22	34.9	CLEAR
1112	Increased flow to dry out well — water level & water quality parameters not stabilizing									
1120	26.15	11500	120	5.12	2.460	14	2.36	17.19	38.9	CLEAR
1130	27.09	12700	120	4.95	2.472	15	2.38	17.00	41.0	CLEAR
1138	–	–	–	–	–	–	–	–	–	DRY

Water Quality Meter (SN): 01C0134 AB
Control Box type (SN): 419
Turbidity Meter (SN): 1760-1800

Pump Intake: 25' started @ Lowered Tubing due to drawdown.

SIGNATURE(S): [signature]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 1901
Sample Location: 12MWT 19
Sampled By: Goerdt
C.O.C. No.: 0099
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9-25-04								
Time: ~~1010~~ 1010								
Method: Peristaltic	clear	5.54	2.404	18.01	7.6	8.99	329.7	---

PURGE DATA: 9-26-04

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9-29-04								
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 29.20								
Static Water Level (WL): 26.08								
One Casing Volume(gal/L): 1.93								
Start Purge (hrs): 1111								
End Purge (hrs): 1224								
Total Purge Time (min): 73								
Total Vol. Purged (gal/L): 5.65								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	No
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 13GWT_____-F

Pump intake @ 29.20

9/25/04 WL = 26.05

29.20
26.08
3.12(.163) = .51 gal
= 1.93 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MW19
DATE: 9-24-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (~~mL/Min.~~)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1111	26.08	—	—	—	—	—	—	—	—	Start purge
1121	26.57	.80	80	5.66	2.087	450	7.72	20.41	251.5	cloudy
1131	27.13	1.60	80	5.58	2.026	100	7.89	18.95	276.0	Sl. cloudy
1141	27.62	2.40	80	5.55	2.096	70	8.20	18.54	297.7	clear
1151	27.95	3.20	80	5.53	2.224	50	8.51	18.99	311.5	"
1201	28.20	3.80	60	5.59	2.331	33	8.78	19.65	318.2	"
1211	28.39	4.55	75	5.60	2.394	18	8.78	19.40	322.5	increased pump
1221	28.75	5.65	110	5.54	2.404	19.0	8.99	18.01	329.7	flow since unable
1224	Well Dry				(end purge)					to get stab. w/ WL.

Water Quality Meter (SN) 99K0055
Control Box type (SN) NA
Turbidity Meter (SN) 4650 4300

Pump Intake 29.20'

SIGNATURE(S): [illegible]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: Goerdt
Field Analyst: Goerdt
Field Form Checked as per QA/QC Checklist (initials): TK

Sample ID No.: 12GWT 1901
Sample Location: 12MWT 19
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

Date: 9/25/04	Color	pH	S.C.	Temp.	Turbidity 9/25/04	DO	Salinity	ORP (Eh)
Time: 1010	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU) 9/25	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	Clear	5.54	2.404	18.01	7.6 9/25	8.99	—	329.7

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 65m DS

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 4.0 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☑	1 to 12 ppm	K-7512	4.0

Analysis Time: 1020

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: 67 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-9810	
☑	50 to 500 ppm	K-9815	67
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1027

Filtered: ☐

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 51 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-1910	51
☐	100 to 1000 ppm	K-1920	
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1031

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-890 Range: 0 - 3.00 mg/L
Program/Module: 500nm 33

Concentration: 0.19 ppm

Analysis Time: 1045

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other: _____

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 1039

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 1901
Project No.:	N6878	Sample Location:	12MWT 19
Sampled By:	[illegible]	Duplicate:	☐
Field Analyst:	[illegible]	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-890 Range: 0 - 0.70 mg/L Concentration: 0.16 ppm

Program/Module: 610nm 93 Analysis Time: 1056 Filtered: ☐

Notes:

Nitrite (NO_2^--N): Concentration: 0.004 ppm

Equipment: DR-850 DR-890 Range: 0 - 0.350 mg/L Analysis Time: 1038 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}): Concentration: 1.9 ppm

Equipment: DR-850 DR-890 Range: 0 - 20.0 mg/L Analysis Time: 1103 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 20 01
Sample Location: 12MWT 20
Sampled By: SJC
C.O.C. No.: 0101
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9/27/04								
Time: 1600								
Method: PERISTALTIC	CLEAR	5.35	2095	18.40	1	2.5	89.5	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9/27/04								
Method: PERISTALTIC								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 27.85								
Static Water Level (WL): 23.90								
One Casing Volume(gal/L): 7 GAL / 2.5 L								
Start Purge (hrs): 1440								
End Purge (hrs): 1600								
Total Purge Time (min): 80								
Total Vol. Purged (gal/L) 7.3								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	~~(1)~~ L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	~~(2)~~ 40ml Vials	NO
		6 TOTAL CONTAINERS	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

Pump intake @ ≈ 1' FROM BOTM

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): SJ Conti

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

24.2

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878

WELL ID.: 12MWT20
DATE: 9-27-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (~~mL/Min~~ L)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1440	23.90	—	—	—	—	—	—	—	—	INITIAL START
1450	24.02	1	~100	5.71	3328	16	1.73	18.82	62.8	CLEAR
1500	24.06	1.9	90	5.48	29.34	9	2.05	18.60	80.4	"
1510	24.08	2.8	90	5.60	2127	3	2.51	18.60	81.4	"
1520	24.09	3.7	90	5.55	1970	1	2.65	18.40	83.7	"
1530	24.10	4.6	90	5.51	1979	1	2.78	18.23	84.7	"
1540	24.11	5.5	90	5.45	2047	1	2.64	18.52	86.1	"
1550	24.11	6.4	90	5.39	2087	1	2.58	18.34	88.1	"
1600	24.12	7.3	90	5.35	2095	1	250	18.40	89.5	"
	SAMPLE @ 1600 HRS									
1640	24.18	DURING SAMPLING								

Water Quality Meter (SN) 0100134
Control Box type (SN) NA
Turbidity Meter (SN) 3592 3502 LAMOTTE

Pump Intake ≈ 1' FROM BOTM

SIGNATURE(S): SJ Conta

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 2101
Sample Location: 12MWT 21
Sampled By: Goodt
C.O.C. No.: 0103
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 10-9-04	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1034								
Method: Peristaltic	Clear	3.44	.419	15.64	6.94	0.35	293.6	--

PURGE DATA:

Date: 10-9-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.62								
Static Water Level (WL): 21.30								
One Casing Volume(gal/L): 2.6								
Start Purge (hrs): 0831								
End Purge (hrs): 1031								
Total Purge Time (min): 120								
Total Vol. Purged (gal/L): 10.8								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 13GWT_____-F

Pump intake @ 26.5'

26.62
21.30
5.32 (.163) = 0.69 gal
= 2.6 L

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 7448

WELL ID.: 12MWT21
DATE: 10-9-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (~~mL/Min.~~)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0831	21.30	–	–	–	–	–	–	–	–	Start purge
0841	21.61	0.9	90	3.12	.476	–	1.38	16.28	361.2	brown
0851	21.74	1.8	90	3.08	.479	–	0.95	15.73	305.6	cloudy
0901	21.99	2.7	90	3.11	.476	24.7	0.69	15.58	294.9	clear
0911	22.17	3.6	90	3.15	.476	–	0.57	15.64	287.1	"
0921	22.29	4.5	90	3.19	.472	–	0.52	15.71	287.5	"
0931	22.38	5.4	90	3.27	.468	25.8	0.46	15.83	289.6	"
0941	22.50	6.3	90	3.29	.461	–	0.44	15.77	283.0	"
0951	22.54	7.2	90	3.31	.450	16.0	0.42	15.75	289.1	"
1001	22.56	8.1	90	3.37	.444	–	0.39	15.72	301.2	"
1011	22.58	9.0	90	3.40	.430	–	0.37	15.70	300.9	"
1021	22.59	9.9	90	3.41	.426	8.98	0.37	15.70	294.4	"
1031	22.60	10.8	90	3.44	.419	6.94	0.35	15.64	293.6	Stop purge

Water Quality Meter (SN) 99K0055
Control Box type (SN) NA
Turbidity Meter (SN) 4650 4300

Pump Intake 26.5'

SIGNATURE(S): [illegible]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: Goerdt
Field Analyst: Goerdt
Field Form Checked as per QA/QC Checklist (initials): TC

Sample ID No.: 12GWT 2101
Sample Location: 12MWT 21
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

Date: 10-9-04	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Time: 1034	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	Clear	3.44	.419	15.64	6.94	0.35	–	293.6

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: 451 650

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 0.9 ppm

Range Used:	Range	Method	Concentration ppm
☑	0 to 1 ppm	K-7510	0.9
☐	1 to 12 ppm	K-7512	

Analysis Time: 1102

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: < 10 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	pink
☐	50 to 500 ppm	K-9815	
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1107

Filtered: ☐

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 135 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-1910	
☑	100 to 1000 ppm	K-1920	135
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1118

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-8 __ Range: 0 - 3.00 mg/L

Program/Module: 500nm 33

Concentration: >3.30 ppm

Analysis Time: 1126

Notes:

Filtered: ☐

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other: _____

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 1124

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 2101
Project No.:	N6878	Sample Location:	12MWT 21
Sampled By:	Goerdt	Duplicate:	☐
Field Analyst:	Goerdt	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-8 __ Range: 0 - 0.70 mg/L Concentration: 0.02 ppm

Program/Module: 610nm 93 Analysis Time: 1139 Filtered: ☐

Notes:

Nitrite (NO_2^--N):

Concentration: 0.0 ppm

Equipment: DR-850 DR-8 __ Range: 0 - 0.350 mg/L Analysis Time: 1115 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}):

Concentration: 2.5 ppm

Equipment: DR-850 DR-8 __ Range: 0 - 20.0 mg/L Analysis Time: 1133 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 2201
Sample Location: 12MWT 22
Sampled By: Goerdt
C.O.C. No.: 0103
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA: 10/10/04

Date: 10-10-04	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 0840								
Method: Peristaltic	Clear	5.27	.448	15.13	7.79	6.02	365.3	--

PURGE DATA:

Date: 10-9-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.70								
Static Water Level (WL): 16.67								
One Casing Volume(gal/L): 6.0								
Start Purge (hrs): 1250								
End Purge (hrs): 1553								
Total Purge Time (min): 183								
Total Vol. Purged (gal/L): 21.7								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	No
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 13GWT_____-F

Pump intake @ 26'

Turbidity 10/10/04 7.79

WL 10/10/04 17.71

26.70
16.67
10.03 (.163) = 1.63 gal
= 6.0 L

Pumping Rate 100 ml/min

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 7448

WELL ID.: 12MWT22
DATE: 10-9-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (~~mL/Min.~~)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1250	16.67	–	–	–	–	–	–	–	–	Start purge
1300	17.41	0.90	90	5.15	.594	–	4.51	17.16	382.1	–
1310	17.94	1.8	90	5.27	.473	–	5.87	16.89	381.4	–
1320	18.12	2.7	90	5.49	.408	–	6.59	16.33	377.6	–
1330	18.36	3.6	90	5.61	.380	11.01	6.42	16.31	371.4	clear
1340	18.75	4.5	90	5.80	.319	4.81	6.31	16.27	364.3	clear
1350	19.12	5.4	90	5.81	.311	–	6.28	16.24	362.1	"
1400	19.41	6.3	90	5.82	.307	–	6.21	16.23	359.7	"
1410	19.67	7.2	90	5.82	.308	–	6.19	16.28	357.9	"
1420	19.98	8.1	90	5.82	.310	6.04	6.17	16.35	357.2	"
1430	20.31	9.0	90	5.81	.310	–	6.13	16.36	356.9	"
1440	20.55	9.9	90	5.82	.311	17.5	6.10	16.38	356.7	"
1450	20.83	10.8	90	5.81	.311	–	6.05	16.42	355.8	"
1500	21.17	11.7	90	5.83	.314	–	5.99	16.45	355.2	"
1510	21.82	13.7	200	5.77	.303	54.4	6.00	15.68	354.8	WL not stabilizing.
1520	–	15.7	200	–	–	–	–	–	–	Pump rate increased
1530	–	17.7	200	–	–	–	–	–	–	to draw water down.
1540	24.65	19.7	200	5.34	.399	96.2	6.09	15.44	365.6	sl. cloudy
1550	26.10	21.7	200	5.27	.448	234	6.02	15.13	365.3	cloudy
1553			Well Dry							Stop Purge

Water Quality Meter (SN) 99K0055
Control Box type (SN) NA
Turbidity Meter (SN) 4650 4300

Pump Intake 26'

SIGNATURE(S): [signature]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: Goerdt
Field Analyst: Goerdt
Field Form Checked as per QA/QC Checklist (initials): TK

Sample ID No.: 12GWT 2201
Sample Location: 12MWT 22
Duplicate: ☐
Blank: ☐

SAMPLING DATA: 10/10/04

Date: 10-10-04	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Time: 0840	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	Clear	5.27	.448	15.13	7.79	6.02	—	365.3

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)
Electrode Make & Model: 451 650
Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:
Equipment: Chemetrics Test Kit
Concentration: 5.0 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☑	1 to 12 ppm	K-7512	5.0

Analysis Time: 0902

Notes:

Alkalinity:
Equipment: Chemetrics Test Kit
Concentration: <10 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	<10
☐	50 to 500 ppm	K-9815	
☐	100 to 1000 ppm	K-9820	

Analysis Time: 0911
Filtered: ☐

Notes:

Carbon Dioxide:
Equipment: Chemetrics Test Kit
Concentration: 30 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-1910	30
☐	100 to 1000 ppm	K-1920	
☐	250 to 2500 ppm	K-1925	

Analysis Time: 0907

Notes:

Ferrous Iron (Fe^{2+}):
Equipment: DR-850 DR-8 __ Range: 0 - 3.00 mg/L
Program/Module: 500nm 33
Concentration: 0.03 ppm
Analysis Time: 0945
Filtered: ☐
Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L
Equipment: HS-C Other: _____
Exceeded 5.0 mg/L range on color chart: ☐
Concentration: 0.0 ppm
Analysis Time: 0930
Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT2201
Project No.:	N6878	Sample Location:	12MWT 22
Sampled By:	Goedt	Duplicate:	☐
Field Analyst:	Goedt	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-8 _ _ Range: 0 - 0.70 mg/L Concentration: 0.03 ppm

Program/Module: 610nm 93 Analysis Time: 0951 Filtered: ☐

Notes:

Nitrite (NO_2^--N): Concentration: 0.003 ppm

Equipment: DR-850 DR-8 _ _ Range: 0 - 0.350 mg/L Analysis Time: 0915 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}): Concentration: 0.2 ppm

Equipment: DR-850 DR-8 _ _ Range: 0 - 20.0 mg/L Analysis Time: 0921 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT2301
Sample Location: 12MWT23
Sampled By: T. ROJAHN
C.O.C. No.: 0089
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9/10/04	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 0840	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: SAME	CLOUDY	2.94	6.359	18.14	218	5.08	301	---

PURGE DATA: 8.24 on 9/10

Date: 9/9/04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): -								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 32.48								
Static Water Level (WL): 27.45								
One Casing Volume(gal/L): 3.1								
Start Purge (hrs): 0927								
End Purge (hrs): 1119								
Total Purge Time (min): 112								
Total Vol. Purged (gal/L): 9.6								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 ~~(2)~~ L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	1 ~~(2)~~ L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

Pump intake @ 30'

5.03' x 0.163 = 0.821 or 3.1 L

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT23
DATE: 9/9/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0927	27.45	0	-	-	-	-	-	-	-	START PURGE
0937	28.11	1100	110	4.03	6.045	7.61	7.32	16.83	+250	CLEAR
0947	28.30	1700	60	3.90	5.958	4.15	7.12	17.22	252	CLEAR
0957	28.66	2400	70	4.00	5.970	5.17	6.78	17.20	234	CLEAR
1007	28.96	3100	70	4.13	6.006	12.80	6.12	17.11	213	CLEAR
1017	29.26	3800	70	4.04	6.056	21.40	5.27	17.23	216	CLEAR
1027	29.55	4400	60	3.95	6.111	28.4	5.47	17.61	221	CLEAR
1037	29.77	4900	50	3.92	6.116	20.2	5.60	17.64	221	CLEAR
1040	—	—	LOWER INTAKE & INCREASE PUMP RATE						—	—
1047	30.24	5900	100	3.42	6.060	179	6.09	16.59	282	CLOUDY
1057	31.14	7400	150	3.38	6.086	71.0	5.89	16.87	278	V. SL. CLOUDY
1107	31.71	8700	130	3.08	6.233	38.8	5.74	17.43	287	CLEAR
1117	32.40	9600	90	2.94	6.359	218	5.08	18.14	301	CLOUDY
1119	DRY	—	—	—	—	—	—	—	—	DRY

Water Quality Meter (SN) 01C0134 AB
Control Box type (SN) 419
Turbidity Meter (SN) 4650 - 4300

Pump Intake 30'

SIGNATURE(S): Tony [illegible]

PAGE 2 OF 2

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE

Project No.: N6878

Sampled By: T. ROJAHN

Field Analyst:

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

Sample ID No.: 12GWT 2301

Sample Location: 12MWT 23

Duplicate: ☐

Blank: ☐

9/10 CLEAR

8.24 FOR METALS ON 9/10

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 9/10/04								
Time: 0840	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	CLOUDY	2.94	6.359	18.14	218	5.08	—	+ 301

PURGE VALUES 9/9

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 650 MDS

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 4.5 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☑	1 to 12 ppm	K-7512	

Analysis Time: 0841

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: < 10 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	ORANGISH
☑	50 to 500 ppm	K-9815	ORANGISH
☐	100 to 1000 ppm	K-9820	

Analysis Time: 0900

Filtered: ☐

Notes: SAMPLE COLOR AFTER ACTIVATOR SOL. WAS ADDED WAS ORANGISH NOT PINK.

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 800 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-1910	
☑	100 to 1000 ppm	K-1920	800
☐	250 to 2500 ppm	K-1925	

Analysis Time: 0907

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-8 __ Range: 0 - 3.00 mg/L

Program/Module: 500nm 33

Concentration: >3.30 ppm

Analysis Time: 0916

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other: _____

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 0936

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT
Project No.:	N6878	Sample Location:	12MWT
Sampled By:	T. ROJAHN	Duplicate:	☐
Field Analyst:	T. ROJAHN	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-8 _ _ Range: 0 - 0.70 mg/L Concentration: 0.03 ppm

Program/Module: 610nm 93 Analysis Time: 0933 Filtered: ☐

Notes:

Nitrite (NO_2^--N): Concentration: 0.063 ppm

Equipment: DR-850 DR-8 _ _ Range: 0 - 0.350 mg/L Analysis Time: 0902 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}): Concentration: >22.0 ppm

Equipment: DR-850 DR-8 _ _ Range: 0 - 20.0 mg/L Analysis Time: 0922 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 24A01
Sample Location: 12MWT 24A
Sampled By: Goerdt
C.O.C. No.: 0098
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-23-04	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1648								
Method: Bladder	Clear	3.13	6.861	18.02	2.3	11.75	214.7	---

PURGE DATA:

Date: 9-23-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Bladder								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 56.55								
Static Water Level (WL): 35.44								
One Casing Volume(gal/L): 13								
Start Purge (hrs): 1245								
End Purge (hrs): 1645								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 18.0								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	No
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT_____-F

Pump intake @ 50'

56.55
35.44
21.11 (.163) = 3.44 gal
= 13 L

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT24A
DATE: 9-23-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(ml/Min.)~~	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (~~Volume~~ & Color)
1245	35.44	–	–	–	–	–	–	–	–	Start purge
1255	34.91	.75	75	3.40	6.798	–	2.59	20.23	208.4	water just coming
1305	35.79	1.50	75	3.21	6.704	60	2.01	18.65	187.0	very slightly cloudy
1315	36.65	2.25	75	3.14	6.713	50	1.97	18.25	157.8	clear
1325	37.10	3.00	75	3.14	6.785	–	2.44	18.53	151.4	–
1335	37.61	3.75	75	3.16	6.846	34	2.27	19.07	160.5	clear
1345	37.93	4.50	75	3.18	6.855	–	2.38	19.21	182.7	
1355	38.24	5.25	75	3.26	6.856	–	2.65	~~19~~ 19.17	191.0	
1405	38.51	6.00	75	3.23	6.830	21	3.00	19.21	208.7	
1415	38.72	6.75	75	3.24	6.828	10	2.96	19.24	227.1	
1425	38.93	7.50	75	3.20	6.873	8.6	3.39	19.26	232.6	
1435	39.12	8.25	75	3.17	6.867	7.4	3.38	19.25	240.2	
1445	39.32	9.00	75	3.15	6.827	–	3.66	18.80	239.3	
1455	39.51	9.75	75	3.14	6.817	–	4.13	18.62	236.6	
1505	39.66	10.50	75	3.13	6.790	–	3.86	18.17	232.3	
1515	39.86	11.25	75	3.14	6.791	5.3	4.12	18.18	231.8	
1525	40.01	12.00	75	3.16	6.819	–	4.81	18.28	233.3	
1535	40.19	12.75		3.14	6.830	–	5.12	18.14	229.7	
1545	40.32	13.50		3.14	6.837	–	5.80	18.07	226.1	
1555	40.45			3.17	6.797	4.4	6.73	17.64	221.0	
1605	40.37			3.28	7.074	3.7	7.21	18.61	216.7	
1615	40.28			3.31	7.125	–	8.66	19.62	212.9	
1625	40.57			3.24	7.166	–	10.45	20.03	215.5	
1635	40.63			3.08	6.882	2.8	12.08	17.74	215.8	
1645	40.87	18.00		3.13	6.861	2.3	11.75	18.02	214.7	Stop purge

Water Quality Meter (SN) 99K0055
Control Box type (SN)
Turbidity Meter (SN) 4650 4300

Pump Intake 50'

SIGNATURE(S): [signature]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: Goerdt
Field Analyst: Goerdt
Field Form Checked as per QA/QC Checklist (initials): TK

Sample ID No.: 12GWT 24 A01
Sample Location: 12MWT 24
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

Date: 9-23-04	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Time: 1648	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Bladder Pump	clear	3.13	6.861	18.02	2.3	11.75	—	214.7

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI MDS C5

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 2.5 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☑	1 to 12 ppm	K-7512	2.5

Analysis Time: 1707

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: ~~>1000~~ <10 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	Pink
☑	50 to 500 ppm	K-9815	Pink
☑	100 to 1000 ppm	K-9820	~~>1000~~ Pink

Analysis Time: 1657

Filtered: ☐

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 2300 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-1910	Pink
☑	100 to 1000 ppm	K-1920	Pink
☑	250 to 2500 ppm	K-1925	2300

Analysis Time: 1715

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-890 Range: 0 - 3.00 mg/L

Program/Module: 500nm 33

Concentration: >3.30 ppm

Analysis Time: 1724

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.1 ppm

Analysis Time: 1742

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 24A01
Project No.:	N6878	Sample Location:	12MWT 24
Sampled By:	Goerdt	Duplicate:	☐
Field Analyst:	Goerdt	Blank:	☐

Sulfide (S^{2-}):

Equipment: (DR-850) DR-8 90 Range: 0 - 0.70 mg/L Concentration: 0.02 ppm

Program/Module: 610nm 93 Analysis Time: 1749 Filtered: ☐

Notes:

Nitrite (NO_2^--N): Concentration: 0.028 ppm

Equipment: (DR-850) DR-8 90 Range: 0 - 0.350 mg/L Analysis Time: 1700 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}): Concentration: >22.0 ppm

Equipment: (DR-850) DR-8 90 Range: 0 - 20.0 mg/L Analysis Time: 1733 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT2501
Sample Location: 12MWT25
Sampled By: SJC
C.O.C. No.: 0103
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 10/10/04	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 0830								
Method: PERISTALTIC	CLEAR	5.92	2265	16.35	3	1.72	46.4	---

PURGE DATA:

Date: 10-9-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: PERISTALTIC								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" Φ			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 27.90								
Static Water Level (WL): 17.85								
One Casing Volume(gal/L): 6.2								
Start Purge (hrs): 1430								
End Purge (hrs): 1630								
Total Purge Time (min): 120								
Total Vol. Purged (gal/L): 18.1	WENT DRY.							

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	
		6 TOTAL	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] ~~12GWT~~ ~~F~~

Pump intake @ ~ 1 OFF BOTTOM.

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): SJ Conti

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE TD 27.90
PROJECT NUMBER: N76878

WELL ID.: 12MWT25
DATE: 10-9-04

	Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~ L	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
	1430	17.85	—	—	—	—	—	—	—	—	—
1HR	1440	18.70	1.1	~100	5.87	2262	8.4	2.49	17.15	66	CLEAR 110 mL/min
	1450	19.30	2.2	110	5.89	2253	4.4	2.52	17.13	65.3	"
	1500	19.80	3.3	"	5.91	2216	2.3	2.74	17.14	62	"
	1510	20.35	4.4	"	5.91	2173	2.3	2.90	17.23	57.6	"
	1520	21.10	5.5	"	5.92	2164	2	3.01	17.18	55.4	"
	1530	21.60	6.6	"	5.93	2189	2	2.96	17.14	53.2	"
2HR	1540	22.25	8.1	~150	5.93	2211	2	2.82	17.01	51.4	"
	1550	23.10	10.1	200	5.95	2231	3	2.67	16.72	49.3	"
	1600	24.20	12.1	200	5.94	2246	3	2.36	16.47	48.1	"
	1610	25.40	14.1	200	5.93	2262	3	2.08	16.41	47.2	"
	1620	26.40	16.1	200	5.98	2270	3	1.92	16.43	46.1	"
	1630	27.41	18.1	200	5.92	2265	3	1.72	16.35	46.4	"

WENT DRY @ 1630 WILL SAMPLE ON SUNDAY

WL 24.85 ON 10/10/04

Water Quality Meter (SN) 0100134
Control Box type (SN) —
Turbidity Meter (SN) 3502

Pump Intake ≈ 1' OFF BOTM

SIGNATURE(S): SJ Conte

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT2601
Sample Location: 12MWT 26
Sampled By: T. ROJAHN
C.O.C. No.: 0099
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9/26/04								
Time: 1425								
Method: SAME	CLEAR	7.22	1.488	17.98	13.3	3.38	+38.3	--

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9/26/04								
Method: Peristaltic								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.80								
Static Water Level (WL): 10.29								
One Casing Volume(gal/L): 10.2								
Start Purge (hrs): 1024								
End Purge (hrs): 1424								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 20.1								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	YES
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	YES

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 12GWT2601-F

Pump intake @ 21.8'

16.51 x 0.163 = 2.7 gal/ox 10.2 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
–	–

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT 26
DATE: 9/26/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1024	10.29	—	—	—	—	—	—	—	—	START PURGE
1034	11.65	1000	100	6.70	1.644	9.6	2.62	18.40	47.3	CLEAR
1044	13.00	2000	100	6.74	1.586	6.0	3.02	18.26	47.9	"
1054	13.61	3000	100	6.78	1.586	5.5	3.11	18.36	47.5	"
1104	14.40	4000	100	6.82	1.571	5.0	3.19	18.49	48.3	"
1114	15.23	5000	100	6.87	1.560	4.4	3.28	18.63	49.0	"
1124	16.02	6000	100	6.90	1.553	3.8	3.35	18.75	49.6	"
1134	16.62	7000	100	6.88	1.553	3.5	3.33	19.16	49.2	"
1144	17.02	7800	80	6.88	1.532	3.1	3.35	19.35	49.8	"
1154	17.23	8600	80	6.91	1.512	2.9	3.38	19.31	49.4	"
1204	17.45	9400	80	6.88	1.549	3.1	3.27	20.16	48.4	"
1214	17.68	10200	80	6.88	1.545	3.3	3.24	20.05	47.3	"
1224	17.92	11000	80	6.93	1.529	3.6	3.30	19.68	46.6	"
1234	18.12	11700	70	6.93	1.524	3.8	3.31	19.43	46.7	"
1244	18.46	12500	80	6.93	1.500	3.6	3.34	19.30	47.6	"
1254	18.68	13200	70	6.93	1.500	3.4	3.34	19.37	47.8	"
1304	18.92	13900	70	6.92	1.524	4.0	3.24	19.87	46.3	"
1314	19.19	14600	70	6.95	1.475	4.3	3.33	19.38	44.2	"
1324	19.39	15300	70	6.96	1.476	6.9	3.32	19.51	43.5	"
1334	19.65	16100	80	6.96	1.481	8.2	3.26	19.75	43.0	"
1344	19.86	16900	80	6.98	1.490	7.9	3.30	19.60	42.5	"
1354	20.06	17700	80	6.99	1.498	8.1	3.23	19.41	41.9	"
1404	20.33	18500	80	6.96	1.509	10.0	3.21	19.06	42.8	"
1414	20.63	19300	80	7.12	1.480	11.1	3.35	18.16	41.0	"
1424	20.98	20100	80	7.22	1.488	13.3	3.38	17.98	38.3	"
1425	—	—	—	—	—	—	—	—	—	START SAMPLING

Water Quality Meter (SN) 01C0134 AB
Control Box type (SN) 419
Turbidity Meter (SN) 3592-3502

Pump Intake 21.8'

SIGNATURE(S): [illegible]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: T. Rosahn
Field Analyst: TK
Field Form Checked as per QA/QC Checklist (initials): TK

Sample ID No.: 12GWT 2601
Sample Location: 12MWT 26
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 9/26/04								
Time: 1424	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	CLEAR	7.22	1.488	17.88	13.3	3.38	—	+38.3

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 650 MDS

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 4.2 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☑	1 to 12 ppm	K-7512	4.2

Analysis Time: 1441

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: 110 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-9810	
☑	50 to 500 ppm	K-9815	Green 110
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1449

Filtered: ☐

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 125 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-1910	
☑	100 to 1000 ppm	K-1920	125
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1455

Notes:

Ferrous Iron (Fe^{2+}):

~~1.43 INFLUENCED~~

Equipment: DR-850 DR-8 __ Range: 0 - 3.00 mg/L

Program/Module: 500nm 33

Concentration: 2.40 ppm

Analysis Time: ~~1503~~ 1530

Notes: Filtered sample Turb 30 NTUS @ this time

Filtered: ☑

Hydrogen Sulfide (H_2S):

Range: 0 - 5 mg/L

Equipment: HS-C Other:

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 1505

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 2601
Project No.:	N6878	Sample Location:	12MWT 26
Sampled By:	TERRY ROJAHN	Duplicate:	☐
Field Analyst:	TA	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-8 __ Range: 0 - 0.70 mg/L Concentration: 0.00 ppm

Program/Module: 610nm 93 Analysis Time: 1541 Filtered: ☑

Notes:

Nitrite (NO_2^--N):

Concentration: 0.006 ppm

Equipment: DR-850 DR-8 __ Range: 0 - 0.350 mg/L Analysis Time: 1456 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes: Analized early during sampling Turb. was low

Manganese (Mn^{2+}):

Concentration: 3.5 ppm

Equipment: DR-850 DR-8 __ Range: 0 - 20.0 mg/L Analysis Time: 1546 Filtered: ☑

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 2701
Sample Location: 12MWT 27
Sampled By: Goard
C.O.C. No.: 0099
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9-25-04								
Time: 1624								
Method: Peristaltic	Clear	6.21	.389	19.14	8.47	7.33	297.3	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9-25-04								
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 27.85								
Static Water Level (WL): 10.58								
One Casing Volume(gal/L): 10.4								
Start Purge (hrs): 1220								
End Purge (hrs): 1620								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 21.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	No
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 13GWT_____-F

Pump intake @ 22.5'

27.85
10.58
17.17 (.163) = 2.8 gal
= 10.36 L

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT27
DATE: 9-25-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (~~mL/Min.~~ L)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1220	10.58	—	—	—	—	—	—	—	—	Start purge
1230	11.70	.85	85	6.05	.362	13	7.45	20.11	255.6	Clear
1240	12.55	1.70	85	6.06	.370	9.7	7.20	21.36	267.9	"
1250	13.24	2.60	90	6.01	.374	—	7.24	21.80	284.7	"
1300	13.99	3.50	90	6.04	.377	10.12	7.28	22.19	299.4	"
1310	14.78	4.4		6.08	.375	—	7.24	22.30	300.9	
1320	15.44	5.3		6.16	.374	—	7.28	21.92	302.7	
1330	16.07	6.2		6.19	.371	—	7.24	22.17	303.1	
1340	16.52	7.1		6.18	.371	—	7.26	21.19	306.5	
1350	17.01	8.0		6.20	.370	5.96	7.24	21.12	307.2	
1400	17.72	8.9		6.18	.371	—	7.29	21.04	303.9	
1410	18.01	9.8		6.20	.375	—	7.17	21.46	301.5	
1420	18.28	10.7		6.21	.372	—	7.13	21.00	300.1	
1430	18.51	11.6		6.20	.374	—	7.14	21.12	298.4	
1440	18.84	12.5		6.22	.373	—	7.13	21.28	297.2	* But low
1450	19.04 ~~18.84~~	13.4		6.23	.372	6.90	7.10	21.12	297.2	in turb
1500	19.21	14.3		6.22	.370	—	6.98	21.07	296.7	meter
1510	19.50	15.2		6.23	.368	—	6.95	20.63	296.1	
1520	19.82	16.1		6.24	.361	—	6.91	20.19	295.6	
1530	19.97	17.0		6.22	.350	—	6.48	19.82	297.2	
1540	20.42	17.9		6.21	.352	—	6.44	20.04	297.2	
1550	20.86	18.8		6.21	.357	—	6.87	19.90	297.3	
1600	21.11	19.7		6.22	.359	8.75	7.07	19.64	297.5	
1610	21.48	20.6		6.20	.388	9.21	7.27	19.23	298.6	
1620	21.72	21.5		6.21	.389	8.47	7.33	19.14	297.3	end purge

Water Quality Meter (SN) 99K0055
Control Box type (SN) NA
Turbidity Meter (SN) 4650 43000

Pump Intake 22.5'

SIGNATURE(S): [illegible]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: Gould
Field Analyst: Gould
Field Form Checked as per QA/QC Checklist (initials): TK

Sample ID No.: 12GWT 2701
Sample Location: 12MWT 27
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 9-25-04								
Time: 1624	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	Clear	6.21	.389	19.14	8.47	7.33	—	297.3

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 65MDS

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 5 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☑	1 to 12 ppm	K-7512	5

Analysis Time: 1637

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: 85 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-9810	
☑	50 to 500 ppm	K-9815	85
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1642

Filtered: ☐

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 50 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-1910	50
☐	100 to 1000 ppm	K-1920	
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1647

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 (DR-890) Range: 0 - 3.00 mg/L
Program/Module: 500nm 33

Concentration: 0.03 ppm

Analysis Time: 1653

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 1654

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 2701
Project No.:	N6878	Sample Location:	12MWT 27
Sampled By:	Goerdt	Duplicate:	☐
Field Analyst:	Goerdt	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-890 Range: 0 - 0.70 mg/L Concentration: 0.05 ppm

Program/Module: 610nm 93 Analysis Time: 1702 Filtered: ☐

Notes:

Nitrite (NO_2^--N): Concentration: 0.0 ppm

Equipment: DR-850 DR-890 Range: 0 - 0.350 mg/L Analysis Time: 1648 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}): Concentration: 0.7 ppm

Equipment: DR-850 DR-890 Range: 0 - 20.0 mg/L Analysis Time: 1708 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT2801
Sample Location: 12MWT28
Sampled By: T. ROJAHN
C.O.C. No.: 0092
Type of Sample:
[X] Low Concentration
[] High Concentration

Prior to sampling Metals = 4.8

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9/13/04								
Time: 1333								
Method: Peristaltic	CLEAR	6.33	1.937	16.31	10.83	7.29	+75	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9/12/04								
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 27.80								
Static Water Level (WL): 12.34								
One Casing Volume(gal/L): 9.5								
Start Purge (hrs): 1542								
End Purge (hrs): 1942								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 19.8								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

Pump intake @ 22.8

15.46 x 0.163 = 2.5 gal or 9.5 L

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT28
DATE: 9/12/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1542	12.34	0	–	–	–	–	–	–	–	start PURGE
1552	14.00	1300	130	6.14	1.964	4.49	9.06	17.81	+38	CLEAR
1602	14.98	2100	80	5.94	1.881	3.92	8.63	18.30	105	CLEAR
1612	15.85	2900	80	5.93	1.886	2.08	8.34	18.82	102	CLEAR
1622	16.70	3700	80	5.92	2.971	14.2	7.00	18.08	105	CLEAR
1632	17.49	4500	80	5.74	2.637	2.83	5.33	18.14	106	CLEAR
1642	18.19	5300	80	5.89	2.118	1.72	5.60	17.81	106	CLEAR
1652	18.78	6100	80	5.95	1.802	0.88	5.95	17.55	104	CLEAR
1702	19.14	6900	80	5.94	1.777	1.06	7.26	17.70	105	CLEAR
1712	19.51	7800	90	5.91	1.783	0.62	7.40	17.80	106	CLEAR
1722	19.85	8600	80	5.94	1.796	1.28	7.29	17.41	105	CLEAR
1732	20.22	9400	80	6.07	1.775	2.65	7.10	17.26	100	CLEAR
1742	20.59	10200	80	6.19	1.775	3.84	7.11	17.58	97	CLEAR
1752	20.95	11000	80	6.26	1.775	6.80	7.20	17.06	96	CLEAR
1802	21.29	11800	80	6.33	1.813	7.58	7.30	17.06	93	CLEAR
1812	21.61	12600	80	6.41	1.857	8.35	7.33	17.06	90	CLEAR
1822	21.92	13400	80	6.48	1.880	7.68	7.17	17.52	88	CLEAR
1832	22.26	14200	80	6.56	1.862	7.97	7.25	16.69	86	CLEAR
1842	22.61	15000	80	6.61	1.861	9.72	7.27	16.57	84	CLEAR
1852	22.95	15800	80	6.65	1.874	8.35	7.23	16.61	82	CLEAR
1902	23.25	16600	80	6.67	1.870	9.51	7.20	16.56	81	CLEAR
1912	23.55	17400	80	6.50	1.896	11.1	7.23	16.81	78	CLEAR
1922	23.88	18200	80	6.42	1.925	14.3	7.20	16.67	77	CLEAR
1932	24.16	19000	80	6.36	1.921	12.4	7.27	16.33	76	CLEAR
1942	24.46	19800	80	6.33	1.937	10.83	7.29	16.31	75	CLEAR
			(Will let well recover & sample 9/13.)							
14:42	9/13	READING prior to collecting metals #				4.8				

Water Quality Meter (SN) 0100 134 AB
Control Box type (SN) 419
Turbidity Meter (SN) 4650-4300

Pump Intake 22.8' @ start
Lowered to complete purge.

SIGNATURE(S): Terry Rogil

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 2901
Sample Location: 12MWT 29
Sampled By: Goerdt
C.O.C. No.: 0101
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-28-04	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1258	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: Bladder	Clear	7.64	.871	15.67	28	3.71	207.3	---

PURGE DATA:

Date: 9-28-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Bladder								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 90.9								
Static Water Level (WL): 60.5								
One Casing Volume(gal/L) 18.3								
Start Purge (hrs): 0855								
End Purge (hrs): 1255								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L) 22.0								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT 2901 -F

Pump intake @ 80'

90.9
60.5
30.4 (.163) = 4.96 gal
= 18.33 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT 29
DATE: 9-28-07

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0855	60.05									Start purge
0905	60.14	-10	100	—	—	—	—	—	—	having initial
0915	60.31	2.0	100	—	—	—	—	—	—	trouble w/ pump.
0925	60.64	3.3	130	7.89	.940	902	5.87	17.58	190.4	Cloudy
0935	62.80	4.6	130	7.55	.879	—	4.35	15.65	219.1	"
0945	63.02	5.3	70	7.56	.877	—	4.27	15.59	223.7	"
0955	63.72	6.0	70	7.48	.879	—	3.88	15.63	237.5	"
1005	64.58	6.7	70	7.44	.882	580	3.89	15.70	244.8	"
1015	65.13	7.6	90	7.41	.884	—	3.81	15.77	252.7	"
1025	65.88	8.5	90	7.52	.880	—	3.74	15.67	253.0	"
1035	66.49	9.4	90	7.71	.873	—	3.75			"
1045	67.00	10.3	90	7.74	.869	—	3.74	15.51	237.8	"
1055	67.41	11.2	90	7.75	.869	440	3.74	15.51	221.1	
1105	67.82	12.1	90	7.74	.871	—	3.73	15.52	219.7	
1115	68.35	13.0	90	7.74	.871	—	3.69	15.61	211.8	
1125	68.95	13.9	90	7.69	.873	120	3.61	15.66	207.4	
1135	69.21	14.8		6.48	.878	—	3.59	15.71	206.1	
1145	69.87	15.7		5.27	.881	84	3.56	15.82	204.8	Clear
1155	70.31	16.6		3.54	.883	68	3.52	15.87	203.6	"
1205	70.65	17.5		7.62	.881	50	3.54	15.76	204.8	"
1215	70.96	18.4		7.61	.877	—	3.53	15.58	204.7	"
1225	71.33	19.3		7.62	.876	45	3.63	15.60	204.6	"
1235	71.67	20.2		7.62	.875	—	3.64	15.62	204.9	
1245	72.04	21.1		7.64	.873	25	3.69	15.64	205.2	
1255	72.58	22.0		7.64	.871	28	3.71	15.67	207.3	end purge

Water Quality Meter (SN) 99K0055
Control Box type (SN) MP101588
Turbidity Meter (SN) 4650 4300

Pump Intake 80'

SIGNATURE(S): [signature]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: Goerdt
Field Analyst: Goerdt
Field Form Checked as per QA/QC Checklist (initials): TR

Sample ID No.: 12GWT 2901
Sample Location: 12MWT 29
Duplicate: ☐
Blank: ☐

SAMPLING DATA: 9-28-04

Date: 9-28-04	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Time: 1258	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Bladder	Clear	7.64	.871	15.67	28	3.71	—	207.3

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: MDS 650 451

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 2.0 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☑	1 to 12 ppm	K-7512	2.0

Analysis Time: 1314

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: 125 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-9810	
☑	50 to 500 ppm	K-9815	125
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1348

Filtered: ☑

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: <10 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-1910	<10
☐	100 to 1000 ppm	K-1920	
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1318

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 (DR-890) Range: 0 - 3.00 mg/L

Program/Module: 500nm 33

Concentration: 0.00 ppm

Analysis Time: 1405

Filtered: ☑

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 1322

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 2901
Project No.:	N6878	Sample Location:	12MWT 29
Sampled By:	Goerdt	Duplicate:	☐
Field Analyst:	Goerdt	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-890 Range: 0 - 0.70 mg/L Concentration: 0.0 ppm

Program/Module: 610nm 93 Analysis Time: 1417 Filtered: ☑

Notes:

Nitrite (NO_2^--N): Concentration: 0.024 ppm

Equipment: DR-850 DR-890 Range: 0 - 0.350 mg/L Analysis Time: 1400 Filtered: ☑

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}): Concentration: 0.1 ppm

Equipment: DR-850 DR-890 Range: 0 - 20.0 mg/L Analysis Time: 1409 Filtered: ☑

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3001
Sample Location: 12MWT 30
Sampled By: Goerdt
C.O.C. No.: NA
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: NA								
Time: NA								
Method: NA	—	—	—	—	—	—	—	—

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9-22-04								
Method: Bailer								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 92.85								
Static Water Level (WL): 92.68								
One Casing Volume(gal/L): .10								
Start Purge (hrs): 0921								
End Purge (hrs): 0921								
Total Purge Time (min): NA								
Total Vol. Purged (gal/L): 0								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	~~Yes~~ No
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	~~Yes~~ No
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~ No
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	No
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	~~Yes~~ No
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

Pump intake @ NA

No samples collected. Well was dry 2 consecutive days.

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MW730
DATE: 9-22-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0921	92.68	–	–	–	–	–	–	–	–	Start purge
	None		purged							well is dry
	9-23-04		Well	Dry						

Water Quality Meter (SN) NA
Control Box type (SN) NA
Turbidity Meter (SN) NA

Pump Intake NA

SIGNATURE(S): [illegible]

Unable to collect any water via bailer.
TD = 92.85
WL = 92.68

PAGE 2 OF 2

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3001 (DRY)
Sample Location: 12MWT 30
Sampled By: T. Kojahn
C.O.C. No.: NA
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 10-30-04	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1440	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: Bailer	—	—	—	—	—	—	—	—

PURGE DATA:

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:			See Low Flow Purge Data Sheets					
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	~~Yes~~ NO
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	~~Yes~~
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	~~Yes~~
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] ~~13~~ 12GWT NA -F (T2)

Pump intake @ NA

(DRY)

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3101
Sample Location: 12MWT 31
Sampled By: Gorzat
C.O.C. No.: 0099E0100
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9-27-04								
Time: 1432								
Method: Bladder	Clear	7.05	.507	16.87	25	6.45	301.9	--

PURGE DATA:

Date: 9-27-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Bladder								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 91.25								
Static Water Level (WL): 70.25								
One Casing Volume(gal/L): 12.6								
Start Purge (hrs): 1029								
End Purge (hrs): 1429								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 22.4								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] ~~13~~ 12GWT 3101 -F

Pump intake @ 90'

91.25
70.25
21.00(.163)=3.4 gal
=12.6 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: Goerdt
Field Analyst: Goerdt
Field Form Checked as per QA/QC Checklist (initials): TK

Sample ID No.: 12GWT 3101
Sample Location: 12MWT 31
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 9-27-04								
Time: 1432	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Bladder	Clear	7.05	.507	16.87	25	6.45	-	301.9

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: 650 MDS 451
Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 4.0 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	<
☑	1 to 12 ppm	K-7512	4.0

Analysis Time: 1444

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: 275 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-9810	
☑	50 to 500 ppm	K-9815	275
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1526

Filtered: ☑

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: <10 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-1910	<10
☐	100 to 1000 ppm	K-1920	
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1446

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-890 Range: 0 - 3.00 mg/L
Program/Module: 500nm 33

Concentration: 0.01 ppm

Analysis Time: 1545

Filtered: ☑

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:
Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm
Analysis Time: 1451

Notes:

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12 MWT 31
DATE: 9-27-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1029	70.25	—	~~100~~	—	—	—	—	—	—	Start purge.
1039	70.59	1.0	100	7.74	.551	—	8.15	18.36	181.4	Sharing
1049	70.92	1.8	80	7.77	.539	—	7.88	17.93	178.2	turb meter.
1059	71.42	2.6	80	7.78	.527	—	7.53	17.74	172.4	clear
1109	71.92	3.4	80	7.82	.523	—	7.33	17.75	170.5	"
1119	72.30	4.2	80	7.78	.519	—	7.23	17.72	171.5	"
1129	72.73	5.0	80	7.76	.515	—	7.26	17.68	175.6	"
1139	73.14	5.8	80	7.73	.510	—	7.27	17.70	187.4	
1149	73.65	6.6	80	7.69	.508	—	7.26	17.76	188.6	
1159	74.05	7.4	80	7.68	.503	25	7.04	17.50	195.3	
1209	74.79	8.4	100	7.61	.501	—	6.93	17.35	200.4	
1219	75.18	9.4	100	7.58	.501	—	6.77	17.47	206.1	
1229	75.64	10.4	100	7.53	.498	24	6.48	17.42	213.5	
1239	75.18	11.4		7.42	.497	—	6.31	17.40	231.7	
1249	76.72	12.4		7.38	.498	—	6.12	17.38	236.3	
1259	77.03	13.4		7.29	.497	—	6.14	17.27	240.2	
1309	77.69	14.4		7.21	.498	—	6.18	17.22	259.4	
1319	78.47	15.4	100	7.18	.499	23	6.19	17.19	268.1	
1329	78.89	16.4		7.16	.500	—	6.27	17.07	274.7	
1339	79.19	17.4		7.14	.503	—	6.33	16.93	281.7	
1349	79.49	18.4		7.14	.503	—	6.48	16.87	291.5	
1359	80.27	19.4		7.12	.504	—	6.43	16.91	291.7	
1409	81.33	20.4		7.10	.504	—	6.49	16.93	292.3	
1419	81.97	21.4		7.03	.504	25	6.53	16.95	296.7	
1429	82.50	22.4		7.05	.507	25	6.45	16.87	301.9	end purge

Water Quality Meter (SN) 99K0055
Control Box type (SN) MP10 1588
Turbidity Meter (SN) 4650-4300

Pump Intake 90'

SIGNATURE(S): [illegible]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 3101
Project No.:	N6878	Sample Location:	12MWT 31
Sampled By:	Goerdt	Duplicate:	☐
Field Analyst:	Goerdt	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-890 Range: 0 - 0.70 mg/L Concentration: 0.02 ppm

Program/Module: 610nm 93 Analysis Time: 1538 Filtered: ☑

Notes:

Nitrite (NO_2^--N): Concentration: 0.023 ppm

Equipment: DR-850 DR-890 Range: 0 - 0.350 mg/L Analysis Time: 1540 Filtered: ☑

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}): Concentration: 0.0 ppm

Equipment: DR-850 DR-890 Range: 0 - 20.0 mg/L Analysis Time: 1550 Filtered: ☑

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☐

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3201
Sample Location: 12MWT 32
Sampled By: JG
C.O.C. No.: 0102
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9/28/04								
Time: 1834								
Method: Bladder	Cloudy	6.57	1.257	14.28	315	11.72	121.2	—

PURGE DATA:

Date: 9/28/04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Bladder								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 100.6'								
Static Water Level (WL): 86.15								
One Casing Volume(gal/L): 9.3								
Start Purge (hrs): 1432								
End Purge (hrs): 1832								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 14.7								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT 3201 -F

Pump intake @ 99'

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: Goerdt
Field Analyst: Goerdt
Field Form Checked as per QA/QC Checklist (initials): TR

Sample ID No.: 12GWT 3201
Sample Location: 12MWT 32
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 9-28-04								
Time: 1834	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Bladder	Cloudy	6.57	1.257	14.28	315	11.72	—	121.2

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 650 MDS

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 3.0 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☑	1 to 12 ppm	K-7512	3.0

Analysis Time: 1838

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: 175 ppm

Range Used:	Range	Method	Concentration ppm
☒	10 to 100 ppm	K-9810	
☑	50 to 500 ppm	K-9815	175
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1851

Filtered: ☑

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 27 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-1910	27
☐	100 to 1000 ppm	K-1920	
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1841

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 (DR-890) Range: 0 - 3.00 mg/L

Program/Module: 500nm 33

Concentration: 0.12 ppm

Analysis Time: 1856

Filtered: ☑

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 1845

Notes:

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT32
DATE: 9-28-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1432	86.15	–	–	–	–	–	–	–	–	Start purge
1442	86.20	1.0	100	7.40	1.344	–	12.21	21.11	152.6	cloudy
1452	86.54	2.0	100	7.17	1.290	500	9.73	17.89	187.0	"
1502	87.02	3.0	100	7.12	1.277	250	10.22	17.54	198.3	"
1512	87.39	3.5	50	7.16	1.289	–	10.29	17.21	197.1	"
1522	87.49	4.0	50	7.18	1.314	–	10.47	18.39	196.8	change air tank
1532	87.62	4.5	50	7.21	1.349	190	11.10	20.02	194.0	cloudy
1542	87.84	5.0	50	7.22	1.321	–	11.23	19.35	189.7	"
1552	87.96	5.5	50	7.21	1.307	–	11.07	19.07	189.7	"
1602	88.23	6.0	50	7.20	1.291	–	10.96	18.24	189.5	"
1612	88.49	6.5	50	7.20	1.273	140	10.82	17.91	189.6	sl. cloudy
1622	88.71	7.0	50	7.22	1.281	–	10.60	18.14	187.9	"
1632	~~89.3~~	7.5	50	7.22	1.276	–	11.03	17.89	186.7	"
1642	89.31	8.0	50	7.23	1.268	120	11.54	17.86	184.9	"
1652	89.63	8.5	50	7.19	1.240	–	11.23	17.15	186.6	"
1702	89.98	9.0	50	7.19	1.231	–	11.38	17.12	186.5	"
1712	90.26	9.5	50	7.12	1.207	112	11.42	16.81	175.9	"
1722	90.45	10.0	50	7.05	1.169	–	11.49	16.08	164.2	"
1732	90.87	10.5	50	7.02	1.170	–	11.62	15.80	139.7	"
1742	91.09	10.0	50	7.00	1.183	–	11.91	15.79	127.4	"
1752	91.37	11.5	50	6.89	1.211	207	12.21	15.78	119.6	"
1802	91.95	12.0	50	6.84	1.221	240	12.66	15.74	108.4	↑ flow
1812	92.50	12.5	50	6.73	1.239	–	11.88	14.79	116.6	cloudy
1822	93.02	13.6	110	6.68	1.241	340	11.76	14.60	119.5	"
1832	93.57	14.7	110	6.57	1.257	315	11.72	14.28	121.2	end purge

Water Quality Meter (SN) 99K 00 55
Control Box type (SN) MP10 1588
Turbidity Meter (SN) 4650-4302

Pump Intake 99'

SIGNATURE(S):

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 3201
Project No.:	N6878	Sample Location:	12MWT 32
Sampled By:	Goerdt	Duplicate:	☐
Field Analyst:	Goerdt	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-890 Range: 0 - 0.70 mg/L Concentration: 0.0 ppm

Program/Module: 610nm 93 Analysis Time: 1858 Filtered: ☑

Notes:

Nitrite (NO_2^--N):

Concentration: 0.026 ppm

Equipment: DR-850 DR-890 Range: 0 - 0.350 mg/L Analysis Time: ~~1906~~ 1926 Filtered: ☑

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}):

Concentration: 1.1 ppm

Equipment: DR-850 DR-890 Range: 0 - 20.0 mg/L Analysis Time: 1931 Filtered: ☑

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3301
Sample Location: 12MWT 33
Sampled By: Goeydt
C.O.C. No.: 0099
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9-26-04								
Time: 1235								
Method: Bladder	Clear	4.72	.646	15.89	2.6	2.35	187.3	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9-26-04								
Method: Bladder								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" PVC	See Low Flow Purge Data Sheets							
Total Well Depth (TD): 97.2								
Static Water Level (WL): 44.89								
One Casing Volume(gal/L): 31.4								
Start Purge (hrs): 0931								
End Purge (hrs): 1231								
Total Purge Time (min): 180								
Total Vol. Purged (gal/L): 34.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Dup.	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	No	No
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	Yes	Yes

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 13GWT_____-F

Pump intake @ 87'

97.20
44.89
52.31 (.163) = 8.5 gal
= 31.4 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
–	12FD0926 0401

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT33
DATE: 9-26-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0931	44.89	—	—	—	—	—	—	—	—	Start purge
0941	45.34	1.0	100	5.08	.678	—	5.45	17.27	202.4	—
0951	45.41	2.0	100	5.08	.657	—	5.16	16.87	196.2	—
1001	45.78	4.5	250	5.09	.648	—	4.34	15.47	185.6	—
1011	46.25	6.5	200	5.08	.643	35	4.40	15.36	185.1	Clear
1021	46.56	8.5	200	5.08	.640	25	3.95	15.33	183.2	"
1031	46.65	10.5		5.08	.642	—	3.61	15.39	175.8	
1041	46.73	12.5		5.09	.642	"	3.32	15.44	162.6	
1051	46.88	14.5		5.12	.641	—	3.04	15.34	155.3	
1101	46.76	16.5		5.12	.641	—	2.98	15.38	154.0	
1111	—	18.5		5.10	.642	—	2.86	15.40	153.6	
1121	—	20.5		5.09	.643	—	2.69	15.51	152.7	
1131	46.93	22.5		5.05	.643	7.3	2.58	15.46	150.3	
1141	46.91	24.5		5.04	.642	—	2.57	15.45	162.0	
1151	46.91	26.5		4.93	.642	—	2.53	15.47	168.7	
1201	46.92	28.5		4.88	.642	—	2.47	15.61	173.4	
1211	46.94	30.5		4.79	.643	—	2.42	15.72	179.2	
1221	46.94	32.5		4.75	.645	2.8	2.36	15.88	184.4	
1231	46.99	34.5		4.72	.646	2.6	2.35	15.89	187.3	End purge

Water Quality Meter (SN) 99K0055
Control Box type (SN)
Turbidity Meter (SN) 4650 4300

Pump Intake 87'

SIGNATURE(S):

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 3301
Project No.:	N6878	Sample Location:	12MWT 33
Sampled By:	Goerdt	Duplicate:	☑
Field Analyst:	Goerdt	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):			

SAMPLING DATA:

Date: 9-26-04	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Time: 1235	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: bladder	Clear	4.72	.646	15.89	2.6	2.35	—	187.3

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: 650 MDS

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 0.3/0.3 ppm

Range Used:	Range	Method	Concentration ppm
☑	0 to 1 ppm	K-7510	0.3/0.3
☐	1 to 12 ppm	K-7512	

Analysis Time: 1300/1304

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: <10/<10 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	<10/<10
☐	50 to 500 ppm	K-9815	
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1313/1317

Filtered: ☐

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 200/210 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-1910	
☑	100 to 1000 ppm	K-1920	200/210
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1419/1421

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-890 Range: 0 - 3.00 mg/L

Program/Module: 500nm 33

Concentration: 3.3/3.3 ppm

Analysis Time: 1427/1432

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0/0.0 ppm

Analysis Time: 1332/1338

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 3301
Project No.:	N6878	Sample Location:	12MWT 33
Sampled By:	Goerdt	Duplicate:	☑
Field Analyst:	Goerdt	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-890 Range: 0 - 0.70 mg/L Concentration: 0.05 / 0.05 ppm

Program/Module: 610nm 93 Analysis Time: 1440 / 1447 Filtered: ☐

Notes:

Nitrite (NO_2^--N):

Concentration: 0.0 / 0.0 ppm

Equipment: DR-850 DR-890 Range: 0 - 0.350 mg/L Analysis Time: 1307 / 1323 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}):

Concentration: 4.7 / 2.7 ppm

Equipment: DR-850 DR-890 Range: 0 - 20.0 mg/L Analysis Time: 1452 / 1453 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3401
Sample Location: 12MWT 34
Sampled By: T. ROJAHN
C.O.C. No.: 0132
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 10-30-04	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1330								
Method: BAILER	—	—	—	—	—	—	—	---

PURGE DATA:

Date: NA	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:			See Low Flow Purge Data Sheets					
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	~600ml (2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	(TL) ~~Yes~~ NO
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	(TL) ~~Yes~~
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	
10/30 Collected ~500ml			
10/31 DRY			
11/01 Collected ~100ml			

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] ~~13GWT~~ -F (TL)

Pump intake @ NA

At start ~6" of water in Bailer
Recharge ~3" every 15 min.

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ted Rojahn

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3401
Sample Location: 12MWT 34
Sampled By: Goerdt
C.O.C. No.: NA
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA: *

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: ~~9/23/04~~ QS								
Time: ~~0845~~ QS								
Method: ~~Bailer~~ QS	—	—	—	—	—	—	—	—

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 9-22-04								
Method: Bailer								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 90.40								
Static Water Level (WL): 88.79								
One Casing Volume(gal/L):								
Start Purge (hrs): 0956								
End Purge (hrs): 1005								
Total Purge Time (min): 9								
Total Vol. Purged (gal/L): 0.7								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330 9/23/04 0.11	4°C	(2) L Glass Amber	~~Yes~~ No
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	~~Yes~~ No
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~ No
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	No
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	~~Yes~~ No
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

Pump intake @ NA

Well is not producing water

Well was checked for 3 consecutive days and no water in well.

* No samples collected

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT34
DATE: 9-22-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (~~mL/Min.~~ L)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0956	88.35	–	–	–	–	–	–	–	–	Start purge
1005	Dry	.200	–	7.01	.979	>1000	2.58	18.45	330.7	Stop purge
										Dark orange w/
										very little
										sediment
	9-23-04		Well Dry							
	9-24-04		Well Dry							

Water Quality Meter (SN) 99K0055
Control Box type (SN) NA
Turbidity Meter (SN) NA

Pump Intake NA

SIGNATURE(S): [signature]

PAGE 2 OF 2

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Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3501
Sample Location: 12MWT 35
Sampled By: Gorzat
C.O.C. No.: 0098
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-22-04	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1556	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: Peristaltic	Clear	3.77	.206	~~15.64~~ 19.64	15	1.33	609.7	--

PURGE DATA:

Date: 9-22-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 28.65								
Static Water Level (WL): 12.44								
One Casing Volume(gal/L): 9.8								
Start Purge (hrs): 1153								
End Purge (hrs): 1553								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 23.2								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT 3501 -F

Pump intake @ 23.5'

28.65
12.44
16.21 (.163) = 2.65 gal
= 9.81 L

* Turbidity taken during sampling was 19 NTUs - filtered sample collected

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT35
DATE: 9-22-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~ L	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1153	12.44	—	—	—	—	—	—	—	—	Start purge
1203	13.69	1.0	100	4.13	.201	—	1.76	20.94	490.2	clear
1213	14.60	2.0	100	3.91	.199	9.6	1.50	21.06	519.6	"
1223	15.69	3.0	100	3.58	.186	—	1.16	20.19	549.7	"
1233	16.15	4.0	100	3.77	.190	5.6	1.31	21.21	556.0	"
1243	16.48	5.1	110	3.82	.190	—	1.35	21.41	561.0	"
1253	—	6.2	110	—	—	—	—	—	—	No readings taken
1303	16.93	7.2	100	3.87	.196	8.0	1.23	22.18	571.3	clear
1313	17.18	8.2	100	3.84	.202	7.6	1.19	22.32	580.1	"
1323	17.36	9.2	100	3.85	.206	6.8	1.19	22.23	582.9	"
1333	17.42	10.2	100	3.88	.204	6.3	1.13	22.18	591.7	"
1343	17.18	11.2	100	3.88	.216	—	1.26	21.97	582.7	pump stopped briefly
1353	17.63	12.2	100	3.58	.219	9.5	1.16	21.82	599.6	clear
1403	18.07	13.2	100	3.45	.227	—	1.19	20.98	607.4	"
1413	18.32	14.2	100	3.38	.220	8.2	1.18	21.46	611.9	"
1423	18.54	15.2	100	3.84	.233	—	1.17	21.15	608.5	"
1433	18.67	16.2	100	4.20	.232	7.5	1.17	20.70	598.5	"
1443	18.84	17.2	100	4.33	.233	7.2	1.18	21.06	587.4	"
1453	18.92	18.2	100	4.50	.239	6.5	1.18	22.09	575.3	"
1503	19.17	19.2		4.39	.227	—	1.18	21.32	587.2	"
1513	19.35	20.2		3.96	.222	7.4	1.19	19.94	593.4	"
1523	19.52	21.2		3.81	.216	7.8	1.21	19.91	597.1	"
1533	19.81	22.2		3.82	.209	10.9	1.27	19.87	598.2	"
1543	20.12	23.2		3.77	.206	15.0	1.33	19.64	609.7	"
1553										stop purge

Water Quality Meter (SN) 99K0055
Control Box type (SN) NA
Turbidity Meter (SN) 4650 4300

Pump Intake 23.5'

SIGNATURE(S): [signature]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3601
Sample Location: 12MWT 36
Sampled By: Goerdt
C.O.C. No.: 0099
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 9-24-04								
Time: 1538								
Method: Peristaltic	clear	6.02	.650	19.94	0.82	3.69	332.5	---

PURGE DATA:

Date: 9-24-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: 1538								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 27.56								
Static Water Level (WL): 13.18								
One Casing Volume(gal/L): 8.9								
Start Purge (hrs): 1323								
End Purge (hrs): 1533								
Total Purge Time (min): 130								
Total Vol. Purged (gal/L): 9.8								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 13GWT_____-F

Pump intake @ 22.5'

27.56
13.18
14.38 (.163) = 2.34 gal
= 8.87 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MW136
DATE: 9-24-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (~~mL/Min.~~)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (~~Volume~~ & Color)
1323	13.18	—	—	—	—	—	—	—	—	Start purge
1333	14.05	.75	75	5.99	.694	5.9	3.77	20.14	268.1	clear
1343	14.74	1.50	75	5.93	.649	2.1	3.55	19.65	285.3	"
1353	15.30	2.25	75	5.96	.645	—	3.58	19.66	297.0	"
1403	15.70	3.00	75	5.96	.647	—	3.49	19.77	303.4	"
1413	—	No	measurements				read	—	—	—
1423	16.28	4.50	75	5.98	.641	—	3.72	19.92	314.3	clear
1433	16.41	5.25	75	5.97	.642	—	3.77	19.98	319.5	"
1443	16.55	6.00	75	5.99	.646	0.95	3.88	20.16	321.6	"
1453	—	No	measurements			(at 12MW139)			—	—
1503	16.68	7.50	75	5.99	.654	0.73	3.85	2[illegible].34	329.3	clear
1513	16.69	8.25	75	5.98	.655	1.4	3.75	2[illegible]	331.9	"
1523	16.69	9.00	75	6.00	.653	0.70	3.65	2[illegible]	332.4	"
1533	16.69	9.75	75	6.02	.650	0.82	3.69	19.[illegible]	332.5	end purge

Water Quality Meter (SN) 99K0055
Control Box type (SN) NA
Turbidity Meter (SN) 4650 4300

Pump Intake 22.5

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3701
Sample Location: 12MWT 37
Sampled By: Gordon
C.O.C. No.: 0101
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: Sep 6 low	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: "								
Method: peristaltic	Clear	4.97	.586	20.85	8.7	6.87	381.7	---

PURGE DATA:

Date: 9-23-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC	See Low Flow Purge Data Sheets							
Total Well Depth (TD): 26.70								
Static Water Level (WL): 24.35								
One Casing Volume(gal/L) 1.5								
Start Purge (hrs): 1000								
End Purge (hrs): 1052								
Total Purge Time (min): 52								
Total Vol. Purged (gal/L) 4.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements			Collected
Explosives SW-846 8330	4°C	9/24, 9/25	1 (2) L Glass Amber	0920, 0945	Yes
Micellaneous Explosives SW-846 8330	4°C	9/26	1 (2) L Glass Amber	0815	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	9/27	(1) L HDPE	0910	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	9/28	(1) L HDPE	0854	Yes
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	9/25	(1) L HDPE	1520	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials			NO

SHIPPED 9/27

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT 3701 -F

Pump intake @ 26.5'

26.70
24.35
2.35(.163) = .38 gal
= 1.45 L

9/24/04 WL = 25.95 9/26/04 WL = 25.95
9/25/04 WL = 25.92

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT37
DATE: 9-23-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1000	24.35	–	–	–	–	–	–	–	–	Start purge
1005	24.54	–	–	5.58	.598	–	4.52	20.00	260.8	Sl. cloudy
1010	24.74	0.9	90	5.21	.565	110	6.06	18.97	288.7	"
1020	25.12	1.8	90	5.12	.572	20	6.53	19.49	318.3	clear
1030	25.52	2.7	90	5.08	.573	8.4	6.74	19.66	342.1	clear
1040	25.93	3.6	90	4.95	.571	8.4	6.71	19.57	363.5	"
1050	26.27	4.5	90	4.97	.586	8.7	6.87	20.85	381.7	"
1052		Well		Dry						Stop purge

Water Quality Meter (SN) 99K0055
Control Box type (SN) NA
Turbidity Meter (SN) 4650 4300

Pump Intake 90/~~27~~ 26.5'

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT38
Sample Location: 12MWT38
Sampled By: SJC
C.O.C. No.: 0103
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 10/9/04	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1300	(Visual)	(S. U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/L)	(mV)	NA
Method: PERISTALTIC	CLEAR	4.20	607	17.61	5	6.88	171.3	---

PURGE DATA:

Date: 10/9/04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: PERISTALTIC								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type: 2" Φ			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.70								
Static Water Level (WL): 10.06								
One Casing Volume(gal/L): 10								
Start Purge (hrs): 0850								
End Purge (hrs): 1250								
Total Purge Time (~~min~~): 4 HRS								
Total Vol. Purged (gal/L): 22								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	~~(1)~~ L HDPE	—
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	~~(8)~~ 40ml Vials	—
		6 TOTAL	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 13GWT_____-F

Pump intake @ ≃ 5' From Botm

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): SJ Conti

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878 TD = 36.70 TOC

WELL ID.: 12MWT38
DATE: 10-9-04

	Time (Hrs.)	Water Level (Ft. below TOC)	Volume L (mL/Min.)	Flowrate 100 (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
	0850	10.06	—	—	—	—	—	—	—	—	INITIAL
1HR	0900	11.30	1	100	4.07	940	26.7	3.98	16.87	91.4	CLEAR
	0910	12.10	2	"	4.00	915	11.8	6.31	17.05	100.4	"
	0920	12.80	3	"	3.99	836	6.7	7.26	17.16	127.2	"
	0930	13.50	4	"	4.15	947	—	7.65	17.28	109	"
	0940	13.95	4.9	90	4.23	693	4.3	7.70	17.21	102	" RED RATE TO 90
	0950	14.20	5.8	90	4.29	656	—	7.56	17.27	101	"
2HR	1000	14.65	6.7	90	4.34	631	4	7.55	17.15	99	"
	1010	15.00	7.6	90	4.38	620	4	7.39	17.08	102	"
	1020	15.35	8.5	90	4.40	604	3	7.36	17.07	105.6	"
	1030	15.90	9.4	90	4.40	592	3	7.33	16.95	109.4	"
	1050	16.90	11.2	90	4.36	595	3	7.21	16.97	120.7	"
3HR	1100	17.00	12.1	90	4.35	596	4	7.09	16.94	122.6	"
	1110	17.15	13.0	90	4.35	594	3	7.10	17.01	127.8	"
	1120	17.32	13.9	90	4.34	593	3	7.15	17.07	132.0	"
	1130	17.51	14.8	90	4.32	592	3	7.16	17.19	137.9	"
	1140	17.70	15.7	90	4.31	593	3	7.04	17.29	139.6	"
	1150	17.85	16.6	90	4.30	594	3	7.05	17.43	149.2	"
4HR	1200	18.05	17.5	90	4.25	594	3	7.02	17.48	150.9	"
	1210	—	18.4	—	—	—	—	—	—	—	"
	1220	18.40	19.3	90	4.25	593	3	6.85	17.38	159.0	"
	1230	18.58	20.2	90	4.23	598	3	6.83	17.34	166.5	"
	1240	18.73	21.1	90	4.21	602	5	6.87	17.55	171.8	"
	1250	18.85	22.0	90	4.20	607	5	6.88	17.61	171.3	"
		Sample Time @ 1300 HRS									

Water Quality Meter (SN): YSI 01C0134
Control Box type (SN): —
Turbidity Meter (SN): 3592 - 3502

Pump Intake: ≈ 5' From Botm

SIGNATURE(S): SJ Conte

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3901
Sample Location: 12MWT 39
Sampled By: Gokrdt
C.O.C. No.: 0098
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: See below *								
Time:								
Method: Bailer	Brown/ Orange	6.34	.581	16.14	>1000	6.40	373.4	---

PURGE DATA:

Date: 9-22-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: bailer								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 37.05								
Static Water Level (WL): 35.85								
One Casing Volume(gal/L) 0.7								
Start Purge (hrs): 1027								
End Purge (hrs): 1041								
Total Purge Time (min): 14								
Total Vol. Purged (gal/L) 1.3								

SAMPLE COLLECTION INFORMATION:

Analysis *	Preservative	Container Requirements	Date		Time	Collected
Explosives SW-846 8330	4°C	(1) ~~(2)~~ L Glass Amber	9/23/04		0930	Yes
Micellaneous Explosives SW-846 8330	4°C	(1) ~~(2)~~ L Glass Amber	9/23/04		0930	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	9/23/04		1805	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	9/24/04		1458	Yes
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	9/24/04		0857	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials				No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT 3901 -F

Pump intake @ NA

37.05
35.85
1.2 (.163) = .2 gal
= .74 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MW T39
DATE: 9-22-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (~~mL/Min.~~ L)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1027	35.85	–	–	–	–	–	–	–	–	Start purge
1035	–	1.1	–	6.59	.839	–	6.93	15.81	379.4	Brownish Orange
1041	Dry	1.3	–	6.34	.581	–	6.40	16.14	373.4	"
										Stop purge

Water Quality Meter (SN) 99K0055
Control Box type (SN) NA
Turbidity Meter (SN) NA

Pump Intake NA

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4001
Sample Location: 12MWT 40
Sampled By: Gerald / Rojahn
C.O.C. No.: 0099
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-26-04	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: ~~1920~~ 0935	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: peristaltic	clear	4.48	.937	16.00	15	5.92	202.7	---

PURGE DATA:

Date: 9-26-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 30.75								
Static Water Level (WL): 21.73								
One Casing Volume(gal/L): 5.6								
Start Purge (hrs): 1517								
End Purge (hrs): 1917								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 18.8								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 13GWT 4001 -F

Pump intake @ 30'

30.75
21.73
9.02 (.163) = 1.5 gal
= 5.6 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT40
DATE: 9-26-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (~~mL/Min.~~)	Flowrate (~~mL/Min.~~ gpd)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1517	21.73	—	—	—	—	—	—	—	—	Start purge
1527	22.01	0.6	60	4.08	.938	6.7	1.74	18.13	196.6	Clear
1537	22.28	1.2	60	4.09	.917	—	2.52	17.58	216.4	"
1547	22.44	1.8	60	4.14	.924	—	3.58	17.80	220.0	"
1557	22.69	2.4	60	4.17	.936	—	5.36	18.13	223.3	"
1607	22.85	3.0	60	4.19	.927	13	5.24	17.92	227.3	"
1617	23.07	3.6	60	4.17	.957	—	5.20	17.67	235.4	"
1627	Left well to get batteries for YSI from FOL									—
1637	"	"	"	"	"	"	"	"	"	—
1647	23.50	5.4	60	4.17	.957	15	5.12	17.10	244.6	Clear
1657	23.89	6.0	60	4.24	.967	13	5.22	16.57	238.3	"
1707	24.03	6.6	60	4.26	.968	—	5.16	16.82	236.7	"
1717	24.18	7.2	60	4.27	.970	—	5.22	16.70	234.8	"
1727	24.35	7.8	60	4.29	.974	—	5.30	16.66	233.6	
1737	24.66	8.8	100	4.30	.952	—	5.50	15.50	231.7	Well was not
1747	25.19	10.2	140	4.33	.949	26	5.76	14.70	226.7	stabilizing.
1757	25.58	11.6	140	4.39	.934	—	5.93	14.48	212.9	Increasing
1807	25.83	12.5	90	4.45	.949	35	5.99	15.20	199.1	flowrate.
1817	25.97	13.4	90	4.47	.950	—	5.77	15.29	196.6	↓ Flow rate
1827	26.14	14.3	90	4.49	.948	—	5.91	15.20	199.7	Clear
1837	26.12	15.2	90	4.48	.945	—	5.99	15.79	200.5	
1847	26.21	16.1	90	4.47	.937	—	5.93	15.59	200.3	
1857	26.22	17.0	90	4.47	.934	—	5.90	15.72	201.4	
1907	26.20	17.9	90	4.46	.934	—	5.89	16.02	203.0	
1917	26.24	18.8	90	4.46	.937	15	5.92	16.00	202.7	end purge

Water Quality Meter (SN) 99K0055
Control Box type (SN) NA
Turbidity Meter (SN) 4650 4300

Pump Intake 29.5'

SIGNATURE(S): [signature]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4101
Sample Location: 12MWT 41
Sampled By: T. ROJAHN
C.O.C. No.: 0134
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 11-10-04								
Time: 1706								
Method: SAME	CLEAR	6.85	0.922	14.12	4.0	2.80	+ 71	---

PURGE DATA:

Date: 11-10-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" & PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 36.6								
Static Water Level (WL): 19.86								
One Casing Volume(gal/L): 10.3								
Start Purge (hrs): 1355								
End Purge (hrs): 1705								
Total Purge Time (min): 190								
Total Vol. Purged (gal/L): 19								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT —— -F

16.74' X 0.163 = 2.73 gal or 10.3L

Pump intake @ 31.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT 4101
DATE: 11-10-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1355	19.86	—	—	—	—	—	—	—	—	START PURGE
1405	21.24	1100	110	6.80	0.924	16	3.53	15.27	91	CLEAR
1415	21.85	2100	100	6.76	0.923	12	3.21	15.30	92	CLEAR
1425	22.46	3100	100	6.73	0.923	10	2.86	15.32	94	CLEAR
1435	22.94	4100	100	6.81	0.935	4.6	2.74	15.63	82	CLEAR
1445	23.48	5100	100	6.73	0.929	3.3	2.68	15.20	87	CLEAR
1455	23.67	6100	100	6.79	0.935	5.2	2.78	15.38	87	CLEAR
1505	23.87	7100	100	6.85	0.939	4.8	3.21	15.53	86	CLEAR
1515	24.13	8100	100	6.80	0.946	4.4	3.66	15.44	86	CLEAR
1525	24.44	9100	100	6.82	0.937	4.1	3.24	15.06	82	CLEAR
1535	24.83	10100	100	6.85	0.929	3.8	2.81	14.73	79	CLEAR
1545	25.30	11100	100	6.72	0.925	4.4	2.79	14.71	77	CLEAR
1555	25.53	12100	100	6.78	0.925	4.3	2.80	14.70	77	CLEAR
1605	25.90	13100	100	6.78	0.921	3.6	2.86	14.56	74	CLEAR
1615	26.10	14100	100	6.82	0.919	3.5	2.88	14.48	73	CLEAR
1625	26.25	15100	100	6.80	0.918	3.4	2.89	14.38	73	CLEAR
1635	26.41	16100	100	6.81	0.918	3.2	2.85	1431	72	CLEAR
1645	26.53	17100	100	6.81	0.918	3.2	2.80	1425	72	CLEAR
1655	26.66	18100	100	6.82	0.916	3.6	2.68	14.19	71	CLEAR
1705	26.70	19100	100	6.85	0.922	4.0	2.80	14.12	71	CLEAR
1706	—	—	—	—	—	—	—	—	—	START SAMPLING

Water Quality Meter (SN) 01C0134 AB
Control Box type (SN) 401
Turbidity Meter (SN) 4650-4300

Pump Intake 31.6'

SIGNATURE(S): Terry Agnew

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4201
Sample Location: 12MWT 42
Sampled By: T. ROJAHN
C.O.C. No.: 0101
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-28-04	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1332								
Method: PERISTALTIC	CLEAR	4.00	0.625	17.50	1.01	0.18	+523	---

PURGE DATA:

Date: 9-28-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: SAME								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 30.45								
Static Water Level (WL): 14.52								
One Casing Volume(gal/L): 9.8								
Start Purge (hrs): 0930								
End Purge (hrs): 1330								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 17.2								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT_____-F

15.93' x 0.163 = 2.6 gal or 9.8 L

Pump intake @ 25.45

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWIT 42
DATE: 9/28/04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0930	14.52	—	—	—	—	—	—	—	—	START PURGE
0940	15.86	1300	130	4.93	0.535	7.29	3.20	14.73	+224	CLEAR
0950	16.25	2200	90	4.88	0.540	3.55	3.01	14.82	+288	CLEAR
1000	16.63	3100	90	4.84	0.547	3.80	2.37	15.12	324	CLEAR
1010	17.03	4000	90	4.79	0.530	4.10	1.69	15.25	354	CLEAR
1020	17.40	4900	90	4.75	0.519	3.98	1.07	15.38	367	CLEAR
1030	17.75	5800	90	4.72	0.505	4.50	0.49	15.40	384	CLEAR
1040	18.15	6700	90	4.68	0.461	2.34	0.24	15.77	401	CLEAR
1050	18.48	7600	90	4.61	0.418	1.80	0.18	16.12	419	CLEAR
1100	18.75	8500	90	4.57	0.401	1.69	0.17	15.82	430	CLEAR
1110	18.96	9200	70	4.55	0.411	1.97	0.16	15.91	439	CLEAR
1120	19.19	9900	70	4.54	0.425	1.84	0.16	16.43	446	CLEAR
1130	19.42	10600	70	4.54	0.446	1.62	0.14	15.95	449	CLEAR
1140	19.72	11300	70	4.48	0.455	1.71	0.14	15.87	462	CLEAR
1150	19.90	11900	60	4.49	0.466	3.04	0.14	16.14	465	CLEAR
1200	20.06	12500	60	4.48	0.481	2.49	0.13	16.25	471	CLEAR
1210	20.21	13100	60	4.47	0.508	1.98	0.13	16.30	475	CLEAR
1220	20.38	13700	60	4.43	0.523	1.71	0.14	16.29	482	CLEAR
1230	20.56	14200	60	4.59	0.537	1.38	0.13	16.42	447	CLEAR
1240	20.68	14700	50	4.41	0.543	1.41	0.14	16.60	483	CLEAR
1250	20.89	15200	50	4.38	0.561	1.44	0.14	16.79	492	CLEAR
1300	20.98	15700	50	4.33	0.574	0.91	0.15	16.77	498	CLEAR
1310	21.16	16200	50	4.25	0.592	1.08	0.15	16.97	504	CLEAR
1320	21.29	16700	50	4.10	0.610	1.21	0.16	17.02	518	CLEAR
1330	21.43	17200	50	4.00	0.625	1.01	0.18	17.50	523	CLEAR
1332	—	—	—	—	—	—	—	—	—	START SAMPLING

Water Quality Meter (SN) 0100979 AA
Control Box type (SN) 419
Turbidity Meter (SN) 3592-3502

Pump Intake 25.45

SIGNATURE(S): Tony Rizzo

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NSWC CRANE
Project No.: N6878
Sampled By: T. ROJAHN
Field Analyst: TR
Field Form Checked as per QA/QC Checklist (initials): TR

Sample ID No.: 12GWT 4201
Sample Location: 12MWT42
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 9/28/04								
Time: 1332	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	(+/- mv)
Method: Peristaltic	CLEAR	4.00	0.625	17.50	1.01	0.18	—	+523

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 650 MDS

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: Chemetrics Test Kit

Concentration: 4 ppm

Range Used:	Range	Method	Concentration ppm
☑	0 to 1 ppm	K-7510	>1
☑	1 to 12 ppm	K-7512	4

Analysis Time: 1347

Notes:

Alkalinity:

Equipment: Chemetrics Test Kit

Concentration: <10 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	Pink
☑	50 to 500 ppm	K-9815	Pink
☑	100 to 1000 ppm	K-9820	Pink

Analysis Time: 1349

Filtered: ☐

Notes:

Carbon Dioxide:

Equipment: Chemetrics Test Kit

Concentration: 135 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-1910	
☑	100 to 1000 ppm	K-1920	135
☐	250 to 2500 ppm	K-1925	

Analysis Time: 1358

Notes:

Ferrous Iron (Fe^{2+}):

Equipment: DR-850 DR-8 90 Range: 0 - 3.00 mg/L
Program/Module: 500nm 33

Concentration: 0.04 ppm

Analysis Time: 1405

Filtered: ☐

Notes:

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HS-C Other:

Exceeded 5.0 mg/L range on color chart: ☐

Concentration: 0.0 ppm

Analysis Time: 1408

Notes:

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NSWC CRANE	Sample ID No.:	12GWT 4201
Project No.:	N6878	Sample Location:	12MWT42
Sampled By:	T. ROWAHN	Duplicate:	☐
Field Analyst:	TR	Blank:	☐

Sulfide (S^{2-}):

Equipment: DR-850 DR-8 90 Range: 0 - 0.70 mg/L Concentration: 0.00 ppm

Program/Module: 610nm 93 Analysis Time: 1421 Filtered: ☐

Notes:

Nitrite (NO_2^--N): Concentration: 0.000 ppm

Equipment: DR-850 DR-8 90 Range: 0 - 0.350 mg/L Analysis Time: 1353 Filtered: ☐

Program/Module: 62

Standard Solution: ☐ Results: _____ Reagent Blank Correction: ☐

Notes:

Manganese (Mn^{2+}): Concentration: 1.4 ppm

Equipment: DR-850 DR-8 90 Range: 0 - 20.0 mg/L Analysis Time: 1427 Filtered: ☐

Program/Module: 525nm 41

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Mulitplication is correct for each *Multiplier* table: ☑

Final calulated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriatly as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test if Nitrite was detected: NA

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4301
Sample Location: 12MWT 43
Sampled By: T. Rojahn
C.O.C. No.: 0142
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 11-16-04								
Time: 0910								
Method: Same	Grey BRN	8.07	0.422	12.30	>1000	6.84	85	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	~~Salinity~~ ORP	Other	Time
Date: 11-15-04									
Method: Dis Bailer	1	7.92	0.430	12.67	>1000	5.96	85	—	1003
Monitor Reading (ppm): --	2	8.05	0.430	12.56	>1000	6.59	84	—	1006
Well Casing Diameter & Material	3	8.07	0.422	12.30	>1000	6.84	85	—	1012
Type: 2" Ø PVC		See Low Flow Purge Data Sheets							
Total Well Depth (TD): 82.95	4	Dry Prior to 4th vol.							1020
Static Water Level (WL): 82.20									
One Casing Volume(gal/L): 0.5									
Start Purge (hrs): 1000									
End Purge (hrs): 1020									
Total Purge Time (min): 20									
Total Vol. Purged (gal/L): 1.75L									

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber 11/16	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber 0910	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE 11/16	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] ~~13~~12GWT 4301 -F

0.75 X 0.163 = 0.1gal or .5L

Pump intake @ NA

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Ty Rojahn

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4401
Sample Location: 12MWT 44
Sampled By: T. ROJAHN
C.O.C. No.: 0134
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 11-10-04	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1325								
Method: Bladder	CLEAR	6.94	1.475	15.27	440	3.62	92	---

PURGE DATA:

Date: 11-10-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Bladder								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 37.15								
Static Water Level (WL): 27.83								
One Casing Volume(gal/L): 5.8								
Start Purge (hrs): 0925								
End Purge (hrs): 1325								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 14								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 12GWT 4401 -F 9.32' x 0.163 = 1.5 gal or 5.8 L

Pump intake @ 1' above bottom of WELL - slow recharge WELL.

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ty Rojahn

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT44
DATE: 11-10-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0925	27.83	–	–	–	–	–	–	–	–	Start PURGE
0935	28.38	1500	150	6.81	1.517	450	3.58	14.37	121	Cloudy
0945	28.75	2300	80	6.85	1.515	392	3.69	14.45	114	Cloudy
0955	29.20	3300	100	6.83	1.503	403	3.83	14.35	107	Cloudy
1005	29.68	4200	90	6.92	1.494	384	3.96	14.46	104	Cloudy
1015	30.01	4900	70	6.91	1.499	380	4.07	14.84	103	Cloudy
1025	30.31	5600	70	6.94	1.470	318	4.30	14.52	104	Cloudy
1035	30.62	6300	70	6.94	1.466	350	4.45	14.55	103	Cloudy
1045	30.91	7000	70	6.96	1.462	376	4.53	14.59	103	Cloudy
1055	31.12	7500	50	6.96	1.482	322	4.54	15.04	100	Cloudy
1105	31.33	8000	50	6.96	1.485	330	4.50	14.98	100	Cloudy
1115	31.53	8500	50	6.96	1.487	328	4.46	14.93	99	Cloudy
1125	31.70	9000	50	6.96	1.480	309	4.44	14.75	98	Cloudy
1135	31.86	9500	50	6.97	1.480	299	4.40	14.81	97	Cloudy
1145	32.06	10000	50	6.98	1.480	289	4.35	14.85	96	Cloudy
1155	32.21	10500	50	6.98	1.478	266	4.29	14.75	96	Cloudy
1205	32.36	11000	50	6.98	1.472	251	4.24	14.64	95	Cloudy
1215	32.47	11400	40	6.96	1.498	203	4.11	15.34	93	Cloudy
1225	32.58	11800	40	6.96	1.513	175	4.01	15.77	92	Sl. Cloudy
1235	32.65	12150	35	6.96	1.527	140	3.91	16.10	91	Sl. Cloudy
1245	32.72	12450	30	6.95	1.541	111	3.80	16.45	91	Sl. Cloudy
1255	32.81	12750	30	6.94	1.531	85.0	3.69	16.16	91	Sl. Cloudy
1305	32.93	13150	40	6.94	1.512	60.6	3.61	15.81	94	V. Sl Cloudy
1315	33.11	13550	40	6.93	1.482	54.7	3.62	15.28	93	V. Sl Cloudy
1325	33.29	13950	40	6.94	1.475	44.0	3.62	15.27	92	CLEAR
1325	–	–	–	–	–	–	–	–	–	Start SAMPLING

Water Quality Meter (SN) 01C0134 AB
Control Box type (SN) MP10-1588
Turbidity Meter (SN) 4650-4300

Pump Intake 1' above well bottom - slow recharge

SIGNATURE(S): Terry Rojek

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4501
Sample Location: 12MWT 45
Sampled By: T. ROJAHN
C.O.C. No.: 0137
Type of Sample:
[X] Low Concentration
[] High Concentration
6.9 on 11-13-04

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 11-13-04								
Time: 1050								
Method: SAME	CLEAR	6.03	0.980	13.95	32.4	6.14	+92	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 11-12-04								
Method: PERISTALTIC								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.60								
Static Water Level (WL): 17.95								
One Casing Volume(gal/L): 5.3								
Start Purge (hrs): 1454								
End Purge (hrs): 1552								
Total Purge Time (min): 58								
Total Vol. Purged (gal/L): 15								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	NO
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT NA -F

8.65' x 0.163 = 1.4 gal or 5.3 L

Pump intake @ Bottom to Purge (11/12)
21.6 to Sample (11/13)

Circle if Applicable:

MS/MSD	Duplicate ID No.:
–	–

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12 MWT 45
DATE: 11-12-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1454	17.95	–	–	–	–	–	–	–	–	START PURGE
1504	19.78	3000	300	5.83	0.917	19.6	6.11	14.27	96	CLEAR
1514	21.08	6000	300	5.37	0.734	26.9	7.18	14.43	99	CLEAR
1524	22.68	9000	300	5.60	0.912	78.1	6.60	14.33	95	SL. Cloudy
1534	23.92	12000	300	5.82	0.941	57.9	6.55	14.21	94	V. SL. Cloudy
1544	25.51	15000	300	6.03	0.980	32.4	6.14	13.95	92	CLEAR
1552	–	–	–	–	–	–	–	–	–	DRY

Water Quality Meter (SN) 0100134 AB
Control Box type (SN) 339
Turbidity Meter (SN) 4650-3200

Pump Intake Bottom

TO FACILITATE SAMPLING ON THE RR TRACKS, DIFFICULTY IN MOBING EQ. - WILL PURGE DRY & SAMPLE TOMORROW.

SIGNATURE(S): Terry Royal

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4601
Sample Location: 12MWT46
Sampled By: T. ROJAHN
C.O.C. No.: 0137
Type of Sample:
[X] Low Concentration
[] High Concentration

G38 11/13/04

SAMPLING DATA:

Date: 11-13-04	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 0945	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: SAME	CLEAR	5.68	0.382	14.99	23.0	5.42	101	--

PURGE DATA:

Date: 11-12-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): -								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.80								
Static Water Level (WL): 15.11								
One Casing Volume(gal/L): 7.2								
Start Purge (hrs): 1316								
End Purge (hrs): 1434								
Total Purge Time (min): 78								
Total Vol. Purged (gal/L) 20								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	1 (2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	No
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT N/A -F

11.69 x 0.163 = 1.9 gal or 7.2 L

Pump intake @ Bottom to Purge
21.8 to sample

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT46
DATE: 11-12-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1316	1511	--	—	—	—	—	—	—	—	START PURGE
1326	1630	2000	200	5.67	0.312	18.9	6.55	14.95	107	CLEAR
1336	17.06	4000	200	5.84	0.275	13.0	4.59	15.09	84	CLEAR
1346	17.75	6000	200	5.92	0.270	11.4	3.07	15.14	78	CLEAR
1356	19.57	8000	200	5.94	0.285	11.0	2.39	15.07	75	CLEAR
1406	20.80	12000	400	5.86	0.270	11.4	2.40	15.36	79	CLEAR
1416	23.03	16000	400	5.63	0.293	23.5	5.01	15.27	105	CLEAR
1426	25.27	20000	400	5.68	0.382	23.0	5.42	14.99	101	CLEAR
1430	—	—	—	—	—	—	—	—	—	DRY

Water Quality Meter (SN) 01C0134 AB
Control Box type (SN) 339
Turbidity Meter (SN) 4650-4300

SIGNATURE(S): Terry Rogel

Pump Intake Bottom

Note: To facilitate sampling on the RR tracks, difficulty in moving EQ. - will purge dry & sample tomorrow.

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4701
Sample Location: 12MWT 47
Sampled By: T. Rosamond
C.O.C. No.: 0137
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 11-13-04	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1355								
Method: SAME	CLEAR	6.66	0.491	14.67	8.0	7.16	+83	---

PURGE DATA:

Date: 11-13-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type: 2" ϕ PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.8								
Static Water Level (WL): 13.41								
One Casing Volume(gal/L): 8.3								
Start Purge (hrs): 1303								
End Purge (hrs): 1353								
Total Purge Time (min): 50								
Total Vol. Purged (gal/L): 10								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	4 (2) L Glass Amber	Yes
Micellaneous Explosives SW-846 8330	4°C	4 (2) L Glass Amber	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	4 (1) L HDPE	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	No
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	4 (1) L HDPE	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 13GWT —-F

13.39 × 0.163 = 2.241 or 8.3L

Pump intake @ 21.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
YES	12FD11130401

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: 6878

WELL ID.: 12MWT47
DATE: 11-13-04

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1303	13.41 TG	~~2000~~	–	–	–	–	–	–	–	START PURGE
1313	13.44	2000	200	6.61	0.485	11	6.94	14.50	93	CLEAR
1323	13.45	4000	200	6.57	0.486	9.1	6.99	14.45	90	CLEAR
1333	13.45	6000	200	6.60	0.489	8.4	7.15	14.53	87	CLEAR
1343	13.45	8000	200	6.63	0.490	8.0	7.14	14.71	84	CLEAR
1353	13.45	10000	200	6.66	0.491	8.0	7.16	14.67	83	CLEAR
1355	–	–	–	–	–	–	–	–	–	START SAMPLING

Water Quality Meter (SN) 01C0134 AB
Control Box type (SN) 339
Turbidity Meter (SN) 4650-4300

Pump Intake Terry Rogers 21.8'

SIGNATURE(S): Terry Rogers

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4801
Sample Location: 12MWT 48
Sampled By: T. ROYAHN
C.O.C. No.: 0137
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 11-14-04	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1045								
Method: Dis Bailer	Lt. BRN	7.71	0.219	11.84	>1000	12.82	49	—

PURGE DATA:

Date: 11-14-04	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	~~Salinity~~ ORP	Other
Method: Dis. Bailer	1	8.25	0.167	10.99	71000	11.55	49	Lt. BRN
Monitor Reading (ppm): —	2	8.03	0.166	12.05	71000	11.16	46	Lt BRN
Well Casing Diameter & Material	3	7.89	0.185	12.05	71000	11.37	45	Lt BRN
Type: 2" Ø PVC	4		See Low Flow Purge Data Sheets					
Total Well Depth (TD): 31.85		7.71	0.219	11.84	>1000	12.82	49	Lt. BRN
Static Water Level (WL): 30.44								
One Casing Volume(gal/L): 1L								
Start Purge (hrs): 1025								
End Purge (hrs): 1040								
Total Purge Time (min): 15								
Total Vol. Purged (gal/L): 4								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	11/14 1 (2) L Glass Amber 1045	Yes
Micellaneous Explosives SW-846 8330	4°C	11/15 2 (2) L Glass Amber 0830	Yes
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	11/14 → (1) L HDPE 1045	Yes
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	11/15 (1) L HDPE 0830	YES
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	11/15 (1) L HDPE 0830	Yes
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	NO

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] ~~13GWT~~ 12GWT 4801 -F

Pump intake @ N/A (Dis. Bailer)

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Tony Royal

APPENDIX C.4.2

SWMU 12 & 25

GROUND WATER SAMPLE LOG SHEETS ROUND 2

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT0102
Sample Location: 12MWT01
Sampled By: CD
C.O.C. No.: 3686
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2/6/05								
Time: 1445								
Method: peristaltic	Clear	4.62	1.062	14.48	1.09	1.23	158.7	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2/6/05								
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC	See Low Flow Purge Data Sheets							
Total Well Depth (TD): 37.80'								
Static Water Level (WL): 9.95'								
One Casing Volume(gal/L): 16.80								
Start Purge (hrs): 1300								
End Purge (hrs): 1440								
Total Purge Time (min): 100								
Total Vol. Purged (gal/L): 17.90								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	(Yes)/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	(Yes)/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	(Yes)/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/(No)
Nitrate & Nitrite (as N) EPA 353.2 & Ammonia	4°C/H2SO4	(1) L HDPE	(Yes)/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/(No)

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT F~~

Pump intake @ 32.80' BTOC

37.80
- 9.95
27.85 (.163) = 4.54 gal
= 16.80 L

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Colin Dooley

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~7448~~ 6878

WELL ID.: 12MWT01
DATE: 2/6/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (L)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Color. etc)
1300	9.95	—	—	—	—	—	—	—	—	Start purge
1310	10.04	1.600	200	5.42	1.052	21.5	1.62	14.10	96.2	slightly cloudy
1320	10.04	3.300	170	5.35	1.069	11.2	1.35	14.19	123.8	clear
1330	10.04	5.100	180	4.78	1.064	11.9	1.26	14.39	176.8	clear
1340	10.05	6.900	180	4.59	1.040	3.40	1.32	14.41	211.4	clear
1350	10.05	8.700	180	4.58	1.046	3.33	1.30	14.48	208.1	clear
1400	10.05	10.500	180	4.59	1.054	1.65	1.27	14.47	198.2	clear
1410	10.06	12.300	180	4.61	1.056	1.57	1.24	14.42	188.5	clear
1420	10.06	14.100	180	4.62	1.059	1.55	1.22	14.45	175.8	clear
1430	10.06	16.000	190	4.63	1.061	1.57	1.22	14.45	169.3	clear
1440	10.06	17.900	190	4.62	1.062	1.09	1.23	14.48	158.7	clear, end purge
1445	—	—	—	—	—	—	—	—	—	Start sample

Water Quality Meter (SN): 01D0956 AA
Control Box type (SN): geopump 2 #401
Turbidity Meter (SN): 475 - 1503

Pump Intake: 32.80' bTOC

SIGNATURE(S): Chris Foster

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 0202
Sample Location: 12MWT 02
Sampled By: T. Rojahn
C.O.C. No.: 3696
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2-17-05								
Time: 1117								
Method: SAME	CLEAR	362	0.277	11.44	1.7	0.73	355	---

PURGE DATA:

Date: 2-17-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 30.97								
Static Water Level (WL): 8.20								
One Casing Volume(gal/L): 14								
Start Purge (hrs): 0915								
End Purge (hrs): 1115								
Total Purge Time (min): 120								
Total Vol. Purged (gal/L): 14.4								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements			Collected
		MS MSD		DUP	
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	3	(2) L Glass Amber	2	Yes/No
Miscellaneous Explosives	4°C	3	(2) L Glass Amber	2	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	3	(1) L HDPE	1	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	—	(1) L HDPE	—	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Ammonia	4°C/H2SO4	3	(1) L HDPE	1	Yes/No
Total Organic Carbon	4°C/H3PO4	6	(2) 40 mL Vial	2	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT NA -F 22.67 X 0.163 = 3.7 gal or 14 L

Pump intake @ 25.8'

Circle if Applicable:

MS/MSD	Duplicate ID No.:
YES	12FD0217050 1

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N~~1245~~ 6878

WELL ID.: 12 MW T 02
DATE: 2-17-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0915	8.20	0	0	—	—	—	—	—	—	START PURGE
0925	8.26	1200	120	5.99	0.471	25	1.32	10.49	+4	CLEAR
0935	8.27	2400	120	5.87	0.466	16	0.70	11.11	10	"
0945	8.28	3600	120	4.20	0.355	10	0.90	10.99	125	"
0955	8.29	4800	120	3.69	0.294	7	1.08	10.90	321	"
1005	8.30	6000	120	3.65	0.290	5	1.03	11.10	335	"
1015	8.30	7200	120	3.62	0.288	3.9	0.98	11.25	349	"
1025	8.31	8400	120	3.63	0.281	3.6	0.88	11.28	349	"
1035	8.31	9600	120	3.64	0.278	3.5	0.96	11.20	350	"
1045	8.31	10800	120	3.64	0.279	2.4	0.81	11.21	352	"
1055	8.31	12000	120	3.64	0.277	1.8	0.78	11.24	353	"
1105	8.31	13200	120	3.64	0.276	2.1	0.74	11.43	351	"
1115	8.31	14400	120	3.62	0.277	1.7	0.73	11.44	355	"
1117	—	—	—	—	—	—	—	—	—	START SAMPLING

Water Quality Meter (SN) 99K1014 AG
Control Box type (SN) 341
Turbidity Meter (SN) 4536-3303

Pump Intake 25.8'

SIGNATURE(S): Terry Royal

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3702 03
Sample Location: 12MW037 03
Sampled By: Goerdt
C.O.C. No.: 3703
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU) 3/5/03	DO (mg/L)	ORP (mV)	Other NA
Date: 3-3-05								
Time: 0820								
Method: Peristaltic	clear	6.32	1.425	12.55	7.71	12.29	26.0	---

PURGE DATA:

Date: 3-2-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 27.8								
Static Water Level (WL): 15.63								
One Casing Volume(gal/L): 7.4								
Start Purge (hrs): 0915								
End Purge (hrs): 1205								
Total Purge Time (min): 170								
Total Vol. Purged (gal/L) 27.45								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & AMMONIA	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT_____-F

Pump intake @ ~~27.8~~ 27.5

27.80
15.63
12.17 (.163) = 1.98 gal
= 7.4 L

Unable to stabalize water level while purging. Decided to increase flow & dry out the well

*WL 3/3/05 15.83

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878

WELL ID.: 12MWT03
DATE: 3-2-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~ L	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0915	15.63	-	-	-	-	-	-	-	-	Start purge
0925	16.86	.90	90	6.30	1.402	-	7.32	9.56	262.9	Clear
0935	17.85	1.8	90	6.32	1.403	11.0	7.93	9.35	257.2	"
0945	17.96	2.7	90	6.34	1.385	-	8.80	9.03	252.8	"
0955	18.32	3.6	90	6.37	1.392	9.6	8.91	9.19	231.6	"
1005	18.78	4.5	90	6.38	1.394	8.2	9.14	9.32	214.8	"
1015	19.14	5.4	90	6.40	1.397	7.4	9.42	9.51	187.6	"
1025	19.93	6.3	90	6.41	1.401	3.8	9.97	9.62	169.4	"
1035	20.16	7.2	90	6.41	1.403	-	10.31	9.90	157.2	"
1045	20.32	8.1	|	6.46	1.402	-	10.57	9.96	131.7	"
1055	20.74	9.0	|	6.41	1.403	3.1	10.89	9.99	115.2	"
1105	21.03	9.9	|	6.41	1.400	2.79	11.03	10.02	92.8	"
1115	21.54	10.8	|	6.42	1.401	2.59	11.16	10.05	61.0	"
1125	21.89	11.7	|	6.41	1.403	-	11.01	10.13	54.9	"
Well not recharging enough, will increase flow to try & dry out										
1135	22.82	14.9	320	6.40	1.474	-	11.09	12.30	49.3	"
1145	24.56	18.1	320	6.38	1.444	-	10.64	12.32	42.3	sl. cloudy
1155	26.03	21.3	320	6.32	1.425	59.2	12.29	12.55	26.0	slightly cloudy
1205	27.45	24.50	320	Well Dry - stop purge						

Water Quality Meter (SN) 99K1014AA
Control Box type (SN) ~~QMA~~ 341
Turbidity Meter (SN) 4175-1503

Pump Intake 27.5'

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT0402
Sample Location: 12MWT 04
Sampled By: Gorski
C.O.C. No.: 3703 & 3704
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3-3-05	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1025								
Method: Peristaltic	Clear	5.96	1.270	11.70	3.41	9.61	32.7	---

PURGE DATA:

Date: 3-3-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.70								
Static Water Level (WL): 13.61								
One Casing Volume(gal/L): 7.9								
Start Purge (hrs): 0905								
End Purge (hrs): 1020								
Total Purge Time (min): 75								
Total Vol. Purged (gal/L): 9.0								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	DUP ~~1~~ 2 (2) L Glass Amber MS MSD 3	Yes/No
Miscellaneous Explosives	4°C	2 (2) L Glass Amber 3	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	1 (1) L HDPE 3	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	~~1~~ (1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & AMMONIA	4°C/H2SO4	1 (1) L HDPE 3	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT _____-F

Pump intake @ 26'

26.70
13.61
13.09(.163) = 2.13 gal
= 7.9 L

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	
Yes	12FD03030501	

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878

WELL ID.: 12MWT04
DATE: 3-3-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~ L	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0905	13.61	–	–	–	–	–	–	–	–	Start Purge
0915	13.78	1.2	120	6.01	1.256	189	7.22	10.74	38.1	Cloudy
0925	13.79	2.4	120	6.01	1.243	–	6.84	11.12	35.4	"
0935	13.81	3.6	120	6.01	1.194	–	8.16	10.93	33.3	"
0945	13.81	4.8	120	5.99	1.196	28	8.47	11.19	32.4	Sl. Cloudy
0955	13.81	6.0	120	5.97	1.223	6.24	8.72	11.60	31.2	Clear
1005	13.81	7.2	120	5.97	1.241	4.71	9.67	11.23	31.6	"
1015	13.81	8.4	120	5.96	1.264	3.62	9.75	11.52	32.4	"
1020	13.81	9.0	120	5.96	1.270	3.41	9.61	11.70	32.7	Stop Purge

Water Quality Meter (SN) 99X1014 AA
Control Box type (SN) 341
Turbidity Meter (SN) 4175-1503

Pump Intake 26'

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 0502
Sample Location: 12MWT 05
Sampled By: Goard
C.O.C. No.: 3682
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 2-3-05	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: peristaltic	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: 1505	Clear	3.73	.413	11.98	0.3	3.88	276.1	---

PURGE DATA:

Date: 2-3-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: peristaltic								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.75								
Static Water Level (WL): 8.96								
One Casing Volume(gal/L): 10.7								
Start Purge (hrs): 1320								
End Purge (hrs): 1500								
Total Purge Time (min): 100								
Total Vol. Purged (gal/L): 11.0								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & Ammonia 350.1	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT – -F

Pump intake @ ~22'

26.75
8.96
17.79(.163) = 2.9 gal
= 10.7 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
–	–

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N~~1245~~ 6878

WELL ID.: 12MWT05
DATE: 2-3-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (~~mL/Min.~~)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1320	8.96	–	–	–	–	–	–	–	–	Start purge
1330	8.98	.70	70	3.73	.418	1.0	4.56	11.67	275.9	clear
1340	8.97	1.40	70	3.74	.418	1.3	4.31	11.70	274.8	"
1350	8.98	2.60	120	3.73	.422	1.2	3.76	12.20	274.1	"
1400	8.98	3.80	120	3.73	.420	0.4	3.70	12.17	274.0	"
1410	9.00	5.00	120	3.74	.420	–	3.67	12.20	274.1	"
1420	9.01	6.2	120	3.74	.419	–	3.42	12.23	274.1	"
1430	9.01	7.4	120	3.73	.419	0.5	3.91	12.34	274.6	"
1440	9.02	8.6	120	3.73	.416	0.4	3.82	12.10	275.0	"
1450	9.02	9.8	120	3.72	.415	0.2	3.79	12.06	275.4	"
1500	9.01	11.0	120	3.73	.413	0.3	3.88	11.98	276.1	stop purge

Water Quality Meter (SN) 99K 1014 AG
Control Box type (SN) NA
Turbidity Meter (SN) 4536 3303

Pump Intake ~22'

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT0602
Sample Location: 12MWT06
Sampled By: CO
C.O.C. No.: TR ~~3697~~ 3700
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Date: 2/21/05								
Time: 1015	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: peristaltic	clear	5.20	.265	11.39	0.28	3.51	91.0	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2/21/05								
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC	See Low Flow Purge Data Sheets							
Total Well Depth (TD): 25.80'								
Static Water Level (WL): 10.12'								
One Casing Volume(gal/L): 9.46								
Start Purge (hrs): 0850								
End Purge (hrs): 1015								
Total Purge Time (min): 80								
Total Vol. Purged (gal/L): 10.10								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Amonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT F~~

Pump intake @ 24.80' bTOC

25.80
− 10.12
15.68 (.163) = 2.56 gal
= 9.46 L

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT06
DATE: 2/21/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0850	10.12	—	—	—	—	—	—	—	—	start purge
0900	10.70	1.700	160	5.20	.264	2.80	1.70	11.84	169.4	clear
0910	10.71	3.000	130	5.20	.266	1.77	2.14	11.41	143.2	clear
0920	10.75	4.300	130	5.20	.267	1.55	2.66	11.50	126.2	clear
0930	10.75	5.500	120	5.19	.266	0.89	3.03	11.28	114.2	clear
0940	10.75	6.700	120	5.19	.265	1.08	3.23	11.17	108.3	clear
0950	10.79	7.900	120	5.19	.267	0.68	3.37	11.49	99.5	clear
1000	10.77	9.000	110	5.19	.267	0.25	3.51	11.43	94.4	clear
1010	10.78	10.100	110	5.20	.265	0.28	3.51	11.39	91.0	clear, end purge
1015	—	—	—	—	—	—	—	—	—	start sample

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) geopump 2 #401
Turbidity Meter (SN) 4175-1503

Pump Intake 24.80' bTOC

SIGNATURE(S): Chris Crooker

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 0702
Sample Location: 12MWT 07
Sampled By: T. Rojahn
C.O.C. No.: TR-~~3699~~ 3700
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 2-21-05	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1142								
Method: SAMP	CLEAR	3.23	3.631	18.30	4.42	1.17	+365	---

PURGE DATA:

Date: 2-21-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): --								
Well Casing Diameter & Material Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.80								
Static Water Level (WL): 12.69								
One Casing Volume(gal/L): 8.7								
Start Purge (hrs): 0855								
End Purge (hrs): 1140								
Total Purge Time (min): 165								
Total Vol. Purged (gal/L): 12.4								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Ammonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT ——— -F 14.11 x 0.163 = 2.3 gal/oz 8.7

Pump intake @ 21.8

Circle if Applicable:

MS/MSD —

Duplicate ID No.: ———

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N~~1245~~ 6878

WELL ID.: 12 MWT 07
DATE: 2-21-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0855	12.69	0	–	–	–	–	–	–	–	START PURGE
0905	13.35	600	60	3.79	3.888	23.8	2.08	10.00	+247	CLEAR
0915	14.11	1500	90	3.14	3.648	12.6	1.53	10.62	379	CLEAR
0925	14.42	2400	90	3.10	3.624	6.75	1.23	10.53	399	CLEAR
0935	14.66	3200	80	3.11	3.592	6.11	1.15	10.16	394	CLEAR
0945	14.89	4000	80	3.12	3.612	5.23	1.15	10.38	394	CLEAR
0955	15.11	4800	80	3.13	3.624	4.50	1.15	10.53	394	CLEAR
1005	15.23	5600	80	3.14	3.624	4.65	1.14	10.42	390	CLEAR
1015	15.36	6400	80	3.15	3.626	4.60	1.13	10.30	386	CLEAR
1025	15.44	7200	80	3.16	3.610	4.75	1.17	10.26	385	CLEAR
1035	15.55	8000	80	3.18	3.628	4.88	1.18	10.32	381	CLEAR
1045	15.61	8800	80	3.19	3.635	4.94	1.15	10.35	376	CLEAR
1050	15.64	9200	80	3.20	3.635	4.73	1.16	10.49	376	CLEAR
1055	15.66	9550	70	3.20	3.690	4.41	1.19	10.55	376	CLEAR
1100	15.75	9900	70	3.25	3.705	4.22	1.21	10.50	365	CLEAR
1105	15.80	10250	70	3.23	3.670	3.98	1.20	10.36	367	CLEAR
1110	15.60	10350	20	3.20	3.609	4.17	1.30	9.67	369	CLEAR (Pump stopped)
1115	15.65	10700	70	3.24	3.625	4.65	1.25	9.85	366	CLEAR
1120	15.82	11005	70	3.23	3.649	4.93	1.27	10.30	367	CLEAR
1125	15.93	11400	70	3.23	3.665	4.80	1.22	10.55	369	CLEAR
1135	16.15	12100	70	3.22	3.649	4.61	1.16	10.34	368	CLEAR
1140	16.11	12400	60	3.23	3.631	4.42	1.17	10.30	365	CLEAR
1142	–	–	–	–	–	–	–	–	–	START SAMPLING

Water Quality Meter (SN) 99K1014 AG
Control Box type (SN) 341
Turbidity Meter (SN) 4536-3303

Pump Intake 21.8

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT0802
Sample Location: 12MWT08
Sampled By: CD
C.O.C. No.: 3700
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2/21/05								
Time: 1335								
Method: peristaltic	clear	4.60	.253	11.49	0.39	6.06	201.7	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2/21/05								
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 25.80'								
Static Water Level (WL): 12.63'								
One Casing Volume(gal/L): 7.94								
Start Purge (hrs): 1120								
End Purge (hrs): 1330								
Total Purge Time (min): 130								
Total Vol. Purged (gal/L): 11.20								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Amonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT F~~

Pump intake @ 24.80' BTOC

25.80
-12.63
13.17 (.163) = 2.15 gal
= 7.94 L

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT08
DATE: 2/21/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1120	12.63	—	—	—	—	—	—	—	—	start purge
1130	13.26	1.200	120	4.64	.252	5.59	8.64	11.75	221.5	clear
1140	13.56	2.200	100	4.60	.253	3.72	6.99	11.73	221.7	clear
1150	13.77	3.200	100	4.61	.254	2.76	6.64	11.82	216.0	clear
1200	13.87	4.000	80	4.60	.254	2.75	6.60	11.61	210.5	clear
1210	13.97	4.800	80	4.59	.253	1.72	6.46	11.62	208.4	clear
1220	14.05	5.600	80	4.60	.253	1.02	6.36	11.43	206.3	clear, pump stopped
1230	14.02	6.400	80	4.61	.251	1.04	6.39	11.23	203.1	clear
1240	14.10	7.200	80	4.59	.252	1.03	6.29	11.40	201.3	clear
1250	14.12	8.000	80	4.60	.252	0.90	6.25	11.47	202.2	clear
1300	14.16	8.800	80	4.60	.254	0.93	6.27	11.58	203.8	clear
1310	14.22	9.600	80	4.58	.256	0.96	6.14	11.87	203.8	clear
1320	14.23	10.400	80	4.60	.254	0.42	6.15	11.60	204.1	clear
1330	14.25	11.200	80	4.60	.253	0.39	6.06	11.49	201.7	clear, end purge
1335	—	—	—	—	—	—	—	—	—	start sample

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) geopump 2 #401
Turbidity Meter (SN) 4175-1503

Pump Intake 24.80' b TOC

SIGNATURE(S): Colin Foster

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 0902
Sample Location: 12MWT 09
Sampled By: Goerdt
C.O.C. No.: 3708
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3-2-05	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1810	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: Peristaltic	Clear	4.25	.313	10.31	2.31	5.57	370.2	---

PURGE DATA:

Date: 3-2-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.76								
Static Water Level (WL): 12.72								
One Casing Volume(gal/L) 8.5								
Start Purge (hrs): 1640								
End Purge (hrs): 1805								
Total Purge Time (min): 85								
Total Vol. Purged (gal/L) 8.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & AMMONIA	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT_____-F

Pump intake @ 26'

26.76
12.72
14.04(.163) = 2.29 gal
= 8.5 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878

WELL ID.: 12MWT09
DATE: 3-2-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~ L	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1640	12.72	–	–	–	–	–	–	–	–	Start Purge
1650	14.21	1.0	100	4.27	.339	6.47	7.54	10.59	355.6	Clear
1700	14.39	2.0	100	4.26	.334	5.62	6.63	10.64	356.2	"
1710	14.36	3.0	100	4.24	.313	–	6.35	10.08	359.1	"
1720	13.82	4.0	100	4.26	.313	3.91	6.06	10.19	363.0	"
1730	13.78	5.0	100	4.26	.315	–	5.87	10.60	366.1	"
1740	13.69	6.0	100	4.25	.313	–	5.61	10.34	367.9	"
1750	13.60	7.0	100	4.26	.313	2.61	5.61	10.32	368.6	"
1800	13.58	8.0	100	4.26	.314	2.47	5.58	10.31	369.7	"
1805	13.60	8.5	100	4.25	.313	2.31	5.57	10.31	370.2	End Purge

Water Quality Meter (SN) 99K1014 AA
Control Box type (SN) 341
Turbidity Meter (SN) 4175-1503

Pump Intake 27'

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT1002
Sample Location: 12MWT10
Sampled By: T. Rosahn
C.O.C. No.: 3686
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 02-07-05	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1422								
Method: SAME	CLEAR	*4.5	0.570	12.10	2.0	5.26	387	---

PURGE DATA:

Date: 2-07-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" & PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.81								
Static Water Level (WL): 13.78								
One Casing Volume(gal/L): 9.3								
Start Purge (hrs): 1020								
End Purge (hrs): 1420								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 12.2								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & Ammonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT—-F

Pump intake @ 24.3

* pH paper YSI probe malfuctioned

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N~~1245~~ 6878

WELL ID.: 12MW710
DATE: 2-07-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1020	13.78	0	—	—	—	—	—	—	—	START PURGE
1030	14.51	600	60	4.5	0.560	45	4.45	11.35	323	CLEAR
1040	14.95	1,000	40	4.5	0.559	53	4.51	11.46	355	"
1050	14.95	1,400	40	4.5	0.557	60	4.58	11.59	348	"
1100	15.27	1,800	40	4.5	0.557	240	4.93	11.47	355	CLOUDY
1110	15.56	2,300	50	4.5	0.558	29	4.62	11.53	362	CLEAR
1120	16.15	3,000	70	4.5	0.561	9.5	4.45	11.84	366	"
1130	16.35	3,600	60	4.5	0.556	7.5	4.58	11.40	370	"
1140	16.56	4,200	60	4.5	0.551	6.2	4.70	11.04	374	"
1150	16.65	4,700	50	4.5	0.551	5.8	4.76	11.06	375	"
1200	16.82	5,200	50	4.5	0.552	5.5	4.80	11.03	376	"
1210	16.90	5,700	50	4.5	0.551	5.3	4.76	10.96	378	"
1220	16.98	6,200	50	4.5	0.550	5.3	4.75	10.94	379	"
1230	17.03	6700	50	4.5	0.550	4.2	4.77	10.92	379	"
1240	17.07	7,200	50	4.5	0.552	3.8	4.90	10.93	380	"
1250	17.05	7,700	50	4.5	0.555	3.0	4.93	11.28	381	"
1300	17.05	8200	50	4.5	0.562	2.7	5.28	11.80	381	"
1310	17.09	8,700	50	4.5	0.567	2.6	5.27	12.05	382	"
1320	17.15	9,200	50	4.5	0.576	2.5	5.44	12.58	384	"
1330	17.25	9,700	50	4.5	0.567	2.5	5.41	12.10	386	"
1340	17.42	10,200	50	4.5	0.571	2.4	5.38	12.29	386	"
1350	17.55	10,700	50	4.5	0.571	3.0	5.36	12.30	387	"
1400	17.58	11,200	50	4.5	0.578	3.9	5.48	11.98	386	"
1410	17.69	11,700	50	4.5	0.569	2.8	5.27	12.12	387	"
1420	17.78	12,200	50	4.5	0.570	2.0	5.26	12.10	387	"
1422	—	—	—	—	—	—	—	—	—	START SAMPLING

Water Quality Meter (SN) 02A0527 AF
Control Box type (SN) 341
Turbidity Meter (SN) 0355-4197

Pump Intake 24.3'

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT1102
Sample Location: 12MWT11
Sampled By: CD
C.O.C. No.: 3701
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 2/22/05	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1015	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: peristaltic	clear	3.89	.197	10.33	0.21	1.71	243.7	---

PURGE DATA:

Date: 2/22/05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.40'								
Static Water Level (WL): 12.64'								
One Casing Volume(gal/L): 8.30								
Start Purge (hrs): 0825								
End Purge (hrs): 1005								
Total Purge Time (min): 100								
Total Vol. Purged (gal/L): 10.71								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	(Yes)/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	(Yes)/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	(Yes)/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/(No)
Nitrate & Nitrite (as N) EPA 353.2 Amonia	4°C/H2SO4	(1) L HDPE	(Yes)/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/(No)

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT~~

Pump intake @ 25.40' BTOC

26.40
−12.64
13.76 (.163) = 2.24 gal
= 8.30 L

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Chris Doolin

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT11
DATE: 2/22/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0825	12.64	—	—	—	—	—	—	—	—	Start purge
0835	13.50	1.210	110	4.63	.242	8.90	2.49	10.98	183.7	clear
0845	13.72	2.310	110	3.97	.204	4.32	2.11	10.86	251.0	clear
0855	13.86	3.410	110	3.89	.200	2.94	1.89	10.84	258.9	clear
0905	13.99	4.510	110	3.88	.199	1.91	1.79	10.80	258.0	clear
0915	14.07	5.610	110	3.88	.199	1.45	1.72	10.91	258.8	clear
0925	14.17	6.710	110	3.86	.199	0.81	1.69	10.89	259.0	clear
0935	14.22	7.810	110	3.88	.198	0.70	1.71	10.67	256.9	clear
0945	14.30	8.910	110	3.88	.199	0.48	1.69	10.75	252.3	clear
0955	14.17	9.810	90	3.89	.197	0.44	1.71	10.30	246.8	clear
1005	14.16	10.710	90	3.89	.197	0.21	1.71	10.33	243.7	clear, end purge
1015	—	—	—	—	—	—	—	—	—	start sample

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) geopump 2 # 401
Turbidity Meter (SN) 4175-1503

Pump Intake 25.40' BTOC

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT1202
Sample Location: 12MWT12
Sampled By: CD
C.O.C. No.: 3701
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2/22/05								
Time: 1355								
Method: peristaltic	clear	6.08	.607	10.82	0.71	1.76	56.0	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2/22/05								
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC	See Low Flow Purge Data Sheets							
Total Well Depth (TD): 26.4'								
Static Water Level (WL): 10.03'								
One Casing Volume(gal/L): 9.87								
Start Purge (hrs): 1230								
End Purge (hrs): 1350								
Total Purge Time (min): 80								
Total Vol. Purged (gal/L): 10.53								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Amonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT F~~

Pump intake @ 25.4' bTOC

26.4
-10.03
16.37(.163) = 2.67 gal
= 9.87 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Chris Jordan

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT12
DATE: 2/22/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1230	10.03	—	—	—	—	—	—	—	—	start purge
1240	10.42	2.130	170	6.02	.645	4.79	2.29	11.59	47.0	clear
1250	10.32	3.330	120	6.05	.629	2.97	2.10	11.09	58.4	clear
1300	10.33	4.530	120	6.06	.631	1.59	1.97	11.12	60.8	clear
1310	10.34	5.730	120	6.07	.628	1.20	1.89	10.85	61.1	clear
1320	10.34	6.930	120	6.07	.628	0.82	1.88	11.05	59.6	clear
1330	10.35	8.130	120	6.07	.617	0.83	1.81	10.88	58.9	clear
1340	10.36	9.330	120	6.07	.617	0.85	1.82	11.27	57.0	clear
1350	10.37	10.530	120	6.08	.607	0.71	1.76	10.82	56.0	clear, end purge
1355	—	—	—	—	—	—	—	—	—	start sample

Water Quality Meter (SN): 01D0956 AA
Control Box type (SN): geopump 2 #401
Turbidity Meter (SN): 4175-1503

Pump Intake: 25.4' bTOC

SIGNATURE(S): Alin Dolan

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 1302
Sample Location: 12MWT 13
Sampled By: Goerdt
C.O.C. No.: 3706
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3-4-05	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1655	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: Peristaltic	Clear	4.14	2.19	11.07	7.84	0.95	247.8	---

PURGE DATA:

Date: 3-4-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 22.83								
Static Water Level (WL): 4.55								
One Casing Volume(gal/L): 11.0								
Start Purge (hrs): 1530								
End Purge (hrs): 1650								
Total Purge Time (min): 80								
Total Vol. Purged (gal/L): 12.0								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & AMMONIA	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT_____-F

Pump intake @ ~18'

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

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878

WELL ID.: 12MWT13
DATE: 3-4-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (~~mL/Min.~~)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1530	4.55	-	-	-	-	-	-	-	-	Start purge
1540	5.01	1.5	150	4.23	.224	15.7	2.21	12.09	246.4	clear
1550	5.07	3.0	150	4.17	.224	10.9	1.81	12.12	250.3	"
1600	5.07	4.5		4.17	.224	-	1.51	12.11	248.8	"
1610	5.08	6.0		4.15	.224	-	1.42	12.02	249.5	"
1620	5.07	7.5		4.14	.223	-	1.27	11.82	249.2	"
1630	5.09	9.0		4.13	.222	8.91	1.07	11.31	248.2	"
1640	5.08	10.5		4.14	.221	8.27	0.97	11.11	247.9	"
1650	5.08	12.0		4.14	.219	7.84	0.95	11.07	247.8	Stop purge

Water Quality Meter (SN) 99K1014AG
Control Box type (SN) 341
Turbidity Meter (SN) 4175-1503

Pump Intake ~18'

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 1402
Sample Location: 12MWT 14
Sampled By: Goerdt
C.O.C. No.: 3703
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: See Below *								
Time: "								
Method: Peristaltic	Cloudy	5.27	2.230	10.30	>1000	18.27	125.8	---

PURGE DATA:

Date: 3-2-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 27.80								
Static Water Level (WL): 20.65								
One Casing Volume(gal/L) 4.3								
Start Purge (hrs): 1310								
End Purge (hrs): 1435								
Total Purge Time (min): 85								
Total Vol. Purged (gal/L) 8.0								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	* Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	3/3/05 1340 (1) (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	3/3/05 1340 (1) (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	3/2/05 1310 (1) L HDPE Purge	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	3/2/05 1310 (1) L HDPE Purge	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & AMMONIA	4°C/H2SO4	3/2/05 1310 (1) L HDPE Purge	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT 1402 -F

Pump intake @ ~ 27.5'

27.80
20.65
7.15(.163) = 1.17 gal
= 4.33 L

Began collecting purge water as possible sample due to slow recovery of well. No parameters measured at this time due to by-passing flow cell. ~~[illegible]~~ 3/3/05 WL = 25.79

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

- Expl & Misc Expl collected on day following purge well dry.
- Metals & Nitrate are purge [illegible]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878

WELL ID.: 12MWT14
DATE: 3-2-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (~~mL/Min.~~ L)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1310	20.65	–	–	–	–	–	–	–	–	Start purge.
1320	21.65	1.0	100	5.07	2.260	45.9	17.81	11.11	162.7	Collecting sample
1340	22.43	3.0	100	Not measured due to bypassing						
1350	23.87	4.0	100	flow-thru cell to collect samples.						
1410	25.44	All samples collected - resume purging.								
1420	26.23	7.0	100	5.02	2.240	961	17.55	10.52	158.7	Cloudy
1430	26.93	8.0	100	5.27	2.230	>1000	18.27	10.30	125.8	"
1435	– Well Dry - Stop purge									

Water Quality Meter (SN) 99K1014 A1
Control Box type (SN) 341
Turbidity Meter (SN) 4175-1503

Pump Intake 27.5'

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT1502
Sample Location: 12MWT15
Sampled By: CD
C.O.C. No.: 3688
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2/8/05								
Time: 1320								
Method: peristaltic	clear	4.55	1.701	12.26	1.57	2.01	335.8	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2/8/05								
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.90'								
Static Water Level (WL): 18.59'								
One Casing Volume(gal/L): 5.01								
Start Purge (hrs): 0915								
End Purge (hrs): 1315								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 20.40								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & Ammonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT F~~

Pump intake @ 25.90' bTOC

26.90'
− 18.59'
8.31 (.163) = 1.35 gal
= 5.01 L

Circle if Applicable:

MS/MSD — Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT15
DATE: 2/8/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0915	18.59	—	—	—	—	—	—	—	—	start purge
0925	19.41	1.400	150	4.28	1.785	13.1	2.08	12.98	295.0	clear
0935	19.82	2.500	110	4.19	1.786	9.51	2.16	12.42	360.5	clear
0945	20.13	3.500	100	4.14	1.770	8.07	2.30	11.82	388.2	clear
0955	20.37	4.300	80	4.10	1.764	5.96	2.37	11.44	397.0	clear
1005	20.59	5.200	90	4.08	1.771	5.20	2.36	11.68	400.0	clear
1015	20.82	6.000	80	4.07	1.790	4.13	2.39	11.64	399.3	clear
1025	21.05	6.800	80	4.07	1.798	4.36	2.40	11.55	390.8	clear
1035	21.27	7.600	80	4.10	1.796	4.03	2.34	11.54	387.7	clear
1045	21.50	8.400	80	4.12	1.793	3.30	2.29	11.52	384.5	clear
1055	21.69	9.200	80	4.14	1.791	2.96	2.23	11.59	380.9	clear
1105	21.90	10.000	80	4.18	1.796	2.26	2.20	11.92	383.0	clear
1115	22.11	10.800	80	4.22	1.799	1.64	2.16	12.01	375.0	clear
1125	22.30	11.600	80	4.26	1.782	1.59	2.04	11.88	366.0	clear
1135	22.50	12.400	80	4.33	1.767	1.63	1.99	11.93	358.4	clear
1145	22.69	13.200	80	4.32	1.757	1.07	2.00	11.78	360.8	clear
1155	22.87	14.000	80	4.34	1.742	1.47	2.06	11.60	359.8	clear
1205	23.04	14.800	80	4.35	1.739	0.95	1.96	11.97	351.7	clear
1215	23.22	15.600	80	4.43	1.720	1.70	1.90	11.81	335.3	clear
1225	23.40	16.400	80	4.48	1.715	1.85	1.95	11.83	327.6	clear
1235	23.55	17.200	80	4.55	1.711	1.42	1.93	11.91	328.0	clear
1245	23.70	18.000	80	4.51	1.703	2.67	2.03	11.90	335.8	clear
1255	23.85	18.800	80	4.50	1.707	0.90	1.92	12.12	341.4	clear
1305	24.00	19.600	80	4.54	1.704	1.28	1.98	12.20	339.9	clear
1315	24.16	20.400	80	4.55	1.701	1.57	2.01	12.26	335.8	clear, end purge
1320	—	—	—	—	—	—	—	—	—	start sample

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) geopump 2 #401
Turbidity Meter (SN) 4175-1503

Pump Intake 25.90' bTOC

SIGNATURE(S): Clin Dzelum

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT1602
Sample Location: 12MWT16
Sampled By: CD
C.O.C. No.: 3695
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 2/16/05	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1355	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: peristaltic	cloudy	6.25	.336	15.02	144	4.49	101.4	---

PURGE DATA:

Date: 2/15/05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.85'								
Static Water Level (WL): 21.35'								
One Casing Volume(gal/L): 2.65								
Start Purge (hrs): 1505								
End Purge (hrs): 1632								
Total Purge Time (min): 87								
Total Vol. Purged (gal/L): 10.0								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[✓] No[] 12GWT 1602 -F

Pump intake @ 25.85' bTOC

26.85
-21.35
5.5 (.163) = 0.72 gal
= 2.65 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Chris Fischer

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT16
DATE: 2/15/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1505	21.35	—	—	—	—	—	—	—	—	start purge
1515	22.34	1.870	170	6.19	.344	13.4	4.92	15.42	104.9	clear
1525	23.09	3.270	140	6.19	.341	32.1	5.57	15.83	118.5	clear
1535	23.65	4.270	100	6.21	.339	34.1	5.45	15.72	109.5	~~clear~~ slightly cloudy
1545	23.94	5.270	100	6.21	.338	69.2	5.25	15.50	108.2	cloudy
1555	24.33	6.270	100	6.21	.337	101.0	4.93	15.38	106.9	cloudy
1605	24.77	7.270	100	6.29	.338	207	4.48	15.33	95.0	cloudy
1615	25.26	8.270	100	6.27	.335	319	4.04	14.99	90.8	cloudy
1625	25.81	9.270	100	6.25	.336	144	4.49	15.02	101.4	cloudy
	Well went dry at 1632									
	Will sample on 2/16/05									

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) geopump 2 #401
Turbidity Meter (SN) 4175-1503

Pump Intake 25.85' bTOC

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT1702
Sample Location: 12MWT17
Sampled By: CD
C.O.C. No.: 3696
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2/17/05								
Time: 1430								
Method: peristaltic	cloudy	5.88	.592	13.02	1.31	8.30	131.0	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2/16/05								
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC	See Low Flow Purge Data Sheets							
Total Well Depth (TD): 27.70'								
Static Water Level (WL): 23.73'								
One Casing Volume(gal/L): 2.39								
Start Purge (hrs): 1510								
End Purge (hrs): 1532								
Total Purge Time (min): 22								
Total Vol. Purged (gal/L): 3.47								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Ammonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[✓] No[] 12GWT1702-F

Pump intake @ 26.70' bTOC

27.70
−23.73
3.97 (.163) = 0.647 gal
= 2.39 L

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	Clin Jacobs
—	—	

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT17
DATE: 2/16/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1510	23.73	—	—	—	—	—	—	—	—	start purge
1520	26.22	2.470	170	5.85	.599	296	8.08	13.38	144.2	cloudy
1530	26.68	3.470	100	5.88	.592	131	8.30	13.02	131.0	cloudy
	well went dry at 1532									
	will sample on 2/17/05									

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) geopump 2 #401
Turbidity Meter (SN) 175-1503

Pump Intake 26.70' bTOC

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 1802
Sample Location: 12MWT 18
Sampled By: Goerlt
C.O.C. No.: 3703
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU) 3/3/05	DO (mg/L)	ORP (mV)	Other NA
Date: 3-3-05								
Time: 1420								
Method: Peristaltic	Clear	4.13	2.132	12.75	26.4	19.36	376.6	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 3-2-05								
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" pvc			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 28.0								
Static Water Level (WL): 22.72								
One Casing Volume(gal/L) 3.2								
Start Purge (hrs): 1500								
End Purge (hrs): 1630								
Total Purge Time (min): 90								
Total Vol. Purged (gal/L) 9.6								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE Yes	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & AMMONIA	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes/No 12GWT 1802 -F

Pump intake @ 28'

28.00
22.72
5.28(.163) = .86 gal
= 3.18 L

Collected Purge water as possible samples.

3/3/05 WL = 23.05 Was able to collect all samples on 3/3/05.

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Purge water samples were discarded.

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878

WELL ID.: 12MWT18
DATE: 3-2-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1500	22.72	-	-	-	-	-	-	-	-	Start Purge
1510		1.0	100	4.31	2.125	17.6	18.02	11.07	268.5	clear
		Due to slow recharge, samples being collected								
		during purge for possible analyses. Did not collect								
1530	24.05	3.0	filtered metal due to low turbidity (<10 NTU).							
1543	24.74					3.63				
1605	25.56									
1610	25.84	7.8	180	4.13	1.983	-	17.06	11.73	349.1	Resume Purge
1620	26.62	9.6	180	4.13	2.132	5.61	19.36	12.75	376.6	clear
1630	27.48			Well Dry						End Purge

Water Quality Meter (SN) 99K1014 AA
Control Box type (SN) 371
Turbidity Meter (SN) 4175-1503

Pump Intake 28'

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 1902
Sample Location: 12MWT 19
Sampled By: CD
C.O.C. No.: 3700
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2/18/05								
Time: 1555								
Method: peristaltic	clear	5.92	1.497	9.78	35.2	6.28	81.6	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2/17/05								
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 29.20'								
Static Water Level (WL): 27.22'								
One Casing Volume(gal/L): 1.19								
Start Purge (hrs): 1535								
End Purge (hrs): 1556								
Total Purge Time (min): 21								
Total Vol. Purged (gal/L): 2.42								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	1 ~~(2)~~ L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 ~~(2)~~ L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	2/19/05 1540 (1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Amonia	4°C/H2SO4	2/19/05 1540 (1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[✓] No[] 12GWT 1902 -F

Pump intake @ 28.20' BTOC

29.20
−27.22
1.98(.163) = 0.32 gal
= 1.19 L

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT19
DATE: 2/17/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1535	(10) ~~[illegible]~~ 27.22	—	—	—	—	—	—	—	—	start purge
1545	27.95	1.420	120	5.95	1.477	21.1	6.09	10.33	83.9	clear
1555	28.33	2.420	100	5.92	1.497	35.2	6.28	9.78	81.6	clear
	well went dry at 1556									
	will sample on 2/18/05									

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) geopump 2 #401
Turbidity Meter (SN) 4175 - 1503

Pump Intake 28.20' bTOC

SIGNATURE(S): Colin Dooley

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT2002
Sample Location: 12MWT20
Sampled By: CD
C.O.C. No.: 3688
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2/7/03								
Time: 1640								
Method: peristaltic	Clear	5.25	1.696	12.07	0.80	4.26	45.4	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2/7/03								
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC	See Low Flow Purge Data Sheets							
Total Well Depth (TD): 27.85'								
Static Water Level (WL): 24.90'								
One Casing Volume(gal/L): 1.78								
Start Purge (hrs): 1505								
End Purge (hrs): 1635								
Total Purge Time (min): 90								
Total Vol. Purged (gal/L): 7.41								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & Ammonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT~~ ~~F~~

Pump intake @ 26.85' BTOC

27.85
-24.90
2.95(.163) = 0.48 gal
= 1.78 L

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT20
DATE: 2/7/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1505	24.90	—	—	—	—	—	—	—	—	start purge
1515	25.04	1.010	110	4.92	2.376	4.1	2.77	12.06	85.6	clear
1525	25.05	1.810	80	5.39	1.637	4.9	4.01	11.85	45.9	clear
1535	25.06	2.610	80	5.62	1.364	5.7	5.01	11.93	42.1	clear
1545	25.08	3.410	80	5.60	1.355	4.1	5.27	12.07	42.5	clear
1555	25.10	4.210	80	5.52	1.435	2.2	5.13	12.22	44.7	clear
1605	25.11	5.010	80	5.42	1.519	1.6	4.77	12.18	44.3	clear
1615	25.12	5.810	80	5.36	1.579	0.95	4.59	12.08	44.4	clear
1625	25.13	6.610	80	5.29	1.645	0.70	4.39	12.08	45.4	clear
1635	25.14	7.410	80	5.25	1.696	0.80	4.26	12.07	45.4	clear, end purge
1640	—	—	—	—	—	—	—	—	—	begin sample
	4 well volumes purged									

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) Geopump 2 #401
Turbidity Meter (SN) 4175-1503

Pump Intake 26.85' bTOC

SIGNATURE(S): Colin Dooley

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 2102
Sample Location: 12MWT 21
Sampled By: Goerdt
C.O.C. No.: 3704
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3-4-05	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1015								
Method: Peristaltic	Clear	3.37	.423	11.22	3.15	2.72	401.9	---

PURGE DATA:

Date: 3-4-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.62								
Static Water Level (WL): 19.61								
One Casing Volume(gal/L): 4.2								
Start Purge (hrs): 0825								
End Purge (hrs): 1010								
Total Purge Time (min): 105								
Total Vol. Purged (gal/L) 7.4								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & AMMONIA	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT_____-F

Pump intake @ 26.5'

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878

WELL ID.: 12MWT21
DATE: 3-4-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0825	19.61	-	-	-	-	-	-	-	-	Start Purge
0835	20.09	0.70	70	3.44	.385	18.6	7.32	9.50	377.5	Clear
0845	20.23	1.4	70	3.49	.376	14.7	6.65	9.40	379.1	"
0855	20.31	2.1	70	3.51	.379	-	6.11	9.68	388.3	"
0905	20.47	2.8	70	3.48	.389	11.3	5.21	10.31	399.0	"
0915	20.53	3.5	70	3.45	.399	-	4.67	10.82	404.9	"
0925	20.60	4.2	70	3.45	.407	8.75	3.90	11.30	409.4	"
0935	20.69	4.9	70	3.42	.409	5.20	3.76	11.28	409.6	"
0945	20.74	5.6	70	3.40	.415	4.87	3.34	11.33	408.3	"
0955	20.79	6.3	70	3.39	.419	4.33	2.94	11.59	404.4	"
1005	20.68	7.0	70	3.38	.421	3.76	2.74	11.13	402.4	
1010	20.68	7.4	70	3.37	.423	3.15	2.72	11.22	401.9	Stop Purge

Water Quality Meter (SN) 99K014 AG
Control Box type (SN) 341
Turbidity Meter (SN) 4175-1503

Pump Intake 26.5'

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 2202
Sample Location: 12MWT22
Sampled By: CD
C.O.C. No.: 3700
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 2/21/05	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1450								
Method: peristaltic	clear	5.61	.186	12.51	~~83.0~~ 9.66	6.10	182.1	---

PURGE DATA:

Date: 2/20/05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.70'								
Static Water Level (WL): 17.04'								
One Casing Volume(gal): 5.83								
Start Purge (hrs): 1415								
End Purge (hrs): 1606								
Total Purge Time (min): 111								
Total Vol. Purged (gal): 19.60								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Amonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT F~~

Pump intake @ 25.70' bTOC

turbidity was measured to be 9.66 prior to sampling for total metals.

26.70
-17.04
9.66 (.163) = 1.57 gal
= 5.83 L

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Colin Drolen

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT22
DATE: 2/20/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1415	17.04	—	—	—	—	—	—	—	—	start purge
1425	17.64	1.100	110	5.87	.170	5.06	9.95	11.48	195.4	clear
1435	18.24	2.600	150	5.91	.166	5.96	9.97	11.93	192.0	clear
1445	19.01	4.300	170	5.93	.166	9.40	9.73	11.94	189.3	clear
1455	19.74	6.000	170	5.93	.170	18.6	9.23	11.98	185.4	clear
1505	20.57	7.800	180	5.93	.173	37.0	8.73	12.10	181.4	slightly cloudy
1515	21.46	9.600	180	5.90	.172	55.1	8.08	12.16	179.5	slightly cloudy
1525	22.12	11.400	180	5.88	.177	89.1	7.78	12.18	179.9	slightly cloudy
1535	23.04	13.400	200	5.80	.179	103	7.29	12.23	181.1	cloudy
1545	23.95	15.400	200	5.72	.181	144	7.14	12.25	182.5	cloudy
1555	24.91	17.400	200	5.64	.188	135	6.83	12.36	184.3	cloudy
1605	25.68	19.400	200	5.61	.186	83.0	6.10	12.51	182.1	slightly cloudy
	well	went	dry	at	1606					
	will	sample	on	2/21/05						

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) geopump 2 #401
Turbidity Meter (SN) 4175-1503

Pump Intake 25.70' bTOC

SIGNATURE(S): Colin Jordan

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT2302
Sample Location: 12MWT23
Sampled By: CD
C.O.C. No.: 3700
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2/20/05								
Time: 1720								
Method: peristaltic	clear	3.33	4.644	12.66	6.80	1.79	504.6	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2/19/05								
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC	See Low Flow Purge Data Sheets							
Total Well Depth (TD): 32.48'								
Static Water Level (WL): 28.24'								
One Casing Volume(gal/L): 2.56								
Start Purge (hrs): 1335								
End Purge (hrs): 1511								
Total Purge Time (min): 96								
Total Vol. Purged (gal/L): 9.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	(Yes)/No
Miscellaneous Explosives	4°C	1 ~~(2)~~ L Glass Amber	(Yes)/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	(Yes)/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/(No)
Nitrate & Nitrite (as N) EPA 353.2 Amonia	4°C/H2SO4	(1) L HDPE	(Yes)/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/(No)

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT~~ F

Pump intake @ 31.48' bTOC

32.48
-28.24
4.24(.163) = 0.69 gal
= 2.56 L

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Colin Dooley

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT23
DATE: 2/19/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1335	28.24	—	—	—	—	—	—	—	—	Start purge
1345	28.77	0.900	90	3.15	4.640	6.48	2.36	12.78	516.5	clear
1355	29.24	1.900	100	3.79	4.602	9.66	3.24	12.79	524.0	clear
1405	29.66	2.900	100	3.41	4.526	17.6	2.99	12.75	527.8	clear
1415	30.03	3.800	90	3.48	4.517	12.8	2.57	12.48	525.8	clear
1425	30.45	4.900	110	3.57	5.964	8.30	2.12	12.25	514.9	clear
1435	30.84	5.900	100	3.58	4.552	8.82	1.74	12.26	506.7	clear
1445	31.23	6.900	100	3.21	4.624	8.33	1.49	12.74	509.1	clear
1455	31.57	7.900	100	3.35	4.595	5.89	1.45	12.26	503.9	clear
1505	31.98	8.900	100	3.33	4.644	6.80	1.79	12.66	504.6	clear
	well went dry at 1511									
	will sample on 2/20/05									

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) geopump 2 #401
Turbidity Meter (SN) 4175 - 1503

Pump Intake 31.48' BTOC

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 24A02
Sample Location: 12MWT 24A
Sampled By: T. ROJAHN
C.O.C. No.: 3695
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 2-16-05	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1335								
Method: SAME	CLEAR	3.77	5.982	12.18	3.2	1.77	249	---

PURGE DATA:

Date: 2/16/05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Bladder								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 56.55								
Static Water Level (WL): 34.47								
One Casing Volume(gal/L): 13.6								
Start Purge (hrs): 0930								
End Purge (hrs): 1330								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 19.4								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	(Tc) Yes/No
Nitrate & Nitrite (as N) EPA 353.2 AMMONIA	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT NA -F 22.08 X 0.169 = 3.6 gal / or 13.6 L

Pump intake @ 51.30'

Circle if Applicable:		Signature(s):
MS/MSD —	Duplicate ID No.: —	Terry Rojahn

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N~~1245~~ 6878

WELL ID.: 12MWT24A
DATE: 2/16/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0930	34.47	—	—	—	—	—	—	—	—	START PURGE
0940	35.58	1200	120	4.22	5.696	50	1.37	10.15	+219	CLEAR
0950	36.18	1920	72	4.24	5.678	45	1.35	10.18	209	CLEAR
1000	36.78	2640	72	4.25	5.680	40	1.32	10.25	204	CLEAR
1010	37.40	3360	72	4.26	5.691	34	1.29	10.29	200	CLEAR
1020	37.91	4080	72	4.23	5.697	35	1.32	10.50	200	CLEAR
1030	38.40	4800	72	4.21	5.716	39	1.35	10.69	201	CLEAR
1040	38.75	5520	72	4.15	5.718	37	1.41	10.81	209	CLEAR
1050	39.15	6240	72	4.09	5.721	35	1.48	10.90	215	CLEAR
1100	39.55	6960	72	4.04	5.722	32	1.49	10.95	218	CLEAR
1110	39.80	7760	80	3.99	5.755	30	1.48	11.15	218	CLEAR
1120	40.05	8560	80	3.98	5.785	26	1.46	11.30	224	CLEAR
1130	40.28	9360	80	3.95	5.797	22	1.45	11.47	230	CLEAR
1140	40.45	10,160	80	3.92	5.799	18	1.48	11.44	233	CLEAR
1150	40.61	10,960	80	3.90	5.801	14	1.50	11.44	236	CLEAR
1200	40.77	11,760	80	3.88	5.802	10	1.52	11.43	239	CLEAR
1210	40.91	12,610	85	3.86	5.829	8.6	1.58	11.54	241	CLEAR
1220	41.07	13460	85	3.84	5.855	7.8	1.64	11.65	243	CLEAR
1230	41.20	14310	85	3.83	5.880	7.2	1.69	11.73	245	CLEAR
1240	41.29	15160	85	3.82	5.886	6.8	1.70	11.90	246	CLEAR
1250	41.37	16010	85	3.81	5.892	6.3	1.71	12.10	248	CLEAR
1300	41.45	16860	85	3.80	5.897	6.0	1.73	12.21	248	CLEAR
1310	41.51	17,710	85	3.79	5.927	5.2	1.75	12.19	248	CLEAR
1320	41.58	18,560	85	3.78	5.960	4.1	1.76	12.18	249	CLEAR
1330	41.63	19,410	85	3.77	5.982	3.2	1.77	12.18	249	CLEAR
1335	—	—	—	—	—	—	—	—	—	SAMPLE TIME

Water Quality Meter (SN) 99K1014 AG
Control Box type (SN) 1588
Turbidity Meter (SN) 4536-3303

Pump Intake 51.5'

SIGNATURE(S): Terry Rogers

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT2502
Sample Location: 12MWT25
Sampled By: CD
C.O.C. No.: 3684
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA: CD

Date: ~~2/2/05~~ 2/4/05	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1345								
Method: peristaltic	clear	6.28	1.952	14.57	13.8	0.84	38.9	---

PURGE DATA:

Date: 2/3/05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC	See Low Flow Purge Data Sheets							
Total Well Depth (TD): 27.90'								
Static Water Level (WL): 17.18'								
One Casing Volume(gal/L): 6.47								
Start Purge (hrs): 1415								
End Purge (hrs): 1634								
Total Purge Time (min): 139								
Total Vol. Purged (gal/L): 17.37								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	~~Yes~~/No
Nitrate & Nitrite (as N) EPA 353.2 & Ammonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT F~~

Pump intake @ 26.90' bTOC

turbidity was measured as 6.33 NTU prior to sampling for dissolved metals

27.90
-17.18
10.72(.163) = 1.75 gal
= 6.47 L

Circle if Applicable:

MS/MSD — Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N1245

WELL ID.: 12 MWT25
DATE: 2/3/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
~~2~~ 1415	17.18	—	—	—	—	—	—	—	—	Start purge
1425	18.93	2.070	170	6.32	1.927	3.16	1.00	14.44	80.2	clear
1435	19.49	3.270	120	6.28	1.889	2.69	1.01	14.21	87.5	clear
1445	19.84	3.970	70	6.36	1.864	2.21	1.13	13.80	85.1	clear
1455	20.21	4.770	80	6.35	1.846	2.08	1.10	13.89	73.2	clear
1505	20.64	5.470	70	6.29	1.809	3.45	1.27	13.73	84.9	clear
1515	20.82	6.070	60	6.40	1.779	2.93	1.26	13.46	70.1	clear
1525	21.18	6.770	70	6.41	1.774	3.35	1.25	13.56	87.9	clear
1535	21.49	7.370	60	6.27	1.773	5.74	1.26	13.31	87.9	clear
1545	22.31	9.370	200	6.30	2.293	4.83	0.97	14.52	64.5	clear
1555	23.33	11.370	200	6.30	1.882	12.0	0.92	14.66	56.3	clear
1605	24.28	13.370	200	6.30	1.915	11.5	0.88	14.64	54.3	clear
1615	25.25	15.370	200	6.28	1.940	10.27	0.86	14.60	44.4	clear
1625	26.21	17.370	200	6.28	1.952	13.8	0.84	14.57	38.9	clear
	Went dry at	1634								
	Will sample on	2/4/05								

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) geopump 2 #401
Turbidity Meter (SN) 4175-1503

Pump Intake 26.90 bTOC

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 2602
Sample Location: 12MWT 26
Sampled By: CD
C.O.C. No.: 3696
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2/17/05								
Time: 1255								
Method: peristaltic	clear	6.18	.774	11.54	9.81	1.70	38.5	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2/17/05								
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.80'								
Static Water Level (WL): 10.44'								
One Casing Volume(gal/L): 9.87								
Start Purge (hrs): 0850								
End Purge (hrs): 1250								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 21.20								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	(Yes)/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	(Yes)/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	(Yes)/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/(No)
Nitrate & Nitrite (as N) EPA 353.2 Ammonia	4°C/H2SO4	(1) L HDPE	(Yes)/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	(Yes)/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT E~~

Pump intake @ 25.80' BTOC

26.80
-10.44
16.36 (.163) = 2.67 gal
= 9.87 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT26
DATE: 2/17/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0850	10.44	—	—	—	—	—	—	—	—	start purge
0900	11.82	1.100	100	6.28	.725	12.3	3.20	10.14	104.7	clear
0910	12.78	2.000	90	6.21	.683	7.45	2.81	9.65	101.5	clear
0920	13.61	2.900	90	6.26	.686	3.72	2.62	10.32	93.2	clear
0930	14.34	3.700	80	6.25	.687	3.05	2.55	10.38	89.7	clear
0940	14.92	4.500	80	6.23	.679	3.29	2.51	10.03	86.3	clear
0950	15.54	5.300	80	6.25	.683	1.88	2.43	10.27	81.3	clear
1000	16.06	6.100	80	6.27	.681	2.08	2.37	9.87	75.2	clear
1010	16.62	6.900	80	6.26	.688	2.46	2.30	10.20	72.3	clear
1020	17.01	7.700	80	6.22	.686	2.07	2.23	10.12	67.9	clear
1030	17.04	8.500	80	6.28	.694	1.38	2.21	10.60	61.6	clear
1040	17.15	9.300	80	6.26	.697	1.15	2.16	10.70	59.4	clear
1050	17.32	9.900	60	6.21	.696	0.72	2.18	10.43	58.9	clear
1100	17.37	10.600	70	6.25	.690	1.12	2.36	10.44	63.0	clear, pump stopped
1110	17.61	11.200	60	6.23	.700	0.86	2.12	10.53	60.5	clear
1120	17.91	12.200	100	6.20	.711	0.69	2.05	11.36	58.9	clear
1130	18.25	13.200	100	6.22	.714	0.85	2.00	11.58	54.5	clear
1140	18.62	14.200	100	6.24	.719	0.95	1.94	11.77	51.8	clear
1150	18.97	15.200	100	6.21	.706	0.76	1.92	11.49	50.1	clear
1200	19.22	16.200	100	6.17	.702	2.99	1.90	11.71	50.8	clear
1210	19.48	17.200	100	6.17	.697	9.39	1.76	11.84	46.7	clear
1220	19.75	18.200	100	6.24	.721	8.38	1.74	11.92	40.5	clear
1230	20.01	19.200	100	6.18	.748	7.97	1.73	12.36	39.2	clear
1240	20.26	20.200	100	6.15	.764	8.29	1.71	12.12	45.1	clear
1250	20.54	21.200	100	6.18	.774	9.81	1.70	11.54	38.5	clear, end purge
1255	—	—	—	—	—	—	—	—	—	start sample

Water Quality Meter (SN) OID 0956 AA
Control Box type (SN) geopump 2 #401
Turbidity Meter (SN) 4175-1503

Pump Intake 25.80' bTOC

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT2702
Sample Location: 12MWT27
Sampled By: CD
C.O.C. No.: 3696
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 2/7/05	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1300								
Method: peristaltic	clear	6.40	.234	11.32	9.1	1.71	4.4	---

PURGE DATA:

Date: 2/7/05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC	See Low Flow Purge Data Sheets							
Total Well Depth (TD): 27.85'								
Static Water Level (WL): 9.15'								
One Casing Volume(gal/L): 11.28								
Start Purge (hrs): 0855								
End Purge (hrs): 1255								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 20.82								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	(Yes)/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	(Yes)/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	(Yes)/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/(No)
Nitrate & Nitrite (as N) EPA 353.2 & Ammonia	4°C/H2SO4	(1) L HDPE	(Yes)/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/(No)

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT F~~

Pump intake @ 22.5' BTOC

27.85
−9.15
18.70 (.163) = ~~18.7~~ 3.05 gal
= 11.28 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT27
DATE: 2/7/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0855	9.15	—	—	—	—	—	—	—	—	start purge
0905	12.66	2420	220	6.37	.244	3.9	2.63	12.63	72.6	clear
0915	14.14	4.020	160	6.38	.240	3.4	2.64	12.07	67.7	clear
0925	15.23	5.120	110	6.39	.237	3.9	2.65	11.65	61.8	clear
0935	16.15	6.120	100	6.39	.234	4.1	2.71	11.32	54.3	clear
0945	16.70	7.120	100	6.39	.231	3.5	2.70	10.87	47.0	clear
0955	17.24	8.020	90	6.40	.231	2.7	2.71	10.73	42.4	clear
1005	17.70	8.920	90	6.40	.230	3.3	2.72	10.67	40.4	clear
1015	18.04	9.620	70	6.41	.230	3.7	2.69	10.75	38.0	clear
1025	18.11	10.320	70	6.40	.231	3.3	2.67	10.87	35.5	clear
1035	18.35	11.020	70	6.40	.230	2.7	2.62	10.75	32.5	clear
1045	18.58	11.720	70	6.40	.231	2.4	2.58	10.71	30.0	clear
1055	18.78	12.420	70	6.40	.230	1.9	2.52	10.73	27.8	clear
1105	18.99	13.120	70	6.40	.230	2.1	2.46	10.84	25.3	clear
1115	19.21	13.820	70	6.40	.229	1.8	2.36	10.72	22.6	clear
1125	19.40	14.520	70	6.41	.229	1.7	2.26	10.78	20.0	clear
1135	19.58	15.220	70	6.41	.229	1.9	2.16	10.83	17.4	clear
1145	19.76	15.920	70	6.41	.228	1.7	2.07	10.88	15.3	clear
1155	19.95	16.620	70	6.41	.228	2.2	1.99	10.90	13.2	clear
1205	20.14	17.320	70	6.41	.228	3.1	1.91	10.89	11.2	clear
1215	20.35	18.020	70	6.41	.229	3.9	1.88	11.04	10.5	clear
1225	20.57	18.720	70	6.41	.230	5.9	1.82	11.07	8.7	clear
1235	20.82	19.420	70	6.40	.231	8.3	1.79	11.04	6.1	clear
1245	21.03	20.120	70	6.40	.233	9.0	1.75	11.11	5.1	clear
1255	21.28	20.820	70	6.40	.234	9.1	1.71	11.39	4.4	clear, end purge
1300	—	—	—	—	—	—	—	—	—	start sample

Water Quality Meter (SN): 01D0956 AA
Control Box type (SN): Geopump 2 #401
Turbidity Meter (SN): 4175 - 1503

Pump Intake: 22.5' bTOC

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT2802
Sample Location: 12MWT28
Sampled By: CD
C.O.C. No.: 3695
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 2/15/05	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1305	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: peristaltic	clear	6.41	1208	16.17	9.03	4.17	82.7	---

PURGE DATA:

Date: 2/15/05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 27.80'								
Static Water Level (WL): 12.02'								
One Casing Volume(gal/L): 9.52								
Start Purge (hrs): 0900								
End Purge (hrs): 1300								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 20.22								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT F~~

Pump intake @ 26.80' bTOC

27.80
-12.02
15.78 (.163) = 2.57 gal
= 9.52 L

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: ~~12MWT16~~ (co) 12MWT28
DATE: 2/15/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0900	12.02	—	—	—	—	—	—	—	—	start purge
0910	13.96	1.620	120	6.58	1062	2.39	5.22	13.09	138.9	clear
0920	14.99	2.620	100	6.60	1047	1.43	5.11	12.83	139.1	clear
0930	15.66	3.420	80	6.59	1048	1.51	5.02	12.84	136.2	clear
0940	16.48	4.320	90	6.60	1053	1.24	4.96	13.02	133.2	clear
0950	17.05	5.020	70	6.59	1056	0.78	4.98	13.08	133.6	clear
1000	17.89	5.820	80	6.58	1085	0.75	4.90	14.01	133.4	clear
1010	18.18	6.620	80	6.55	1093	1.44	4.99	14.36	134.5	clear
1020	18.43	7.420	80	6.53	1101	2.12	4.90	14.49	133.9	clear
1030	18.76	8.220	80	6.55	1106	1.16	4.80	14.74	133.6	clear
1040	19.09	9.020	80	6.54	1115	0.69	4.81	14.96	135.9	clear
1050	19.40	9.820	80	6.50	1122	2.07	4.62	15.09	134.8	clear
1100	19.73	10.620	80	6.50	1127	0.77	4.59	15.30	131.4	clear
1110	20.07	11.420	80	6.58	1128	0.68	4.58	15.18	122.3	clear
1120	20.43	12.220	80	6.48	1124	2.69	4.37	15.31	117.8	clear
1130	20.77	13.020	80	6.46	1136	3.79	4.42	15.53	108.3	clear
1140	21.11	13.820	80	6.45	1153	4.75	4.38	15.56	113.2	clear
1150	21.45	14.620	80	6.42	1168	4.33	4.44	15.60	108.6	clear
1200	21.76	15.420	80	6.49	1183	5.52	4.29	15.84	102.2	clear
1210	22.08	16.220	80	6.47	1196	5.26	4.32	16.02	94.4	clear
1220	22.36	17.020	80	6.51	1204	7.32	4.34	16.32	88.0	clear
1230	22.66	17.820	80	6.42	1207	6.78	4.30	16.09	92.3	clear
1240	22.94	18.620	80	6.48	1206	7.58	4.33	16.20	86.1	clear
1250	23.24	19.420	80	6.44	1209	6.85	4.36	16.29	85.7	clear
1300	23.54	20.220	80	6.41	1208	9.03	4.17	16.17	82.7	clear, end purge
1305	—	—	—	—	—	—	—	—	—	start sample

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) geopump 2 # 401
Turbidity Meter (SN) 4175-1503

Pump Intake 26.80' BTOC

SIGNATURE(S): [signature]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 2902
Sample Location: 12MWT 29
Sampled By: T. ROJAHN
C.O.C. No.: 3700
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2-20-05								
Time: 1332								
Method: SAME	Greyish	8.05	0.791	10.72	71000	0.21	+ 72	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2-20-05								
Method: Bladder Pump								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 90.9								
Static Water Level (WL): 61.17								
One Casing Volume(gal/L): 18.3								
Start Purge (hrs): 0910								
End Purge (hrs): 1330								
Total Purge Time (min): 260								
Total Vol. Purged (gal/L): 19.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Ammonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT 2902 -F 29.73 x 0.163 = 4.8 gal or 18.3

Pump intake @ 80.9

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s): Tony Rojahn

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N~~1245~~ 6878

WELL ID.: 12MWT29
DATE: 2-20-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0910	61.17	0	—	7.26	—	—	—	—		
0920	62.22	900	90	~~7.862~~	0.752	>1000	0.96	8.35	+21	Grey
0930	63.20	1800	90	7.29	0.751	>1000	0.94	8.47	22	"
0940	63.80	2700	90	7.32	0.751	>1000	0.92	8.58	23	"
0950	64.41	3500	80	7.42	0.738	>1000	0.87	8.24	33	"
1000	65.04	4300	80	7.63	0.770	>1000	0.83	9.16	63	"
1010	PROBLEM W/	PUMP	—	—	—	—	—	—	→	REPAIR PUMP
1020	↓	—	—	—	—	—	—	—	—	↓ BAD O-RING
1030	65.30	5200	90	7.76	0.788	>1000	0.95	9.71	61	Grey
1040	66.59	6200	100	7.85	0.797	>1000	0.48	10.28	61	"
1050	67.35	7200	100	7.91	0.791	>1000	0.40	10.21	62	"
1100	68.15	8200	100	7.96	0.794	>1000	0.35	10.37	63	"
1110	68.85	9000	80	7.98	0.786	>1000	0.35	10.11	64	"
1120	69.32	9800	80	7.99	0.788	>1000	0.35	10.28	65	"
1130	69.70	10600	80	8.00	0.796	>1000	0.33	10.70	68	"
1140	70.15	11300	70	8.01	0.790	>1000	0.32	10.54	70	"
1150	70.60	12000	70	8.01	0.788	>1000	0.30	10.43	71	"
1200	71.02	12750	75	8.01	0.793	>1000	0.29	10.65	74	"
1210	71.40	13500	75	8.01	0.797	>1000	0.27	10.90	77	"
1220	71.87	14250	75	8.00	0.798	>1000	0.26	10.96	80	"
1230	72.34	15000	75	8.00	0.796	>1000	0.25	10.89	83	"
1240	72.78	15750	75	8.01	0.797	>1000	0.24	10.88	83	"
1250	72.99	16500	75	8.03	0.794	>1000	0.23	10.79	80	"
1300	73.20	17250	75	8.03	0.791	>1000	0.22	10.70	78	"
1310	73.35	18000	75	8.04	0.788	>1000	0.22	10.53	75	"
1320	73.51	18750	75	8.04	0.789	>1000	0.21	10.62	74	"
1330	73.64	19500	75	8.05	0.791	>1000	0.21	10.72	72	"
1332	—	—	—	—	—	—	—	—	—	SAMPLE TIME

Water Quality Meter (SN) 99K1014 AG
Control Box type (SN) 1588
Turbidity Meter (SN) 4536-3303

Pump Intake 80.9

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT ~~3002~~ TK
Sample Location: 12MWT 30
Sampled By: —
C.O.C. No.: —
Type of Sample:
[X] Low Concentration NO SAMPLE
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Date: 2-15-05	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Time: 1441								
Method: BAILER	GREY	—	—	—	—	—	—	—

PURGE DATA:

Date: NA	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 92.85								
Static Water Level (WL): 92.53								
One Casing Volume(gal/L): —								
Start Purge (hrs): NA								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 12GWT — -F

Pump intake @ NA

DRY - ROUND 2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3102
Sample Location: 12MWT 31
Sampled By: Goerdt
C.O.C. No.: 3686
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2-7-05								
Time: 1345								
Method: Bladder	clear	8.09	.431	10.99	75	1.16	70.7	---

PURGE DATA:

Date: 2-7-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Bladder								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 91.25								
Static Water Level (WL): 66.83								
One Casing Volume(gal/L): 14.7								
Start Purge (hrs): 0940								
End Purge (hrs): 1340								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L) 24								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & Ammonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT 3102-F

Pump intake @ 89'

91.25
66.83
24.42(.163) = 3.98 gal
= 14.7 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

Heavy rain/mud

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ N68678

WELL ID.: 12MWT31
DATE: 2-7-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (~~mL/Min.~~ L)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0940	66.83	—	—	—	—	—	—	—	—	Start purge
0950	68.21	1.0	100	8.02	.419	>1000	5.88	9.24	28.2	Dark Gray
1000	69.55	2.0	100	8.06	.418	"	4.87	9.20	38.5	"
1010	—	3.0	100	8.07	.413	"	3.75	9.10	53.3	"
1020	71.06	4.0	100	8.08	.410	—	3.23	9.15	60.7	—
1030	—	5.0	100	8.08	.411	—	2.80	9.37	64.2	—
1040	—	6.0	100	8.08	.411	—	2.57	9.41	67.4	—
1050	72.59	7.0	100	8.08	.410	65	2.37	9.46	69.8	Sl. cloudy
1100	—	8.0	100	8.09	.412	—	2.16	9.77	70.5	—
1110	—	9.0	100	8.09	.412	—	2.07	9.84	71.1	—
1120	—	10.0	100	8.09	.412	—	2.01	9.87	71.4	—
1130	74.36	11.0	100	8.09	.410	28	1.94	9.91	71.8	Sl. cloudy
1140	—	12.0	100	8.08	.408	—	1.92	9.97	72.3	—
1150	75.29	13.0	100	8.08	.405	—	1.95	9.91	72.6	—
* 1230	77.85	17.0	100	8.10	.417	—	1.52	10.42	72.1	—
1240	—	18.0	100	8.11	.418	—	1.52	10.37	72.1	—
1250	—	19.0	100	8.11	.420	—	1.46	10.56	72.0	—
1300	—	20.	100	8.10	.423	—	1.34	10.63	72.0	—
1310	—	21	100	8.10	.425	—	1.24	10.73	71.9	—
1320	—	22	100	8.09	.425	—	1.21	10.76	72.6	—
1330	—	23	100	8.09	.429	—	1.19	10.97	71.8	—
1340	82.79	24	100	8.09	.431	75	1.16	10.99	70.7	Stop purge

Water Quality Meter (SN) 99K1014 A6
Control Box type (SN) MP10 1588
Turbidity Meter (SN) 4536 3303

Pump Intake 89'

*left well for another air tank

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3202
Sample Location: 12MWT 32
Sampled By: Gerald
C.O.C. No.: 3688
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2-8-05								
Time: 1230								
Method: Bailer	clear	6.7	1.355	11.67	360	1.06	-7.1	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2-8-05								
Method: Bailer								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 100.6								
Static Water Level (WL): 85.42								
One Casing Volume(gal/L): 9.2								
Start Purge (hrs): 0820								
End Purge (hrs): 1220								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 25.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & Ammonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X]/No[] 12GWT 3202 -F

100.60
85.42

Pump intake @ 99'

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N~~1245~~ 6878

WELL ID.: 12MW32
DATE: 2-8-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume ~~(mL/Min.)~~ L	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0820	85.42	–	–	–	–	–	–	–	–	Start purge
0830	85.79	1.0	100	6.75	1.371	–	4.63	11.69	10.9	dark gray
0840	–	2.0	100	6.76	1.379	>1000	3.17	11.86	4.0	"
0850	–	3.0	100	6.74	1.383	–	2.37	11.90	-0.7	cloudy
0900	86.84	4.0	100	6.73	1.382	>1000	2.23	11.85	-2.2	"
0910	–	5.0	100	6.73	1.385	>1000	2.07	12.04	-4.4	"
0920	87.75	6.0	100	6.72	1.385	"	1.99	12.05	-5.4	"
0930	88.21	7.0	100	6.72	1.379	"	1.89	11.96	-5.1	"
0940	88.81	8.0	|	6.70	1.368	–	1.82	12.02	-4.7	"
0950	89.18	9.0	|	6.69	1.360	–	1.81	12.11	-2.1	"
1000	89.87	10.0	|	6.66	1.359	–	1.79	12.18	6.3	"
1010	90.60	11.0	|	6.65	1.359	400	1.79	12.23	12.1	"
1020	91.28	12.5	150	6.64	1.365	–	1.65	12.41	7.4	"
1030	91.96	13.0	150	6.63	1.379	–	1.52	12.43	-1.9	"
1040	92.47	15.5	150	6.63	1.382	–	1.41	12.28	-6.1	"
1050	93.27	16.5	100	6.64	1.388	400	1.35	12.11	-7.3	"
1100	93.71	17.5	100	6.64	1.370	–	1.33	11.80	-6.4	"
1110	94.02	18.5	100	6.64	1.372	–	1.30	11.87	-6.5	"
1120	94.29	19.5	100	6.65	1.378	–	1.27	11.99	-6.7	"
1130	94.80	20.5	100	6.68	1.376	–	1.21	11.92	-6.6	"
1140	95.08	21.5	100	6.69	1.375	–	1.17	11.88	-6.4	"
1150	95.22	22.5	|	6.69	1.371	380	1.14	11.79	-6.6	"
1200	95.87	23.5	|	6.71	1.368	–	1.12	11.74	-6.7	"
1210	96.19	24.5	|	6.69	1.359	–	1.08	11.69	-6.7	"
1220	96.67	25.5	|	6.70	1.355	360	1.06	11.67	-7.1	Stop purge

Water Quality Meter (SN) 99K 1014 AG
Control Box type (SN) MPC 1588
Turbidity Meter (SN) 4536 3303

Pump Intake 99'

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT3302
Sample Location: 12MWT 33
Sampled By: T. Rosahn
C.O.C. No.: 3696
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 2-18-05	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1242								
Method: Bladder Pump	CLEAR	5.28	0.634	13.49	10	0.57	+ 44	---

PURGE DATA:

Date: 2-18-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: BLADDER PUMP								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 97.2								
Static Water Level (WL): 41.66								
One Casing Volume(gal/L):								
Start Purge (hrs): 0925								
End Purge (hrs): 1240								
Total Purge Time (min): 195								
Total Vol. Purged (gal/L) 37								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Ammonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT_____-F

56.14 x 0.163 = 9.2 gal or 34.6 L

Pump intake @ 87'

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ty Rosahn

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N~~1245~~ 6878

WELL ID.: 12MWT33
DATE: 2/18/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0925	41.06	0	–	–	–	–	–	–	–	START PURGE
0935	42.22	1000	100	5.70	0.644	270	2.71	12.84	+28	CLOUDY
0945	42.72	2000	100	5.53	0.640	175	1.39	13.18	24	SL. Cloudy
0955	42.95	4000	200	5.48	0.636	110	1.03	13.13	21	V. SL. Cloudy
1005	42.95	6000	200	5.45	0.634	80	0.86	13.21	20	" " "
1015	42.99	8000	200	5.46	0.637	55	0.81	13.26	16	CLEAR
1025	43.02	10000	200	5.42	0.634	45	0.72	13.38	17	CLEAR
1035	43.06	12000	200	5.38	0.635	35	0.68	13.43	19	CLEAR
1045	43.10	14000	200	5.36	0.631	27	0.64	13.13	22	CLEAR
1055	43.10	16000	200	5.35	0.633	23	0.62	13.36	25	CLEAR
1105	43.10	18000	200	5.33	0.632	20	0.59	13.30	30	CLEAR
1115	43.12	20000	200	5.32	0.632	18	0.58	13.35	32	CLEAR
1125	43.13	22000	200	5.31	0.633	17	0.57	13.48	34	CLEAR
1135	43.14	24000	200	5.30	0.635	16	0.56	13.51	37	CLEAR
1145	43.15	26000	200	5.29	0.636	15	0.56	13.50	39	CLEAR
1155	43.15	28000	200	5.29	0.636	14	0.56	13.56	40	CLEAR
1205	43.16	30000	200	5.29	0.633	13	0.57	13.45	41	CLEAR
1215	43.17	32000	200	5.29	0.635	14	0.56	13.59	43	CLEAR
1225	43.18	34000	200	5.28	0.633	14	0.57	13.49	43	CLEAR
1230	43.20	35000	200	5.28	0.634	13	0.56	13.44	44	CLEAR
1235	43.20	36000	200	5.28	0.634	11	0.56	13.46	44	CLEAR
1240	43.20	37000	200	5.28	0.634	10	0.57	13.49	44	CLEAR
1242	—	—	—	—	—	—	—	—	—	START SAMPLING

Water Quality Meter (SN) 99K1014 AG
Control Box type (SN) 1568
Turbidity Meter (SN) 4536-3303

Pump Intake 87'

SIGNATURE(S): Troy Hegel

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3402
Sample Location: 12MWT 34
Sampled By: T. ROJAHN
C.O.C. No.: 3695
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Date: 2-15-05								
Time: 1340	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: BAILER	NA							

PURGE DATA:

Date: 2-15-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: NA								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: ND			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 90.40								
Static Water Level (WL): 87.93								
One Casing Volume(gal/L): 1.5								
Start Purge (hrs): NA								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber 2/15/05	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT — -F VERY SLOW RECHARGE WELL

Pump intake @ NA

WELL DRIED OUT AFTER 1 L

CHECKED WELL 2/16 - DRY

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3502
Sample Location: 12MWT 35
Sampled By: CD
C.O.C. No.: 3695
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2/16/05								
Time: 1240								
Method: peristaltic	clear	4.91	.155	12.65	5.93	1.23	121.9	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2/16/05								
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 28.65'								
Static Water Level (WL): 12.36'								
One Casing Volume(gal/L): 9.82								
Start Purge (hrs): 0835								
End Purge (hrs): 1235								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 24.65								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT F~~

Pump intake @ 27.65' BTOC

28.65
−12.36
16.29 (.163) = 2.66 gal
= 9.82 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT35
DATE: 2/16/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0835	12.36	—	—	—	—	—	—	—	—	start purge
0845	14.17	1.550	150	4.59	.139	8.26	1.98	11.56	251.0	clear
0855	15.18	2.650	110	4.55	.135	6.00	1.91	10.88	244.7	clear
0905	15.59	3.650	100	4.54	.133	4.49	1.87	10.26	231.4	clear
0915	15.89	4.650	100	4.53	.133	3.97	1.80	10.23	221.7	clear
0925	16.27	5.650	100	4.53	.133	5.18	1.69	10.48	204.5	clear
0935	16.48	6.650	100	4.54	.134	4.41	1.61	10.47	197.6	clear
0945	16.73	7.650	100	4.55	.134	5.34	1.55	10.37	183.3	clear
0955	16.95	8.650	100	4.56	.134	4.89	1.51	10.22	175.8	clear
1005	17.16	9.650	100	4.58	.134	5.17	1.47	10.04	165.3	clear
1015	17.37	10.650	100	4.61	.135	6.68	1.42	10.04	158.2	clear
1025	17.53	11.650	100	4.65	.139	4.81	1.39	10.34	157.1	clear
1035	17.73	12.650	100	4.69	.143	5.79	1.34	10.44	149.9	clear
1045	17.88	13.650	100	4.71	.145	5.58	1.32	10.69	143.1	clear
1055	18.03	14.650	100	4.75	.147	6.02	1.30	10.60	137.8	clear
1105	18.18	15.650	100	4.80	.149	5.98	1.28	10.60	137.0	clear
1115	18.33	16.650	100	4.84	.153	6.11	1.26	11.65	141.4	clear
1125	18.48	17.650	100	4.87	.154	6.21	1.24	11.23	128.0	clear
1135	18.62	18.650	100	4.89	.157	7.77	1.24	11.82	119.6	clear
1145	18.83	19.650	100	4.91	.156	5.45	1.22	11.85	120.5	clear
1155	18.94	20.650	100	4.93	.158	5.91	1.22	12.01	125.4	clear
1205	19.03	21.650	100	4.93	.159	5.24	1.21	12.56	118.7	clear
1215	19.11	22.650	100	4.94	.155	5.05	1.21	12.19	121.8	clear
1225	19.21	23.650	100	4.93	.156	5.18	1.21	12.59	125.0	clear
1235	19.31	24.650	100	4.91	.155	5.93	1.23	12.65	121.9	clear, end purge
1240	—	—	—	—	—	—	—	—	—	start sample

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) geopump 2 #401
Turbidity Meter (SN) 4175-1503

Pump Intake 27.65' BTOC

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3602
Sample Location: 12MWT 36
Sampled By: Goardt
C.O.C. No.: 3704
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3-4-05								
Time: 1430								
Method: Peristaltic	Clear	6.29	.550	13.02	0.22	2.63	222.7	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 3-4-05								
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 27.56								
Static Water Level (WL): 14.11								
One Casing Volume(gal/L): 8.1								
Start Purge (hrs): 1215								
End Purge (hrs): 1425								
Total Purge Time (min): ~~8.75~~ 1430								
Total Vol. Purged (gal/L): 8.45								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & AMMONIA	4°C/H2SO4	~~(3)~~ (4) (1) L HDPE MS/MSD	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT_ _____-F

Pump intake @ 27'

Circle if Applicable:		Signature(s):
MS/MSD Yes	Duplicate ID No.: 12FD03040501	

Nitrate & Nitrite & NH3 only

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878

WELL ID.: 12MWT 36
DATE: 3-4-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (~~mL/Min.~~)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1215	14.11	-	-	-	-	-	-	-	-	Start purge
1225	15.15	.65	65	6.21	.553	1.9	5.92	13.26	201.0	Clear
1235	15.23	1.30	65	6.26	.554	-	4.48	13.39	207.3	"
1245	15.41	1.95	65	6.28	.553	1.62	4.13	13.46	208.7	"
1255	15.72	2.60	65	6.29	.555	1.31	3.87	13.59	210.2	"
1305	16.01	3.25	65	6.31	.555	0.92	3.33	13.67	211.5	"
1315	16.30	3.90	65	6.31	.553	0.87	3.19	13.52	212.0	"
1325	16.15	4.55	65	6.31	.550	0.61	3.12	13.39	213.0	"
1335	16.16	5.20	65	6.32	.551	0.52	3.10	13.31	215.1	~~Stop purge~~ (QS)
1345	16.13	5.85	65	6.33	.552	-	3.07	13.27	217.3	"
1355	16.14	6.50	65	6.32	.554	-	3.01	13.18	217.9	"
1405	16.15	7.15	65	6.30	.553	-	2.96	13.14	219.5	"
1415	16.13	7.80	65	6.28	.551	0.21	2.75	13.09	221.6	"
1425	16.14	8.45	65	6.29	.550	0.22	2.63	13.02	222.7	Stop purge

Water Quality Meter (SN) 99K 1014 AG
Control Box type (SN) 341
Turbidity Meter (SN) 4175-1503

Pump Intake 27'

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT —
Sample Location: 12MWT 37
Sampled By: TR
C.O.C. No.: —
Type of Sample:
[X] Low Concentration DRY WELL
[] High Concentration

SAMPLING DATA:

Date: NA	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time:								
Method:	NA							

PURGE DATA:

Date: 3-02-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: NA								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:			See Low Flow Purge Data Sheets					
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives SW-846 8330	4°C	(2) L Glass Amber	~~Yes~~ No
Micellaneous Explosives SW-846 8330	4°C	(2) L Glass Amber	~~Yes~~
Total Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	~~Yes~~
Diss. Metals SW846 6020/Mercury 7470A	4°C/HNO_3	(1) L HDPE	
Nitrate + Nitrite (as N) EPA 353.2 & Ammonia (as N) EPA 350.1	4°C/H_2SO_4	(1) L HDPE	~~Yes~~
Total Organic Carbon	4°C/H_3PO_4	(2) 40ml Vials	

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT —-F

Pump intake @ —

DRY WELL

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT3802
Sample Location: 12MWT38
Sampled By: CD
C.O.C. No.: 3200
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Date: 2/20/05								
Time: 1235	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: peristaltic	clear	3.60	.330	10.48	1.21	3.67	399.7	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2/20/05								
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.70'								
Static Water Level (WL): 9.98'								
One Casing Volume(gal/L): 10.08								
Start Purge (hrs): 0830								
End Purge (hrs): 1230								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 21.70								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Amonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT F~~

Pump intake @ 26.20' BTOC

26.70
− 9.98
16.72(.163) = 2.73 gal
= 10.08 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT38
DATE: 2/20/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0830	9.98	—	—	—	—	—	—	—	—	Start purge
0840	11.09	0.900	90	3.54	.396	53.8	5.29	10.45	403.7	slightly cloudy
0850	12.06	1.800	90	3.49	.368	15.2	4.64	10.47	423.2	clear
0900	12.61	2.800	100	3.48	.347	9.83	4.63	9.45	425.0	clear
0910	13.04	3.700	90	3.48	.344	8.49	4.49	9.29	427.6	clear
0920	13.46	4.600	90	3.49	.342	7.04	4.40	9.24	426.6	clear
0930	13.85	5.500	90	3.50	.340	7.69	4.29	9.22	423.5	clear
0940	14.20	6.400	90	3.51	.339	4.69	4.24	9.38	420.2	clear
0950	14.53	7.300	90	3.53	.338	3.91	4.12	9.53	418.1	clear
1000	14.83	8.200	90	3.53	.336	3.59	4.04	9.44	415.9	clear
1010	15.09	9.100	90	3.54	.336	3.69	3.98	9.64	412.8	clear
1020	15.41	10.000	90	3.55	.333	2.38	3.90	9.58	410.7	clear
1030	15.74	10.900	90	3.56	.333	2.67	3.92	9.55	408.9	clear
1040	16.05	11.800	90	3.57	.332	1.94	3.78	9.73	406.8	clear
1050	16.32	12.700	90	3.57	.331	2.37	3.82	9.73	405.6	clear
1100	16.56	13.600	90	3.58	.330	1.57	3.73	9.80	402.9	clear
1110	16.70	14.500	90	3.58	.330	1.63	3.76	9.83	402.9	clear
1120	16.86	15.400	90	3.58	.329	1.38	3.75	9.87	401.3	clear
1130	16.94	16.300	90	3.58	.328	1.32	3.73	9.68	401.4	clear
1140	17.00	17.200	90	3.58	.327	1.72	3.71	9.73	400.4	clear
1150	17.06	18.100	90	3.59	.327	1.58	3.68	9.87	399.5	clear
1200	17.12	19.000	90	3.59	.327	1.40	3.61	9.99	399.8	clear
1210	17.19	19.900	90	3.59	.328	1.02	3.57	10.21	400.2	clear
1220	17.25	20.800	90	3.60	.330	1.23	3.63	10.48	399.9	clear
1230	17.30	21.700	90	3.60	.330	1.21	3.67	10.48	399.7	clear, end purge
1235	—	—	—	—	—	—	—	—	—	start sample

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) geopump 2 #401
Turbidity Meter (SN) 4175-1503

Pump Intake 26.20' bTOC

SIGNATURE(S): Clin Foster

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 3902
Sample Location: 12MWT 39
Sampled By: T. ROJAHN
C.O.C. No.: 3695, 3696
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2/15/05								
Time: 1415								
Method: BAILER	CLOUDY	6.88	0.472	16.59	330	5.15	135	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	~~Salinity~~ ORP	Other
Date: 2-15-05								
Method: BAILER	1	6.88	0.472	16.59	330	5.15	135	CLOUDY
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 37.05								
Static Water Level (WL): 35.53								
One Casing Volume(gal/L): 0.9								
Start Purge (hrs): 1410								
End Purge (hrs): 1412								
Total Purge Time (min): 2								
Total Vol. Purged (gal/L): 0.9								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	1 ~~(2)~~ L Glass Amber 2/15/05	Yes/No
Miscellaneous Explosives	4°C	1 ~~(2)~~ L Glass Amber 2/15/05	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE 2/16/05 1510	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE 2/17/05 1515	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 AMMONIA	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT 3902 -F

1.52 x 0.163 = 0.24 gal = 0.9 L

Pump intake @ NA

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Ted Rojahn

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4002
Sample Location: 12MWT 40
Sampled By: CD
C.O.C. No.: 3696
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2/18/05								
Time: 1300								
Method: peristaltic	cloudy	~~.726~~ 4.45	.726	12.30	28.4	2.95	169.0	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2/18/05								
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 30.75'								
Static Water Level (WL): 22.68'								
One Casing Volume(gal/L): 4.87								
Start Purge (hrs): 0855								
End Purge (hrs): 1255								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 16.09								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Amonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[✓] No[] 12GWT 4002 -F

Pump intake @ 30.00' bTOC

30.75
-22.68
8.07 (.163) = 1.32 gal
= 4.87 L

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT40
DATE: 2/18/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0855	22.68	—	—	—	—	—	—	—	—	start purge
0905	23.14	0.990	90	4.41	.616	6.90	3.33	9.66	263.9	clear
0915	23.48	1.890	90	4.40	.616	13.6	3.16	9.44	250.9	clear
0925	23.71	2.490	60	4.41	.618	24.4	3.10	8.74	237.3	clear
0935	23.90	3.090	60	4.41	.630	24.9	3.08	9.06	218.8	clear
0945	24.15	3.690	60	4.42	.642	25.2	3.07	9.39	195.0	clear
0955	24.40	4.290	60	4.42	.654	29.1	3.06	9.38	185.1	slightly cloudy
1005	24.60	4.890	60	4.42	.645	30.9	3.00	8.86	185.9	slightly cloudy
1015	24.80	5.490	60	4.44	.650	28.7	3.02	8.69	175.7	slightly cloudy
1025	24.97	6.090	60	4.44	.658	27.9	2.99	9.11	170.7	clear
1035	25.15	6.690	60	4.43	.683	24.9	3.00	9.99	171.8	clear
1045	25.31	7.290	60	4.43	.699	25.4	2.98	10.86	184.8	clear
1055	25.46	7.890	60	4.41	.707	28.5	2.99	11.25	192.2	slightly cloudy
1105	25.63	8.490	60	4.44	.693	30.0	2.90	10.28	197.7	slightly cloudy
1115	25.80	9.090	60	4.44	.704	28.1	2.93	11.09	192.0	slightly cloudy
1125	25.95	9.690	60	4.43	.717	28.5	2.91	11.21	187.5	slightly cloudy
1135	26.07	10.290	60	4.47	.715	30.0	2.99	11.77	187.9	slightly cloudy
1145	26.17	11.890	60	4.48	.718	27.2	3.05	12.37	193.2	slightly cloudy
1155	26.17	12.490	60	4.42	.721	23.5	2.94	12.35	205.6	clear
1205	26.34	13.090	60	4.42	.727	23.5	2.96	12.42	206.8	clear
1215	26.50	13.690	60	4.44	.729	22.9	2.98	12.43	198.8	clear
1225	26.66	14.290	60	4.44	.735	29.7	2.96	12.68	192.8	slightly cloudy
1235	26.81	14.890	60	4.45	.734	31.4	2.97	12.63	185.2	slightly cloudy
1245	26.96	15.490	60	4.47	.725	29.8	2.93	12.15	177.1	slightly cloudy
1255	27.10	16.090	60	4.45	.726	28.4	2.95	12.30	169.0	slightly cloudy, end purge
1300	—	—	—	—	—	—	—	—	—	begin sample

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) geopump 2 #401
Turbidity Meter (SN) 475 - 1503

Pump Intake 30.00' bTOC

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4102
Sample Location: 12MWT 41
Sampled By: T. ROJAHN
C.O.C. No.: 3700
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2-19-05								
Time: 1623								
Method: SAME	CLEAR	6.78	0.754	10.02	3.6	1.26	-39	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2-19-05								
Method: Peristaltic								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" ø, PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 36.60								
Static Water Level (WL): 20.38								
One Casing Volume(gal/L): 10								
Start Purge (hrs): 1316								
End Purge (hrs): 1621								
Total Purge Time (min): 185								
Total Vol. Purged (gal/L): 10.3								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Ammonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT NA -F 16.22 × 0.163 = 2.6 gal or 10L

Pump intake @ 31.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N~~1245~~ 6878

WELL ID.: 12MWT41
DATE: 2-19-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1316	20.38	0	–	--	–	–	--	–	–	START PURGE
1326	21.21	700	70	6.73	0.762	6.1	1.54	10.99	-43	CLEAR
1336	21.64	1400	70	6.69	0.756	2.9	1.09	11.35	-44	CLEAR
1346	22.15	2100	70	6.68	0.758	2.3	0.89	11.63	-44	CLEAR
1356	22.32	2800	70	6.68	0.747	2.1	0.93	11.19	-44	CLEAR
1406	22.71	3500	70	6.68	0.746	2.0	0.96	11.23	-44	CLEAR
1416	22.75	4000	50	6.69	0.742	2.4	0.96	10.80	-44	CLEAR
1426	22.74	4500	50	6.69	0.742	2.2	0.99	10.48	-45	CLEAR
1436	22.73	5000	50	6.70	0.743	2.3	1.04	10.47	-45	CLEAR
1446	22.73	5500	50	6.72	0.747	2.5	1.14	10.59	-44	CLEAR
1456	22.75	6000	50	6.72	0.749	2.7	1.08	10.63	-43	CLEAR
1506	22.76	6500	50	6.72	0.747	2.9	1.14	10.54	-43	CLEAR
1516	22.74	7000	50	6.73	0.751	2.9	1.22	10.41	-42	CLEAR
1526	27.73	7500	50	6.74	0.754	2.7	1.31	10.29	-41	CLEAR
1536	27.75	8000	50	6.76	0.758	2.7	1.26	10.05	-42	CLEAR
1546	27.77	8500	50	6.75	0.746	2.7	1.29	10.08	-38	CLEAR
1556	27.79	9000	50	6.77	0.742	3.1	1.36	9.80	-38	CLEAR
1606	27.81	9500	50	6.75	0.752	3.5	1.23	10.01	-41	CLEAR
1616	27.83	10000	50	6.78	0.753	3.8	1.22	10.11	-40	CLEAR
1621	27.84	10250	50	6.78	0.754	3.6	1.26	10.02	-39	CLEAR

Water Quality Meter (SN) 99K1014 AG
Control Box type (SN) (TA) ~~3418~~ 341
Turbidity Meter (SN) 4536-3303

Pump Intake 31.6'

SIGNATURE(S): Troy Rogers

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT42 02
Sample Location: 12MWT42
Sampled By: CD
C.O.C. No.: 3700
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 2/19/05	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1220								
Method: peristaltic	clear	4.24	.303	11.27	0.55	1.25	279.9	---

PURGE DATA:

Date: 2/19/05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 30.45'								
Static Water Level (WL): 12.05'								
One Casing Volume(gal/L): 11.10								
Start Purge (hrs): 0815								
End Purge (hrs): 1215								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 17.90								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Amonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[✓] ~~12GWT F~~

Pump intake @ 29.45' bTOC

30.45
-12.05
18.4 (.163) = 3.00 gal
= 11.10 L

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT42
DATE: 2/19/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0815	12.05	—	—	—	—	—	—	—	—	Start purge
0825	13.40	1.000	100	5.33	.281	5.03	2.45	9.75	118.6	clear
0835	14.21	2.000	100	4.51	.217	2.11	1.51	9.71	208.7	clear
0845	15.15	3.000	100	4.36	.204	1.45	1.37	9.64	234.4	clear
0855	15.69	3.800	80	4.32	.195	1.24	1.43	8.80	257.6	clear
0905	15.82	4.600	80	4.35	.196	1.29	1.43	8.75	254.9	clear
0915	15.98	5.400	80	4.36	.197	1.56	1.44	8.62	255.7	clear
0925	16.14	6.200	80	4.32	.197	1.17	1.40	8.61	268.5	clear
0935	16.30	7.000	80	4.34	.200	0.67	1.39	8.85	250.7	clear
0945	16.39	7.600	60	4.33	.202	1.06	1.42	9.04	267.8	clear
0955	16.57	8.400	80	4.33	.205	0.60	1.34	8.98	267.5	clear
1005	16.81	9.200	80	4.35	.209	1.28	1.27	9.65	270.6	clear
1015	17.01	10.000	80	4.32	.212	0.47	1.26	9.65	283.5	clear
1025	17.27	10.800	80	4.32	.216	0.65	1.22	9.99	267.9	clear
1035	17.29	11.400	60	4.32	.210	0.45	1.53	8.26	277.6	clear
1045	17.41	12.000	60	4.32	.215	0.70	1.40	8.85	274.2	clear
1055	17.48	12.500	50	4.30	.217	0.69	1.47	8.88	277.1	clear
1105	17.61	13.000	50	4.33	.221	0.39	1.38	9.14	263.7	clear
1115	17.70	13.500	50	4.31	.227	0.86	1.41	9.22	272.7	clear
1125	17.80	14.000	50	4.31	.233	0.99	1.38	9.88	277.0	clear
1135	17.91	14.500	50	4.30	.243	0.46	1.39	9.72	276.3	clear
1145	18.02	15.000	50	4.29	.252	0.54	1.40	10.03	276.4	clear
1155	18.24	15.900	90	4.30	.262	0.33	1.28	10.63	285.3	clear
1205	18.52	16.900	100	4.25	.280	0.54	1.24	11.02	281.4	clear
1215	18.85	17.900	100	4.24	.303	0.55	1.25	11.27	279.9	clear, end purge
1220	—	—	—	—	—	—	—	—	—	start sample

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) geopump 2 #401
Turbidity Meter (SN) 4175 - 1503

Pump Intake 29.45' bTOC

SIGNATURE(S): Clio Jordan

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4302
Sample Location: 12MWT 43
Sampled By: T. ROJAHN
C.O.C. No.: 3703
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3-3-05 & 3/4								
Time: 1232 & @0900								
Method: SAME	CLEAR	7.66	0.471	11.96	>1000	6.64	-7	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	~~Salinity~~ ORP	Other
Date: 3-3-05								
Method: BAILER	1	6.75	0.471	11.46	>1000	3.43	+53	1218
Monitor Reading (ppm): —	2	7.44	0.470	11.66	>1000	5.38	-7	1225
Well Casing Diameter & Material	3	7.66	0.471	11.96	>1000	6.64	-7	1230
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 82.95								
Static Water Level (WL): 78.16								
One Casing Volume(gal/L): 3.1								
Start Purge (hrs): 1215								
End Purge (hrs): 1230								
Total Purge Time (min): 15								
Total Vol. Purged (gal/L): 9								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements		Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	3/4/05 @0900	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	3/3/05	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	3/3/05	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	3/4/05 @0900	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & AMMONIA	4°C/H2SO4	3/3/05	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4		(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT 4302 -F

Pump intake @ NA (BAILER)

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT4402
Sample Location: 12MWT44
Sampled By: T. ROJAHN
C.O.C. No.: 3700
Type of Sample:
[X] Low Concentration
[] High Concentration

TURD. 8.9 PRIOR to collecting Total Metals

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2-19-05								
Time: 1237								
Method: Bladder Pump	CLEAR	6.73	1.668	8.99	16	1.24	-60	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2-19-05								
Method: Bladder Pump								
Monitor Reading (ppm): --								
Well Casing Diameter & Material Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 37.15								
Static Water Level (WL): 26.32								
One Casing Volume(gal/L): 6.7								
Start Purge (hrs): 0835								
End Purge (hrs): 1235								
Total Purge Time (min): 240								
Total Vol. Purged (gal/L): 10.9								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Ammonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT NA -F 10.83 x 0.163 = 1.9 gal or 6.7

Pump intake @ 1' OFF Bottom - slow recharge well

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): Tony Rojahn

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: ~~N1245~~ 6878

WELL ID.: 12MWT44
DATE: 2-19-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0835	26.32	0	—	—	—	—	—	—	—	Start Purge
0845	26.84	800	80	6.67	1.690	800	1.51	8.77	-7	CLOUDY (Greyish)
0855	27.50	1500	70	6.69	1.685	180	1.01	8.55	-19	Sl. Cloudy
0905	27.75	2000	50	6.70	1.664	100	0.92	8.14	-25	V. Sl Cloudy
0915	28.01	2500	50	6.71	1.659	85	0.90	8.04	-30	V. Sl. Cloudy
0925	28.26	3000	50	6.71	1.659	73	0.88	8.10	-31	V. Sl. Cloudy
0935	28.49	3500	50	6.72	1.660	65	0.86	8.13	-32	V. Sl. Cloudy
0945	28.78	4000	50	6.72	1.661	49	0.95	8.36	-32	CLEAR
0955	29.05	4500	50	6.73	1.662	33	1.01	8.55	-31	CLEAR
1005	29.21	4900	40	6.73	1.666	28	1.10	8.80	-30	CLEAR
1015	29.36	5300	40	6.73	1.670	22	1.19	9.05	-29	CLEAR
1025	29.54	5700	40	6.72	1.684	20	1.23	9.37	-29	CLEAR
1035	29.72	6100	40	6.72	1.696	19	1.27	9.66	-30	CLEAR
1045	29.85	6500	40	6.72	1.660	19	1.28	8.91	-33	CLEAR
1055	30.01	6900	40	6.72	1.635	20	1.28	8.23	-35	CLEAR
1105	30.13	7300	40	6.72	1.627	21	1.29	8.19	-37	CLEAR
1115	30.25	7700	40	6.73	1.624	23	1.31	8.11	-42	CLEAR
1125	30.41	8100	40	6.72	1.649	25	1.32	8.63	-44	CLEAR
1135	30.55	8500	40	6.72	1.657	25	1.31	8.81	-51	CLEAR
1145	30.69	8900	40	6.72	1.665	27	1.30	8.99	-56	CLEAR
1155	30.81	9300	40	6.72	1.669	26	1.29	9.10	-56	CLEAR
1205	30.93	9700	40	6.72	1.674	26	1.27	9.24	-57	CLEAR
1215	31.06	10100	40	6.72	1.679	25	1.26	9.31	-57	CLEAR
1225	31.20	10500	40	6.73	1.677	20	1.24	9.20	-58	CLEAR
1235	31.32	10900	40	6.73	1.668	16	1.24	8.99	-60	CLEAR

Water Quality Meter (SN) 99K1014 AG
Control Box type (SN) 1588
Turbidity Meter (SN) 4536-3303

Pump Intake 1' off Bottom

SIGNATURE(S): Terry Rupp

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4502
Sample Location: 12MWT 45
Sampled By: T. ROJAHN
C.O.C. No.: 3703
Type of Sample:
[X] Low Concentration
[] High Concentration

13.8 on 3/3

SAMPLING DATA:

Date: 3/3/05	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1000	(Visual)	(S. U.)	(mS/cm)	(°C)	(NTU)	(mg/L)	(mV)	NA
Method: SAME	Clear	5.72	0.755	12.39	10.2	1.66	+116	---

PURGE DATA:

Date: 3/02/05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.60								
Static Water Level (WL): 16.73								
One Casing Volume(gal/L): 6.1								
Start Purge (hrs): 1330								
End Purge (hrs): 1438								
Total Purge Time (min): 68								
Total Vol. Purged (gal/L): 19.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & AMMONIA	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT 4502 -F 9.87 x 0.163 = 1.6 gal or 6.1

Pump intake @ Bottom

Well historically has water level that will not stabilize - will dry out well & sample tomorrow

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878

WELL ID.: 12MWT45
DATE: 3/02/05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1330	16.73	0	–	–	–	–	–	–	–	START PURGE
1340	18.10	2500	250	5.75	0.703	189	1.44	12.10	145	CLOUDY
1350	19.10	5000	250	4.93	0.597	97	8.50	12.06	274	SL. CLOUDY
1400	19.95	7500	250	4.82	0.575	52	9.22	12.19	296	CLEAR
1410	21.80	11500	400	4.81	0.623	41	7.74	12.12	299	CLEAR
1420	23.43	15500	400	5.44	0.099	20	3.91	12.31	182	CLEAR
1430	24.90	19500	400	5.72	0.755	10.2	1.66	12.35	116	CLEAR
1435	–	–	–	–	–	–	–	–	–	DRY

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) 401
Turbidity Meter (SN) 4536-3303

Pump Intake Bottom

SIGNATURE(S): Troy Rogers

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4602
Sample Location: 12MWT 46
Sampled By: T. ROSAHN
C.O.C. No.: 3703
Type of Sample:
[X] Low Concentration
[] High Concentration

22 ON 3/3

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3-3-05								
Time: 0913								
Method: SAME	CLEAR	6.02	0.296	12.99	4.61	0.64	-10	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 3-02-05								
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2"Φ PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.80								
Static Water Level (WL): 17.07								
One Casing Volume(gal/L): 6								
Start Purge (hrs): 1158								
End Purge (hrs): 1302								
Total Purge Time (min): 64								
Total Vol. Purged (gal/L): 18.6								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & AMMONIA	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT 4602 -F 9.73' x 0.163 = 1.6 gal / or 6.0

Pump intake @ 23.8' for sampling

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s): [signature]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878

WELL ID.: 12MWT46
DATE: 3-02-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1158	17.07	0	—	—	—	—	—	—	—	START PURGE
1208	18.20	2200	220	6.01	0.275	41.6	0.79	12.51	+9	CLEAR
1218	19.10	4400	220	5.96	0.261	26.6	0.75	12.37	16	"
1228	20.65	6600	220	5.93	0.253	14.9	0.71	12.29	23	"
1238	22.66	10600	400	5.89	0.259	19.2	0.65	12.60	8	"
1248	24.45	14600	400	5.96	0.288	15.9	0.64	12.76	-1	"
1258	26.01	18600	400	6.02	0.296	4.61	0.64	12.59	-10	"
1302	—	—	—	—	—	—	—	—	—	DRY

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) 401
Turbidity Meter (SN) 4536-3303

Pump Intake Bottom

WELL Historically HAS WATER level that will not stabilize - will dry out well & sample tomorrow.

SIGNATURE(S): Terry Lizak

PAGE 2 OF 2

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4702
Sample Location: 12MWT 47
Sampled By: T. ROJAHN
C.O.C. No.: 3693
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3/02/05	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Time: 1057								
Method: SAME	CLEAR	6.33	0.454	10.25	4.87	8.92	+166	--

PURGE DATA:

Date: 3-02-05	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Peristaltic								
Monitor Reading (ppm): –								
Well Casing Diameter & Material								
Type: 2"ϕ PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 26.80								
Static Water Level (WL): 13.05								
One Casing Volume(gal/L): 8.5								
Start Purge (hrs): 1000								
End Purge (hrs): 1055								
Total Purge Time (min): 55								
Total Vol. Purged (gal/L): 9.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 & AMMONIA	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 12GWT —— -F 13.75 X 0.163 = 2.2 gal or 8.5

Pump intake @ 21.8'

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878

WELL ID.: 02MWT47
DATE: 3-02-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1000	13.05	0	–	–	–	–	–	–	–	START PURGE
1010	13.02	1600	160	6.35	0.454	7.66	10.82	10.30	+164	CLEAR
1020	13.03	3200	160	6.32	0.452	7.15	10.04	10.21	167	"
1030	13.05	4800	160	6.32	0.453	6.60	9.52	10.20	165	"
1040	13.05	6400	160	6.31	0.455	6.34	9.26	10.28	166	"
1050	13.06	8000	160	6.32	0.458	4.95	9.01	10.24	166	"
1055	13.06	8800	160	6.33	0.454	4.87	8.92	10.25	166	"

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) 401
Turbidity Meter (SN) 4536-3303

Pump Intake 21.9'

SIGNATURE(S): Terry Pogue

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4802
Sample Location: 12MWT 48
Sampled By: T. ROJAHN
C.O.C. No.: 3695
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2-15-05								
Time: 1000								
Method: BAILER	LT TAN	6.80	0.206	12.91	71100	3.23	+193	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	~~Salinity~~	Other
Date: 2-15-05								
Method: BAILER	1	6.80	0.206	12.91	71100	3.23	+193	—
Monitor Reading (ppm): -								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 31.85								
Static Water Level (WL): 30.22								
One Casing Volume(gal/L): 1.2								
Start Purge (hrs): 0950								
End Purge (hrs): 0953								
Total Purge Time (min): 3								
Total Vol. Purged (gal/L): 1.2								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 AMMONIA	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 12GWT 4802 -F

Pump intake @ NA

MIN. VOL.
SLOW RECHARGE

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT 4901
Sample Location: 12MWT 49
Sampled By: T. ROJAHN
C.O.C. No.: 3695
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2-15-05								
Time: 1035								
Method: Bailer	Cloudy	6.78	0.652	13.87	380	2.92	+188	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	~~Salinity~~ ORP	Other
Date: 2-15-05								
Method: TT ~~1035~~ Bailer	1	6.78	0.652	13.87	380	2.92	+188	—
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2"Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 31.80								
Static Water Level (WL): 25.70								
One Casing Volume(gal/L): 3.7								
Start Purge (hrs): 1030								
End Purge (hrs): 1033								
Total Purge Time (min): 3								
Total Vol. Purged (gal/L): 3.7								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	1 ~~(2)~~ L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 ~~(2)~~ L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2 Ammonia	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 12GWT 4901 -F MIN. SAMPLE VOL.

Pump intake @ NA

WELL WAS DRY during Round 1.
SAMPLE AFTER 1 Vol. Purged

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rojahn

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 12GWT —
Sample Location: 12MWT 50
Sampled By: T. ROJAHN
C.O.C. No.: —
Type of Sample: NO SAMPLE
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: NA								
Time:								
Method:	NA							

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2-15-05								
Method: NA								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 35.58								
Static Water Level (WL): 35.32 @ 1110								
One Casing Volume(gal/L): NA								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Nitrate & Nitrite (as N) EPA 353.2	4°C/H2SO4	(1) L HDPE	Yes/No
Total Organic Carbon	4°C/H3PO4	(2) 40 mL Vial	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 12GWT NA -F

Pump intake @ NA

DRY - ROUND 2

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s): T. Rojahn

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 25GW 0201
Sample Location: 7/2
Sampled By: T. ROWAHN
C.O.C. No.: 3704
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3-4-05								
Time: 1427								
Method: BAILER	ORANGISH	6.28	0.385	13.63	71000	3.48	+35	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 3-4-05								
Method: BAILER	1	6.28	0.385	13.63	71000	3.48	+35	—
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2" Ø	See Low Flow Purge Data Sheets							
Total Well Depth (TD): 38'								
Static Water Level (WL): 33.89								
One Casing Volume(gal/L): 2.5								
Start Purge (hrs): 1420								
End Purge (hrs): 1425								
Total Purge Time (min): 5								
Total Vol. Purged (gal/L): 3								

SAMPLE COLLECTION INFORMATION:

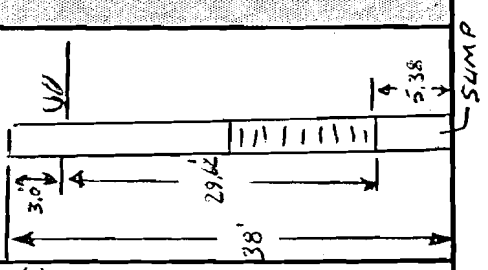
Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	1 (2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	1 (2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[X] No[] 25GW 0201 -F

Pump intake @ NA (Bailer)

WATER LEVEL is below bottom of screen
WATER IS only in the SUMP.



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Terry Rowan

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 25GW0301
Sample Location: 25MW03 (7/3)
Sampled By: T. ROJAHN
C.O.C. No.: 3704
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 3-3-05								
Time: 1520								
Method: SAME	CLEAR	6.80	0.261	10.36	8.93	1.09	-21	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 3-3-05								
Method: Peristaltic								
Monitor Reading (ppm): -								
Well Casing Diameter & Material								
Type: 2" Ø PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 35.72*								
Static Water Level (WL): 27.45								
One Casing Volume(gal/L): 5.1								
Start Purge (hrs): 1357								
End Purge (hrs): 1517								
Total Purge Time (min): 90								
Total Vol. Purged (gal/L): 5.8								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	(2) L Glass Amber	Yes/No
Miscellaneous Explosives	4°C	(2) L Glass Amber	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	(1) L HDPE	Yes/No

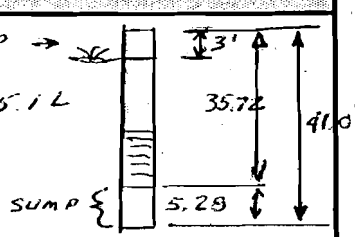
OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[] 25GW_____-F

Pump intake @ 30.7'

8.27' X 0.163 = 1.3941 or 5.1 L

* Doesn't include sump



Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N6878

WELL ID.: 713 DUMP SITE A
DATE: 3-3-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
1357	27.45	0	-	—	—	—	—	—	-	START PURGE
1407	28.03	900	90	6.87	0.299	42.5	2.74	11.07	33	CLEAR
1417	28.15	1700	80	6.90	0.294	29.7	1.61	10.57	4.3	"
1427	28.16	2300	60	6.84	0.287	30.5	1.67	10.38	5	"
1437	28.20	3000	70	6.80	0.289	22.0	1.42	10.88	-2	"
1447	28.25	3700	70	6.81	0.288	18.8	1.29	11.41	-1	"
1457	28.27	4400	70	6.80	0.278	14.9	1.19	11.05	-13	"
1507	28.29	5100	70	6.80	0.269	11.8	1.03	10.64	-23	"
1512	28.29	5450	70	6.80	0.263	9.95	1.05	10.40	-23	"
1517	28.29	5800	70	6.80	0.261	8.93	1.09	10.36	-21	"

Water Quality Meter (SN) 01D0956 AA
Control Box type (SN) 401
Turbidity Meter (SN) 4536-3303

Pump Intake 30.7

SIGNATURE(S): [illegible]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSWC CRANE, SWMU12
Project No.: N6878 CTO 0357

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

Sample ID No.: 25GW0501
Sample Location: (7/5) 25MW05
Sampled By: T. ROJAHN
C.O.C. No.: 3701
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S. U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Other NA
Date: 2-22-05								
Time: 1227								
Method: SAME	CLEAR	5.96	0.518	9.42	9.7	1.21	+109	---

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 2-22-05								
Method: Peristaltic								
Monitor Reading (ppm): —								
Well Casing Diameter & Material								
Type: 2"Φ PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 41.20								
Static Water Level (WL): 24.20								
One Casing Volume(gal/L): 10.5								
Start Purge (hrs): 0925								
End Purge (hrs): 1225								
Total Purge Time (min): 180								
Total Vol. Purged (gal/L): 27.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements			Collected
		Dup		MS/MSD	
Explosives (Nitroaromatics and Nitramines) SW-846 8330	4°C	2	(2) L Glass Amber	3	Yes/No
Miscellaneous Explosives	4°C	2	(2) L Glass Amber	3	Yes/No
Total Metals SW-846-6020 & Toatl Mercury SW-846-7470A	4°C/HNO3	1	(1) L HDPE	3	Yes/No
Dissolved Metals SW-846-6020 & Dissolved Mercury SW-846-7470A	4°C/HNO3	NA	(1) L HDPE	NA	Yes/No

OBSERVATIONS / NOTES:

Filtered Sample Collected Yes[] No[X] 25GW — -F 17.0' x 0.163 = 2.8 gal or 10.5

Pump intake @ 26' WELL HAS ~9' SUMP
LOWERED to 27.5'

Circle if Applicable:

MS/MSD	Duplicate ID No.:
YES	12FD 02220501

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSWC CRANE
PROJECT NUMBER: N~~1246~~ 6878

WELL ID.: 25MW05
DATE: 2-22-05

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (mL/Min.)	Flowrate (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments (Volume & Color)
0925	24.20	0	–	–	–	–	–	–	–	START PURGE
0935	25.49	2000	200	5.44	0.422	232	2.07	10.31	+168	BROWNISH
0945	25.80	4000	200	5.68	0.454	321	1.73	10.35	60	Cloudy
0955	25.99	6000	200	5.75	0.469	252	1.54	10.52	49	CLOUDY
1005	26.05	8000	200	5.79	0.478	207	1.40	10.51	44	CLOUDY
1015	26.04	10000	200	5.84	0.519	132	2.26	10.77	55	Sl. Cloudy CLEAN OUT FLOW CELL → LOWER tubing to 27.5'
1025	26.12	12000	200	5.87	0.523	99.6	1.26	10.69	51	V. Sl. Cloudy
1035	25.81	13500	150	5.88	0.528	49.9	1.19	10.17	63	CLEAR
1045	25.66	15000	150	5.92	0.532	30.4	1.16	9.91	74	CLEAR
1055	25.61	16500	150	5.93	0.532	30.6	1.15	9.96	81	CLEAR
1105	25.60	18000	150	5.93	0.530	29.3	1.13	9.92	85	CLEAR
1115	25.60	19500	150	5.93	0.520	28.8	1.17	9.83	94	CLEAR
1125	25.62	21000	150	5.92	0.523	26.4	1.16	10.01	98	CLEAR
1135	25.64	22500	150	5.92	0.524	24.0	1.16	10.11	101	CLEAR
1145	25.58	23500	100	5.97	0.535	18.3	1.17	9.29	106	CLEAR
1155	25.33	24500	100	5.98	0.530	13.3	1.36	9.35	108	CLEAR
1205	25.33	25500	100	5.96	0.521	15.1	1.24	9.53	109	CLEAR
1215	25.31	26500	100	5.96	0.520	13.0	1.25	9.47	109	CLEAR
1225	25.31	27500	100	5.96	0.518	9.7	1.21	9.42	109	CLEAR
1227	—	—	—	—	—	—	—	—	—	START SAMPLING

Water Quality Meter (SN) 99K1014 AG
Control Box type (SN) 341
Turbidity Meter (SN) 4536 3303

Pump Intake 26.0' → 27.5'

SIGNATURE(S): Terry Rogal

APPENDIX C.5.1

SWMU 12

CHAIN OF CUSTODY RECORDS ROUND 1

RA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 0069 | PAGE 1 OF

PROJECT NO: CTO 6878 357	FACILITY: NSWC CRANE	PROJECT MANAGER RALPH BASINSKI	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER TERRY ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER FED. EX AB# 8447 8135 5443		CITY, STATE SEATTLE, WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G/P, G/P, G, G, G
PRESERVATIVE USED: 4°C, 4°C, 4°C, 4°C, 4°C

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	VOLATILES SW 846 8260B	VOLATILES SW 846 8015B	SEMIVOLATILES 8270C, 8151A & SIM	EXPLOSIVES SW 846 8330	METALS & HG SW 846 6020 & 7471A				COMMENTS
8/13	1245	127808130401 ~~12FB~~ (R)	QC	-	-	QC	G	4	2	2							FIXED W/HCl TRIP BLANK
8/13	1410	125S130002	125B 13	0	2	SO	G	9	3	2	2	1	1				
8/13	1420	125B130204	↓	2	4	SO	G	9	3	2	2	1	1				
8/13	1442	125B130607	↓	6	7	SO	G	9	3	2	2	1	1				
8/13	1444	125S150002	125B 15	0	2	SO	G	9	3	2	2	1	1				
8/13	1455	125B150204	↓	2	4	SO	G	9	3	2	2	1	1				
8/13	1504	125B150607	↓	6	7	SO	G	9	3	2	2	1	1				
8/13	1521	125S140002	125B 14	0	2	SO	G	9	3	2	2	1	1				
8/13	1532	125B140204	↓	2	4	SO	G	9	3	2	2	1	1				
8/13	1540	125B140607	↓	6	7	SO	G	9	3	2	2	1	1				
8/13	1555	125S120002	125B 12	0	2	SO	G	9	3	2	2	1	1				
8/13	1607	125B120204	↓	2	4	SO	G	9	3	2	2	1	1				

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	8/13/04	1900	1. RECEIVED BY FEDERAL EXPRESS	8/13/04	1900
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 0070 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALAH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8947 8135 5844		SEATTLE WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): *G | P | *G | P | G | G | G

PRESERVATIVE USED: 4°C | 4°C | 4°C | 4°C | 4°C

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	VOLATILES SW 846 8260B	VOLATILES SW 846 8015B	SEMIVOLATILES 8270C / 8151A & SIM	EXPLOSIVES SW 846 8330	METALS & HG SW 846 6020 & 7471A				COMMENTS
8/15	0700	12TB08150401	QC	–	–	QC	G	4	*2	*2							TRIP BLANK FIXED W/ HCl
8/15	0831	125510 0002	125B 10	0	2	SO	G	2	–	–	–	2	1				
8/15	0834	125B10 0205	↓	2	5	SO	G	2	–	–	–	1	1				
8/15	0838	125B10 0508	↓	5	8	SO	G	2	–	–	–	1	1				
8/15	0902	125509 0002	125B 09	0	2	SO	G	2	–	–	–	1	1				
8/15	0908	125B09 0205	↓	2	5	SO	G	2	–	–	–	1	1				
8/15	0911	125B09 0508	↓	5	8	SO	G	4	–	–	–	2	2				DO MS/MSD
8/15	0928	125508 0002	125B 08	0	2	SO	G	2	–	–	–	1	1				
8/15	0931	125B08 0204	↓	2	4	SO	G	2	–	–	–	1	1				
8/15	0934	125B08 0507	↓	5	7	SO	G	2	–	–	–	1	1				
8/15	0945	125511 0002	125B 11	0	2	SO	G	2	–	–	–	1	1				
8/15	0952	125B11 0205	↓	2	5	SO	G	2	–	–	–	1	1				
8/15	0954	125B11 0507	↓	5	7	SO	G	2	–	–	–	1	1				

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Terry Rojahn	8/16/04	1900	1. RECEIVED BY FED. EX AB # (TR)	8/16/04	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS:

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

4/02R
FORM NO. TtNUS-001

RA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0075 PAGE 1 OF

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER: TERRY ROJAHN	PHONE NUMBER: (412) 921-8857	ADDRESS: 940 SOUTH HARNEY ST
		CARRIER/WAYBILL NUMBER: FED EX AB # 8447 8135 5844		CITY, STATE: SEATTLE, WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G G
PRESERVATIVE USED: 4°C 4°C 4°C

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: EXPLOSIVES SW 846 8330	METALS & Hg SW846 6020/7471A	TOC, CEC, pH & AMMONIA							COMMENTS
8/15	1028	125504 0002	125B 04	0	2	SO	G	2	1	1								
8/15	1037	125804 0207	125B 04	2	7	SO	G	2	1	1								
8/15	1039	125804 0712	125B 04	7	12	SO	G	2	1	1								
8/15	1055	125507 0002	125B 07	0	2	SO	G	2	1	1								
8/15	1101	125807 0206	125B 07	2	6	SO	G	2	1	1								
8/15	1103	125807 0610	125B 07	6	10	SO	G	2	1	1								
8/15	1240	125505 0002	125B 05	0	2	SO	G	2	1	1								
8/15	1245	125805 0204	125B 05	2	4	SO	G	2	1	1								
8/15	1248	125805 0509	125B 05	5	9	SO	G	2	1	1								
8/15	1304	125506 0002	125B 06	0	2	SO	G	2	1	1								
8/15	1310	125806 0205	125B 06	2	5	SO	G	4	2	2								DO MS/MSD
8/15	1315	125806 0509	125B 06	5	9	SO	G	2	1	1								
8/15	1348	125503 0002	135B 03	0	2	SO	G	1	–	–	1							

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY [signature]	8/16/04	1900	1. RECEIVED BY FEDERAL EXPRESS	8/16/04	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 0076 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROJAHN	(412) 921-8857	990 SOUTH HARNEY ST
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8447 8135 5844		SEATTLE WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G G P P G

PRESERVATIVE USED: 4°C 4°C 4°C 4°C 4°C 4°C

TYPE OF ANALYSIS: EXPLOSIVES SW-846 8330 | METALS # HG SW846 6020/7471A | TOC, CEC, pH # AMMONIA | VOLATILES SW 846 8260B | VOLATILES SW 846 8015B | SEMIVOLATILES 8270C, 8151A & SIM

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW-846 8330	METALS # HG SW846 6020/7471A	TOC, CEC, pH # AMMONIA	VOLATILES SW 846 8260B	VOLATILES SW 846 8015B	SEMIVOLATILES 8270C, 8151A & SIM			COMMENTS
8/15	1354	125803 0608	125B 03	6	8	SO	G	2	–	–	2						DO MS/MSD
8/15	1425	125502 0002	125B 02	0	2	SO	G	1	–	–	1						
8/15	1432	125802 0608	125B 02	6	8	SO	G	1	–	–	1						
8/15	1505	125801 0002 (FR)	125B 01	0	2	SO	G	9	1	*1	–	3	2	2			*ANALIZE FOR CN ALSO
8/15	1520	125801 0608	↓	6	8	SO	G	9	1	*1	–	3	2	2			*ANALIZE FOR CN
8/15	1550	125520 0002	125B 20	0	2	SO	G	9	1	1	–	3	2	2			
8/15	1557	125820 0204		2	4	SO	G	9	1	1	–	3	2	2			
8/15	1600	125820 0608	↓	6	8	SO	G	9	1	1	–	3	2	2			
8/15	1617	125519 0002	125B 19	0	2	SO	G	23	2	2	–	9	6	4			DO MS/MSD
8/15	1643	125819 0204	↓	0	4	SO	G	9	1	1	–	3	2	2			
8/15	1655	125518 0002	125B 18	0	2	SO	G	9	1	1	–	3	2	2			
8/15	1701	125818 0204		2	4	SO	G	9	1	1	–	3	2	2			
8/15	1705	125818 0608	↓	6	8	SO	G	9	1	1	–	3	2	2			

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Tony Rojahn	8/16/04	1900	1. RECEIVED BY FED. EX. AB #	8/16/04	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS: Tony Rojahn TRIP BLANK ON 0070

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

4/02R
FORM NO. TtNUS-001

TtA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0077 PAGE 1 OF

PROJECT NO: CTO 6878 357	FACILITY: NSWC CRANE	PROJECT MANAGER: RALPH BASINSKI	PHONE NUMBER: (412) 921-8308
LABORATORY NAME AND CONTACT: LAUCKS / HUGH PRENTICE	SAMPLERS (SIGNATURE): [signature]	FIELD OPERATIONS LEADER: TERRY ROJAHN	PHONE NUMBER: (412) 921-8857
ADDRESS: 940 SOUTH HARNEY ST.	CARRIER/WAYBILL NUMBER: FED. EX AB# 8447 8135 5844	CITY, STATE: SEATTLE WA 98108	

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES SW-846 8330	METALS & Hg SW846 6020/7471A	VOLATILES SW846 8260B	VOLATILES SW846 8260B	SEMI VOLATILES SW846 8015B	8270C, 8151A & SIM	TOC, pH, CEC & AMMONIA		COMMENTS
									G	4°C									
									G	4°C									
									P	4°C									
									P	4°C									
									G	4°C									
									G	4°C									
8/15	0000	12FD08150401	QC	–	–	SO	G				1	1	–	–	–	–			1258110205
8/15	0000	12FD08150402	QC	–	–	SO	G				1	1	–	–	–	–			1258056204
8/15	0000	12FD08150403	QC	–	–	SO	G				–	–	–	–	–	1			1258020608
8/15	0000	12FD08150404	QC	–	–	SO	G				1	1	3	~~2~~ 3 (Tt)	2	–			1258180608

1. RELINQUISHED BY: [signature]	DATE: 8/16/04	TIME: 1900	1. RECEIVED BY: FEDERAL EXPRESS	DATE: 8/16/04	TIME: 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS: Trip Blank on 0070

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0078 PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 357 6878	NSWC CRANE	RALPH RASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn		TERRY ROJAHN	(412) 921	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8447 8135 5844		SEATTLE WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G)

PRESERVATIVE USED

TYPE OF ANALYSIS

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	VOLATILES SW 846 8260B	VOLATILES SW 846 8015B	EXPLOSIVES SW 846 8330	MISC EXPLOSIVES SW 846 8330	TOTAL METALS / Hg SW846 6020 7470A	Nitrate, Nitrite (as N)	Ammonia (as N)	TOC SW 846 9060	SEMIVOLATILES 8270C, SIM, 8151A	CYANIDE SW846 9012A	COMMENTS
									4°C/HCl	4°C/HCl	4°C	4°C	4°C/HNO3	4°C H2SO4	4°C H3PO4	4°C	4°C NaOH	P	
									G	G	P	P	G	G					
8/15	1400	12RB08150401	QC	–	–	QC	G	11	3	3	1	–	1	–	–	3	–		Mixing Container
8/15	1420	12RB08150402	QC	–	–	QC	G	11	3	3	1	–	1	–	–	3	–		Cutting Saw
8/15	1450	12RB08150403	QC	–	–	QC	G	11	3	3	1	–	1	–	–	3	–		Trowel
8/15	1510	12RB08150404	QC	–	–	QC	G	15	3	3	1	–	1	*1	2	3	1		Corer Sleeve * Ammonia only
8/15	1530	12SB08150401	QC	–	–	QC	G	16	3	3	1	1	1	1	2	3	1		TAP H2O
8/15	1600	12SB08150402	QC	–	–	QC	G	16	3	3	1	1	1	1	2	3	1		DI H2O

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
Terry Rojahn	8/16/04	1900	FEDERAL EXPRESS	8/16/04	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS TB on 0070 (TB: Trip Blank)

DISTRIBUTI WHITE (ACCOMPANIES SAMPLE) YELLOW (FIEL PY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

A TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0088 PAGE 1 OF _

PROJECT NO: CTO 6878 357	FACILITY: NSWC CRANE	PROJECT MANAGER: RALPH BASINSKI	PHONE NUMBER: (412) 921-8308	LABORATORY NAME AND CONTACT: LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE): [signature]		FIELD OPERATIONS LEADER: TERRY ROJAHN	PHONE NUMBER: (412) 921-8857	ADDRESS: 940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER: FED. EX. AB# 8447 8135 5476		CITY, STATE: SEATTLE WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G P P

PRESERVATIVE USED: 4°C 4°C 4°C/H_2SO_4 4°C/HNO_3

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: Explosives 846 8330	Misc. Explosives 846 8330	Nitrate + Nitrite 353.2	Ammonia 350.1	Total Metals 6020 / 7470A Hg				COMMENTS
8/30	1223	12GWT0801 (TR)	12MW T08	–	–	GW	G	6	2	2	1	1					
8/30	1601	12GWT1301	12MW T13	–	–	GW	G	6	2	2	1	1					

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY [signature]	8/30/04	1900	1. RECEIVED BY FEDERAL EXPRESS	8/30/04	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC.

CHAIN OF CUSTODY

NUMBER 0089

PAGE 1 OF 1

PROJECT NO: CTO 6878 357	FACILITY: NSWC CRANE	PROJECT MANAGER: RALPH BASINSKI	PHONE NUMBER: (412) 921-8308
LABORATORY NAME AND CONTACT: LAUCKS / HUGH PRENTICE	SAMPLERS (SIGNATURE): Terry Rojahn	FIELD OPERATIONS LEADER: TERRY ROJAHN	PHONE NUMBER: (412) 921-8857
ADDRESS: 940 SOUTH HARNEY ST.	CARRIER/WAYBILL NUMBER: FED EX AB# 8447 8135 5487	CITY, STATE: SEATTLE WA 98108	

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	MISC. EXPLOSIVES SW 846 8330 MOD.	NITRATE & NITRITE 353.2	AMMONIA 350.1	TOTAL METALS & Hg 6020 / 7470A				COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P					
PRESERVATIVE USED									4°C	4°C	4°C	4°C/H_2SO_4	4°C/HNO_3				
9/9	1540	12GWT0701	12GW T07	-	-	GW	G	6	2	2	1	1					
9/10	0840	12GWT2301	12GW T23	-	-	GW	G	4	1	1	1	1					MIN. VOL. LOW YIELD WELL
9/10	1200	12GWT0901	12GW T09	-	-	GW	G	6	2	2	1	1					

1. RELINQUISHED BY Terry Rojahn	DATE 9/10/04	TIME 1900	1. RECEIVED BY FEDERAL EXPRESS	DATE 9/10/04	TIME 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUT. WHITE (ACCOMPANIES SAMPLE) YELLOW (FIE. OPY) PINK (FILE COPY)

4/02R
FORM . . . TINUS-001

A TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0092 PAGE 1 OF

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB# 8447 8135 5800		SEATTLE, WA 98108

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW-846 8330	MISC EXPLOSIVES SW 846 8330 MOD.	Nitrite & Nitrate 353.2	AMMONIA 350.1	TOTAL METALS & Hg 6020 / 7470A	DIS. METALS & Hg 6020 / 7470A	TOC			COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P	P	G				
PRESERVATIVE USED									4°C	4°C	4°C / H_2SO_4	4°C / HNO_3	4°C / HNO_3	4°C / H_3PO_4				
9/11	1010	12GWT1701	12GW T17	-	-	GW	G	4	1	1	1	1						Low Recharge well
9/11	1010	12GWT1701-F	12GW T17	-	-	GW	G	1	-	-	-	-	1					↓
9/11	1518	12GWT0101	12GW T01	-	-	GW	G	6	2	2	1	1	-					
9/11	0000	FD091104 01	QC	-	-	GW	G	6	2	2	1	1	-					From 12GWT0101
9/12	1035	12GWT0201	12GW T02	-	-	GW	G	24	6	6	3	3	-	6				
9/12	1410	12GWT1601	12GW T16	-	-	GW	G	4	1	1	1	1	-					Low Recharge well
9/12	1410	12GWT1601-F	12GW T16	-	-	GW	G	1	-	-	-	-	1					↓
9/13	1153	12GWT1101	12GW T11	-	-	GW	G	6	2	2	1	1						
9/13	1333	12GWT2801	12GW T28	-	-	GW	G	6	2	2	1	1						

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Terry Rojahn	9/13/04	1900	1. RECEIVED BY FEDERAL EXPRESS	9/13/04	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TINUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0093 PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 357 6878	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8447 8135 5785		SEATTLE, WA 98108

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: EXPLOSIVES 8330	MISC EXPLOSIVES 8330 MOD.	NITRITE & NITRATE 353.2	AMMONIA 350.1	TOTAL METALS & Hg 6020/7470A					COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P						
PRESERVATIVE USED									4°C	4°C	4°C	4°C/H2SO4	4°C/HNO3					
9/14	0930	12GWT0601	12GW T06	—	—	GW	G	6	2	2	1	1						
9/14	1223	12GWT1201	12GW T12	—	—	GW	G	6	2	2	1	1						
9/14	1532	12GWT0501	12GW T05	—	—	GW	G	6	2	2	1	1						

1. RELINQUISHED BY Terry Rojahn	DATE 9/14/04	TIME 1900	1. RECEIVED BY FEDERAL EXPRESS	DATE 9/14/04	TIME 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTI WHITE (ACCOMPANIES SAMPLE) YELLOW (FIEL PY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

T TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0094 PAGE 1 OF

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
6878 CTO 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX AB # 8447 8135 5741		SEATTLE WA 98108

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	VOLATILES SW-846 8260B	VOLATILES SW-846 8015B	Semivolatiles SW-846 8270C, 8151A	EXPLOSIVES SW-846 8330	METALS 6020 / 7471A				COMMENTS
									CONTAINER TYPE PLASTIC (P) or GLASS (G)		P	P	G	G	G		
									PRESERVATIVE USED		4°C	4°C	4°C	4°C	4°C		
9/21	1100	TB09210401	QC	–	–	QC	G	4	*2	*2							*HCl W/HCl GLASS - TRIP BLANK
9/21	1107	1255210002	1258 21	0	0.5	SO	G	10	3	3	2	1	1				
9/21	1109	1255220002	1258 22	0	0.5	SO	G	10	3	3	2	1	1				
9/21	1115	1255230002	1258 23	0	0.5	SO	G	10	3	3	2	1	1				
9/21	1119	1255240002	1258 24	0	0.5	SO	G	10	3	3	2	1	1				

1. RELINQUISHED BY Terry Rojahn	DATE 9/21/04	TIME 1900	1. RECEIVED BY FEDERAL EXPRESS	DATE 9/21/04	TIME 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TINUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 0098 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
6878 CTO 0357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROJAHN	(412) 921-8857	940 S. HARNEY STREET
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX AB # 8447 8135 5708		SEATTLE WA 98108

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	Explosives SW-846 8330	Explosives SW 846 8330	Misc. Nitrate + Nitrite 353.2	Ammonia 350.1	Total Metals & Hg 6020 / 7470A	Dis Metals & Hg 6020 / 7470A				COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P	P					
PRESERVATIVE USED									4°C	4°C	4°C	4°C / H_2SO_4	4°C / HNO_3					
9/22	1556	12GWT3501	12GW T35	-	-	GW	G	6	2	2	1	1						
9/22	1556	12GWT3501-F	↓	-	-	GW	G	1	-	-	-	-	1					
9/23	1648	12GWT24A01	12GW T24A	-	-	GW	G	6	2	2	1	1						
9/23	0930	12GWT3901	12GW T39	-	-	GW	G	2	1	1								LOW YIELD WELL
9/23	1805	12GWT3901	↓	-	-	GW	G	1	-	-	-	1	-					↓
9/24	0857	12GWT3901		-	-	GW	G	1	-	-	1	-	-					
9/24	1458	12GWT3901-F		-	-	GW	G	1	-	-	-	-	1					

1. RELINQUISHED BY Terry Rojahn	DATE 9/24/04	TIME 1900	1. RECEIVED BY FEDERAL EXPRESS	DATE 9/24/04	TIME 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TINUS-001

A TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0099 PAGE 1 OF _

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
6878 CTO 0357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY STREET
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB# 8447 8135 5693		SEATTLE WA 98108

TR for S. Conti: Terry Rojahn

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW-846 8330	MISC EXPLOSIVES SW-846 8330	NITRITE + NITRATE 353.2	AMMONIA 350.1	Total METALS & Hg 6020/7470A	TOC	DIS METALS & Hg 6020/7470A			COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P	G					
PRESERVATIVE USED									4°C	4°C	4°C	4°C / H2SO4	4°C / HNO3	4°C / H3PO4				
9/24	1538	12GWT3601	12MW T36	–	–	GW	G	6	2	2	1	1						
9/25	1010	12GWT1901	12MW T19	–	–	GW	G	6	2	2	1	1						
9/25	1624	12GWT2701	12MW T27	–	–	GW	G	6	2	2	1	1						
9/25	1625	12GWT1001	12MW T10	–	–	GW	G	6	2	2	1	1						
9/26	0839	12GWT1801	12MW T18	–	–	GW	G	6	2	2	1	1						
9/26	1235	12GWT3301	12MW T33	–	–	GW	G	8	2	2	1	1	2					
9/26	1425	12GWT2601	12MW T26	–	–	GW	G	8	2	2	1	1	2					
9/26	1425	12GWT2601-F	12MW T26	–	–	GW	G	1	–	–	–	–	–	1				
9/26	0000	12FD09260401	QC	–	–	GW	G	8	2	2	1	1	2					From 12GWT3301
9/27	0935	12GWT4001	12MW T40	–	–	GW	G	6	2	2	1	1						
9/27	0935	12GWT4001-F	12MW T40	–	–	GW	G	1	–	–	–	–	–	1				
9/27	1320	12GWT1501	12MW T15	–	–	GW	G	6	2	2	1	1						
9/27	1432	12GWT3101	12MW T31	–	–	GW	G	6	2	2	1	1						

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Terry Rojahn	9/27/04	1900	1. RECEIVED BY FEDERAL EXPRESS	9/27/04	
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 0100 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 0357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX AB # 8447 8135 5693		SEATTLE WA 98108

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	MISC EXPLOSIVES SW 846 8330	NITRATE + NITRITE 353.2	AMMONIA 350.1	TOTAL METALS + Hg 6020 / 7470A	DIS METALS & Hg 6020 / 7470A				COMMENTS
								CONTAINER TYPE PLASTIC (P) or GLASS (G)	G	G	P	P	P					
								PRESERVATIVE USED	4°C	4°C	4°C / H2SO4	4°C / HNO3	4°C / HNO3					
9/25	0920 45	12GWT3701	12GW T36	–	–	GW	G	1	1	–	–	–						VERY SLOW YELD WELL
9/26	0815	12GWT3701	↓	–	–	GW	G	1	–	1	–	–						↓
9/27	0910	12GWT3701	↓	–	–	GW	G	1	–	–	–	1						↓
9/25	0835	12GWT1401	12GW T14	–	–	GW	G	2	1	1	–	–						VERY SLOW YELD WELL
9/26	0830	12GWT1401	↓	–	–	GW	G	2	–	–	1	1						↓
9/27	0910	12GWT1401-F	↓	–	–	GW	G	1	–	–	–	–	1					↓
9/27	1053	12GWT0301	12GW T03	–	–	GW	G	6	2	2	1	1						
9/27	1432	12GWT3101-F	12GW T31	–	–	GW	G	1	–	–	–	–	1					

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	9/27/04	1900	1. RECEIVED BY FED. EXPRESS	9/27/04	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0101 PAGE 1 OF ____

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 357 6878	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
TK for J. Guerdt		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY
S Conti		CARRIER/WAYBILL NUMBER		CITY, STATE
Terry Rojahn		FED EX AB # 8447 8135 5498		SEATTLE, WA 98108

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	MISC EXPLOSIVES SW 846 8330	Nitrate + Nitrite 353.2	AMMONIA 350.1	Total Metals & Hg 6020 / 7470A	TOC	DIS METALS & Hg 6020 / 7470A			COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)											G	G	P	P	G	P		
PRESERVATIVE USED											4°C	4°C	4°C / H2SO4	4°C / HNO3	4°C / H3PO4	4°C / HNO3		
9/27	1600	12GWT2001 (W TR)	12MW T20	–	–	GW	G	6	2	2	1	1						
9/27	1650	12RB09270401	QC	–	–	QC	G	6	1	1	1	1	2					Bladder Pump Peristaltic - Tubing
9/27	1800	12RB09270402	QC	–	–	QC	G	6	1	1	1	1	2					
9/28	1040	12GWT0401	12MW T04	–	–	GW	G	18	6	6	3	3						DO MS/MSD
9/28	1258	12GWT2901	12MW T29	–	–	GW	G	6	2	2	1	1						
9/28	1258	12GWT2901-F	12MW T29	–	–	GW	G	1	–	–	–	–	–	1				
9/28	1332	12GWT4201	12MW T42	–	–	GW	G	6	2	2	1	1						
9/28	0854	12GWT3701-F	12MW T37	–	–	GW	G	1	–	–	–	–	–	1				Low Yield Well ↓
9/28	1580	12GWT3701	12MW T37	–	–	GW	G	1	–	–	1	–	–	–				

1. RELINQUISHED BY Terry Rojahn	DATE 9/28/04	TIME 1900	1. RECEIVED BY FEDERAL EXPRESS	DATE 9/28/04	TIME 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TINUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 0102 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8447 8135 5513		SEATTLE WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G P P P

PRESERVATIVE USED: 4°C 4°C 4°C/H2SO4 4°C/HNO3 4°C/HNO3

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: EXPLOSIVES SW 846 8330	MISC EXPLOSIVES SW 846 8330	Nitrate + Nitrite 353.2	AMMONIA 350.1	Total METALS & Hg 6020/7470A	DIS METALS & Hg 6020/7470A				COMMENTS
9/28	1834	12GWT3201	12MW T32	-	-	GW	G	6	2	2	1	1						
9/28	1834	12GWT3201-F	12MW T32	-	-	GW	G	1	-	-	-	-	1					

1. RELINQUISHED BY [signature]	DATE 9/29/04	TIME 1130	1. RECEIVED BY FEDERAL EXPRESS	DATE 9/29/04	TIME 1130
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0103 PAGE 1 OF __

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8303	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8447 8135 5568		SEATTLE, WA 98108

S. Conti

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G P P P G

PRESERVATIVE USED: 4°C 4°C 4°C 4°C/H_2SO_4 4°C/HNO_3 4°C/HNO_3 4°C

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	MISC EXPLOSIVES SW 846 8330	Nitrate + Nitrite 353.2	AMMONIA 350.1	Total Metals & Hg 6020 / 7470A	Dis Metals & Hg 6020 / 7470A	~~METALS & Hg~~ ~~6020/7470A~~			COMMENTS
10/9	1300	12GWT3801	12MW T38			GW	G	6	2	2	1	1	—					
10/9	1034	12GWT2101	12MW T21			GW	G	6	2	2	1	1	—					
10/10	0830	12GWT2501	12MW T25			GW	G	6	2	2	1	1	—					
10/10	0840	12GWT2201	12MW T22			GW	G	6	2	2	1	1	—					

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Terry Rojahn	10/11/04	1800	1. RECEIVED BY FED EX.	10/11/04	1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TINUS-001

SEDIMENT

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 0106 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
N6878 CTO 357	NSWC CRANE	BASINSKI R	412 921 8308	LAUCKS / PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
SJ Conti		CONTI SJ	412 921 8422	940 SOUTH HARNEY
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX # 8447 8135 5568		SEATTLE, WA. 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G G G G

PRESERVATIVE USED: 4°C 4°C 4°C 4°C 4°C

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: EXP / MISC EXP SW 846 8330	METALS + Hg 6020 / 7471A	METALS, Hg, CEC PH, TOC	AVS/SEM	SEMI VOLATILES 8270C, 8151A/SIM				COMMENTS
10/11	0950	12SD250004	12SW SD25	0	4"	SD	G	2	1	1							
10/11	1110	12SD260004	12SW SD 26	0	4"	SD	G	2	1	1							
10/11	1130	12SD240004	12SW SD 24	0	4"	SD	G	2	1	1							
10/11	1320	12SD100004	12SW SD10	0	4"	SD	G	3	1	—	1	1					
10/11	1410	12SD080004	12SW SD08	0	4"	SD	G	2	1	1							
10/11	1425	12SD090004	12SW SD09	0	4"	SD	G	3	1	1			1				
10/11	1445	12SD070004	12SW SD07	0	4"	SD	G	8	2	—	2	2	2				DO MS/MSD
10/11	0000	12FD101104 02	—	—	—	SD	G	4	1	—	1	1	1				DUP OF 12SD070004

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
Tony Hogue	10/11/04	1800	FED EX	10/11/04	1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TINUS-001

SURFACE WATERS

TT TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0107 PAGE 1 OF ____

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 357 NG878	NSWC CRANE	BASINSKI, R.	412 921 8308	LAUCKS / PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		CONTI, S.J.	412 921 8422	940 SOUTH HARNEY
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX 8447 8135 5568		SEATTLE, WA. 98108

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXP & MISC EXP 8330 (2)	TOTAL METALS/Hg 6020/7470A	DISS METALS/Hg 6020/7470A	NITRATE/NITRITE(N) & AMMONIA	SEMI VOA 8270C (2)	SEMI VOA SIM (2)	SEMI VOA 8151A (2)	MISC EXPL	COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	P	P	P	G	G	G	G	
PRESERVATIVE USED									4°C	4°C/HNO3	4°C HNO3	4°C H2SO4	4°C	4°C	4°C	4°C	
10/11	0920	12SW2501	12SW SD25	0	2"	SW	G	~~12~~ 18	6	3		3				6	DO MS/MSD
10/11	0000	12FD10110401	—	—	—	SW	G	~~4~~ 6	2	1	—	1	—	—	—	2	DUP OF 12SW2501
10/11	0920	12SW2501-F	12SW SD25	0	2"	SW	G	3			3						DO MS/MSD
10/11	0000	12FD10110401-F	—	—	—	SW	G	1			1						

1. RELINQUISHED BY	DATE 10/11/04	TIME 1800	1. RECEIVED BY FED EX	DATE 10/11/04	TIME 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 0110 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 357 6878	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
[signature]		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX AB# 8447 8135 5579		SEATTLE, WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G P P P

PRESERVATIVE USED: 4°C 4°C 4°C/H2SO4 4°C/HNO3 4°C/HNO3

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: Explosives SW 846 8330	Misc. Explosives SW 846 8330	NaD. Nitrate + Nitrite 353.2	Ammonia 350.1	Total Metals 6020 / 7470A Hg	Dis Metals 6020 / 7470A Hg			COMMENTS
10/12	0920	12SW2701	12SW/SD 27	0	-2"	SW	G	~~7~~ 6	2	2	1	1	1				
10/12	~~1020~~ 0920	12SW2701-F	"	0	2"	SW	G	1	–	–	–	–	1				
10/12	1020	12SW1101	12SW SD11	0	2"	SW	G	6	2	2	1	1	–				
10/12	1020	12SW1101-F	"	0	2"	SW	G	1	–	–	–	–	1				
10/12	1135	12SW0401	12SW SD04	0	3"	SW	G	6	2	2	1	1	–				
10/12	1135	12SW0401-F	↓	0	3"	SW	G	1	–	–	–	–	1				
10/12	1445	12SW0101	12SW SD01	0	1"	SW	G	6	2	2	1	1	–				
10/12	1445	12SW0101-F	↓	0	1"	SW	G	1	–	–	–	–	1				

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY [signature]	10/12/04	1900	1. RECEIVED BY FED EX		
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	~~10~~/12/04	~~1~~200
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTIO WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TINUS-001

TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0112 PAGE 1 OF _

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 357 6878	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn, S Conti		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX AB# 8447 8135 5579		SEATTLE WA 98108

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: EXPLOSIVES/MISC. EXP. SW8468330 / MOD.	METALS 6020 & Hg AVS/SEM	METALS, Hg, CEC PH + TOC	SVOCS SW8468270C, 8151A ESIM					COMMENTS
								CONTAINER TYPE PLASTIC (P) or GLASS (G)	G	G	G	G	G				
								PRESERVATIVE USED	4°C	4°C	4°C	4°C	4°C				
10/12	0930	125D270004	125W SD27	0	4"	SD	G	2	1	1							
10/12	1030	125D110004	125W SD11	0	4"	SD	G	2	1	1							
10/12	1330	125D220004	125W SD22	0	4"	SD	G	3	1		1	1					
10/12	1340	125D210004	125W SD21	0	4"	SD	G	2	1	1							
10/12	1400	125D190004	125W SD19	0	4"	SD	G	3	1		1	1					
10/12	1015	125D060004	125W SD04	0	4"	SD	G	2	1	1							
10/12	1110	125D050004	125W SD05	0	4"	SD	G	2	1	1							
10/12	1140	125D040004	125W SD04	0	4"	SD	G	3	1	1	1						
10/12	1400	125D030004	125W SD03	0	4"	SD	G	4	1	1			2				
10/12	1425	125D020004	125W SD02	0	4"	SD	G	2	1	1							
10/12	1510	125D010004	125W SD01	0	4"	SD	G	3	1	1	1						

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Terry Rojahn	10/12/04	1900	1. RECEIVED BY FEDERAL EXPRESS	10/12/04	1900
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 0119 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 357 6878	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn, S. Gionti		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB# 8447 8135 5580		SEATTLE WA 98108

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES/MISC. EXP. SW846 8330 / MOD.	METALS & Hg 6020 & 7471A	AVS/SEM	METALS, Hg, CEC PH, TOC	SVOCs 8270C	8151A & SIM			COMMENTS
								CONTAINER TYPE PLASTIC (P) or GLASS (G)	G	G	G	G	G				
								PRESERVATIVE USED	4°C	4°C	4°C	4°C	4°C				
10/13	0910	12SD230004	12SW SD23	0	4"	SD	G	2	1	1							
10/13	1040	12SD120004	12SW SD12	0	4"	SD	G	2	1	1							
10/13	1325	12SD170004	12SW SD17	0	4"	SD	G	2	1	1							
10/13	1355	12SD160004	12SW SD16	0	4"	SD	G	3	1	-	1	1					
10/13	1440	12SD130004	12SW SD13	0	4"	SD	G	3	1	-	1	1					
10/13	0935	12SD290004	12SW SD29	0	4"	SD	G	2	1	1							
10/13	1000	12SD300004	12SW SD30	0	4"	SD	G	4	2	2							DO MS/MSD
10/13	1045	12SD150004	(TR) 12SW SD~~30~~15	0	4"	SD	G	2	1	1							
10/13	1100	12SD180004	12SW SD18	0	4"	SD	G	2	1	1							
10/13	1130	12SD200004	12SW SD20	0	4"	SD	G	2	1	1							
10/13	1200	12SD140004	12SW SD14	0	4"	SD	G	2	1	1							
10/13	0000	12FD10130401	QC	0	4"	SD	G	2	1	1							FROM 12SD30

1. RELINQUISHED BY Terry Rojahn	DATE 10/13/04	TIME 1800	1. RECEIVED BY FED EX	DATE 10/13/04	TIME 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TINUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0120 PAGE 1 OF

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
S. Conti		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB# 8447 8135 5580		SEATTLE WA 98108

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXP & MISC EXP SW 8260	MISC EXP SW 8330	MOD 8330	NITRATE+NITRITE 353.2	AMMONIA 350.1	TOTAL METALS & Hg 6020/7470A	DIS METALS & Hg 6020/7470A				COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)										G	G	P	P	P					
PRESERVATIVE USED										4°C	4°C	4°C H2SO4	4°C HNO3	4°C HNO3					
10/13	0900	12SW2301	12SW/SD 23	0	3"	SW	G	6	2	2	1	1	–						
10/13	0900	12SW2301-F	"	"	"	"	"	1	–	–	–	–	1						
10/13	1030	12SW1201	12SW SD12	0	2"	SW	G	6	2	2	1	1	–						
10/13	1030	12SW1201-F	"	"	"	"	"	1	–	–	–	–	1						
10/13	1345	12SW1601	12SW SD16	0	2"	SW	G	4	1	1	1	1	–						
10/13	1345	12SW1601-F	"	"	"	"	"	1	–	–	–	–	1						
10/13	1425	12SW1301	12SW SD13	0	1"	SW	G	4	1	1	1	1	–						
10/13	1425	12SW1301-F	"	"	"	"	"	1	–	–	–	–	1						

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Terry Rojahn	10/13/04	1800	1. RECEIVED BY FED EX	10/13/04	1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0121 PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 7448 343	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB# 8447 8135 5580		SEATTLE WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): P
PRESERVATIVE USED: 4°C / HNO3

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: Dis Metals & Hg 6020/7470A							COMMENTS
10/12	0810	16SW2401-F	16SW 24	-	-	SW	G	1	1							
10/12	0820	16SW2501-F	16SW 25	-	-	SW	G	3	3							DO MS/MSD
10/12	0000	16FD10120401-F	QC	-	-	SW	G	1	1							FROM 16SW2501-F

1. RELINQUISHED BY Terry Rojahn	DATE 10/13/04	TIME 1800	1. RECEIVED BY FEDERAL EXPRESS	DATE 10/13/04	TIME 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTIC WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELL PY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

T ATECH NUS, INC. CHAIN OF CUSTODY NUMBER 0123 PAGE 1 OF ____

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB# 8447 8135 5590		SEATTLE, WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G
PRESERVATIVE USED: 4°C 4°C

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: Explosives & Misc. Exp. SW846-8330 / Mod.	TYPE OF ANALYSIS: Total Metals Hg 6020 / 7471A								COMMENTS
10/14	1540	125D280004	125W/ SD 28	0	4"	SD	G	2	1	1								

1. RELINQUISHED BY Terry Rojahn	DATE 10/18/04	TIME 1800	1. RECEIVED BY FEDERAL EXPRESS	DATE 10/18/04	TIME 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC.

CHAIN OF CUSTODY

NUMBER 0126

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX AB# 8447 8135 6623		SEATTLE WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G P P P

PRESERVATIVE USED: 4°C | 4°C | 4°C | H2SO4 4°C | HNO3 4°C | HNO3

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: EXPLOSIVES SW 846 8330	MISC. EXPLOSIVES MODIFIED 846 8330	NITRATE+NITRITE 353.2	AMMONIA 350.1	TOTAL METALS & Hg 6020 / 7470A	DIS. METALS & Hg 6020 / 7470A				COMMENTS
10/27	1230	12SW2601	12SW SD26	-	-	SW	G	4	1	1	1	1	-					
10/27	1230	12SW2601-F	↓	-	-	SW	G	1	-	-	-	-	1					
10/27	1306	12SW2401	12SW SD24	-	-	SW	G	4	1	1	1	1	-					
10/27	1306	12SW2401-F	↓	-	-	SW	G	1	-	-	-	-	1					
10/27	1400	12SW1001	12SW SD10	-	-	SW	G	4	1	1	1	1	-					
10/27	1400	12SW1001-F	12SW SD10	-	-	SW	G	1	-	-	-	-	1					
10/27	1440	12SW0801	12SW SD08	-	-	SW	G	4	1	1	1	1	-					
10/27	1440	12SW0801-F	12SW SD08	-	-	SW	G	1	-	-	-	-	1					
10/27	1455	12SW0901	12SW SD09	-	-	SW	G	4	1	1	1	1	-					
10/27	1455	12SW0901-F	12SW SD09	-	-	SW	G	1	-	-	-	-	1					

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Terry Rojahn	10-27-04	1830	1. RECEIVED BY FEDERAL EXPRESS	10-27-04	1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

A TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0127 PAGE 1 OF _ _

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 357 6878	NSWC CRANE	R. BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn		T. ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB# 8447 8135 6612		SEATTLE WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G P P P

PRESERVATIVE USED: 4°C 4°C 4°C/H2SO4 4°C/HNO3 4°C/HNO3

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	MISC. EXPLOSIVES MODIFIED 846 8330	NITRATE + NITRITE 353.2	AMMONIA 350.1	Total METALS & Hg 6020/7470A	DIS METALS & Hg 6020/7470A	SEMIVOLATILES SW-846 8270C	SEMIVOLATILES SW 846 8151A	SEMIVOLATILES SIM	COMMENTS
10/28	1355	12SW0601	12SW SD06	–	–	SW	G	4	1	1	1	1	–					
10/28	1355	12SW0601-F	↓	–	–	SW	G	1	–	–	–	–	1					
10/28	1440	12SW0201	12SW SD02	–	–	SW	G	4	1	1	1	1	–					
10/28	1440	12SW0201-F	↓	–	–	SW	G	1	–	–	–	–	1					
10/28	1508	12SW0501	12SW SD05	–	–	SW	G	4	1	1	1	1	–					
10/28	1508	12SW0501-F	↓	–	–	SW	G	1	–	–	–	–	1					
10/28	1630	12SW0301	12SW SD03	–	–	SW	G	22	1	1	1	1	–	*6	*6	*6	*DO MS/MSD ON SVOCS	
10/28	1630	12SW0301-F	↓	–	–	SW	G	1	–	–	–	–	1					
10/28	0000	12FD10280401	QC	–	–	SW	G	6	–	–	–	–	–	2	2	2	FROM 12SW0301	
10/29	1250	12SW1901	12SW SD19	–	–	SW	G	4	1	1	1	1	–					
10/29	1250	12SW1901-F	↓	–	–	SW	G	1	–	–	–	–	1					
10/29	1320	12SW2201	12SW SD22	–	–	SW	G	4	1	1	1	1	–					
10/29	1320	12SW2201-F	↓	–	–	SW	G	1	–	–	–	–	1					

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Terry Rojahn	10-29-04	1830	1. RECEIVED BY FEDERAL EXPRESS	10-29-04	1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 0128 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
6878 CTO 357	NSWIC CRANE	R. BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Tony Rojahn		T. ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8447 8135 6612		SEATTLE, WA 98108

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	Explosives SW 846 8330	Misc. Explosives	Nitrate + Nitrite 353.2	Ammonia 350.1	Total Metals & Hg 6020/7470A	Dis Metals & Hg 6020/7470A			COMMENTS
								CONTAINER TYPE PLASTIC (P) or GLASS (G)	G	G	P	P	P				
								PRESERVATIVE USED	4°C	4°C	4°C	4°C / H_2SO_4	4°C / HNO_3				
								TYPE OF ANALYSIS									
10/29	1340	12SW2101	12SW SD21	–	–	SW	G	4	1	1	1	1	–				
10/29	1340	12SW2101-F	↓	–	–	SW	G	1	–	–	–	–	1				
10/29	1420	12SW1701	12SW SD17	–	–	SW	G	4	1	1	1	1	–				
10/29	1420	12SW1701-F	↓	–	–	SW	G	1	–	–	–	–	1				

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Tony Rojahn	10-29-04	1830	1. RECEIVED BY FEDERAL EXPRESS	10-29-04	1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTIO. WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD Y) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

A TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0129 PAGE 1 OF ____

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahi		TERRY ROJAHI	(412) 921-8857	940 SOUTH HARNEY ST
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8447 8135 6597		SEATTLE, WA 98108

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	MISC. EXPLOSIVES MODIFIED 846 8330	NITRATE + NITRITE 353.2	AMMONIA 350.1	Total METALS 6020 / 7470A HG	DIS METALS 6020 / 7470A HG				COMMENTS
								CONTAINER TYPE PLASTIC (P) or GLASS (G)	G	G	P	P	P					
								PRESERVATIVE USED	4°C	4°C	4°C/H2SO4	4°C/HNO3	4°C/HNO3					
10/30	0940	12SW2801	12SW SD28	–	–	SW	G	4	1	1	1	1	–					
10/30	0940	12SW2801-F	↓	–	–	SW	G	1	–	–	–	–	1					
10/30	1030	12SW2001	12SW SD20	–	–	SW	G	18	6	6	3	3	–					DO MS/MSD
10/30	1030	12SW2001-F	↓	–	–	SW	G	3	–	–	–	–	3					DO MS/MSD
10/30	0000	12FD10300401	QC	–	–	SW	G	4	1	1	1	1	–					FROM 12SW2001
10/30	0000	12FD10300401-F	QC	–	–	SW	G	1	–	–	–	–	1					↓
11/01	0955	12SW3001	12SW SD30	–	–	SW	G	4	1	1	1	1	–					
11/01	0955	12SW3001-F	↓	–	–	SW	G	1	–	–	–	–	1					
11/01	1015	12SW2901	12SW SD29	–	–	SW	G	4	1	1	1	1	–					
11/01	1015	12SW2901-F	↓	–	–	SW	G	1	–	–	–	–	1					
11/01	1055	12SW1401	12SW SD14	–	–	SW	G	4	1	1	1	1	–					
11/01	1055	12SW1401-F	↓	–	–	SW	G	1	–	–	–	–	1					
11/01	1245	12SW0701	12SW SD07	–	–	SW	G	4	1	1	1	1	–					

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Terry Rojahi	11/01/04	1800	1. RECEIVED BY FEDERAL EXPRESS	11/01/04	1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 0130 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 357 6878	NSWC CRANE	R. BASINSKI	(412) 921-8308	LAUCKS / HUGE PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn		T. ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB# 8447 8135 6597		SEATTLE WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G P P P

PRESERVATIVE USED: 4°C 4°C 4°C/H2SO4 4°C/HNO3 4°C/HNO3

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: EXPLOSIVES SW 846 8330	MISC. EXPLOSIVES MODIFIED 846 8330	NITRATE + NITRITE 353.2	AMMONIA 350.1	Total METALS & Hg 6020 / 7470A	DIS METALS & Hg 6020 / 7470A				COMMENTS
11/01	1245	12SW0701-F	12SW SD07	—	—	SW	G	1	—	—	—	—	1					
11/01	1320	12SW1501	12SW SD15	—	—	SW	G	4	1	1	1	1	—					
11/01	1320	12SW1501-F	↓	—	—	SW	G	1	—	—	—	—	1					
11/01	1335	12SW1801	12SW SD18	—	—	SW	G	4	1	1	1	1	—					
11/01	1335	12SW1801-F	↓	—	—	SW	G	1	—	—	—	—	1					

1. RELINQUISHED BY Terry Rojahn	DATE 11/01/04	TIME 1800	1. RECEIVED BY FEDERAL EXPRESS	DATE 11/01/04	TIME 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUT WHITE (ACCOMPANIES SAMPLE) YELLOW (FIEL PY) PINK (FILE COPY)

4/02R
FORM NO. TINUS-001

T. A TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0132 PAGE 1 OF

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
N6878 CTO 357	NSWC CRANE	R. BASINSKI	412 921 8308	LAUCKS - HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		T ROJAHN	412 921 8857	940 SOUTH HARNEY ST
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX AB # 844781356601		SEATTLE, WA. 98108

S. Conti / Tony Rojahn

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: EXPLOSIVES MISC EXPLOSIVES SW 846 8330 MOD SW 846 8330	COMMENTS
10/30	1330	12GWT3401 ~~12M~~ SQC	12 mw T34	-	-	GW	G	1	1	THIS WELL WAS A VERY LOW PRODUCER - IE LESS THAN MINIMUM VOLUME WAS ALL THAT COULD BE OBTAINED

1. RELINQUISHED BY Tony Rojahn	DATE 11-02-04	TIME 1830	1. RECEIVED BY FED EX	DATE 11-02-04	TIME 1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 0134 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB# 8447 8135 6586		SEATTLE WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G P P P

PRESERVATIVE USED: 4°C 4°C 4°C/H_2SO_4 4°C/HNO_3 4°C/HNO_3

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	MISC. EXPLOSIVES MODIFIED 8330	Nitrate + Nitrite 353.2	AMMONIA 350.1	Total Metals 6020 / 7470A Hg	Dis Metals 6020 / 7470A Hg			COMMENTS
11/10	1325	12GWT4401 ~~12GWT4~~ FR	12MW T44	-	-	GW	G	4	1	1	1	1					
11/10	1325	12GWT4401-F	↓	-	-	GW	G	1	-	-	-	-	1				
11/10	1706	12GWT4101	12MW T41	-	-	GW	G	4	1	1	1	1					

1. RELINQUISHED BY Terry Rojahn	DATE 11-11-04	TIME 1800	1. RECEIVED BY FEDERAL EXPRESS	DATE 11-11-04	TIME 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0137 PAGE 1 OF

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY St
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB# 8447 8135 6277		SEATTLE, WA 98108

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

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	MISC. EXPLOSIVES MODIFIED 8330	Nitrate + Nitrite 353.2	Ammonia 350.1	Total Metals Hg 6020/7470A	Dis Metals & Hg 6020/7470A				COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P	P					
PRESERVATIVE USED									4°C	4°C	4°C	H_2SO_4 4°C	HNO_3 4°C	HNO_3				
11/13	0945	12GWT4601	12MW T46	-	-	GW	G	4	1	1	1	1						
11/13	1050	12GWT4501	12MW T45	-	-	GW	G	4	1	1	1	1						
11/13	1355	12GWT4701	12MW T47	-	-	GW	G	12	3	3	3	3						DO MS/MSD
11/13	0000	12FD11130401	QC	-	-	GW	G	4	1	1	1	1						FROM 12GWT4701
11/14	1045	12GWT4801	12MW T48	-	-	GW	G	2	-	1	-	1						SLOW RECHARGE WELL
11/15	0830	12GWT4801	↓	-	-	GW	G	2	1	-	1	-						↓
11/15	0830	12GWT4801-F	↓	-	-	GW	G	1	-	-	-	-	1					

1. RELINQUISHED BY Terry Rojahn	DATE 11-15-04	TIME 1800	1. RECEIVED BY FEDERAL EXPRESS	DATE 11-15-04	TIME 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TINUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 0142 PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 357 6878	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn		T. ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX AB# 8447 8135 6303		SEATTLE WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G P P P

PRESERVATIVE USED: 4°C | 4°C | HNO3 | 4°C | H2SO4 | 4°C | HNO3

TYPE OF ANALYSIS

DATE YEAR 2004	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXP. & MISC EXP 8330	Total Metals & Hg MOD 8330 / 6020 / 7470A	Nitrate + Nitrite 353.2 Ammonia 350.1	Dis. Metals & Hg 6020 / 7470A					COMMENTS
11/16	0910	12GWT4301	12MW T43	-	-	GW	G	2	*1	*1							VERY SLOW RECHARGE WELL
(TC) ~~11/16~~ 11/17	0830	12GWT4301	↓	-	-	GW	G	1	-	-	*1						↓
11/17	0830	12GWT4301-F	↓	-	-	GW	G	1	-	-	-	*1					

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Terry Rojahn	11-17-04	1100	1. RECEIVED BY FEDERAL EXPRESS	11-17-04	1100
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENT * MIN. VOLUME

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIL OPY) PINK (FILE COPY)

4/02R
FOR. TINUS-001

APPENDIX C.5.2

SWMU 12

CHAIN OF CUSTODY RECORDS ROUND 2

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 3682 PAGE 1 OF

PROJECT I CTO N6878 357	FACILITY: NSWIC CRANE	PROJECT MANAGER RALPH BASINSKI	PHONE NUMBER (412) 921-8308
LABORATORY NAME AND CONTACT: LAUCKS / HUGH PRENTICE	SAMPLERS (SIGNATURE)	FIELD OPERATIONS LEADER TERRY ROJAHN	PHONE NUMBER (412) 921-8857
ADDRESS 940 SOUTH HARNEY ST.	CARRIER/WAYBILL NUMBER FED. EX. AB # 8447 8135 7413	CITY, STATE SEATTLE, WA 98108	

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

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	Explosives SW-846 8330	Misc. Explosives	Nitrate + Nitrite 353.2	Ammonia 350.1	Total Metals + Hg 6020 / 7470A	Dis. Metals + Hg 6020 / 7470A	TOC			COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P	P	G				
PRESERVATIVE USED									4°C	4°C	4°C / H_2SO_4	4°C / HNO_3	4°C / HNO_3	4°C / H_2PO_4				
2/03	1505	12GWT0502	12GW/T05	-	-	GW	G	6	2	2	1	1	—	—				

1. RELINQUISHED BY	DATE 2/3/05	TIME 1830	1. RECEIVED BY FEDERAL EXPRESS	DATE 2/03/05	TIME 1930
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 3684 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 357 N6878	NSWIC CRANE	RALPH BASINSKI	(412) 921-8308	HUGH PRENTICE / LALICKS
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
[signature]		TERRY ROSAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8447 8135 7424		SEATTLE, WA 98108

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

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW-846 8330	MISC EXPLOSIVES	Nitrate + Nitrite 353.2	Ammonia 350.1	Total Metals 6020 / 7470A	Dis Metals 6020 / 7470A			COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P	P				
PRESERVATIVE USED									4°C	4°C	4°C/H2SO4	4°C/HNO3	4°C/HNO3				
TYPE OF ANALYSIS																	
2/04	1345	12GWT2502	12GW T25	–	–	GW	G	6	2	2	1	1					
~~2/04~~	~~1345~~	~~12GWT2502-F~~	↓	–	–	GW	G	1	–	–	–	–	1	–	–	FL	

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
[signature]	2/04/05	1800	FEDERAL EXPRESS	2/04/05	1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FOR. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 3686 PAGE 1 OF 1

PROJECT NO.	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
N6878 CTO 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	HUGH PRENTICE / LAUCKS
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8447 8135 7457		SEATTLE WA 98108

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

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW-846 8330	MISC. EXPLOSIVES	NITRATE + NITRITE	AMMONIA	TOTAL METALS & HG 6020 / 7470A	DIS METALS & HG 6020 / 7470A				COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P	P					
PRESERVATIVE USED									4°C	4°C	4°C/H2SO4	4°C/HNO3	4°C/HNO3					
2/06	1445	12GWT0102	12MW T01	-	-	GW	G	6	2	2	1	1						
2/07	1300	12GWT2702	12MW T27	-	-	GW	G	6	2	2	1	1						
2/07	1345	12GWT3102	12MW T31	-	-	GW	G	6	2	2	1	1						
2/07	1345	12GWT3102-F	↓	-	-	GW	G	1	-	-	-	-	1					
2/07	1422	12GWT1002	12MW T10	-	-	GW	G	6	2	2	1	1						

1. RELINQUISHED BY Terry Rojahn	DATE 2-07-05	TIME 1800	1. RECEIVED BY FEDERAL EXPRESS	DATE 2-07-05	TIME 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS LABEL MAY HAVE 12MWIT FOR SAMPLE ID... SHOULD BE 12GWIT!

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 3688 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
N6878 CTO 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROSAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX AB # 8447 8135 7479		SEATTLE WA 98108

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

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: EXPLOSIVES SW-846 8330	MISC. EXPLOSIVES MOD 8330	NITRATE & NITRITE	AMMONIA	Total METALS & Hg 6020/7470A	Dis. METALS & Hg 6020/7470A				COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P	P					
PRESERVATIVE USED									4°C	4°C	4°C/H2SO4	4°C/HNO3	4°C/HNO3					
2/08	1640	12GWT200Z	12MW T20	-	-	GW	G	6	2	2	1	1	-					
2/08	1230	12GWT320Z	12MW T32	-	-	GW	G	6	2	2	1	1	-					
2/08	1230	12GWT320Z-F	↓	-	-	GW	G	1	-	-	-	-	1					
2/08	1320	12GWT150Z	12GW T15	-	-	GW	G	6	2	2	1	1						

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	2/08/05	1800	1. RECEIVED BY FEDERAL EXPRESS	2/08/05	1800
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUT WHITE (ACCOMPANIES SAMPLE) YELLOW (FIEI PY) PINK (FILE COPY)

FORM TtNUS-001 4/02R

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 3695 PAGE 1 OF _

PROJECT NO.	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
N6878 CTO 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8447 8135 7490		SEATTLE, WA 98108

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

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	Explosives SW-846 8330	Misc. Explosives (MOD 8330)	Nitrate + Nitrite 353.2	Ammonia 350.1	Total Metals & Hg 6020 / 7470A	Dis. Metals & Hg 6020 / 7470A	Explosives & Misc. Explosives		COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P	P	G			
PRESERVATIVE USED									4°C	4°C	4°C / H_2SO_4	4°C / HNO_3	4°C / HNO_3	4°C			
2/15	1305	12GWT28O2	12MW T28	–	–	GW	G	6	2	2	1	1	–				
2/15	1000	12GWT48O2	12MW T48	–	–	GW	G	4	1	1	1	1	–				MIN. VOL
2/15	1000	12GWT4802-F	↓	–	–	GW	G	1	–	–	–	–	1				↓
2/15	1035	12GWT4901	12MW T49	–	–	GW	G	4	1	1	1	1	–				↓
2/15	1035	12GWT4901-F	↓	–	–	GW	G	1	–	–	–	–	1				↓
2/15	1340	12GWT34O2	12MW T34	–	–	GW	G	1	–	–	–	–	–	1			VERY SLOW RECHARGE IN WELL
2/15	1415	12GWT39O2	12MW T39	–	–	GW	G	2	1	1	–	–	–				↓
2/16	1240	12GWT35O2	12MW T35	–	–	GW	G	6	2	2	1	1	–				
2/16	1335	12GWT24AO2	12MW T24A	–	–	GW	G	6	2	2	1	1	–				
2/16	1355	12GWT16O2	12MW T16	–	–	GW	G	6	2	2	1	1	–				
2/16	1510	12GWT39O2	12MW T39	–	–	GW	G	1	–	–	–	1	–				VERY SLOW RECHARGE WELL
2/16	1355	12GWT1602-F	12MW T16	–	–	GW	G	1	–	–	–	–	1				

1. RELINQUISHED BY	DATE 2/16/05	TIME 1830	1. RECEIVED BY FEDERAL EXPRESS	DATE 2/16/05	TIME 1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 3696 PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 357 N6878	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROSAHNI	(412) 921-8857	940 SOUTH HARBIGY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8447 8135 7505		SEATTLE, WA 98108

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

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	MISC. EXPLOSIVES	NITRATE & NITRITE 353.2 & AMMONIA 350.1	TOTAL METALS Hg 6020 / 7470A	DIS METALS Hg 6020 / 7470A	TOC			COMMENTS
								CONTAINER TYPE PLASTIC (P) or GLASS (G)	G	G	P	P	P				
								PRESERVATIVE USED	4°C	4°C	4°C / H2SO4	4°C / HNO3	4°C / HNO3				
2/17	1117	12GWT0202	12MW T02	–	–	GW	G	18	3	3	3	3	–	6			DO MS/MSD
2/17	1255	12GWT2602	12MW T26	–	–	GW	G	8	2	2	1	1	–	2			
2/17	1415	12GWT3902	12MW T39	–	–	GW	G	1	–	–	1	–	–	–			MIN VOL WELL
2/17	1415	12GWT3902-F	↓	–	–	GW	G	1	–	–	–	–	1	–			↓
2/17	1430	12GWT1702	12MW T17	–	–	GW	G	4	1	1	1	1	–	–			↓
2/17	1430	12GWT1702-F	↓	–	–	GW	G	1	–	–	–	–	1	–			↓
2/17	0000	12FD02170501	QC	–	–	GW	G	8	2	2	1	1	–	2			DUP FROM 12GWT0202
2/18	1242	12GWT3302	12MW T33	–	–	GW	G	8	2	2	1	1	–	2			
2/18	1300	12GWT4002	12MW T40	–	–	GW	G	6	2	2	1	1	–	–			
2/18	1300	12GWT4002-F	12MW T40	–	–	GW	G	1	–	–	–	–	1	–			
2/18	1515	12RB02180501	QC	–	–	QC	G	6	1	1	1	1	–	2			Bladder PUMP RINSATE
2/18	1555	12GWT1902	12MW T19	–	–	GW	G	3	1	1	–	1	–	–			MIN. VOL. WELL

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	2-18-05	1800	1. RECEIVED BY FEDERAL EXPRESS	2-18-05	1800
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUT WHITE (ACCOMPANIES SAMPLE) YELLOW (FIE' 'PY) PINK (FILE COPY)

4/02R
FORI TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 3700 PAGE 1 OF

PROJECT NO.	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
6878 CTO 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB# 8447 8135 7516		SEATTLE WA 98108

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G P P P

PRESERVATIVE USED: 4°C 4°C 4°C/H_2SO_4 4°C/HNO3 4°C/HNO3

TYPE OF ANALYSIS: EXPLOSIVES SW 846 8330 / MISC. EXPLOSIVES / NITRATE + NITRITE 353.2 / AMMONIA 350.1 / TOTAL METALS & Hg 6020/7470A / DIS METALS & Hg 6020/7470A

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	MISC. EXPLOSIVES	NITRATE + NITRITE 353.2	AMMONIA 350.1	TOTAL METALS & Hg 6020/7470A	DIS METALS & Hg 6020/7470A				COMMENTS
2/19	1220	12GWT42O2	12MW T42	–	–	GW	G	6	2	2	1	1	–					
2/19	1237	12GWT44O2	12MW T44	–	–	GW	G	4	1	1	1	1	–					SLOW RECHARGE / (MIN. VOL.) PURGE RATE
2/19	1540 ~~1555~~	12GWT19O2	12MW T19	–	–	GW	G	1	–	–	1	–	–					
2/19	1540	12GWT19O2-F	↓	–	–	GW	G	1	–	–	–	–	1					
2/19	1623	12GWT41O2	12MW T41	–	–	GW	G	4	1	1	1	1	–					
2/20	1235	12GWT38O2	12MW T38	–	–	GW	G	6	2	2	1	1	–					
2/20	1332	12GWT29O2	12MW T29	–	–	GW	G	4	1	1	1	1	–					SLOW RECHARGE MIN VOL
2/20	1332	12GWT29O2-F	↓	–	–	GW	G	1	–	–	–	–	1					
2/20	1720	12GWT23O2	12MW T23	–	–	GW	G	5	2	1	1	1	–					
2/21	1015	12GWT06O2	12MW T06	–	–	GW	G	6	2	2	1	1	–					
2/21	1142	12GWT07O2	12MW T07	–	–	GW	G	4	1	1	1	1	–					SLOW RECHARGE
2/21	1335	12GWT08O2	12MW T08	–	–	GW	G	6	2	2	1	1	–					
2/21	1450	12GWT22O2	12MW T22	–	–	GW	G	6	2	2	1	1	–					

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	2-21-05	1830	1. RECEIVED BY FEDERAL EXPRESS	2-21-05	1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 3701 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8447 8135 6406		SEATTLE WA 98108

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

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	MISC. EXPLOSIVES	NITRATE+NITRITE 353.2	AMMONIA 350.1	Total METALS 6020/7470A Hg	DIS METALS 6020/7470A Hg				COMMENTS
									TYPE OF ANALYSIS									
									CONTAINER TYPE PLASTIC (P) or GLASS (G)				G	G	P	P	P	
									PRESERVATIVE USED				4°C	4°C	4°C	4°C/H2SO4	4°C/HNO3	4°C/HNO3
2/22	1015	12GWT1102	12MW T11	—	—	GW	G	6	2	2	1	1	—					
2/22	1227	~~12GWT05~~ 25GW05	25MW 05	—	—	GW	G	9	3	3	—	3	—					do MS/MSD
2/22	1355	12GWT1202	12MW T12	—	—	GW	G	6	2	2	1	1	—					
2/22	0000	12FD02220501	QC	—	—	GW	G	5	2	2	—	1	—					from 25GW05

1. RELINQUISHED BY	DATE 2/22/05	TIME 1800	1. RECEIVED BY FEDERAL EXPRESS	DATE 2/22/05	TIME 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUT WHITE (ACCOMPANIES SAMPLE) YELLOW (FIEI PY) PINK (FILE COPY)

FORI 4/02R TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 3706 PAGE 1 OF

PROJECT NO.	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HLIGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY St
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB# 8447 8135 7549		SEATTLE, WA 98108

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

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	MISC EXPLOSIVES 353.2	Nitrate + Nitrite 350.1	AMMONIA	Total Metals 6020 / 7470A	Dis. Metals 6020 / 7470A				COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P	P					
PRESERVATIVE USED									4°C	4°C	4°C / H2SO4	4°C / HNO3	4°C / HNO3					
3/04	1655	12GWT1302	12MW 713	–	–	GW	G	6	2	2	1	1	–					
3/05	0850	12SW2702	12SW 27	–	–	SW	G	4	1	1	1	1						
3/05	0850	12SW2702-F	↓	–	–	SW	G	1	–	–	–	–	1					
3/05	0945	12SW2602	12SW 26	–	–	SW	G	4	(TR) 1	(TR) 1	1	1						
3/05	0945	12SW2602-F	↓	–	–	SW	G	1	–	–	–	–	1					
3/05	0958	12SW2502	12SW 25	–	–	SW	G	4	1	1	1	1						
3/05	0958	12SW2502-F	↓	–	–	SW	G	1	–	–	–	–	1					
3/05	1020	12SW2402	12SW 24	–	–	SW	G	4	1	1	1	1						
3/05	1020	12SW2402-F	↓	–	–	SW	G	1	–	–	–	–	1					
3/05	1225	12SW2302	12SW 23	–	–	SW	G	4	1	1	1	1						
3/05	1225	12SW2302-F	↓	–	–	SW	G	1	–	–	–	–	1					
3/05	1333	12SW1602	12SW 16	–	–	SW	G	4	1	1	1	1						
3/05	1333	12SW1602-F	↓	–	–	SW	G	1	–	–	–	–	1					

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	9/7/05	1800	1. RECEIVED BY FEDERAL EXPRESS		
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 3707 PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY St
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8447 8135 7549		SEATTLE WA 98108

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

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 8330	MISC. EXPLOSIVES	Nitrate+Nitrite 353.2	AMMONIA 350.1	Total METALS 6020 & 7470A Hg	DIS. METALS 6020 & 7470A Hg				COMMENTS
								CONTAINER TYPE PLASTIC (P) or GLASS (G)	G	G	P	P	P					
								PRESERVATIVE USED	4°C	4°C	4°C	4°C/H2SO4	4°C/HNO3	4°C/HNO3				
3/05	1344	125W1702	125W 17	–	–	SW	G	4	1	1	1	1						
3/05	1344	125W1702-F	↓	–	–	SW	G	1	–	–	–	–	1					
3/05	1415	125W1302	125W 13	–	–	SW	G	4	1	1	1	1						
3/05	1415	125W1302-F	↓	–	–	SW	G	1	–	–	–	–	1					
3/05	1435	125W1202	125W 12	–	–	SW	G	4	1	1	1	1						
3/05	1435	125W1202-F	↓	–	–	SW	G	1	–	–	–	–	1					
3/05	1450	125W3101	125W 31	–	–	SW	G	4	1	1	1	1						
3/05	1450	125W3101-F	↓	–	–	SW	G	1	–	–	–	–	1					
3/05	1500	125W3201	125W 32	–	–	SW	G	4	1	1	1	1						
3/05	1500	125W3201-F	↓	–	–	SW	G	1	–	–	–	–	1					
3/05	0907	125W1102	125W 11	–	–	SW	G	4	1	1	1	1						
3/05	0907	125W1102-F	↓	–	–	SW	G	1	–	–	–	–	1					
3/06	0830	125W1002	125W 10	–	–	SW	G	(TR) 4/12	3	3	3	3						DO MS/MSD

1. RELINQUISHED BY Terry Rojahn	DATE 3/7/05	TIME 1800	1. RECEIVED BY FEDERAL EXPRESS	DATE 3/7/05	TIME 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUT WHITE (ACCOMPANIES SAMPLE) YELLOW (FIE')PY) PINK (FILE COPY)

4/02R
FOR. TINUS-001

TERRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 3708 PAGE 1 OF

PROJECT #	CTO	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
6878	357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)			FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn			TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
			CARRIER/WAYBILL NUMBER		CITY, STATE
			FED. EX. AB # 8447 8135 7549		SEATTLE WA 98108

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

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	Explosives SW 8330	Misc. Explosives 8330	Nitrate & Nitrite 353.2	Ammonia 350.1	Total Metals & Hg 6020/7470A	D.S. Metals & Hg 6020/7470A				COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P	P					
PRESERVATIVE USED									4°C	4°C	4°C	4°C/H2SO4	4°C/HNO3	4°C/HNO3				
3/06	0830	125W1002-F	125W 10	-	1 (TR)	~~125W~~ SW	G	3	-	-	-	-	3					DO MS/MSD
3/06	0918	125W0802	125W 08	-	-	SW	G	4	1	1	1	1						
3/06	0918	125W0802-F	↓	-	-	SW	G	1	-	-	-	-	1					
3/06	0925	125W0902	125W 09	-	-	SW	G	4	1	1	1	1						
3/06	0925	125W0902-F	↓	-	-	SW	G	1	-	-	-	-	1					
3/06	1005	125W0602	125W 06	-	-	SW	G	4	1	1	1	1						
3/06	1005	125W0602-F	↓	-	-	SW	G	1	-	-	-	-	1					
3/06	1045	125W2802	125W 28	-	-	SW	G	4	1	1	1	1						
3/06	1045	125W2802-F	↓	-	-	SW	G	1	-	-	-	-	1					
3/06	1110	125W3302 (TR)	125W 33	-	-	SW	G	4	1	1	1	1						
3/06	1110	125W3302-F (TR)	↓	-	-	SW	G	1	-	-	-	-	1					
3/06	1340	125W0502	125W 05	-	-	SW	G	4	1	1	1	1						
3/06	1340	125W0502-F	↓	-	-	SW	G	1	-	-	-	-	1					

1. RELINQUISHED BY Terry Rojahn	DATE 3/18/05 (TR)	TIME 1800	1. RECEIVED BY FEDERAL EXPRESS	DATE 3/7/05	TIME 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 3709 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8447 8135 7549		SEATTLE, WA 98108

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

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	Explosives SW 8330	Misc. Explosives 8332	Nitrate & Nitrite 353.1	Ammonia 350.1	Total Metals & Hg 6020/7470A	Dis Metals & Hg 6020/7470A				COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P	P					
PRESERVATIVE USED									4°C	4°C	4°C/H2SO4	4°C/HNO3	4°C/HNO3					
3/06	1350	12SW0402	12SW 04	-	-	SW	G	4	1	1	1	1						
3/06	1350	12SW0402-F	↓	-	-	SW	G	1	-	-	-	-	1					
3/06	1445	12SW0202	12SW 02	-	-	SW	G	4	1	1	1	1						
3/06	1445	12SW0202-F	↓	-	-	SW	G	1	-	-	-	-	1					
3/06	1500	12SW3401	12SW 34	-	-	SW	G	4	1	1	1	1						
3/06	1500	12SW3401-F	↓	-	-	SW	G	1	-	-	-	-	1					
3/06	1510	12SW3501	12SW 35	-	-	SW	G	4	1	1	1	1						
3/06	1510	12SW3501-F	↓	-	-	SW	G	1	-	-	-	-	1					
3/06	1515	12SW3601	12SW 36	-	-	SW	G	4	1	1	1	1						
3/06	1515	12SW3601-F	↓	-	-	SW	G	1	-	-	-	-	1					
3/06	0000	12FD03060501	QC	-	-	SW	G	4	1	1	1	1						DUP OF 12SW0502
3/06	0000	12FD03060501-F	QC	-	-	SW	G	1	-	-	-	-	1					↓
3/06	0000	12FD03060502	QC	-	-	SW	G	4	1	1	1	1						DUP OF 12SW0202

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Terry Rojahn	3/7/05	1800	1. RECEIVED BY FEDERAL EXPRESS	3/7/05	1800
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

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

4/02R
FORM: TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 3710 PAGE 1 OF 1

PROJECT: 6870 CTO 357	FACILITY: NSWC CRANE	PROJECT MANAGER: RALPH BASINSKI	PHONE NUMBER: (412) 921-8308
LABORATORY NAME AND CONTACT: LAUCKS / HUGH PRENTICE	SAMPLERS (SIGNATURE): Terry Rojahn	FIELD OPERATIONS LEADER: TERRY ROJAHN	PHONE NUMBER: (412) 921-8857
ADDRESS: 940 SOUTH HARNEY ST.	CARRIER/WAYBILL NUMBER: FED. EX. AB # 8447 8135 7549	CITY, STATE: SEATTLE, WA 98108	

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

DATE YEAR	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	MISC. EXPLOSIVES	Nitrate & Nitrite 353.2	AMMONIA 350.1	Total METALS & Hg 6020/7470A	DIS. METALS & Hg 6020/7470A				COMMENTS
								CONTAINER TYPE PLASTIC (P) or GLASS (G)	G	G	P	P	P					
								PRESERVATIVE USED	4°C	4°C	4°C H2SO4	4°C	4°C HNO3	4°C HNO3				
3/06 2005	0000	12FD03060502-F	QC	–	–	SW	G	1	–	–	–	–	1					FROM 12SW02UC

1. RELINQUISHED BY: Terry Rojahn	DATE: 3/7/05	TIME: 1800	1. RECEIVED BY: FEDERAL EXPRESS	DATE: 3/7/05	TIME: 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 3711 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 357 6878	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX AB # 8947 8135 4610		SEATTLE, WA 98108

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

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	MISC. EXPLOSIVES	Nitrate + Nitrite 353.2	AMMONIA 350.1	TOTAL METALS & Hg 6020/7470A	DIS METALS & Hg 6020/7470A	SVOCS SW 846 8270C	SELECTED ION MONITORING SVOCS SW 846 8151A	COMMENTS
								CONTAINER TYPE PLASTIC (P) or GLASS (G)	G	G	P	P	P	G	G	G	
								PRESERVATIVE USED	4°C	4°C	4°C/H2SO4	4°C	4°C/HNO3	4°C	4°C	4°C	
3/07	0805	12SW1402	12SW 14	-	-	SW	G	4	1	1	1	1					
3/07	0805	12SW1402-F	↓	-	-	SW	G	1	-	-	-	-	1				
3/07	0810	12SW0302	12SW 03	-	-	SW	G	21	3	3	3	3	-	3	3	3	
3/07	0810	12SW0302-F	↓	-	-	SW	G	3	-	-	-	-	3				
3/07	0835	12SW1802	12SW 18	-	-	SW	G	4	1	1	1	1					
3/07	0835	12SW1802-F	↓	-	-	SW	G	1	-	-	-	-	1				
3/07	0855	12SW2002	12SW 20	-	-	SW	G	4	1	1	1	1					
3/07	0855	12SW2002-F	12SW 20	-	-	SW	G	1	-	-	-	-	1				
3/07	1000	12SW0102	12SW 01	-	-	SW	G	4	1	1	1	1					
3/07	1000	12SW0102-F	↓	-	-	SW	G	1	-	-	-	-	1				
3/07	0000	12FD03070501	QC	-	-	SW	G	4	-	-	-	-	-	2	1	1	DUP OF 12SW0302

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Terry Rojahn	3/8/05	1800	1. RECEIVED BY FEDERAL EXPRESS	3/8/05	1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBU WHITE (ACCOMPANIES SAMPLE) YELLOW (FIE PY) PINK (FILE COPY) 4/02R

FOR. J. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER 3703 PAGE 1 OF _

PROJECT NO.	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
6878 CTO 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
TR FOR Jim Goerdt		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED.EX. AB# 8447 8135 6380		SEATTLE, WA 98108

Terry Rojahn

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

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	EXPLOSIVES MISC.	Nitrate + Nitrite 353.2	AMMONIA 350.1	Total METALS & Hg 6020 / 7470A	DIS. METALS & Hg 6020 / 7470A				COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P	P					
PRESERVATIVE USED									4°C	4°C	4°C	4°C / H2SO4	4°C / HNO3	4°C / HNO3				
3/02	1310	12GWT1402	12MW T14	-	-	GW	G	2	-	-	1	1						SLOW RECHARGE WELL
3/02	1310	12GWT1402-F	↓	-	-	GW	G	1	-	-	-	-	1					↓
3/02	1810	12GWT0902	12MW T09	-	-	GW	G	6	2	2	1	1						
3/03	0820	12GWT0302	12MW T03	-	-	GW	G	6	2	2	1	1						
3/03	0913	12GWT4602	12MW T46	-	-	GW	G	4	1	1	1	1						SLOW RECHARGE WELL
3/03	0913	12GWT4602-F	↓	-	-	GW	G	1	-	-	-	-	1					↓
3/03	1000	12GWT4502	12MW T45	-	-	GW	G	4	1	1	1	1						
3/03	1000	12GWT4502-F	↓	-	-	GW	G	1	-	-	-	-	1					↓
3/03	1025	12GWT0402	12MW T04	-	-	GW	G	14	4	4	3	3						DO MS/MSD
3/03	1232	12GWT4302	12MW T43	-	-	GW	G	3	-	1	1	1						SLOW RECHARGE WELL
3/03	1340	12GWT1402	12MW T14	-	-	GW	G	2	1	1	-	-						↓
3/03	1420	12GWT1802	12MW T18	-	-	GW	G	6	2	2	1	1						
3/03	1420	12GWT1802-F	↓	-	-	GW	G	1	-	-	-	-	1					

1. RELINQUISHED BY Terry Rojahn	DATE 3-4-05	TIME 1830	1. RECEIVED BY FEDERAL EXPRESS	DATE 3-4-05	TIME 1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 3704 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
CTO 6878 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
TR for Jim Goerdt		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8447 81356380		SEATTLE WA 98108

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

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	EXPLOSIVES SW 846 8330	MISC. EXPLOSIVES	Nitrate + Nitrite 353.2	AMMONIA 350.1	Total METALS & Hg 6020/7470A	DIS. METALS & Hg 6020/7470A				COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P	P					
PRESERVATIVE USED									4°C	4°C	4°C / H2SO4	4°C / HNO3	4°C / HNO3					
3/03	1520	25GW0301	7/3	-	-	GW	G	5	2	2	-	1	-					
3/03	0000	12FD03030501	QC	-	-	GW	G	6	2	2	1	1	-					DUP OF 12GWT040Z
3/04	0900	12GWT430Z	12MW T43	-	-	GW	G	1	1	-	-	-	-					
3/04	0900	12GWT430Z-F	↓	-	-	GW	G	1	-	-	-	-	1					
3/04	1015	12GWT210Z	12MW T21	-	-	GW	G	6	2	2	1	1	-					
3/04	1427	25GW0201	7/2	-	-	GW	G	(TR) ~~4~~ 3	1	1	(TR) ~~1~~ -	1	-					
3/04	1427	25GW0201-F	7/2	-	-	GW	G	1	-	-	-	-	1					
3/04	1430	12GWT360Z	12MW T36	-	-	GW	G	8	2	2	3	1	-					DO MS/MS Ammonia, Nitrate & Nitrite
3/04	0000	12FD03040501	QC	-	-	GW	G	1	-	-	1	-	-					FROM 12GWT360Z

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
Terry Rojahn	3-4-05	1830	FEDERAL EXPRESS	3-4-05	1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

FORM TtNUS-001 4/02R

T A TECH NUS, INC. CHAIN OF CUSTODY NUMBER 3693 PAGE 1 OF _

PROJECT NO.	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
6878 CTO 357	NSWC CRANE	RALPH BASINSKI	(412) 921-8308	LAUCKS / HUGH PRENTICE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Rojahn		TERRY ROJAHN	(412) 921-8857	940 SOUTH HARNEY ST.
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB# 8447 8135 6391		SEATTLE WA 98108

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

DATE YEAR 2005	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: EXPLOSIVES SW 846 8330	MISC. EXPLOSIVES	NITRATE + NITRITE 353.2	AMMONIA 350.1	Total METALS & Hg 6020 / 7470A					COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	G	P	P						
PRESERVATIVE USED									4°C	4°C	4°C / H_2SO_4	4°C / HNO_3						
3/02	1057	12GWT4702	12MW T47	-	-	GW	G	6	2	2	1	1						

1. RELINQUISHED BY Terry Rojahn	DATE 3/02/05	TIME 1830	1. RECEIVED BY FEDERAL EXPRESS	DATE 3/02/05	TIME 1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

APPENDIX C.6

SWMU 25 (DUMP SITE A)

MONITORING WELL INSPECTION SHEETS

MONITORING WELL INSPECTION SHEET

Well ID: 7/1

Time: 1600 Date: 1/19/05 Inspector's Name: C. Doolan T. Rojahn

Inspection Item	Types of Problems	Status		Observation
		S	U	
Well Tag	Is it in-place, legible	/	✓	ASSUME WELL IS 7/1
Well security	Condition protective case, cap, lock	✓		HAS PROTECTIVE CASING; SCREW ON CAP
Well pad	Concrete or gravel & condition	NA	NA	Soil only
Well seal	Condition of...	✓		
Area Immediately around well pad	Record any evidence of/or standing water in area of well	✓		No standing water
Dedicated sampling equipment	Condition of...	—	—	NA
PVC Riser	Condition of riser & survey reference point	✓		

Comments:

Signature(s) [signature]

Note: S= Satisfactory, U= Unsatisfactory
Check one, if unsatisfactory explain

NSB-NLON
Field Form
Revision: 1
January: 1999

MONITORING WELL INSPECTION SHEET

Well ID: 7/2

Time: 1555 **Date:** 1/19/05 **Inspector's Name:** C. Doolan
T. Rojahn

Inspection Item	Types of Problems	Status		Observation
		S	U	
Well Tag	Is it in-place, legible		✓	Assume that it is 7/2; same construction as 7/3 - 7/5
Well security	Condition protective case, cap, lock	✓		Riser only no protective casing
Well pad	Concrete or gravel & condition	✓		Gravel & soil
Well seal	Condition of...	✓		
Area Immediately around well pad	Record any evidence of/or standing water in area of well	✓		No standing water
Dedicated sampling equipment	Condition of...	–	–	NA
PVC Riser	Condition of riser & survey reference point	✓		

Comments:

Signature(s) [signature]

Note: S= Satisfactory, U= Unsatisfactory
Check one, if unsatisfactory explain

MONITORING WELL INSPECTION SHEET

Well ID: 7/4

Time: 1553 Date: 1/19/05 Inspector's Name: C. Doolan
T. Rosahn

Inspection Item	Types of Problems	Status		Observation
		S	U	
Well Tag	Is it in-place, legible	✓		Marking Pen only
Well security	Condition protective case, cap, lock	✓		Riser only No Protective casing
Well pad	Concrete or gravel & condition	✓		Gravel
Well seal	Condition of...	✓		OK since well repair on 1/18/05 Rinse was broken off @ Ground Level @ Coupler.
Area Immediately around well pad	Record any evidence of/or standing water in area of well	✓		No standing water
Dedicated sampling equipment	Condition of...	—	—	NA
PVC Riser	Condition of riser & survey reference point	✓		

Comments:
THUS Repaired stick-up on 1-18-05; well was open @ Ground level.

Signature(s) Terry Rosahn

Note: S= Satisfactory, U= Unsatisfactory
Check one, if unsatisfactory explain

NSB-NLON
Field Form
Revision: 1
January: 1999

MONITORING WELL INSPECTION SHEET

Well ID: 7/3

Time: 1544 Date: 1-19-05 Inspector's Name: T. Rosahn C. Doolan

Inspection Item	Types of Problems	Status		Observation
		S	U	
Well Tag	Is it in-place, legible	✓		Paint
Well security	Condition protective case, cap, lock	✓		Riser only. No protective casing
Well pad	Concrete or gravel & condition	✓		Gravel/soil
Well seal	Condition of...	✓		
Area Immediately around well pad	Record any evidence of/or standing water in area of well	✓		No standing water
Dedicated sampling equipment	Condition of...	—	—	NA
PVC Riser	Condition of riser & survey reference point	✓		

Comments:

Signature(s) [signature]

Note: S= Satisfactory, U= Unsatisfactory
Check one, if unsatisfactory explain

NSB-NLON
Field Form
Revision: 1
January: 1999

MONITORING WELL INSPECTION SHEET

Well ID: 7/5

Time: 1550 Date: 1/19/05 Inspector's Name: C. Doolan T. Rojann

Inspection Item	Types of Problems	Status		Observation
		S	U	
Well Tag	Is it in-place, legible	✓		PAINT
Well security	Condition protective case, cap, lock	✓		RISER ONLY NO PROTECTIVE CASING
Well pad	Concrete or gravel & condition	✓		GRAVEL & SOIL
Well seal	Condition of...	✓		
Area Immediately around well pad	Record any evidence of/or standing water in area of well	✓		NO STANDING WATER
Dedicated sampling equipment	Condition of...	–	–	NA
PVC Riser	Condition of riser & survey reference point	✓		

Comments:

Signature(s) [signature]

Note: S= Satisfactory, U= Unsatisfactory
Check one, if unsatisfactory explain

NSB-NLON
Field Form
Revision: 1
January: 1999

APPENDIX C.7.1

SWMU 12

MONITORING WELL DEVELOPMENT RECORDS ROUND 1

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT01
Site: SWMU 12
Date Installed: 7/24/04
Date Developed: 8/1/04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): with PVC Section 37.80 | without PVC Section 35.4
Static Water Level Before (ft.): 9.36 | 7.12
Static Water Level After (ft.): 13.30
Screen Length (ft.): 10'
One Well Volume (gal/L): 4.6
Casing ID (in.): 2"

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1011	—	—	—	—	—	—	—	Start DEVELOPMENT
1016	↓	—	12.55	16.28	4.10	1.353	75	Sl. Cloudy
1021	↓	—	12.97	15.82	4.03	1.384	45	Clear
1026	28 gal	—	13.30	16.10	4.13	1.387	19	Clear

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT 02
Site: SWMU 12
Date Installed: 7/25/04
Date Developed: 8/1/04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): 30.87
Static Water Level Before (ft.): 8.29
Static Water Level After (ft.): 15.75
Screen Length (ft.): 10'
One Well Volume (gal/L): 3.8
Casing ID (in.): 2"

Responsible Personnel: T. ROGAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1725	0	–	–	–	–	–	–	Start Purge Dark Grey
1730	8	~~14.70~~	14.70	16.51	3.98	0.353	750	~~Dark~~ Grey
1735	15	–	15.15	15.72	3.80	0.314	85	V. Sl. Cloudy
1740	23	–	15.40	15.49	3.61	0.323	12	CLEAR
1750	30	–	15.75	15.27	3.70	0.335	3.1	CLEAR

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT03
Site: SWMU 12
Date Installed: 8/31/04
Date Developed: 9/23/04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): 27.8
Static Water Level Before (ft.): 16.36
Static Water Level After (ft.): DRY
Screen Length (ft.): 10
One Well Volume (gal/L): 1.9
Casing ID (in.): 2"

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0952	–	–	–	–	–	–	–	START DEV
0955	3	NA	*	16.93	5.71	1.482	>1000	LT. BRN (DRY)
0956	4	NA	DRY	–	–	–	–	RECHARGE
1001	↓	NA	24.95	–	–	–	–	↓
1006	↓	NA	24.65	–	–	–	–	↓
1011	↓	NA	24.46	–	–	–	–	↓
1016	4	NA	24.22	–	–	–	–	↓
1018	5	NA	DRY	15.34	625	1.424	>1000	LT. BRN (DRY
1023	↓	NA	*	–	–	–	–	RECHARGE
1028	↓	NA	*	–	–	–	–	↓
1033	5	NA	*	–	–	–	–	↓
1034	5.5	NA	*	16.16	6.42	1.388	>1000	LT BRN (DRY)

* W.L. BELOW TOP OF PUMP

WL 60.5 TD 90.9 T29 (TOC) " (TOC)

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT04
Site: 12
Date Installed: 9/10/04
Date Developed: 9/23/04
Dev. Method: SURGE/PURGE
Pump Type: WHALE

Depth to Bottom (ft.): 26.70
Static Water Level Before (ft.): 14.30 (TOC)
Static Water Level After (ft.): >25.5
Screen Length (ft.): 10
One Well Volume (gal/L): ≈ 2 GAL
Casing ID (in.): 2"

Responsible Personnel: CONTI
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: N6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (~~ml/min.~~) (GPM)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units µS/cm)	Turbidity (NTU) (Lamotte)	Remarks (odor, color, etc.)
0958	—	—	—	—	—	—	—	START PUMP
1000	—	—	—	16.29	7.04	780	>1000	Gray Brn
1005	8	1.1	23.00	14.62	6.77	1396	950	" "
1012	16	1.1	25.00	14.48	6.69	1354	310	" "
1021	24	1.0	25.50*	14.43	6.62	1319	37	" " * 25.50 - PROBE HITTING PUMP - NO WATER LEVEL
1032	32	.9	>25.50	14.34	6.57	1291	3	Clear
1037	36.5	.9	"	14.28	6.59	1273	2	"
1042	41	.9	"	14.25	6.60	1268	2	"
								* WL IS AT PUMP LEVEL.

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT05
Site: SWMU 12
Date Installed: 9/8/04
Date Developed: 9/11/04
Dev. Method: Surge & Purge
Pump Type: WHALER

Depth to Bottom (ft.): 26.75
Static Water Level Before (ft.): 8.90
Static Water Level After (ft.): *
Screen Length (ft.): 10'
One Well Volume (gal/L): 2.9 (37 gal max)
Casing ID (in.): 2"

Responsible Personnel: T. Rosahn
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0815	0	–	–	–	–	–	–	Start DEV. Dark Grey
0820	8	NA	17.03	16.64	5.38	0.561	>1000	Grey
0825	16	NA	19.25	16.69	5.20	0.537	584	Lt. Grey
0830	24	NA	19.45	15.13	5.10	0.510	271	Cloudy
0835	29	NA	19.80	15.00	5.17	0.510	704	Grey
0840	34	NA	21.30	14.73	5.25	0.521	>1000	Grey
0845	39	NA	25.55	14.55	5.28	0.495	>1000	Dark Grey
0850	44	NA	*	14.82	5.08	0.505	407	Lt Grey
0855	49	NA	*	14.77	5.06	0.505	202	Containers Full Exceeded
0856								MAX. PURGE stop Dev.
								Sl. Cloudy @ END

* W.L. below Pump Top

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT06
Site: SWMU 12
Date Installed: 8/15/04
Date Developed: 8/30/04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): 25.8
Static Water Level Before (ft.): 9.04
Static Water Level After (ft.): *
Screen Length (ft.): 10'
One Well Volume (gal/L): 2.2
Casing ID (in.): 2"

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole - ppm
PID Readings: Breathing Zone - ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1035	0	0	9.04	—	—	—	-	START DEV. (BRN)
1038	↓	NA	*	16.10	5.75	0.552	>1000	BRN
1043	↓	NA	*	16.21	5.94	0.329	140	SL Cloudy
1048	8	NA	*	16.28	5.92	0.327	50	CLEAR
1053	10	NA	*	16.28	5.91	0.321	29	CLEAR
1054	—	—	—	—	—	—	—	END DEV.

* W.L. Below Top of Pump

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT07
Site: SWMU 12
Date Installed: 8/27/04
Date Developed: 8/30/04
Dev. Method: Surge & Purge
Pump Type: Whaler

Depth to Bottom (ft.): 26.8
Static Water Level Before (ft.): 11.5
Static Water Level After (ft.): Dry
Screen Length (ft.): 10'
One Well Volume (gal/L): 2.4
Casing ID (in.): 2"

Responsible Personnel: T. Rojahn
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole - ppm
PID Readings: Breathing Zone - ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0927	0	0	11.50	—	—	—	—	Start Dev BRN
0932	6	-	25.3	16.04	4.45	3.618	>1000	BRN
0933	7	-	Dry	—	—	—	—	Dry Stop Pump
0938	↓	-	25.55	—	—	—	—	Recharge
0943	↓	-	22.73	—	—	—	—	↓
0948	↓	-	22.20	—	—	—	—	↓
0953	7	-	21.70	—	—	—	—	↓ Restart Pump
0955	↓	-	*	16.17	3.82	4.098	1000	Very Cloudy
0956	10	-	Dry	—	—	—	—	Dry Stop Pump
1001	↓	-	23.15	—	—	—	—	Recharge →
1006	↓	-	22.74	—	—	—	—	
1011	10	-	22.37	—	—	—	—	Restart Pump ↓
1013	10.5	-	—	16.12	3.69	4.163	>1000	Lt Brn
1014	11	-	Dry	—	—	—	—	Dry

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT 08
Site: SWMU
Date Installed: 7/25/04
Date Developed: 8/1/04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): 25.90
Static Water Level Before (ft.): 10.80
Static Water Level After (ft.):
Screen Length (ft.): 10'
One Well Volume (gal/L): 2.4
Casing ID (in.): 2"

Responsible Personnel: T. Rozahn
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1620	0	—	—	—	—	—	—	Start Dev.
1625	4	NA	22.05	18.72	4.31	0.442	700	Milky
1630	6.5	"	23.90	18.10	4.20	0.924	>1000	Milky BRN
1633	7.5	"	DRY	—	—	—	—	DRY
1638		"	22.35	—	—	—	—	RECHARGE
1643		"	—	—	—	—	—	
1648		"	20.39	—	—	—	—	
1653		"	19.41	—	—	—	—	
1653	7.5	"	19.41	17.24	4.18	1.579	170	Sl Cloudy
1656	9.0	"	DRY	—	—	—	—	DRY
1701		"	22.70	—	—	—	—	RECHARGE
1706		"	21.58	—	—	—	—	
1711		"	20.45	—	—	—	—	
1711	9.0	"	20.45	16.52	3.96	1.684	240	Cloudy
1713	10.5	"	DRY					

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT 09
Site: SWMU 12
Date Installed: 8/29/04
Date Developed: 8/31/04
Dev. Method: Surge & Purge
Pump Type: WHALER

Depth to Bottom (ft.): 26.76
Static Water Level Before (ft.): 12.56
Static Water Level After (ft.): *
Screen Length (ft.): 10'
One Well Volume (gal/L): 2.2
Casing ID (in.): 2" Φ

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0929	0	0	12.56	–	–	–	–	START DEV.
0934	5	NA	*	16.74	677	0.779	>1000	BRN
0944	9	NA	*	16.85	6.53	0.685	47.5	CLEAR
0949	9.5	NA	*	17.23	6.44	0.732	55.1	CLEAR
0954	10	NA	*	17.25	6.37	0.742	20.7	CLEAR
1004	11	NA	*	17.20	6.24	0.754	11.8	CLEAR

* W.L. BELOW TOP OF PUMP

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT10
Site: 12
Date Installed: 8-11-04
Date Developed: 9-22-04
Dev. Method: SURGE/PURGE
Pump Type: WHALE

Depth to Bottom (ft.): 26.81 TOC
Static Water Level Before (ft.): 14.73 TOC
Static Water Level After (ft.): 25.30
Screen Length (ft.): 10
One Well Volume (gal/L): 7.9
Casing ID (in.): 2"

Responsible Personnel: CONTI
Drilling Company: 8-M
Project Name: NSWC-CRANE
Project Number: N6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units µS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1605	START							
1608	≈ 2GAL	NA	14.73	18.07	4.40	729	> 1000	WENT DRY @ 1608
1613	↓	↓	23.85	—	—	—	> 1000	RECHARGE
1618			23.30	—	—	—	—	"
1623			23.01	—	—	—	—	"
1628	↓	↓	22.81	—	—	—	—	START PUMP @ 1628 - WENT DRY @ 1630
1630	≈.3 GAL	NA	DRY	17.51	4.60	703	>1000	DRY
1635	↓	↓	DRY	—	—	—	—	RECHARGE
1640	↓	↓	25.43	—	—	—	—	"
1645	≈4GAL (TOTAL)	NA	25.30	18.20	4.63	733	>1000	START @ 1645 DRY AFTER 1 MIN END DEV.

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT 11
Site: SWMU 12
Date Installed: 8/14/04
Date Developed: 9/8/04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): 26.4
Static Water Level Before (ft.): 14.35
Static Water Level After (ft.): DRY
Screen Length (ft.): 10'
One Well Volume (gal/L): 1.9
Casing ID (in.): 2"Ø

Responsible Personnel: T. ROJAHN
Drilling Company: B·M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1026	0	NA	14.35	–	–	–	–	START DEV
1031	↓	NA	*	15.66	7.32	0.991	>1000	BRN
1032	4	NA	DRY	–	–	–	–	RECHARGE
1037		NA	*	–	–	–	–	"
1042		NA	22.70	–	–	–	–	"
1047		NA	21.98	–	–	–	–	"
1052	↓	NA	21.10	–	–	–	–	" (RESTART)
1053	4	NA	*	16.93	7.03	0.985	>1000	LT BRN
1057	6	NA	* (DRY)	–	–	–	–	(DRY)
1102		NA	*	–	–	–	–	RECHARGE
1107		NA	24.20	–	–	–	–	"
1112	↓	NA	23.75	–	–	–	–	"
1114	6	NA	*	17.56	6.93	0.822	>1000	LT. BRN
1116	7	NA	* (DRY)	–	–	–	–	(DRY)

* W.L. BELOW TOP OF PUMP

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT12
Site: SWMU 12
Date Installed: 8/14/04
Date Developed: 9/8/04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): 26.4
Static Water Level Before (ft.): 11.98
Static Water Level After (ft.): *
Screen Length (ft.): 10'
One Well Volume (gal/L): 2.4
Casing ID (in.): 2"Ø

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole - ppm
PID Readings: Breathing Zone - ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0849	0	-	11.98	-	-	-	-	START DEV. TAN
0854	5	NA	*	15.44	7.53	0.794	>1000	BRN
0859	10	NA	*	15.74	7.38	0.732	>1000	BRN
0904	↓	NA	*	15.77	7.06	0.690	>1000	LT. BRN - CLOUDY
0909	↓	NA	*	15.83	7.05	0.677	646	CLOUDY
0914	16	NA	*	15.86	7.05	0.669	524	CLOUDY
0919	↓	NA	*	15.93	7.02	0.676	>1000	LT. BRN - CLOUDY
0924	21	NA	*	15.97	7.01	0.672	>1000	" - "
0929	↓	NA	*	15.97	7.02	0.669	733	CLOUDY
0934	↓	NA	*	16.00	7.02	0.668	234	SL. CLOUDY
0939	↓	NA	*	16.16	7.04	0.667	181	SL. CLOUDY
0942	27	NA	*	-	-	-	-	-
0944	↓	NA	*	16.14	7.02	0.663	223	SL. CLOUDY
0949	↓	NA	*	16.18	7.05	0.665	151	SL CLOUDY
0959	↓	NA	*	16.27	7.07	0.668	146	SL. CLOUDY
1009	34	NA	*	16.38	6.99	0.670	138	SL. CLOUDY (END)

* W.L. BELOW PUMP TOP.

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT13
Site: SWMU 12
Date Installed: 7/23/04
Date Developed: 8/1/04
Dev. Method: Surge & Purge
Pump Type: WHALER

Depth to Bottom (ft.): 20.37 ~~Do~~ without Extra Section
Static Water Level Before (ft.): 2.92
Static Water Level After (ft.): DRY
Screen Length (ft.): 10
One Well Volume (gal/L): 2.7
Casing ID (in.): 2"

Responsible Personnel: T. RUSHAN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1100	0	1gpm	2.92	—	—	—	—	Start Purge
1105	5	~~1~~ ½ 1gpm	17.80	17.07	4.30	0.347	>1000	Brn
1108	8	1gpm	(DRY)	—	—	—	—	Recharge (DRY)
1113	↓	—	12.98	—	—	—	—	"
1118		—	10.10	—	—	—	—	"
1123		—	7.45	—	—	—	—	"
1128		—	6.06	—	—	—	—	"
1129	8	1.25	6.06	—	—	—	—	Restart Dev.
1132	↓	1.25	18.50	19.65	4.03	0.336	400	Tannish
1133	13	1.25	(DRY)	—	—	—	—	Recharge (DRY)
1138	↓	—	13.80	—	—	—	—	"
1143	↓	—	11.20	—	—	—	-	"
1148	13	—	8.93	—	—	—	—	" Restart
1153	16.75	1.25	(DRY)	18.82	4.27	0.357	>1000	Brownish

68.8
91.25 " T31 WL
TD

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Page ___ of ___

Well: 12MW14
Site: 12 NSWC
Date Installed: 8-31-04
Date Developed: 9-22-04
Dev. Method: SURGE/PURGE
Pump Type: WHALE

Depth to Bottom (ft.): 27.80 TOC
Static Water Level Before (ft.): 19.81 TOC
Static Water Level After (ft.): 26.40 "
Screen Length (ft.): 10
One Well Volume (gal/L): 1.3
Casing ID (in.): 2"

Responsible Personnel: CONTI
Drilling Company: —
Project Name: NSWC-CRANE
Project Number: N6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units uS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1300	—	NA	DRY	—	—	—	—	
1320	1	NA	22.8	24.14	5.96	2633	> 1000	BRN/TURBID - WENT DRY
1340	≈ 1	NA	23.7	21.05	5.96	2129	> 1000	" " " "
1355	≈.25	NA	26.4	25.95	5.86	2208	> 1000	" " " "
	2.25							

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT 15
Site: 12
Date Installed: 8/31/04
Date Developed: 9/22/04
Dev. Method: Surge & Purge
Pump Type: Whaler

Depth to Bottom (ft.): 26.8
Static Water Level Before (ft.): 16.33
Static Water Level After (ft.): DRY
Screen Length (ft.): 10
One Well Volume (gal/L): 1.7
Casing ID (in.): 2"

Responsible Personnel: T. Rojahn
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1255	–	–	–	–	–	–	–	Start DEV.
1258	3	NA	*	18.86	5.24	1.429	>1000	Lt BRN
1300	4	NA	DRY	–	–	–	–	RECHARGE
1305	↓	NA	25.66	–	–	–	–	↓
1310		NA	25.09	–	–	–	–	
1315		NA	24.85	–	–	–	–	
1320	4	NA	24.80	–	–	–	–	
1321	5	NA	DRY	20.11	5.24	1.633	>1000	Lt BRN
1326	↓	NA	25.95	–	–	–	–	RECHARGE
1331		NA	25.73	–	–	–	–	↓
1336	5	NA	25.55	–	–	–	–	
1337	6	NA	*	18.08	5.25	1.549	190	Sl. Cloudy

* W.L. Below Top of pump

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT16
Site: SWMU 12
Date Installed: 8/14/04
Date Developed: 9/8/04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): 26.85
Static Water Level Before (ft.): 20.23
Static Water Level After (ft.): DRY
Screen Length (ft.): 10'
One Well Volume (gal/L): 1
Casing ID (in.): 2"

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1246	0	0	20.23	–	–	–	–	START PURGE
1251	2.5	NA	DRY	15.60	7.06	0.463	>1000	BRN
1256	↓	NA	*	–	–	–	–	RECHARGE
1301	↓	NA	25.22	–	–	–	–	↓
1306	↓	NA	25.12	–	–	–	–	↓
1311	2.5	NA	25.06	–	–	–	–	↓
1313	2.75	NA	* DRY	16.22	6.97	0.509	>1000	(DRY) BRN
1318	↓	NA	26.08	–	–	–	–	RECHARGE
1323	↓	NA	25.98	–	–	–	–	↓
1328	2.75	NA	25.92	–	–	–	–	↓
1330	3	NA	DRY	16.32	6.97	0.511	>1000	(DRY) BRN

* W.L. BELOW TOP OF PUMP.

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT17
Site: SWMU 12
Date Installed: 8/15/04
Date Developed: 9/8/04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): 27.70
Static Water Level Before (ft.): 21.66
Static Water Level After (ft.): DRY
Screen Length (ft.): 10'
One Well Volume (gal/L): 1
Casing ID (in.): 2"

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole - ppm
PID Readings: Breathing Zone - ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1345	0	NA	21.66	–	–	–	–	START PURGE
1342	↓	NA	*	16.40	7.16	0.808	>1000	LT BRN
1348	2	DRY →	*	–	–	–	–	DRY
1353	↓	NA	26.00	–	–	–	–	RECHARGE
1358		NA	25.76	–	–	–	–	↓
1403	↓	NA	25.64	–	–	–	–	↓
1408	2	NA	25.53	–	–	–	–	↓
1410	2.2	DRY →	*	18.24	6.57	0.535	>1000	DRY BRN
1415	↓	NA	26.52	–	–	–	–	RECHARGE
1420	↓	NA	26.43	–	–	–	–	↓
1425	2.2	NA	26.37	–	–	–	–	↓
1426	2.3	DRY →	*	20.12	6.21	1.110	>1000	DRY BRN

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT18
Site: SWMU 12
Date Installed: 8/27/04
Date Developed: 9/22/04
Dev. Method: Surge & Purge
Pump Type: WHALER

Depth to Bottom (ft.): 28.00
Static Water Level Before (ft.): 21.61
Static Water Level After (ft.): DRY
Screen Length (ft.): 10'
One Well Volume (gal/L): 1.1
Casing ID (in.): 2"

Responsible Personnel: T. ROJAHN
Drilling Company: 8-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1459	–	–	–	–	–	–	–	START DEV.
1501	2	NA	*	16.83	5.10	1,703	>1000	BRN
1502	3	NA	DRY	–	–	–	–	DRY
1507	↓	NA	26.81	–	–	–	–	RECHARGE
1512	↓	NA	26.57	–	–	–	–	↓
1517	↓	NA	26.43	–	–	–	–	↓
1522	3	NA	26.31	–	–	–	–	↓
1523	3.5	NA	*	–	–	–	–	DRY BEFORE ENOUGH VOL.
1528	↓	NA	*	–	–	–	–	RECHARGE could be obtained to run parameters
1533	↓	NA	27.11	–	–	–	–	↓
1538	3.5	NA	27.05	–	–	–	–	↓
1539	4	NA	*	20.66	3.82	1,951	>1000	DRY

W.L. BELOW top of PUMP

80.55 WL T32
100.70 TD T32

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12 MWT19
Site: 12
Date Installed: 8/28/04
Date Developed: 9-22-04
Dev. Method: SURGE/PURGE
Pump Type: WHALE

Depth to Bottom (ft.): 29.20 TOC
Static Water Level Before (ft.): 25.98 TOC
Static Water Level After (ft.): DRY
Screen Length (ft.): 10
One Well Volume (gal/L): 0.5
Casing ID (in.): 2"

Responsible Personnel: CONTI
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: N6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1448	—	—	25.98	—	—	—	—	START PUMP
1450	1	NA	—	18.55	6.06	2760	>1000	WENT DRY ≈ 2 MIN
1510	1.25	NA	27.82	21.80	5.94	3458	>1000	" " AFTER ≈ 1 MIN
1525	—	NA	DRY	—	—	—	—	END DEV. DID NOT REC ABOVE LEVEL OF PUMP

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT20
Site: 12
Date Installed: 9/1/04
Date Developed: 9/22/04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): 27.75
Static Water Level Before (ft.): 24.20
Static Water Level After (ft.): DRY
Screen Length (ft.): 10
One Well Volume (gal/L): 0.7
Casing ID (in.): 2"

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6879
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1358	–	–	–	–	–	–	–	START DEV BRN
1400	2	NA	*	17.09	5.51	1.546	>1000	BRN
1401	3	NA	DRY	–	–	–	–	RECHARGE (DRY)
1406	↓	NA	24.60	–	–	–	–	↓
1411	↓	NA	24.43	–	–	–	–	↓
1416	↓	NA	24.42	–	–	–	–	↓
1421	3	NA	24.33	–	–	–	–	↓
1422	4	NA	DRY	16.42	5.20	1.692	750	LT BRN (DRY)
1427	↓	NA	24.55	–	–	–	–	RECHARGE
1432	↓	NA	24.45	–	–	–	–	↓
1437	4	NA	24.43	–	–	–	–	↓
1439	5	NA	DRY	16.36	4.92	1.802	500	CLOUDY

* W.L. BELOW TOP OF PUMP

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT21
Site: 12
Date Installed: 9/12/04
Date Developed: 9/23/04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): 26.62
Static Water Level Before (ft.): 19.23
Static Water Level After (ft.): DRY
Screen Length (ft.): 10'
One Well Volume (gal/L): 1.3
Casing ID (in.): 2"

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1538	—	—	—	—	—	—	—	Start DEV
1541	3	NA	*	16.75	5.35	0.424	>1000	Dark Grey
1546	↓	NA	TA * 24.20	—	—	—	—	RECHARGE
1551	↓	NA	23.62	—	—	—	—	↓
1556	↓	NA	23.02	—	—	—	—	↓
1601	3	NA	22.60	—	—	—	—	↓
1604	4	NA	Dry	15.79	4.98	0.291	>1000	Dark Grey
1609	↓	NA	24.79	—	—	—	—	RECHARGE
1614	↓	NA	23.98	—	—	—	—	↓
1619	4	NA	23.53	—	—	—	—	↓
1620	4.5	NA	DRY	15.49	5.14	0.267	>1000	GREY

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT22
Site: 12
Date Installed: 9/11/04
Date Developed: 9/23/04
Dev. Method: PURGE/SURGE
Pump Type: WHALE

Depth to Bottom (ft.): 26.70
Static Water Level Before (ft.): 16.65
Static Water Level After (ft.): ____
Screen Length (ft.): 10
One Well Volume (gal/L): 1.6
Casing ID (in.): 2"

Responsible Personnel: CONTI
Drilling Company: —
Project Name: NSWC-CRANE
Project Number: N6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units uS/cm)	Turbidity (NTU) LAMOTTE	Remarks (odor, color, etc.)
1328	0	—	16.65	—	—	—	—	START DEV.
1329	2	—	NA	17.74	6.07	498	>1000	Brn- V Turbid
1331	3	WENT DRY	NA					RECHARGE
1336	—	—	23.80					"
1341	—	—	23.40					"
1346	—	—	23.22					"
1351	—	—	23.05					"
1353	4	WENT DRY	—	16.58	6.34	467	>1000	DRY
1358	—	DRY	—					Brn-Turbid RECHARGE
1403	—	DRY	—					"
1408	—	—	25.4					"
1413	—		25.3					"
1414	4.25	DRY	—	NOT ENOUGH	FOR	PARAMETERS		END DEV - SLOW REC

20

15

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT23
Site: SWMU 12
Date Installed: 8/10/04
Date Developed: 8/30/04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): 32.50
Static Water Level Before (ft.): 27.55
Static Water Level After (ft.): DRY
Screen Length (ft.): 10'
One Well Volume (gal/L): 0.8
Casing ID (in.): 2"

Responsible Personnel: TERRY ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole - ppm
PID Readings: Breathing Zone - ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1323	0	0	27.55	—	—	-	-	Start Purge / DEV.
1326	↓	NA	*	16.57	4.04	6.396	>1000	LT. BRN
1328	2	NA	DRY	—	—	—	—	DRY
1333	↓	NA	30.85	—	-	-	-	RECHARGE
1338	↓	NA	30.70	—	-	-	-	↓
1343	↓	NA	30.65	-	-	-	-	↓
1348	2	NA	30.60	-	-	-	—	↓ RESTART PUMP
1349	3	NA	DRY	19.64	3.03	6.854	>1000	BRN
1354	↓	NA	31.15	—	-	-	-	RECHARGE
1359	↓	NA	31.10	-	-	-	-	↓
1404	3	NA	31.06	—	-	-	-	↓ RESTART PUMP
1406	3.5	NA	DRY	24.64	3.03	7.743	>1000	DRY

* W.L. BELOW TOP OF PUMP

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

12MWT24 - DRY WELL
12MWT24A - REPLACEMENT FOR ABOVE

Well: 12MWT24A
Site: SWMU 12
Date Installed: 8/16/04
Date Developed: 8/31/04
Dev. Method: Surge & Purge
Pump Type: Waterra

Depth to Bottom (ft.): 56.55
Static Water Level Before (ft.): 35.5
Static Water Level After (ft.): DRY
Screen Length (ft.): 10'
One Well Volume (gal/L): 3.5
Casing ID (in.): 2"Ø

Responsible Personnel: T. Rojano
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/)	Turbidity (NTU)	Remarks (odor, color, etc.)
1055	0	NA	35.5	–	–	–	–	Start Purge
1105	↓	NA	49.7	18.06	5.26	9.086	>1000	
1110	5	NA	DRY	–	–	–	–	DRY
1115		NA	52.05	–	–	–	–	RECHARGE
1120		NA	51.80	–	–	–	–	"
1125	↓	NA	51.45	–	–	–	–	"
1130	5	NA	50.90	–	–	–	–	"
1132	7	NA	DRY	26.63	4.34	9.934	>1000	DRY
1134		NA	55.40	–	–	–	–	RECHARGE
1139		NA	54.60	–	–	–	–	↓
1144	↓	NA	54.20	–	–	–	–	
1149	7	NA	53.71	–	–	–	–	
1200	8	NA	DRY	21.58	4.43	9.512	>1000	END

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT25
Site: 12
Date Installed: 9/12/04
Date Developed: 9/23/04
Dev. Method: Surge & Purge
Pump Type: WHALER

Depth to Bottom (ft.): 27.8
Static Water Level Before (ft.): 18.20
Static Water Level After (ft.): DRY
Screen Length (ft.): 10
One Well Volume (gal/L): 1.6
Casing ID (in.): 2"

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1308	—	—	—	—	—	—	—	Start DEV
1310	3	NA	DRY	18.18	6.11	1597	290	SL Cloudy
1315	↓	NA	**	—	—	—	—	RECHARGE
1320		NA	24.30	—	—	—	—	↓
1325	↓	NA	24.09	—	—	—	—	
1330	3	NA	23.99	—	—	—	—	
1331	3.5	NA	* DRY	17.74	6.06	1589	>1000	BRN
1336	↓	NA	26.16	—	—	—	—	RECHARGE
1341	↓	NA	26.06	—	—	—	—	↓
1346	3.5	NA	2600	—	—	—	—	
1347	3.75	NA	* DRY	18.98	6.10	2407	>1000	BRN

** Missed Reading
* W.L. Below Pump Top

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT26
Site: 12
Date Installed: 9/12/04
Date Developed: 9/23/04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): 26.8
Static Water Level Before (ft.): 10.30
Static Water Level After (ft.): DRY
Screen Length (ft.): 10
One Well Volume (gal/L): 2.7
Casing ID (in.): 2"

Responsible Personnel: T. ROWAN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1433	—	—	—	—	—	—	—	START PURGE
1435	3	NA	22.35	18.84	7.05	0.925	>1000	LT. BRN
1438	6	NA	(DRY)	—	—	—	—	DRY
1443	↓	NA	24.50	—	—	—	—	RECHARGE
1448		NA	24.06	—	—	—	—	↓
1453	↓	NA	23.80	—	—	—	—	
1458	6	NA	23.60	—	—	—	—	
1459	7	NA	*(DRY)	20.40	6.28	0.935	>1000	LT. BRN (DRY)
1504	↓	NA	25.60	—	—	—	—	RECHARGE
1509	↓	NA	25.31	—	—	—	—	↓
1514	7	NA	25.19	—	—	—	—	
1515	7.5	NA	(DRY)	18.24	6.26	1.440	>1000	LT BRN – BRN

* W.L. BELOW PUMP TOP

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT27
Site: 12
Date Installed: 9/2/04
Date Developed: 9/22/04
Dev. Method: Surge & Purge
Pump Type: WHALER

Depth to Bottom (ft.): 27.85 (TOC)
Static Water Level Before (ft.): 10.53 (TOC)
Static Water Level After (ft.): DRY
Screen Length (ft.): 10
One Well Volume (gal.): 2.9
Casing ID (in.): 2"

Responsible Personnel: S. Conti
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1100	–	–	–	–	–	–	–	START PURGE
1105	4	NA	*	17.81	6.48	0.425	>1000	LT. BRN
1106	5	NA	DRY	–	–	–	–	RECHARGE
1116	↓	NA	*	–	–	–	–	↓
1121	↓	NA	*	–	–	–	–	↓
1126	↓	NA	*	–	–	–	–	↓
1131	5	NA	*	–	–	–	–	END DEV. VERY SLOW RECHARGE

* WL BELOW TOP OF PUMP

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT28
Site: SWMU 12
Date Installed: 8/30/04
Date Developed: 9/8/04
Dev. Method: Surge & Purge
Pump Type: WHALER

Depth to Bottom (ft.): 27.86
Static Water Level Before (ft.): 11.75
Static Water Level After (ft.): *
Screen Length (ft.): 10'
One Well Volume (gal.): 2.6
Casing ID (in.): 2"

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1447	0	NA	11.75	–	–	–	–	START PURGE (BRN)
1452	4	NA	*	16.80	7.04	2.555	>1000	BRN
1453	↓	NA	DRY	–	–	–	–	DRY
1458		NA	25.87	–	–	–	–	RECHARGE
1503		NA	25.51	–	–	–	–	↓
1508		NA	25.32	–	–	–	–	
1513	4	NA	25.19	–	–	–	–	
1515	5	NA	*	16.81	7.21	1.744	>1000	BRN
1520	↓	NA	*	–	–	–	–	RECHARGE
1525		NA	*	–	–	–	–	↓
1530	5	NA	26.62	–	–	–	–	
1532	5.25	NA	*	18.85	6.96	2.424	>1000	LT BRN

* W/L BELOW TOP OF PUMP

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT29
Site: 12
Date Installed: 9/10/04
Date Developed: 9/24/04
Dev. Method: WATERRA
Pump Type: WATERRA

Depth to Bottom (ft.): 90.9 (TOC)
Static Water Level Before (ft.): 60.5 (TOC)
Static Water Level After (ft.): DRY
Screen Length (ft.): 20
One Well Volume (gal/L): 4.9
Casing ID (in.): 2"

Responsible Personnel: CONTI/ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: N6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1008	—	—	60.5	—	—	—	—	Start Dev.
1013	5	NA	78.3	15.83	8.34	0.842	>1000	Dark Grey
1021	9	NA	89.4	15.27	8.27	0.873	>1000	Dark Grey
1022	9.5	NA	DRY	—	—	—	—	RECHARGE
1027	↓	NA	89.03	—	—	—	—	↓
1032	↓	NA	88.73	—	—	—	—	↓
1037	↓	NA	88.56	—	—	—	—	↓
1042	9.5	NA	87.90	—	—	—	—	↓
1049	10.5	NA	DRY	16.35	8.30	0.914	>1000	Dark Grey
1054	↓	NA	89.75	—	—	—	—	RECHARGE
1059	↓	NA	89.55	—	—	—	—	↓
1104	10.5	NA	89.30	—	—	—	—	↓
1106	11	NA	DRY	18.25	8.29	0.904	>1000	Dark Grey

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT30
Site: SWMU 12
Date Installed: 8-29-04
Date Developed: 8-31-04
Dev. Method: Surge & Purge
Pump Type: Disposable bailer

Depth to Bottom (ft.): 92.85
Static Water Level Before (ft.): 91.85
Static Water Level After (ft.): 92.65
Screen Length (ft.): 20'
One Well Volume (gal.): 0.163 gal
Casing ID (in.): 2.0

Responsible Personnel: J. Goerdt
Drilling Company: Bowser Morner
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole - ppm
PID Readings: Breathing Zone - ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0928	.5	NA	91.85	*	*	*	*	dark grey, Sediment
0941			92.60				>1000	recharge
0946			92.56					"
0951			92.54					"
0956			92.53					"
1001			92.53					"
1011	.6		DRY					DRY
1012			92.67					RECHARGE
1017			92.65					"
1022			92.65					"
1023			DRY					Pump Dry

* No readings water heavy w/ sedi. etc. may cause probe to malfunction; pH ~10 w/ indicator paper 5 ips

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT31
Site: 12
Date Installed: 8-30-04
Date Developed: 9-23-04
Dev. Method: WATERRA
Pump Type: WATERRA

Depth to Bottom (ft.): 91.25 (TOC)
Static Water Level Before (ft.): 68.75 (TOC)
Static Water Level After (ft.): DRY
Screen Length (ft.): 20'
One Well Volume (gal/L): 3.6
Casing ID (in.): 2"

Responsible Personnel: CONT'
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: N6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0825	—	—	—	—	—	—	—	Start DEV
0829	I	NA	72.0	17.49	7.60	0.567	120	I = Initial water from waterra
0839	3	NA	81.0	15.87	8.15	0.521	>1000	V. Cloudy
0846	6.5	NA	DRY	—	—	—	—	RECHARGE
0851	↓	NA	89.10	—	—	—	—	↓
0856	↓	NA	88.92	—	—	—	—	↓
0901	↓	NA	88.76	—	—	—	—	↓
0906	6.5	NA	88.59	—	—	—	—	↓
0908	7.0	NA	DRY	17.12	8.33	0.588	>1000	DRY Grey
0913	↓	NA	90.34	—	—	—	—	RECHARGE
0918	↓	NA	90.19	—	—	—	—	↓
0923	7.0	NA	90.10	—	—	—	—	↓
0924	7.25	NA	DRY	18.13	8.51	0.615	>1000	DRY Grey
	+2 gal in Tubing							
	9.25 Total							

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT32
Site: 12
Date Installed: 9/1/04
Date Developed: 9/24/04
Dev. Method: WATERRA
Pump Type: "

Depth to Bottom (ft.): ± 100.6 (TOC)
Static Water Level Before (ft.): 80.5 (TOC)
Static Water Level After (ft.): DRY
Screen Length (ft.): 20'
One Well Volume (gal/L): 3.3 gal
Casing ID (in.): 2"

Responsible Personnel: CONTI/ROJAIN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: N6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0855	–	–	80.50	–	–	–	–	START DEV
0905	9	NA	95.50	16.84	7.46	0.401	>1000	DARK GREY
0907	10	NA	DRY	–	–	–	–	DRY
0915	↓	NA	96.80	–	–	–	–	RECHARGE
0917	↓	NA	96.54	–	–	–	–	↓
0922	↓	NA	96.35	–	–	–	–	↓
0927	10	NA	96.15	–	–	–	–	↓
0928	11	NA	DRY	16.41	8.04	0.443	>1000	DARK GREY
0933	↓	NA	99.43	–	–	–	–	RECHARGE
0938	↓	NA	98.84	–	–	–	–	↓
0943	11	NA	98.45	–	–	–	–	↓
0944	11.5	NA	DRY	20.60	8.03	0.505	>1000	DARK GREY

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT33
Site: 12
Date Installed: 9/2/04
Date Developed: 9/22/04
Dev. Method: Surge & Purge
Pump Type: WATTERRIA

Depth to Bottom (ft.): 97.2
Static Water Level Before (ft.): 44.8
Static Water Level After (ft.): 84.7
Screen Length (ft.): 20'
One Well Volume (gal/L): 8.7
Casing ID (in.): 2"

Responsible Personnel: T. ROWAN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole - ppm
PID Readings: Breathing Zone - ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0928	—	—	—	—	—	—	—	START DEV.
0933	5	—	70.0	16.20	5.55	0.632	>1000	Lt BRN
0940	8	—	74.8	16.13	5.51	0.620	>1000	Grey BRN
0953	15	—	76.1	16.29	5.64	0.596	>1000	" "
1002	20	—	79.9	16.36	5.54	0.683	>1000	" "
1012	25	—	81.6	16.49	5.69	0.688	>1000	" "
1018	28	—	84.4	15.55	5.69	0.581	>1000	" "
1024	31	—	85	15.82	5.54	0.583	>1000	" "
1034	36	—	85.4	15.89	5.54	0.581	>1000	" "
1045	41	—	84.7	15.87	5.62	0.580	>1000	" "
1050	43 +	Tube water = 45 gals						
	Turbidity will not clear up with Watterra method All other READS Are Stable.							

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT34
Site: SWMU 12
Date Installed: 8-13-04
Date Developed: 8-31-04
Dev. Method: Surge & Pump
Pump Type: Disposable Bailer

Depth to Bottom (ft.): 90.40
Static Water Level Before (ft.): 87.45
Static Water Level After (ft.): 88.32
Screen Length (ft.): 20'
One Well Volume (gal.): ~~88.32~~ .48 gal
Casing ID (in.): 2.0

Responsible Personnel: J. Goerdt
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1041	.	—	87.45	*	*	*	>1000	dark gray.
1059	.5	—	88.23					Dry
1104		—	88.19					recharge
1109		—	88.18					
1114		—	88.15					
1119		—	88.15					
1129	.525	—	~~88~~. Dry					Dry
1134		—	88.32					Recharge
1139		—	88.32					"
1145	.540	—	Dry					Dry

* No readings. W/ too heavy w/ sediments.

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT35
Site: SWMU 12
Date Installed: 8-27-04
Date Developed: 8-31-04
Dev. Method: Surge & Purge
Pump Type: Whale

Depth to Bottom (ft.): 28.65
Static Water Level Before (ft.): 10.85
Static Water Level After (ft.): 27.52
Screen Length (ft.): 10'
One Well Volume (gal/L): 2.9
Casing ID (in.): 2.0

Responsible Personnel: J. Goerdt
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1353	0	N/A	10.85	–	–	–	–	
1403	↓			19.62	5.92	.759	>1000	Lt. Gray/Sed.
1407	6.0		27.58					Dry
1412			26.66					Recharge
1417			25.98					"
1422			25.54					"
1427	↓		25.05					"
1430	7.0		27.35	17.37	6.41	1.385	>1000	Dry
1435			26.91					Recharge
1440			26.62					"
1445			26.15					"
1450	↓		25.79					"
1452	8.0		25.72	18.14	6.49	1.337	>1000	Dry

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT36
Site: SWMU 12
Date Installed: 8/27/04
Date Developed: 8/31/04
Dev. Method: Surge & Purge
Pump Type: WHALER

Depth to Bottom (ft.): 27.56
Static Water Level Before (ft.): 13.32
Static Water Level After (ft.): *
Screen Length (ft.): 10'
One Well Volume (gal/L): 2.2
Casing ID (in.): 2" Ø

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1408	0	0	13.32	–	–	–	–	START PURGE
1413	5	NA	*	18.50	6.71	1.866	> 1000	BRN
1418	6	NA	DRY	–	–	–	–	BRN
1423	↓	NA	26.37	–	–	–	–	RECHARGE
1428		NA	25.98	–	–	–	–	↓
1433		NA	25.71	–	–	–	–	
1438	6	NA	25.42	–	–	–	–	
1440	↓	NA	*	18.69	7.62	1.373	513	CLOUDY
1441	7	NA	DRY	–	–	–	–	DRY
1446	↓	NA	26.71	–	–	–	–	RECHARGE
1451		NA	26.59	–	–	–	–	↓
1456	7	NA	26.45	–	–	–	–	START PUMP
1457	7.25	NA	*	19.13	7.61	1.331	500	(DRY)

* W/L Below Top of Pump

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT37
Site: SWMU 12
Date Installed: 7/29/04
Date Developed: 8/1/04
Dev. Method: SURGE & PURGE
Pump Type: WHALER & WATTERIX

Depth to Bottom (ft.): 26.70
Static Water Level Before (ft.): 20.45
Static Water Level After (ft.): DRY
Screen Length (ft.): 10'
One Well Volume (gal/L): 4.3
Casing ID (in.): 2"Ø

Responsible Personnel: T. ROJAHN
Drilling Company: ~~6878~~ (TR) B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1353	0	—	20.45	—	—	—	—	START DEV.
1355	2	NA	DRY	16.05	522	0.577	>1000	BRN (DRY)
1403	↓	↓	24.61	—	—	—	—	RECHARGE
1405			24.50					"
1410			24.46					"
1415	↓		24.41					"
1429	2.5		DRY	27.40	5.89	0.789	>1000	WHALER PUMP MALFUNCTION SWITCH to WATTERIX
1434	↓		25.03	—	—	—	—	RECHARGE
1439	↓		25.80	—	—	—	—	"
1444	2.5		25.75	—	—	—	—	"
1448	3.0	↓	DRY ~~24.60~~ (TR)	24.60	6.35	0.856	>1000	(DRY) BRN

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT38
Site: 12
Date Installed: 9-11-04
Date Developed: 9-23-04
Dev. Method: PURGE/SURGE
Pump Type: WHALE

Depth to Bottom (ft.): 26.70 (TOC)
Static Water Level Before (ft.): 9.92 (TOC)
Static Water Level After (ft.): DRY
Screen Length (ft.): 10'
One Well Volume (gal/L): 2.7±
Casing ID (in.): 2"

Responsible Personnel: CONTI
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: N6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

	Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
	1609	—	—	9.92	—	—	—	—	START PUMP
	1610	2		—	19.69	6.15	721	>1000	BRN - TURBID
	1612	5	WENT DRY	—	—	—	—	—	RECHARGE
	1617	—	—	23.68	—	—	—	—	"
20	1622	—	—	23.10	—	—	—	—	"
	1627	—		22.70	—	—	—	—	"
	1632	START PUMP		22.30	—	—	—	—	"
	1634	6	DRY @ 1634		18.75	5.91	908	>1000	Brn - Turbid.
	1635		—	—	—	—	—	—	
	1640		DRY	—	—	—	—	—	24.9 DRY (HIT PUMP TOP)
15	1645		DRY	—	—	—	—	—	" " "
	1650	6	DRY	—	—	—	—	—	END DEV SLOW REC
									NO PARAMETERS

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT 39
Site: SWMU 12
Date Installed: 7/30/04
Date Developed: 8/1/04
Dev. Method: Surge & Purge
Pump Type: BAILER

Depth to Bottom (ft.): 37.05
Static Water Level Before (ft.): 35.26
Static Water Level After (ft.): DRY
Screen Length (ft.): 10'
One Well Volume (gal/L): 1.2 L
Casing ID (in.): 2" Φ

Responsible Personnel: T. KOZAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (TK) ~~(Gal.)~~ L	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1505	–	NA	35.26	–	–	–	–	Start Purge
1506	1 L	NA	–	19.11	4.77	0.451	>1000	BRN
1510	4 L	NA	–	14.92	4.02	0.440	>1000	"
1518	5 L	NA	36.87 (TK)	–	–	–	–	DRY
1523	↑	NA	36.26	–	–	–	–	RECHARGE
1528		NA	36.11	–	–	–	–	"
1533		NA	36.00	–	–	–	–	"
1538	↓	NA	35.88	–	–	–	–	"
1542	6 L	NA	–	17.23	4.53	0.467	>1000	BRN
1547	8 L	NA	DRY	–	–	–	–	DRY
1552	↑	NA	36.43	–	–	–	–	RECHARGE
1557		NA	36.31	–	–	–	–	"
1602	↓	NA	36.21	–	–	–	–	"
1605	8.5 L	NA	–	16.18	3.48	0.465	>1000	BRN

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT40
Site: 12
Date Installed: 8/12/04
Date Developed: 9/23/04
Dev. Method: SURGE/PURGE
Pump Type: WHALE

Depth to Bottom (ft.): 30.75
Static Water Level Before (ft.): 21.40 (TOC)
Static Water Level After (ft.): DRY
Screen Length (ft.): 10
One Well Volume (gal/L): 1.6 ±
Casing ID (in.): 2"

Responsible Personnel: CONTI
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: N6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

	Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units: uS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
	1210	—	—	21.40	—	—	—	—	START - Brn - V. Turbid.
	1212	3	—		16.54	5.15	1023	>1000	INITIAL.
	1215	4	WENT DRY	NA	—	—	—	—	RECHARGE
	1220	—	—	28.10	—	—	—	—	
	1225	—	—	27.80	—	—	—	—	
20	1230	—	—	27.55	—	—	—	—	
+	1235		—	27.40	—	—	—	—	
	1236	4.5	DRY	—	17.44	5.29	1149	>1000	Brn RECHARGE
	1241	—	—	29.00	—	—	—	—	
15	1246	—	—	28.75	—	—	—	—	
	1251	—	—	28.60	18.85	5.05	1047	>1000	Brn - End Dev.
	1252	5.0	DRY	—	—	—	—	—	

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT 41
Site: SWMU 12
Date Installed: 10/27/04
Date Developed: 10/31/04
Dev. Method: Surge & Purge
Pump Type: Whaler

Depth to Bottom (ft.): 36.6
Static Water Level Before (ft.): 18.5
Static Water Level After (ft.): DRY
Screen Length (ft.): 10
One Well Volume (gal/L): 3
Casing ID (in.): 2"

Responsible Personnel: T. Rosahn
Drilling Company: BM
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
(74) ~~0956~~	—	—	—	—	—	—	—	tube off pump
1000	—	—	—	—	—	—	—	Restart Pump
1008	5	NA	31.9	14.40	7.11	0.981	+1000	Milky Brn
1013	6	600 ml	*	13.79	7.20	1.008	+1000	" "
1015	6.4	600 ml	(DRY)	—	—	—	—	Recharge (DRY)
1020	↓	—	35.03	—	—	—	—	"
1025	↓	—	34.65	—	—	—	—	"
1030	↓	—	34.39	—	—	—	—	"
1035	6.4	—	34.18	—	—	—	—	" & Restart
1037	↓	NA	*	13.84	7.40	1.005	+1000	Milky Brn
1038	7.4	NA	*(DRY)	—	—	—	—	Recharge (DRY)
1043	↓	—	35.30	—	—	—	—	"
1048	↓	—	35.12	—	—	—	—	"
1053	7.4	—	34.96	—	—	—	—	"
1055	8.4	NA	* DRY	14.57	7.46	1.029	+1000	Milky Brn (DRY)

* W.L. Below top of Pump

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT42
Site: 12
Date Installed: 9/1/04
Date Developed: 9/23/04
Dev. Method: Surge & Purge
Pump Type: WHALER

Depth to Bottom (ft.): 30.45
Static Water Level Before (ft.): 14.54
Static Water Level After (ft.): DRY
Screen Length (ft.): 15'
One Well Volume (gal/L): 2.4
Casing ID (in.): 2" ⌀

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1100	–	–	–	–	–	–	–	START DEV.
1103	6	NA	21.10	15.58	6.10	0.390	>1000	LT BRN
1108	9	NA	*	16.18	5.39	0.708	>1000	BRN
1112	10	NA	(DRY)	–	–	–	–	BRN
1117	↓	NA	28.85	–	–	–	–	RECHARGE
1122		NA	28.46	–	–	–	–	↓
1127	↓	NA	28.19	–	–	–	–	↓
1132	10	NA	28.00	–	–	–	–	↓
1133	10.5	NA	*	15.23	6.03	0.462	>1000	LT BRN
1134	11	NA	(DRY)	–	–	–	–	RECHARGE
1139	↓	NA	29.23	–	–	–	–	↓
1144	↓	NA	29.10	–	–	–	–	↓
1149	11	NA	28.89	–	–	–	–	↓
1150	11.5	NA	(DRY)	15.80	6.13	0.563	>1000	LT BRN

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: ~~11-14-04~~ 12 MWT 43 (FL)
Site: SWMU 12
Date Installed: 11-12-04
Date Developed: 11-14-04
Dev. Method: Dis. Bailer
Pump Type: Surge & Purge

Depth to Bottom (ft.): 82.95
Static Water Level Before (ft.): 80.50
Static Water Level After (ft.): DRY
Screen Length (ft.): 15'
One Well Volume (gal/L): 1.5
Casing ID (in.): 2"

Responsible Personnel: T. Rojahn
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume ~~(Gal.)~~ L	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0855	0	NA	80.5	–	–	–	–	Start Dev.
0857	2.0 L		–	11.58	7.57	0.270	>1000	Grey Brn
0905	4.0 L		–	11.05	7.74	0.278	>1000	" "
0915	5.0 L		DRY	10.66	7.93	0.283	>1000	" " DRY
0920			82.42	–	–	–	–	Recharge
0925			82.40	–	–	–	–	"
0930			82.39	–	–	–	–	"
0935	5.0 L		82.38	–	–	–	–	"
0939	5.5 L		DRY	–	–	–	–	DRY

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MW44
Site: SWMU 12
Date Installed: 10/27/04
Date Developed: 10/31/04
Dev. Method: Surge & Purge
Pump Type: WHALER

Depth to Bottom (ft.): 37.15
Static Water Level Before (ft.): 33.05
Static Water Level After (ft.): DRY
Screen Length (ft.): 10
One Well Volume (gal/L): 0.7
Casing ID (in.): 2"

Responsible Personnel: T. ROWAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1418	—	—	—	—	—	—	—	Start Purge
1420	2	NA	* (DRY)	14.46	7.56	1.199	+1000	CLOUDY → MILKY BRN
1425	↓	—	**	—	—	—	—	RECHARGE **Problem with water meter
1430		—	**	—	—	—	—	↓ ↓
1435	↓	—	**	—	—	—	—	
1440	2	—	**	—	—	—	—	
1441	2.5	NA	* (DRY)	15.79	7.20	1.634	+1000	Milky BRN
1446	↓	—	34.90	—	—	—	—	RECHARGE
1451		—	34.87	—	—	—	—	↓
1456	2.5	—	34.85	—	—	—	—	
1457	3	—	* (DRY)	16.04	7.49	1.300	+1000	(DRY)

* W.L. BELOW top of Pump

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT45
Site: SWMU 12
Date Installed: 10-29-04
Date Developed: 11-9-04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): 26.60
Static Water Level Before (ft.): 18.35
Static Water Level After (ft.): DRY
Screen Length (ft.): 10'
One Well Volume (gal/L): 1.3
Casing ID (in.): 2"

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1231	0	NA	—	—	—	—	—	START DEV.
1233	3	NA	*	14.66	6.39	0.849	>1000	GRAY BRN
1234	3.5	NA	* DRY	—	—	—	—	" "
1239	↓	NA	24.90	—	—	—	—	RECHARGE
1244	↓	NA	24.65	—	—	—	—	"
1249	↓	NA	24.48	—	—	—	—	"
1254	3.5	NA	24.38	—	—	—	—	"
1255	4.5	NA	DRY	14.37	6.14	0.980	>1000	GRAYISH BRN → CLOUDY
1300	↓	NA	*	—	—	—	—	RECHARGE
1305	↓	NA	*	—	—	—	—	↓
1310	4.5	NA	*	—	—	—	—	
1310	4.75	NA	DRY	14.31	6.51	0.605	>1000	GRAYISH BRN

* W.L. BELOW PUMP TOP

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT46
Site: SWMU 12
Date Installed: 10-30-04
Date Developed: 11-9-04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): 26.80
Static Water Level Before (ft.): 15.66
Static Water Level After (ft.): DRY
Screen Length (ft.): 10'
One Well Volume (gal/L): 1.8 gal
Casing ID (in.): 2"

Responsible Personnel: T. ROJAHAI
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1127	—	—	—	—	—	—	—	Start Dev.
1128	2	NA	*	17.95	6.33	0.405	81.4	V. Sl. Cloudy
1131	4	NA	DRY	—	—	—	—	RECHARGE
1136	↓	NA	24.53	—	—	—	—	"
1141	↓	NA	24.26	—	—	—	—	"
1146	↓	NA	24.10	—	—	—	—	"
1151	4	NA	23.97	—	—	—	—	"
1153	5	NA	DRY	16.24	6.15	0.823	298	CLOUDY
1158	↓	NA	*	—	—	—	—	RECHARGE
1203	↓	NA	*	—	—	—	—	"
1208	5	NA	*	—	—	—	—	"
1208	5.25	NA	DRY	—	—	—	—	UNABLE to get READINGS
								before well dried out
								for the 3rd time

* W.L. BELOW TOP OF PUMP

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT47
Site: SINMU 12
Date Installed: 10-31-04
Date Developed: 11-9-04
Dev. Method: SURGE & PURGE
Pump Type: WHALER

Depth to Bottom (ft.): 26.8
Static Water Level Before (ft.): 13.93
Static Water Level After (ft.): 14.3
Screen Length (ft.): 10'
One Well Volume (gal/L): 2.1
Casing ID (in.): 2"

Responsible Personnel: T. ROSAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6873
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1025	0	NA	—	—	—	—	—	START PURGE
1028	4	↓	*	13.61	7.32	0.550	114	TANNISH SLIGHTLY
1031	9	↓	*	14.06	6.83	0.618	32.9	CLEAR
1034	14	↓	*	14.07	6.78	0.614	17.6	CLEAR
1037	19	↓	*	14.05	6.75	0.616	34.1	CLEAR
1040	24	→	→	→	→	→	→	STOP DEV.
1042	—	—	14.30	—	—	—	—	RECOVERED to 14.3'
								RAPID RECHARGE

* NO MEASUREMENT TUBING IN WAY

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT48
Site: SWMU 12
Date Installed: 11-9-04
Date Developed: 11-12-04
Dev. Method: SURGE & PURGE
Pump Type: DIS. BAILER

Depth to Bottom (ft.): 31.85
Static Water Level Before (ft.): 30.20
Static Water Level After (ft.): 31.08
Screen Length (ft.): 10'
One Well Volume (gal/L): 1.2
Casing ID (in.): 2"

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume ~~(Gal.)~~ L	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1055	0	NA	–	–	–	–	–	START DEV.
1056	1.5		–	13.28	7.36	0.170	>1000	BRN
1059	3.0		–	13.10	7.20	0.183	>1000	"
1102	4.5		–	13.05	7.06	0.195	>1000	"
1107	6.0		DRY	–	–	–	–	RECHARGE
1112			31.04	–	–	–	–	"
1117			31.03	–	–	–	–	"
1122			31.01	–	–	–	–	"
1127	6.0		31.00	–	–	–	–	"
1132	7		DRY	13.94	6.80	0.260	>1000	RECHARGE
1137			31.13	–	–	–	–	"
1142			31.10	–	–	–	–	"
1147	7 L		31.08	–	–	–	–	END DEV

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT49
Site: SWMU 12
Date Installed: 11-10-04
Date Developed: 11-12-04
Dev. Method: NA
Pump Type: NA

Depth to Bottom (ft.): 31.9
Static Water Level Before (ft.): DRY
Static Water Level After (ft.): DRY
Screen Length (ft.): 10'
One Well Volume (gal/L): NA
Casing ID (in.): 2"

Responsible Personnel: T. KOJAHAI
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1030	—	—	DRY	—	—	—	—	DRY WELL

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 12MWT50
Site: SWMU 12
Date Installed: 11-29-04
Date Developed: 11-12-04
Dev. Method: NA
Pump Type: NA

Depth to Bottom (ft.): 35.60
Static Water Level Before (ft.): DRY
Static Water Level After (ft.): DRY
Screen Length (ft.): 10'
One Well Volume (gal/L): NA
Casing ID (in.): 2"

Responsible Personnel: T. ROJAHN
Drilling Company: B-M
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole – ppm
PID Readings: Breathing Zone – ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1010	–	–	DRY	–	–	–	–	DRY WELL

APPENDIX C.7.2

SWMU 25 (DUMP SITE A)

MONITORING WELL DEVELOPMENT RECORDS ROUND 2

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

WES-7-2-81

Well: 7/2
Site: Dump Site A
Date Installed: --
Date Developed: 2-08-05
Dev. Method: Surge & Purge
Pump Type: Whaler

Depth to Bottom (ft.): 44.15
Static Water Level Before (ft.): 34.08
Static Water Level After (ft.): DRY
Screen Length (ft.): 9.35' & 5.38' sump
One Well Volume (gal/L): 1.6
Casing ID (in.): 2" PVC

Responsible Personnel: T. Ruhan
Drilling Company: Army Corp
Project Name: NSWC-CRANE
Project Number: 6879
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	*pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1120	0	—	—	—	—	—	—	Grey w/ Particulants
1124	3.5	NA	DRY	11.50	6.0	0.452	>1100	Orangish Brn (DRY)
1129	↓	↓	37.55	—	—	—	—	RECHARGE
1134			36.67	—	—	—	—	"
1139			36.00	—	—	—	—	"
1144			35.55	—	—	—	—	"
1148	5.0	NA	DRY	11.91	6.0	0.435	550	Greyish (DRY)
1153	↓	↓	37.76	—	—	—	—	RECHARGE
1158			36.77	—	—	—	—	"
1203			36.20	—	—	—	—	"
1205	7.0		DRY	11.63	6.0	0.423	650	Greyish (DRY

* pH paper

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 7/3 WES-7-3-81
Site: Dump Site A
Date Installed: —
Date Developed: 2-08-05
Dev. Method: Surge & Purge
Pump Type: WHALER

Depth to Bottom (ft.): MEAS. 38.6' WELL CONST. SHEET 41.0
Static Water Level Before (ft.): 28.46
Static Water Level After (ft.): DRY
Screen Length (ft.): 9.32' + 5.28' sump
One Well Volume (gal/L): 1.6
Casing ID (in.): 2"

Responsible Personnel: TERRY ROSAHN
Drilling Company: Army Corp
Project Name: NSWC-CRANE
Project Number: 6879
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	* pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1003	—	—	28.46	—	—	—	—	START DEV.
1005	2	1 gpm	DRY	12.63	6.0	0.298	950	(DRY) ORANGISH BRN
1010	↓	NA	31.70	—	—	—	—	RECHARGE
1015	↓	↓	30.42	—	—	—	—	"
1020	↓	↓	29.60	—	—	—	—	"
1025	↓	↓	29.07	-	—	—	—	"
1028	4	NA	DRY	12.03	6.0	0.256	390	Cloudy GREYISH BRN (DRY)
1033	↓	↓	32.23	—	—	—	—	RECHARGE
1038	↓	↓	31.52	—	—	—	—	"
1043	4	↓	30.80	—	—	—	—	"
1046	6.5	NA	DRY	10.57	6.0	0.233	1100	(DRY) V. CLOUDY

* PAPER Strip

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: WES-7-4-81 7/4
Site: DUMP SITE A
Date Installed: (Checked on 2/8/05)
Date Developed: —
Dev. Method: —
Pump Type: —

Depth to Bottom (ft.): MEAS 27.55 / WELL CONST. SHEET 42.0
Static Water Level Before (ft.): —
Static Water Level After (ft.): —
Screen Length (ft.): 9.33' + 5.36' sump
One Well Volume (gal/L): —
Casing ID (in.): 2"

Responsible Personnel: Tony Royal
Drilling Company: Army Corps
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1212	—	—	—	—	—	—	—	WELL WAS damaged @
								ground level - it appears
								that materials have
								entered the well
								prior to well being
								repaired on 1-18-05

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

WES-7-5-81

Well: 715
Site: Dump Site A
Date Installed: —
Date Developed: 2-8-05
Dev. Method: Surge & Purge
Pump Type: WHALER

Depth to Bottom (ft.): 40.9
Static Water Level Before (ft.): 24.38
Static Water Level After (ft.): *
Screen Length (ft.):
One Well Volume (gal/L): 2.5
Casing ID (in.): 2"

Responsible Personnel: T. Rojahn
Drilling Company: Army Corp
Project Name: NSWC-CRANE
Project Number: 6878
PID Readings: Bore Hole — ppm
PID Readings: Breathing Zone — ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	** pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1345	0	—	24.38	—	—	—	—	START PURGE REDISH BRN
1349	4	NA	* W.L.	11.99	6.0	0.496	850	ORANGISH BRN
1354	8		*	12.06	6.0	0.511	200	Sl. Cloudy
1359	10.5		*	12.43	6.0	0.516	160	Sl. Cloudy
1404	11.5		*	12.52	6.0	0.529	210	Sl. Cloudy
1409	12.5		*	12.59	6.0	0.540	90	V. Sl. Cloudy
1414	13.5		*	12.50	6.0	0.549	>1100	Grey
1424	15.5		*	12.40	6.0	0.549	130	Sl. Cloudy
1429	16.5		*	12.42	6.0	0.551	65	Clear
1434	17.5		*	12.42	6.0	0.550	40	CLEAR (END DEV)

* W.L. below top of pump
** pH paper

APPENDIX C.8.1

SWMU 12

WATER LEVEL MEASUREMENTS ROUND 1

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name:	NSWC CRANE	**Project No.:**	N6878
Location:	SWMU 12	**Personnel:**	T. Rojahn
Weather Conditions:	Mostly Sunny, mid 50°s	**Measuring Device:**	M-Scope
Tidally Influenced:	Yes ___ No _X_	**Remarks:**	----

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
12MWT01	10/17/2004	1551	726.87	35.00	11.1	NA	715.77	
12MWT02	10/17/2004	1547	725.64	29.00	10.02	NA	715.62	
12MWT03	10/17/2004	1540	734.44	26.00	16.91	NA	717.53	
12MWT04	10/17/2004	1538	730.74	25.00	14.94	NA	715.80	
12MWT05	10/17/2004	1533	725.36	25.00	10.12	NA	715.24	
12MWT06	10/17/2004	1518	726.70	24.00	9.54	NA	717.16	
12MWT07	10/17/2004	1516	728.40	25.00	11.8	NA	716.60	
12MWT08	10/17/2004	1505	728.83	24.00	12.03	NA	716.80	
12MWT09	10/17/2004	1510	728.00	25.00	13.44	NA	714.56	
12MWT10	10/17/2004	1458	726.68	25.00	15.17	NA	711.51	
12MWT11	10/17/2004	1340	740.79	25.00	15.55	NA	725.24	
12MWT12	10/17/2004	1338	741.66	25.00	13.03	NA	728.63	
12MWT13	10/17/2004	1342	735.81	21.00	8.21	NA	727.60	
12MWT14	10/17/2004	1346	736.67	26.00	19.51	NA	717.16	
12MWT15	10/17/2004	1349	736.74	25.00	16.32	NA	720.42	
12MWT16	10/17/2004	1415	745.97	25.00	20.97	NA	725.00	
12MWT17	10/17/2004	1413	747.23	26.00	22.79	NA	724.44	
12MWT18	10/17/2004	1417	745.94	26.00	21.55	NA	724.39	
12MWT19	10/17/2004	1411	746.89	27.00	25.83	NA	721.06	
12MWT20	10/17/2004	1402	746.56	26.00	23.86	NA	722.70	
12MWT21	10/17/2004	1529	737.72	25.00	21.42	NA	716.30	
12MWT22	10/17/2004	1501	739.74	25.00	16.56	NA	723.18	
12MWT23	10/17/2004	1447	739.75	31.00	27.2	NA	712.55	
12MWT24	10/17/2004	1442	740.60	31.00	32.07	NA	708.53	
12MWT24A	10/17/2004	1438	740.53	54.00	34.68	NA	705.85	

* All measurements to the nearest 0.01 foot

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name:	NSWC CRANE	**Project No.:**	N6878
Location:	SWMU 12	**Personnel:**	T. Rojahn
Weather Conditions:	Mostly Sunny, mid 50°s	**Measuring Device:**	M-Scope
Tidally Influenced:	Yes ___ No _X_	**Remarks:**	----

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
12MWT25	10/17/2004	1328	748.66	26.00	17.80	NA	730.86	
12MWT26	10/17/2004	1611	743.72	25.00	10.56	NA	733.16	
12MWT27	10/17/2004	1333	740.52	26.00	10.96	NA	729.56	
12MWT28	10/17/2004	1323	745.53	26.00	12.96	NA	732.57	
12MWT29	10/17/2004	1536	731.23	89.00	59.97	NA	671.26	
12MWT30	10/17/2004	1513	727.59	90.50	92.71	NA	634.88	
12MWT31	10/17/2004	1345	736.75	89.00	85.17	NA	651.58	
12MWT32	10/17/2004	1409	747.44	100.00	68.55	NA	678.89	
12MWT33	10/17/2004	1331	740.49	95.00	44.99	NA	695.50	
12MWT34	10/17/2004	1556	740.52	87.00	88.42	NA	652.10	
12MWT35	10/17/2004	1355	734.64	27.00	12.33	NA	722.31	
12MWT36	10/17/2004	1358	738.63	26.00	13.15	NA	725.48	
12MWT37	10/17/2004	1423	738.77	25.00	22.20	NA	716.57	
12MWT38	10/17/2004	1524	728.03	25.00	10.03	NA	718.00	
12MWT39	10/17/2004	1559	737.64	35.00	35.83	NA	701.81	
12MWT40	10/17/2004	1453	727.50	29.00	22.23	NA	705.27	
12MWT41	10/17/2004	NA	622.97	35.00	NA	NA	NA	Not Installed
12MWT42	10/17/2004	1543	720.22	29.00	15.03	NA	705.19	
12MWT43	10/17/2004	NA	679.01	81.00	NA	NA	NA	Not Installed
12MWT44	10/17/2004	NA	626.69	35.50	NA	NA	NA	Not Installed
12MWT45	10/17/2004	NA	691.07	25.00	NA	NA	NA	Not Installed
12MWT46	10/17/2004	NA	675.67	24.50	NA	NA	NA	Not Installed
12MWT47	10/17/2004	NA	663.12	25.00	NA	NA	NA	Not Installed
12MWT48	10/17/2004	NA	650.05	30.00	NA	NA	NA	Not Installed
12MWT49	10/17/2004	NA	619.25	30.00	NA	NA	NA	Not Installed
12MWT50	10/17/2004	NA	609.01	35.00	NA	NA	NA	Not Installed

* All measurements to the nearest 0.01 foot

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name:	NSWC CRANE	**Project No.:**	N6878
Location:	SWMU 12	**Personnel:**	S. Conti/J. Goerdt
Weather Conditions:	Sunny	**Measuring Device:**	M-Scope
Tidally Influenced:	Yes ___ No _X_	**Remarks:**	----

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
12MWT01	12/15/2004	0850	726.87	35.00	9.68	NA	717.19	
12MWT02	12/15/2004	0903	725.64	29.00	8.63	NA	717.01	
12MWT03	12/15/2004	0909	734.44	26.00	16.21	NA	718.23	
12MWT04	12/15/2004	0912	730.74	25.00	13.67	NA	717.07	
12MWT05	12/15/2004	0914	725.36	25.00	8.72	NA	716.64	
12MWT06	12/15/2004	0933	726.70	24.00	10.51	NA	716.19	
12MWT07	12/15/2004	0939	728.40	25.00	13.05	NA	715.35	
12MWT08	12/15/2004	0945	728.83	24.00	13.05	NA	715.78	
12MWT09	12/15/2004	0942	728.00	25.00	13.60	NA	714.40	
12MWT10	12/15/2004	0949	726.68	25.00	14.67	NA	712.01	
12MWT11	12/15/2004	1032	740.79	25.00	12.96	NA	727.83	
12MWT12	12/15/2004	1031	741.66	25.00	10.61	NA	731.05	
12MWT13	12/15/2004	1034	735.81	21.00	5.30	NA	730.51	
12MWT14	12/15/2004	1028	736.67	26.00	20.05	NA	716.62	
12MWT15	12/15/2004	1027	736.74	25.00	18.52	NA	718.22	
12MWT16	12/15/2004	1019	745.97	25.00	21.95	NA	724.02	
12MWT17	12/15/2004	1018	747.23	26.00	24.11	NA	723.12	
12MWT18	12/15/2004	1021	745.94	26.00	22.61	NA	723.33	
12MWT19	12/15/2004	1017	746.89	27.00	27.06	NA	719.83	
12MWT20	12/15/2004	1014	746.56	26.00	24.97	NA	721.59	
12MWT21	12/15/2004	0852	737.72	25.00	19.92	NA	717.80	
12MWT22	12/15/2004	0947	739.74	25.00	17.40	NA	722.34	
12MWT23	12/15/2004	1000	739.75	31.00	28.22	NA	711.53	
12MWT24	12/15/2004	0955	740.60	31.00	32.38	NA	708.22	
12MWT24A	12/15/2004	0952	740.53	54.00	35.00	NA	705.53	

* All measurements to the nearest 0.01 foot

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name:	NSWC CRANE	**Project No.:**	N6878
Location:	SWMU 12	**Personnel:**	S. Conti/J. Goerdt
Weather Conditions:	Sunny	**Measuring Device:**	M-Scope
Tidally Influenced:	Yes ___ No _X_	**Remarks:**	----

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
12MWT25	12/15/2004	1040	748.66	26.00	17.35	NA	731.31	
12MWT26	12/15/2004	1043	743.72	25.00	10.91	NA	732.81	
12MWT27	12/15/2004	1037	740.52	26.00	9.35	NA	731.17	
12MWT28	12/15/2004	0857	745.53	26.00	12.78	NA	732.75	
12MWT29	12/15/2004	0911	731.23	89.00	61.20	NA	670.03	
12MWT30	12/15/2004	0941	727.59	90.50	92.74	NA	634.85	
12MWT31	12/15/2004	1030	736.75	89.00	68.86	NA	667.89	
12MWT32	12/15/2004	1015	747.44	100.00	85.93	NA	661.51	
12MWT33	12/15/2004	1036	740.49	95.00	42.44	NA	698.05	
12MWT34	12/15/2004	0954	740.52	87.00	88.32	NA	652.20	
12MWT35	12/15/2004	1026	734.64	27.00	12.53	NA	722.11	
12MWT36	12/15/2004	1023	738.63	26.00	14.19	NA	724.44	
12MWT37	12/15/2004	1012	738.77	25.00	25.74	NA	713.03	
12MWT38	12/15/2004	0930	728.03	25.00	10.64	NA	717.39	
12MWT39	12/15/2004	1003	737.64	35.00	36.05	NA	701.59	
12MWT40	12/15/2004	1006	727.50	29.00	23.11	NA	704.39	
12MWT41	12/15/2004	1110	622.97	35.00	20.33	NA	602.64	
12MWT42	12/15/2004	0920	720.22	29.00	13.02	NA	707.20	
12MWT43	12/15/2004	1051	679.01	81.00	78.15	NA	600.86	
12MWT44	12/15/2004	1106	626.69	35.50	26.25	NA	600.44	
12MWT45	12/15/2004	1235	691.07	25.00	17.07	NA	674.00	
12MWT46	12/15/2004	1239	675.67	24.50	16.07	NA	659.60	
12MWT47	12/15/2004	1242	663.12	25.00	12.85	NA	650.27	
12MWT48	12/15/2004	1246	650.05	30.00	30.50	NA	619.55	
12MWT49	12/15/2004	1252	619.25	30.00	30.03	NA	589.22	
12MWT50	12/15/2004	1300	609.01	35.00	DRY	NA	NA	

* All measurements to the nearest 0.01 foot

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name:	NSWC CRANE	**Project No.:**	N6878
Location:	SWMU 12	**Personnel:**	T. Rojahn/D. Westerhoff
Weather Conditions:	Sunny	**Measuring Device:**	M-Scope
Tidally Influenced:	Yes ___ No _X_	**Remarks:**	----

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
12SG01	12/15/2004	0935	730.97	NA	3.19	NA	NA	Stagnant
12SG02	12/15/2004	0938	731.64	NA	Dry	NA	NA	Dry
12SG03	12/15/2004	0940	735.03	NA	1.87	NA	NA	Stagnant
12SG04	12/15/2004	0945	736.72	NA	4.50	NA	NA	Stagnant
12SG05	12/15/2004	0947	724.28	NA	Dry	NA	NA	Dry
12SG06	12/15/2004	0950	713.38	NA	3.75	NA	NA	Flow = 224 gpm
12SG07	12/15/2004	0955	713.45	NA	4.28	NA	NA	Flow = 15 gpm
12SG08	12/15/2004	0851	668.56	NA	5.05	NA	NA	Flow = 44 gpm
12SG09	12/15/2004	0916	529.35	NA	17.24	NA	NA	Flow = 295 gpm
12SG10	12/15/2004	0900	517.21	NA	14.58	NA	NA	Flow = 6265 gpm
12SG11	12/15/2004	0908	513.47	NA	20.00	NA	NA	Flow = 4704 gpm
12SG12	12/15/2004	0927	538.45	NA	6.02	NA	NA	Flow = 73 gpm

* All measurements to the nearest 0.01 foot

APPENDIX C.8.2

SWMU 12

WATER LEVEL MEASUREMENTS ROUND 2

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name:	NSWC CRANE	**Project No.:**	N6878
Location:	SWMU 12	**Personnel:**	T. Rojahn/C. Doolan
Weather Conditions:	Partly Sunny, 20°s	**Measuring Device:**	M-Scope
Tidally Influenced:	Yes ___ No _X_	**Remarks:**	----

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
12MWT01	1/18/2005	1339	726.87	35.00	9.34	NA	717.53	
12MWT02	1/18/2005	1332	725.64	29.00	8.32	NA	717.32	
12MWT03	1/18/2005	1350	734.44	26.00	16.00	NA	718.44	
12MWT04	1/18/2005	1348	730.74	25.00	13.35	NA	717.39	
12MWT05	1/18/2005	1345	725.36	25.00	8.41	NA	716.95	
12MWT06	1/18/2005	1324	726.70	24.00	10.75	NA	715.95	
12MWT07	1/18/2005	1321	728.40	25.00	13.42	NA	714.98	
12MWT08	1/18/2005	1310	728.83	24.00	13.19	NA	715.64	
12MWT09	1/18/2005	1314	728.00	25.00	13.40	NA	714.60	
12MWT10	1/18/2005	1315	726.68	25.00	14.19	NA	712.49	
12MWT11	1/18/2005	1229	740.79	25.00	12.88	NA	727.91	
12MWT12	1/18/2005	1227	741.66	25.00	9.95	NA	731.71	
12MWT13	1/18/2005	1230	735.81	21.00	4.63	NA	731.18	
12MWT14	1/18/2005	1222	736.67	26.00	20.75	NA	715.92	
12MWT15	1/18/2005	1220	736.74	25.00	19.17	NA	717.57	
12MWT16	1/18/2005	1240	745.97	25.00	22.13	NA	723.84	
12MWT17	1/18/2005	1241	747.23	26.00	24.63	NA	722.60	
12MWT18	1/18/2005	1235	745.94	26.00	23.06	NA	722.88	
12MWT19	1/18/2005	1242	746.89	27.00	27.77	NA	719.12	
12MWT20	1/18/2005	1245	746.56	26.00	25.35	NA	721.21	
12MWT21	1/18/2005	1341	737.72	25.00	19.54	NA	718.18	
12MWT22	1/18/2005	1320	739.74	25.00	17.71	NA	722.03	
12MWT23	1/18/2005	1250	739.75	31.00	28.65	NA	711.10	
12MWT24	1/18/2005	1258	740.60	31.00	32.34	NA	708.26	
12MWT24A	1/18/2005	1254	740.53	54.00	35.23	NA	705.30	

* All measurements to the nearest 0.01 foot

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name:	NSWC CRANE	**Project No.:**	N6878
Location:	SWMU 12	**Personnel:**	T. Rojahn/C. Doolan
Weather Conditions:	Partly Sunny, 20°s	**Measuring Device:**	M-Scope
Tidally Influenced:	Yes ___ No _X_	**Remarks:**	----

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
12MWT25	1/18/2005	1214	748.66	26.00	17.35	NA	731.31	
12MWT26	1/18/2005	1402	743.72	25.00	11.01	NA	732.71	
12MWT27	1/18/2005	1218	740.52	26.00	9.24	NA	731.28	
12MWT28	1/18/2005	1211	745.53	26.00	12.78	NA	732.75	
12MWT29	1/18/2005	1349	731.23	89.00	61.34	NA	669.89	
12MWT30	1/18/2005	1313	727.59	90.50	92.69	NA	634.90	
12MWT31	1/18/2005	1225	736.75	89.00	68.72	NA	668.03	
12MWT32	1/18/2005	1244	747.44	100.00	86.11	NA	661.33	
12MWT33	1/18/2005	1217	740.49	95.00	41.8	NA	698.69	
12MWT34	1/18/2005	1358	740.52	87.00	88.12	NA	652.40	
12MWT35	1/18/2005	1233	734.64	27.00	12.7	NA	721.94	
12MWT36	1/18/2005	1234	738.63	26.00	14.58	NA	724.05	
12MWT37	1/18/2005	1248	738.77	25.00	26.24	NA	712.53	
12MWT38	1/18/2005	1330	728.03	25.00	10.63	NA	717.40	
12MWT39	1/18/2005	1252	737.64	35.00	35.82	NA	701.82	
12MWT40	1/18/2005	1306	727.50	29.00	23.18	NA	704.32	
12MWT41	1/18/2005	0955	622.97	35.00	20.42	NA	602.55	
12MWT42	1/18/2005	1343	720.22	29.00	12.13	NA	708.09	
12MWT43	1/18/2005	1415	679.01	81.00	78.56	NA	600.45	
12MWT44	1/18/2005	0958	626.69	35.50	26.58	NA	600.11	
12MWT45	1/18/2005	0913	691.07	25.00	16.03	NA	675.04	
12MWT46	1/18/2005	0918	675.67	24.50	16.02	NA	659.65	
12MWT47	1/18/2005	0922	663.12	25.00	12.67	NA	650.45	
12MWT48	1/18/2005	0929	650.05	30.00	30.41	NA	619.64	
12MWT49	1/18/2005	0935	619.25	30.00	25.66	NA	593.59	

* All measurements to the nearest 0.01 foot

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name:	NSWC CRANE	**Project No.:**	N6878
Location:	SWMU 12	**Personnel:**	T. Rojahn/C. Doolan
Weather Conditions:	Partly Sunny, 20°s	**Measuring Device:**	M-Scope
Tidally Influenced:	Yes ___ No _X_	**Remarks:**	----

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
12MWT50	1/18/2005	0938	609.01	35.00	35.34	NA	NA	
WES-7-1-81	1/18/2005	1445	631.95	41.50	20.41	NA	611.54	
WES-7-2-81	1/18/2005	1107	604.72	35.00	34.26	NA	570.46	
WES-7-3-81	1/18/2005	1100	599.22	38.00	28.82	NA	570.40	
WES-7-4-81	1/18/2005	1443	598.22	39.00	26.53	NA	571.69	
WES-7-5-81	1/18/2005	1103	596.50	39.00	24.25	NA	572.25	
Staff Gauges								
12SG01	1/18/2004	1224	730.97	NA	Dry	NA	NA	Dry
12SG02	1/18/2004	1232	731.64	NA	Dry	NA	NA	Dry
12SG03	1/18/2004	1235	735.03	NA	Dry	NA	NA	Dry
12SG04	1/18/2004	1247	736.72	NA	Dry	NA	NA	Dry
12SG05	1/18/2004	1308	724.28	NA	Dry	NA	NA	Dry
12SG06	1/18/2004	1327	713.38	NA	3.95	NA	NA	Flow = 1 gpm
12SG07	1/18/2004	1335	713.45	NA	4.26	NA	NA	Flow = 3-5 gpm
12SG08	1/18/2004	0845	668.56	NA	5.23	NA	NA	Flow = 116 gpm
12SG09	1/18/2004	1041	529.35	NA	17.40	NA	NA	Flow = 225 gpm
12SG10	1/18/2004	1026	517.21	NA	14.69	NA	NA	Flow = 8960 gpm
12SG11	1/18/2004	1010	513.47	NA	19.94	NA	NA	Flow = 6048 gpm
12SG12	1/18/2004	1049	538.45	NA	6.05	NA	NA	Flow = 215 gpm

* All measurements to the nearest 0.01 foot

APPENDIX C.9.1

SWMU 12

EQUIPMENT CALIBRATION FORMS ROUND 1

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSWC CRANE

INSTRUMENT NAME/MODEL: PID/ PHOTOVAC

SITE NAME: SWMUs 12, 13 &16

MANUFACTURER: PHOTOVAC

PROJECT No.: N6878 & N7448, CTO 0357 & 0343

SERIAL NUMBER: ED MF 336

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
7-9-04	ED MF 336	SJC	AS PER MANUFACTURER				ISOBUTYLENE 00237 EXP 11-25-04	
7-10-04	"	NA					NA	100 PPM
7-24-04	"	SJC	"	"	95	100	ISOBUTYLENE	
7-25-04	"	SJC	"	"	92	100	"	
7-26-04	"	SJC	"	"	98	100	"	
7/27/04	"	SJC	"	"	91	100	"	
7-28/04	"	SJC	"	"	90	100	"	
7-29/04	"	SJC	"	"	95	100	"	
7/30/04	"	SJC	"	"	96	100	"	
7/31/04	"	SJC	"	"	90	100	"	
8-10-04	"	SJC	"	"	98	100	"	
8-11-04	"	SJC	"	"	101	100	"	
8-12-04	"	SJC	"	"	102	100	"	
8-13-04	"	SJC	"	"	95	100	"	
8-14-04	"	SJC	"	"	—	100	"	
8-15-04	"	SJC	"	"	96	100	"	
8-16-04	"	SJC	"	"	95	100	"	
8/17/04	"	SJC	"	"	—	100	"	
8/26/04	"	SJC	"	"	94	100	LOT 00250-03 EXP 2/17/05	
8/27/04	"	SJC	"	"	—	100	"	
8/28/04	"	SJC	"	"	—	100	"	
8/29/04	"	SJC	"	"	95	100	"	
8/30/04	"	SJC	"	"	"	100	"	
8/31/04	"	SJC	"	"	"	100	"	
9/1/04	"	SJC	"	"	"	100	"	
9/2/04	"	SJC	"	"	"	100	"	
9/8/04	"	SJC	"	"	"	100	"	
9/9/04	"	SJC	"	"	"	100	"	
9/10/04	"	SJC	"	"	91	100	"	
9/11/04	"	SJC	"	"	95	100	"	

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSWC CRANE

INSTRUMENT NAME/MODEL: PID / PHOTOVAC

SITE NAME: SWMUs 12, 13 &16

MANUFACTURER: PHOTOVAC

PROJECT No.: N6878 & N7448, CTO 0357 & 0343

SERIAL NUMBER: ED MF 336

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
9-12-04	ED MF 336	SJC	—	—	95	100	00250-03	EXP 2-17-05
10-17-04	"	TA	—	—	95.8	100	"	"
10-26-04	"	SJC	—	—	96	100	"	"
10-27-04	"	SJC	—	—	94.5	100	"	"
10-28-04	"	SJC	—	—	95	100	"	"
10-29-04	"	SJC	—	—	93.5	100	"	"
10-30-04	"	SJC	—	—	98	100	"	"
10-31-04	"	SJC	—	—	100	100	"	"
11-1-04	"	SJC	—	—	96.5	100	"	"
11-2-04	"	SJC	—	—	95	100	"	"
11-9-04	"	SJC	—	—	98	100	"	"
11-10-04	"	SJC	—	—	95	100	"	"
11-12-04	"	SJC	—	—	98	100	"	"
11-14-04	ED MF 352	TA	—	—	96	100	"	"

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSWC CRANE

INSTRUMENT NAME/MODEL: MiniRae 2000

SITE NAME: SWMUs 12, 13 &16

MANUFACTURER: RAE SYSTEMS

PROJECT No.: N6878 & N7448, CTO 0357 & 0343

SERIAL NUMBER: 110-002635

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration (Zero Air)	Post-calibration	Pre-calibration (Isobutylene)	Post-calibration		
8/11/04	110-002635	CCL	0.4	0.0	—	100	00237	
8/12/04	"	CCL	0.9	0.0	—	100	"	
8/13/04	"	CCL	1.9	0.0	—	100	"	
8/14/04	"	CCL	0.8	0.0	—	100	"	
8/15/04	"	CCL	0.8	0.0	—	100	"	
8/16/04	"	CCL	0.5	0.0	—	100	"	
8/17/04	"	Tom Dickson	0.0/100.0	0.0/100	0.9/100	0.9/103	"	Bkgd 0.9
8/27/04	"	CCL	1.6	0.0	—	104	LOT 00250-03 EXP. 3/17/05	
8/28/04	"	CCL	0.8	0.0	—	100	"	"
8/29/04	"	CCL	0.5	0.0	—	100	"	"
8/30/04	"	CCL	0.5	0.0	—	100	"	"
8/31/04	"	CCL	0.6	0.0	—	100	"	"
9/1/04	"	CCL	0.4	0.0	—	100	"	"
9/2/04	"	CCL	0.5	0.0	—	100	"	"

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : NSWC CRANE

INSTRUMENT NAME/MODEL: YSI

SITE NAME: SWMUs 12, 13 &16

MANUFACTURER: YSI

PROJECT No.: N6878 & N7448, CTO 0357 & 0343

SERIAL NUMBER: 99K0055

Date of Calibration	Person Performing Calibration	INITIAL READINGS PH 7	PH 4	COND	DO	ORP	FINAL READINGS PH 7	PH 4	COND	DO	ORP	Calibration Standard (Lot No.)	Remarks and Comments
7/9/04	QD	~~6.86~~ ~~5.26~~	5.56	890	7.12	158.1 24.5°C	7.00	4.01	1000	7.12	237.2 24.5°C	pH 4 3300 pH 7 3223 ORP 3100	
7/26/04	QD	7.01	3.95	965	—	21.0 247.5	7.01	4.04	1000	—	237.4 21.0°		
7/27/04	QD	6.99	4.07	943	—	20.8 237.8	—	—	1000	—	—		
7/28/04	QD	7.02	4.06	1009	—	20.1 346.1	—	—	—	—	20.1 236.6		
7/29/04	QD	7.00	4.18	1055	~~5.78~~	21.33 264.3	7.00	4.00	1000	~~5.85~~	21.31 236.3		
7/30/04	QD	7.02	4.02	1005	—	21.1 238.1	—	—	—	—	—		
7/31/04	CCL	7.05	4.00	1002	—	23.47 262.1	7.00	4.00	1000	—	23.18 237.2		
8/1/04	QD	7.00	4.03	986	—	22.62 237.2	—	—	999	—	—		
8/14/04	QD	7.08	3.75	977	7.35	19.30 233.8	7.00	4.00	999	7.12	19.32 236.5		
8/17/04	QD	7.21	4.19	1037	5.45	20.35 236.7	7.01	4.00	1000	8.76	20.43 237.4	ORP 03K0667 exp 2/05	
8/24/04	QD	7.02	3.86	10~~42~~ 28	4.46	23.47 218.6	7.00	4.00	~~1000~~ 1000	8.37	~~23.47~~ ~~218.6~~	23.48 237.4	
8/25/04	QD	7.07	4.06	1008	3.25	23.77 285.0	7.00	4.00	1000	8.25	23.78 237.4		
8/26/04	QD	6.72	4.28	1013	5.75	23.22 202.6	7.00	4.00	1000	8.41	23.15 237.4		
8/27/04	QD	7.01	4.23	1010	5.87	24.68 232.8	7.01	3.99	1000	7.66	24.71 237.4		
8/28/04	QD	6.95	3.96	1012	7.42	25.07 231.6	7.00	4.00	1000	8.39	25.08 237.4		
8/29/04	QD	7.12	3.83	1025	15.91	23.32 252.6	7.01	3.99	982	8.29	23.30 ~~252.6~~	237.4	

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : NSWC CRANE

SITE NAME: SWMUs 12, 13 &16

PROJECT No.: N6878 & N7448, CTO 0357 & 0343

INSTRUMENT NAME/MODEL: YSI

MANUFACTURER: YSI

SERIAL NUMBER: 0160979

Date of Calibration	Person Performing Calibration	INITIAL READINGS					FINAL READINGS					Calibration Standard (Lot No.)	Remarks and Comments
		PH 7	PH 4	COND	DO	ORP	PH 7	PH 4	COND	DO	ORP		
7/23/04	JD	7.05	3.50	868	8.37	23.9° 234.2	7.01	4.0	1.000	8.25	24.1° 237.4	ORP-0311385	
7/24/04	JD	7.19	3.91	449	–	20.6 395	7.00	4.0	1000	–	20.4 237.2	pH 4 - 3390	
7/25/04	JD	6.99	3.91	995	–	21.7 217.2	–	–	–	–	21.6 236.1	pH 7 - 3223	
7/26/04	meter returned due to malfunction											Sp.C - 4100	

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : NSWC CRANE

INSTRUMENT NAME/MODEL: YSI

SITE NAME: SWMUs 12, 13 &16

MANUFACTURER: YSI

PROJECT No.: N6878 & N7448, CTO 0357 & 0343

SERIAL NUMBER: 01C0134

Date of Calibration	Person Performing Calibration	INITIAL READINGS PH 7	PH 4	COND	DO	ORP	FINAL READINGS PH 7	PH 4	COND	DO	ORP	Calibration Standard (Lot No.)	Remarks and Comments
7/23/04	QS	7.41	4.89	.883	7.47	23.90 242.5	7.00	3.99	1.000	8.24	23.90 237.8	7/23 ORP-0311385	
7/24/04	QS	6.15	4.12	972	—	—	7.00	4.00	1000	—	19.6 237.2	PH4-3390	
7/25/04	QS	6.09	3.57	978	—	20.2 236.7	7.00	4.00	1001	—	—	PH7-3223	
7/26/04	QS	7.54	3.51	955	—	21.2 243.3	7.00	4.01	1000	—	21.0 237.4	Sp.C.-4100	
7/27/04	QS	6.61	4.07	983	—	20.1 236.7	7.00	4.01	1000	—	20.3 237.5		
7/28/04	QS	6.84	4.23	994	—	20.4 200.7	6.99	4.00	1000	—	20.4 237.8		
7/29/04	CCL	7.42	3.50	1026	—	21.65 248.5	7.00	4.00	1000	—	21.39 237.5		
7/30/04	CCL	7.48	4.13	1007	—	22.64 227.4	7.00	4.00	1000	—	22.65 237.6		
7/31/04	CCL	6.91	4.43	979	—	23.46 245.4	7.00	4.00	1000	—	23.45 237.4		
8/1/04	CCL	7.06	3.43	1012	—	22.79 240.5	7.00	4.00	1000	—	22.79 237.4		
8/15/04	TR	8.07	3.98	900	9.14	19.01 238.3	6.99	3.99	1000	9.02	18.75 237.6	8/15 PH7: SAME	Mixed NEW Zobell Sol and used until FEB 15, 2005
8/17/04	QS	6.95	3.71	999	8.62	20.84 221.4	7.00	4.00	1000	8.64	20.86 237.4	PH4: "	
8/25/04	QS	6.84	3.70	1058	0.7	23.87 257.7	7.00	4.00	1000	8.25	23.83 238.6	Sp.C.: "	
8/26/04	QS	7.76	2.70	996	6.95	23.63 210.4	7.00	4.00	1000	8.44	23.65 237.7	ORP-03K0667	
8/27/04	QS	7.17	3.76	993	8.47	25.12 273.0	7.01	4.00	1007	8.17	25.09 237.7		
8/28/04	QS	6.99	3.85	1025	8.27	24.93 199.3	7.00	4.00	1012	8.32	24.91 237.4		

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : NSWC CRANE

SITE NAME: SWMUs 12, 13 &16

PROJECT No.: N6878 & N7448, CTO 0357 & 0343

INSTRUMENT NAME/MODEL: YSI

MANUFACTURER: YSI

SERIAL NUMBER: 01C0979

Date of Calibration	Person Performing Calibration	INITIAL READINGS PH 7	PH 4	COND	DO	ORP		FINAL READINGS PH 7	PH 4	COND	DO	ORP	Calibration Standard (Lot No.)	Remarks and Comments
7/29/04	QD	~~3.98~~ 5.03	3.98	948	6.78	21.49 225		7.00	4.00	1000	8.65	21.34 234.7	PH 4 3390	
7/30/04	QD	7.01	3.97	1000	—	21.5 238.2		—	4.00	1001	—	—	PH7 3223	
7/31/04	QD	7.02	4.06	1018	—	23.0 324.1		7.00	4.00	1000	—	22.8 232.6	SpCon 4100	
8/1/04	QD	7.10	3.99	980	—	22.62 234.1		7.00	—	1001	—	22.64 237.1		
8/17/04	QD	7.00	3.94	950	8.70	20.4 238.7		7.00	4.00	1000	8.78	20.4 237.5	exp = 03K0667 exp 2/05	
8/24/04	QD	7.08	3.96	1042	5.55	23.8 497		7.00	4.00	1040	8.40	23.08 237.6		
9/22/04	QD	7.05	1.80	1837	6.07	20.17 189.4		6.98	3.99	922	8.91	20.17 237.4		
9/23/04	QD	6.40	~~6.~~ 4.05	839	4.04	20.98 294.0		7.00	4.00	1000	8.76	20.46 237.2		
9/28/04	SJC	6.50	4.16	968	12.91	19.09 175.3		7.01	4.00	1001	8.87	19.13 237.3		
9/29/04	SJC													

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : NSWC CRANE

SITE NAME: SWMUs 12, 13 &16

PROJECT No.: N6878 & N7448, CTO 0357 & 0343

INSTRUMENT NAME/MODEL: YSI

MANUFACTURER: YSI

SERIAL NUMBER: 99K0055

Date of Calibration	Person Performing Calibration	INITIAL READINGS PH 7	PH 4	COND	DO	ORP	FINAL READINGS PH 7	PH 4	COND	DO	ORP	Calibration Standard (Lot No.)	Remarks and Comments
8/30/04	QD	7.20	3.66	847	8.49	21.98 252.6	7.01	4.00	952	8.50	21.96 237.2	pH4 3390 pH7 3223	
8/31/04	QD	6.93	4.16	540	6.48	21.37 252.8	7.01	3.99	937	8.47	21.37 237.4	SpC 4387 ORP 03K0667	
9/22/04	QD	6.70	4.07	1113	11.66	19.01 178.5	7.02	3.99	1000	7.12	20.07 236.8		
9/23/04	QD	7.09	3.81	889	6.74	20.26 373.1	7.02	4.00	999	8.90	20.79 236.1		
9/24/04	QD	7.02	3.73	1141	7.30	21.05 290	7.00	4.00	996	8.81	20.75 237.5		
9/25/04	QD	6.91	4.08	975	8.50	20.74 257.4	7.01	3.99	1000	8.78	20.66 237.4		
9/26/04	QD	7.03	4.00	1021	7.87	18.97 252.1	7.01	4.00	1000	8.75	19.12 237.9		
9/27/04	QD	7.17	3.82	989	6.92	19.83 213.6	7.00	4.00	1000	8.89	19.81 237.4		
9/28/04	QD	6.79	4.00	983	7.42	19.30 216.7	7.02	4.00	1000	8.78	19.29 237.4		
10/6/04	QD	7.21	3.94	941	7.80	16.77 234.9	7.01	3.99	1000	8.73	16.77 237.3		
10/7/04	QD	6.93	4.08	1044	7.77	17.49 120.8	7.00	3.99	1000	9.32	17.53 237.4		changed DO membrane
10/8/04	QD	6.99	3.84	1040	8.36	19.86 271.5	7.01	3.99	1000	8.85	19.92 237.4		
10/9/04	QD	7.14	3.97	992	9.39	20.45 168.7	7.01	3.99	1000	8.86	20.41 237.1		
10/11/04	QD	7.05	3.74	992	8.81	17.85 261.8	7.00	4.01	1000	8.85	17.61 237.3		
10/12/04	QD	6.68	3.77	1016	10.27	18.31 197.1	7.00	4.00	1000	8.95	18.24 237.4		
10/13/04	QD	6.77	3.98	1025	9.61	19.78 250.7	7.01	4.00	1000	8.70	19.89 ~~237.4~~ 236.9	QD	

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : NSWC CRANE

INSTRUMENT NAME/MODEL: YSI

SITE NAME: SWMUs 12, 13 &16

MANUFACTURER: YSI

PROJECT No.: N6878 & N7448, CTO 0357 & 0343

SERIAL NUMBER: 01K 0134

Date of Calibration	Person Performing Calibration	INITIAL READINGS PH 7	PH 4	COND	DO	ORP	FINAL READINGS PH 7	PH 4	COND	DO	ORP	Calibration Standard (Lot No.)	Remarks and Comments
8/29/04	QD	7.21	3.67	479	7.21	23.56 238.9	7.00	4.00	982 ~~995~~	8.27 ~~45~~	23.64 237.7	ORP ~~03K0067~~ pH 4 3300	03K0667
8/30/04	QD	6.77	4.28	793	8.41	21.68 239.4	7.00	4.00	955	8.47	21.74 237.4	pH 7 3223 Sp. C. ~~4100~~	04 ~~4256~~ 4387
8/31/04	QD	6.99	3.37	631	9.61	21.85 238.5	7.00	4.00	967	8.51	21.83 237.6		
9/8/04	TK	8.04	3.50	451	–	–	7.00	4.00	1000	–	–		WELL DEV. ONLY
9/9/04	TK	7.27	3.85	467	9.20	20.20 240.0	7.00	4.00	1000	8.71	20.20 237.7		OK
9/10/04	TK	6.73	3.81	997	8.96	20.01 256	7.00	4.00	–	8.83	20.02 237.7		OK
9/11/04	TK	7.34	3.99	1024	8.64	20.31 244.9	7.00	4.00	1000	8.82	20.32 237.7		OK
9/12/04	TK	6.75	4.04	1001	8.92	19.66 215.4	7.00	4.00	–	8.70	19.74 237.4		OK
9/13/04	TK	7.18	3.68	1032	8.46	21.47 255.1	7.00	4.00	1000	8.49	21.44 238.1		OK
9/14/04	TK	6.97	4.08	995	13.00	20.84 228.7	–	–	–	8.48	20.70 238.4		
9/22/04	SC	6.90	4.54	984	6.02	18.5 225	7.00	4.00	998	8.93	19.94 236.8		OK
9/23/04	SJC	7.27	3.33	988	11.24	20.08 235.6	7.00	4.00	1000	8.99	20.41 237.4		OK
9/24/04	SJC	7.03	4.24	997	7.08	21.43 234.2	7.00	3.99	1000	8.67	21.24 237.4		OK
9/25/04	JG	7.02	4.07	1.016	11.70	20.94 263.6	7.00	4.00	1000	8.70	20.96 237.8		
9/26/04	QD	6.64	3.99	803	7.08	19.30 231.1	7.00	4.00	1000	8.86	19.34 237.6		
9/27/04	SJC	7.22	4.16	1274	7.20	18.76 216.7	7.00	4.00	1004	8.92	18.92 237.5		

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : NSWC CRANE

INSTRUMENT NAME/MODEL: YSI

SITE NAME: SWMUs 12, 13 &16

MANUFACTURER: YSI

PROJECT No.: N6878 & N7448, CTO 0357 & 0343

SERIAL NUMBER: OK ~~OK~~ 0134

Date of Calibration	Person Performing Calibration	INITIAL READINGS PH 7	PH 4	COND	DO	ORP	FINAL READINGS PH 7	PH 4	COND	DO	ORP	Calibration Standard (Lot No.)	Remarks and Comments
9/28/04	SJC	7.07	3.95	982	8.44	18.34 / 240.6	7.01	3.99	1001	8.85	18.05 / 237.3	PH-7 4410 PH 4 3390	OR
9/29/04	SJC	7.06	3.94	1031	8.79	18.35 / 238	7.02	4.00	999	9.21	18.39 / 237.6	SC 4387 ORP 03K0667	"
10/9/04	SJC	7.24	3.65	1006	10.03	20.31 / 248	7.00	4.00	1001	8.77	20.20 / 237.6		"
10/12/04	QD	7.32	4.05	1025	12.01	18.95 / 238.6	7.01	4.00	1000	8.98	18.82 / 237.6		"
10/13/04	QD	7.25	3.68	992	9.61	19.78 / 230.7	7.00	4.00	1000	8.81	19.79 / 237.5		"
10/15/04	TR	7.00	3.86	899	7.70 / 85.4	19.01 / 235	—	4.00	1000	8.65 / 96.0	—		"
10/26/04	TR	7.06	3.99	992	9.35 / 98.5	17.50 / 237.7	7.00	4.00	1000	9.30 / 98.0	—		"
10/27/04	TR	7.03	3.98	1053	7.54 / 80.3%	18.42 / 237.2	—	—	1000	9.13 / 97.8%	—		"
10/28/04	TR	7.01	3.98	1003	8.74 / 93.6	18.83 / 238	—	—	—	9.15 / 97.9%	—		"
10/29/04	TR	7.02	3.99	1060	10.69 / 113.6	20.89 / 233.8	—	—	1000	8.70 / 97.3%	—		"
10/30/04	TR	7.02	3.99	1008	9.54 / 105.3%	20.20 / 232.7	—	—	—	8.77 / 96.9	—		"
10/31/04	TR	6.99	3.98	937	10.72 / 111.3	17.59 / 236.6	—	4.00	1000	9.39 / 97.5%	17.12 / 237.4		"
11/1/04	TR	7.11	4.04	1004	9.03 / 96.7	17.31 / 239	7.00	4.00	—	9.15 / 97.2%	17.33 / 237.7		"
11/2/04	TR	6.98	3.97	1008	8.66 / 95.0	19.73 / 238.5	—	—	1000	8.87 / 97.9%	—		"
11/9/04	TR	6.96	3.91	986	14.09 / 159.7	20.02 / 236.2	7.00	4.00	1000	8.74 / 99.2%	2000 / 237.3		"
11/10/04	TR	7.01	4.00	1009	71.6 / 6.74	15.34 / 241	—	—	—	9.18 / 98.8%	—		"

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : NSWC CRANE

SITE NAME: SWMUs 12, 13 &16

PROJECT No.: N6878 & N7448, CTO 0357 & 0343

INSTRUMENT NAME/MODEL: YSI

MANUFACTURER: YSI

SERIAL NUMBER: 01C0134 AB

Date of Calibration	Person Performing Calibration	INITIAL READINGS					FINAL READINGS					Calibration Standard (Lot No.)	Remarks and Comments
		PH 7	PH 4	COND	DO	ORP	PH 7	PH 4	COND	DO	ORP		
11/11/04	TR	7.01	3.99	1039	11.67 / 124.8%	17.5° / 236	—	—	1000	9.18 / 98.2%	17.5 / 240	PH 7 4110 PH 4 3310	OK
11/12/04	TR	7.04	3.99	980	8.46 / 87.9%	16.74 / 240	—	—	1001	9.37 / 98.1%	—	SC 4387 ORP 03K0667	"
11/13/04	TR	7.01	3.98	988	8.89 / 94.6	15.1 / 240.1	—	—	1000	9.22 / 99.2%	—	↓	"
11/14/04	TR	7.00	3.98	1018	6.89 / 72.2	16.05 / 262	—	—	1001	9.51 / 99.7%	16.05 / 242.2	↓	"
11/15/04	TR	7.02	4.02	992	12.83 / 136%	15.25 / 237	—	—	1001	9.37 / 99.5%	15.4 / 243	↓	"

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSWC CRANE

SITE NAME: SWMUs 12, 13 &16

PROJECT No.: N6878 & N7448, CTO 0357 & 0343

INSTRUMENT NAME/MODEL: Turbidimeter/2020

MANUFACTURER: LaMotte

SERIAL NUMBER: 1760 - 1800

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
7/23/04		JB	0	0	8.8	10		
7/24/04		JB	–	–	9.2	10		
7/25/04		JB	0	0	9.6	10		
7/26/04		JB	0	–	10	–		
7/27/04		JB	0	–	10	–		
7/28/04		CCL	0	0	10	10		
7/29/04		CCL	0	0	10	10		
7/30/04		CCL	0	0	11	10		
7/31/04		CCL	0	0	11	10		
8/1/04		CCL	0	0	11	10		
8/17/04		JB	0	0	10	10		
8/24/04		JB	0	0	10	10		
8/25/04		JB	0	0	10	10		
8/26/04		JB	0	0	10	10		
8/27/04		JB	0	0	10	10		
8/28/04		JB	0	0	10	10		
8/29/04		JB	0	0	10	10		
8/30/04		JB	0	0	10	10		
8/31/04		JB	0	0	10	10		
9/22/04		JB	0	0	10	10		
9/23/04		JB	0	0	10	10		
9/24/04		JB	0	0	11	10		
9-25-04		JB	0	0	9.3	10		

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME: NSWC CRANE

SITE NAME: SWMUs 12, 13 &16

PROJECT No.: N6878 & N7448, CTO 0357 & 0343

INSTRUMENT NAME/MODEL: Turbidimeter/2020

MANUFACTURER: LaMotte

SERIAL NUMBER: 4650 - 4300

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
7-23-04		JD	0	0	10.14	10.0	—	
7-24-04		JD	—	—	9.5	10.0	—	
7-25-04		JD	0	0	9.6	10.0	—	
7-26-04		JD	0	—	9.8	10.0	—	
7-27-04		JD	0	—	10.0	—	—	
7-28-04		JD	0	—	10	—	—	
7-29-04		JD	0	—	10	—	—	
7-30-04		JD	0	—	10	—	—	
7-31-04		JD	0	—	10	—	—	
8-1-04		CCL	0	0	10	10	—	
8-14-04		JD	0	0	10	10	—	
8-15-04		TK	0	0	10.1	10	—	
8-17-04		JD	0	0	10.3	10	—	
8-24-04		JD	0	0	9.71	10	—	
8-25-04		JD	0	0	9.96	10	—	
8-26-04		JD	0	0	10.14	10	—	
8-27-04		JD	0	0	10.08	10	—	
8-28-04		JD	0	0	9.99	10	—	
8-29-04		JD	0	0	9.96	10	—	
8-30-04		JD	0	0	9.8	10	—	
8-31-04		JD	0	0	9.95	10	—	
9-8-04		TK	0	0	10.04	10	—	
9-9-04		TK	0	0	9.97	10	—	
9-10-04		TK	0	0	9.94	10	—	
9-11-04		TK	0	0	9.94	10	—	
9-12-04		TK	0	0	9.93	10	—	
9-13-04		TK	0	0	10.0	10	—	
9-14-04		TK	0	0	10.0	10	—	
9-22-04		JD	0	0	10	10	—	
9-23-04		TK	0	0	9.9	10	—	
9/24/04		JD	0	0	9.9	10	—	
9/25/04		TK	0	0	9.9	10	—	

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSWC CRANE

SITE NAME: SWMUs 12, 13 &16

PROJECT No.: N6878 & N7448, CTO 0357 & 0343

INSTRUMENT NAME/MODEL: Turbidimeter

MANUFACTURER: LaMotte

SERIAL NUMBER: 3592 3502

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
7-29-04		CCL	0	0	10	10	—	
7-30-04		CCL	0	0	12	10	—	
7-31-04		CCL	0	0	10	10	—	
8-1-04		CCL	0	0	10	10	—	
8-17-04		QJD	0	0	9.8	10	—	
9-22-04		QJD	0	0	11	10	—	
9-23-04		TA	0.3	0	10	10	—	
9-24-04		TA	0.0	0.0	10	10	—	
9-27-04		QJD	0	0	10	10	—	
9-28-04		QJD	0	0	10.15	10	—	
10-9-04		[illegible]	0	0	10	10	—	
10-12-04		QJD	0	0	9.84	10	—	
10-13-04		QJD	0	0	9.25	10	—	

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME: NSWC CRANE

SITE NAME: SWMUs 12, 13 &16

PROJECT No.: N6878 & N7448, CTO 0357 & 0343

INSTRUMENT NAME/MODEL: Turbidimeter / 2020

MANUFACTURER: LaMotte

SERIAL NUMBER: 4650 - 4300

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
9-25-04		JS	0	0	10	10		
9-26-04		JS	0	0	9.9	10		
9-27-04		JS	0	0	10	10		
9-28-04		JS	0	0	10	10		
9/29/04		SJS	0	0	10	10		ok
10-6-04		JS	0	0	10	10		
10-7-04		JS	0	0	9.95	10		
10-8-04		JS	0	0	10	10		
10-9-04		JS	0	0	10.10	10		
10-10-04		JS	0	0	9.97	10		
10-11-04		JS	0	0	10.05	10		
10-12-04		JS	0	0	10	10		
10-13-04		JS	0	0	9.87	10		
10-15-04		TR	0	0	10.34	10		ok
10-16-04		TR	0	0	10	10		"
10-26-04		TR	0	0	10.14	10		"
10-27-04		TR	0	0	10.07	10		"
10-28-04		TR	0	0	10.08	10		"
10-29-04		TR	0	0	10.09	10		"
10-30-04		TR	0	0	10	10		"
10-31-04		TR	0	0	10.08	10		"
11-1-04		TR	0	0	10.02	10		"
11-2-04		TR	0	0	10.11	10		"
11-9-04		TR	0	0	9.90	10		"
11-10-04		TR	0	0	9.98	10		"
11-11-04		TR	0	0	9.98	10		"
11-12-04		TR	0	0	9.92	10		"
11-13-04		TR	0	0	9.90	10		"
11-14-04		TR	0	0	9.98	10		"
11-15-04		TR	0	0	9.96	10		"

APPENDIX C.9.2

SWMU 12

EQUIPMENT CALIBRATION FORMS ROUND 2

FIGURE 7-1

DOCUMENTATION OF FIELD CALIBRATION

SITE NAME: Swmu's 08/15 12/13/16

PROJECT NO.: 1245 6778 / 7448

Date of Calibration	Instrument Name and Model	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot Number)	Remarks/ Comments
				Pre-Calibration	Post-Calibration	Pre-Calibration	Post-Calibration		
1-5-05	LaMotte	4175-1503	JD	0	—	9.96	10.0	NA	ok
1-6-05	"		JD	0	—	9.99	10.0		ok
1-7-05	"		JD	0	—	10.00	10.0		ok
1-8-05	"		JD	0	—	10.0	10.0		ok
1-9-05	"		CO	0.05	0	10.0	10.0		ok
1-10-05	"		CO	0	—	10.0	—		ok
1-11-05	"		CO	0	0	10.0	10.0		ok
1-12-05	"		CO	0	0	9.87	10.0		ok
1-22-05	"		CO	0	—	10.0	—		ok
1-23-05	"		TA	0	0	10.0	—		ok
1-25-05	"		CO	0.0	—	10.0	—		ok

FIGURE 7-1

DOCUMENTATION OF FIELD CALIBRATION

SITE NAME: Swmu 08/15 12/13/16

PROJECT NO.: 1245 6878/7448

Date of Calibration	Instrument Name and Model	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot Number)	Remarks/ Comments
				Pre-Calibration	Post-Calibration	Pre-Calibration	Post-Calibration		
1-5-05	Lamotte	4536-3303	JS	0	–	9.98	10.0		ok
1-6-05	"		JS	0	–	10.0	–		ok
1-7-05	"		JS	0	–	10.0	–		"
1-8-05	"		JS	0	–	10.0	–		ok
1-12-05	"		CD	0	–	10.0	–		OK
1-22-05	"		CD	0	–	10.0	–		OK
1-23-05	"		JK	0	0	10.0	–		OK
1-25-05	"		CD	0.0	–	10.0	–		OK

Turbidity Meter
LaMotte
0355-4197

FIGURE 7-1

DOCUMENTATION OF FIELD CALIBRATION

SITE NAME: NSWC CRANE

PROJECT NO.: 7448/6878

Date of Calibration	Instrument Name and Model	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot Number)	Remarks/ Comments
				Pre-Calibration	Post-Calibration	Pre-Calibration	Post-Calibration		
2-2-05	2020	0355-4197	TR	0.0	0.0	0.0	0.0	Provided by Vendor	ok
2-3-05			QS	0	0	11	9.9		ok
2-5-05			QS	0	0	9.2	10		
2-6-05			LD	0	0	10	10		ok
2-7-05			TR	0	0	10	10		ok

FIGURE 7-1

DOCUMENTATION OF FIELD CALIBRATION

SITE NAME: SWMU 13/16 - R&4 12 Rd 2

PROJECT NO.: 7448 / 6878

Date of Calibration	Instrument Name and Model	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot Number)	Remarks/ Comments
				Pre-Calibration	Post-Calibration	Pre-Calibration	Post-Calibration		
2-1-05	Lamotte	4536-3303	QD	0	0	10	10	NA	
2-2-05			QD	0	0	10	10		
2-3-05			QD	0	0	10	10		
2-4-05			QD	0	0	11	10		
2-5-05			QD	0	0	10	10		
2-6-05			CD	0	0	10	10		OK
2-7-05			TR	0	0	10	10		
2-8-05			QD	0	0	9.8	10		
2-15-05			CD	0	0	9.9	10		OK
2-16-05			CD	0	0	10	10		OK
2-17-05			CD	0	0	9.5	10		OK
2-18-05			CD	0	0	10	10		OK
2-19-05			CD	0	0	10	10		OK
2-20-05			CD	0	0	10	10		OK
2-21-05			CD	0	0	10.31	10		OK
2-22-05			CD	0	0	10.64	10		OK

FIGURE 7-1

DOCUMENTATION OF FIELD CALIBRATION

SITE NAME: Swmu 13/16 RD 4 12 Rd 2

PROJECT NO.: 7448 6878

Date of Calibration	Instrument Name and Model	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot Number)	Remarks/ Comments
				Pre-Calibration	Post-Calibration	Pre-Calibration	Post-Calibration		
2-1-05	Lamotte	4175-1503	QD	0	0	10	10	NA	
2-2-05			QD	0	0	10	10		
2-3-05			QD	0	0	9.97	10		
2-4-05			CD	0	0	10.12	10		
2-5-05			QD	0.7	0	9.98	10		
2-6-05			CD	0	0	9.90	10		OK
2-7-05			TR	0	0	10	10		OK
2-15-05			CD	0	0	9.27	10		replaced battery
2-16-05			CD	0	0	10.54	10		ok
2-17-05			CD	0	0	9.41	10		ok
2-18-05			CD	0	0	9.95	10		ok
2-19-05			CD	0	0	10.26	10		OK
2-20-05			CD	0	0	10	10		OK
2-21-05			CD	0	0	10.07	10		OK
2-21-05			CD	0	0	10.56	10		OK

FIGURE 7-1

DOCUMENTATION OF FIELD CALIBRATION

SITE NAME: NISHC CRANE SWMU 12 PROJECT NO.: 6578

Date of Calibration	Instrument Name and Model	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot Number)	Remarks/ Comments
				Pre-Calibration	Post-Calibration	Pre-Calibration	Post-Calibration		
3/2/05	Lamotte	4536-3303	TA	—	—	0.00	0.00	AS/VENDOR	OK
3/3/05			JG	0	0	9.08	10.01		
3/4/05			JG	0	0	9.92	9.99		
3/5/05			JG	0	0	9.98	10.02		

FIGURE 7-1

DOCUMENTATION OF FIELD CALIBRATION

SITE NAME: NSWC CRANE SWMU 12 PROJECT NO.: 6878

Date of Calibration	Instrument Name and Model	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot Number)	Remarks/ Comments
				Pre-Calibration	Post-Calibration	Pre-Calibration	Post-Calibration		
3-2-05	Lamotte 2020	4175-1503	QS	0	0	9.54	10.00	AS/Vendor	
3-3-05			QS	0	0	9.77	9.99		
3-~~3~~4-05			SW	0	0	9.10	10.00		
3-6-05			QS	0	0	10.07	10.00		
3-7-05			QS	0	0	9.38	10.00		

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : NSWC CRANE

SITE NAME: SWMUs 08 &15 12/13/16

PROJECT No.: N1245, CTO 0331 6878/7448

INSTRUMENT NAME/MODEL: YSI

MANUFACTURER: YSI

SERIAL NUMBER: 01009 56 A2

Date of Calibration	Person Performing Calibration	INITIAL READINGS PH 7	PH 4	COND	DO	ORP	FINAL READINGS PH 7	PH 4	COND	DO	ORP	Calibration Standard (Lot No.)	Remarks and Comments
1/5/05	JG CD	6.99	4.05	1155	9.87	256.5 17.61	7.00	4.00	1000	9.50	237.4 17.33	7.0 4110 8/23/05 4.0 4098 8/18/05	
1/6/05	JG CD	7.06	3.92	1069	9.22	219.3 17.61	6.99	4.00	1001	9.10	237.6 17.69	SPC 4387 1/21/05 ORP 0332 0667	10/05
1/7/05	CD	7.01	4.21	1009	10.04	238.1 16.55	7.00	4.00	1000	9.61	238.0 16.68	"	
1/8/05	CD	7.10	3.79	946	9.74	250.2 15.07	7.00	4.00	1000	9.97	234.6 15.30	"	
1/9/05	CD	7.01	3.99	1054	9.54	233.8 15.47	7.00	4.00	1000	9.63	238.5 15.55	"	
1/11/05	CD	7.01	4.00	1005	7.64	237.6 17.28	7.00	4.00	1001	9.11	236.8 17.43	"	
1/12/05	TR	7.06	3.90	990	9.15	246 19.25	7.00	4.00	1000	9.07	237.4 19.32	"	
1/22/05	CD	7.04	3.96	1014	8.40	227.3 14.53	7.00	4.00	1000	8.60	238.2 14.62	"	replaced DO membrane
1/23/05	CD	7.00	4.03	998	10.53	242.2 10.63	7.00	4.00	1000	9.62	236.7 10.57	"	
1/25/05	CD	7.00	3.99	1101	10.96	227.9 15.31	7.00	4.00	1000	8.88	238.2 16.62	"	
							SWMU 13/16				RD 4		
2/1/05	CD	6.98	4.01	910	10.40	240.6 17.93	7.00	4.00	1000	8.79	237.5 17.57	SPC 4699 7/27/05	
2/2/05	JG	7.06	3.97	8.65	1136	233.8 18.05	7.00	4.00	1000	9.42	237.5 18.12	"	
2/3/05	JG	6.86	4.00	1100	9.86 ~~1100~~	241.6 15.25	7.00	4.00	1000	9.45	237.6 18.10	"	
2/5/05	CD	7.10	3.99	1109	4.77	235.6 16.24	7.00	4.00	1000	9.12	237.2 16.30	"	replaced DO membrane
2/6/05	CD	7.03	4.00	1036	9.12	238.6 17.10	7.00	4.00	1000	8.77	237.5 17.04	"	
2/7/05	JG	6.98	4.02	952	9.60	241.2 18.70	7.00	4.00	1000	8.92	238.6 18.60		
2/8/05	JG	6.58	4.03	1016	9.61	242.3 19.87	7.	4.00	1000	9.15	237.5 19.89		

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : NSWC CRANE

INSTRUMENT NAME/MODEL: YSI

SITE NAME: SWMUs 08 &15 12/13/16

MANUFACTURER: YSI

PROJECT No.: N1245, CTO 0331 6878 & 7498

SERIAL NUMBER: 99K1014 AG

Date of Calibration	Person Performing Calibration	INITIAL READINGS PH 7	PH 4	COND	DO	ORP	FINAL READINGS PH 7	PH 4	COND	DO	ORP	Calibration Standard (Lot No.)	Remarks and Comments
1/5/05	JG CD	7.09	3.84	494	8.96	236.7 17.48	7.00	4.00	1000	9.40	239.8 17.51	7.00 4110 8/23/05 4.00 4098 8/18/05	
1/6/05	JG CD	7.03	3.89	536	8.63	268.7 18.38	7.00	4.01	1000	9.13	239.6 18.01	SPC 4387 1/21/05 ORP 03K0667 10/05	
1/7/05	JG	6.98	3.88	890	9.49	214.5 15.38	7.00	4.00	1000	9.66	240.0 15.63	"	
1/8/05	JG	6.92	3.90	826	9.24	220.7 14.37	7.00	4.00	1000	9.81	239.9 14.16	"	
1/10/05	CD	7.02	3.87	529	9.59	225.5 16.17	7.00	4.00	1000	9.71	251.6 16.44	"	
1/12/05	CD	7.06	3.89	1039	9.57	214.1 17.94	7.00	4.00	1000	9.26	253.1 17.89	"	
1/22/05	CD	6.99	3.89	1068	7.55	253.1 18.25	7.00	4.00	1000	8.43	235.1 18.34	"	replaced DO membrane
1/23/05	CD	7.04	3.82	1065	9.12	217.3 11.75	7.00	4.00	1000	9.91	252.5 11.75	"	
1/25/05	CD	7.08	3.84	1130	8.90	211.5 17.93	7.00	4.00	1000	8.85	252.9 17.92	"	
				SWMU			B/16		RQ	4			
2/1/05	JG	7.02	3.88	978	14.73	210.1 18.40	7.00	4.00	1010	9.27	240.2 18.40	SPC 4599 7/27/05	
2/2/05	JG	7.04	3.95	947	15.62	18.56 208.8	7.00	4.00	1000	9.35	18.48 252.9		
2/3/05	JG	6.96	3.95	1155	12.01	18.14 221.7	7.00	4.00	1000	9.41	18.37 250.7		
2/4/05	JG	7.04	3.94	952	13.65	18.39 209.3	7.00	4.00	1000	9.37	18.32 237.4		
2/5/05	JG	7.00	3.92	945	12.95	18.58 208.6	7.00	4.00	1000	9.04	19.09 252.8		
2/6/05	JG	7.11	3.88	1151	12.52	19.74 208.3	7.00	4.00	1000	8.99	19.66 252.9		
2/7/05	JG	6.98	3.92	1173	10.05	208.2 19.27	7.00	4.00	1000	8.97	19.84 252.8		
2/8/05	JG	6.97	4.07	1154	9.02	211.2 19.70	7.00	4.00	1000	9.12	19.70 252.9		

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : NSWC CRANE

INSTRUMENT NAME/MODEL: YSI

SITE NAME: SWMUs ~~08 & 15~~ 13/16

MANUFACTURER: YSI

PROJECT No.: N ~~1245~~ 7448, CTO ~~0331~~ 357 / 6878 CTO 343

SERIAL NUMBER: 02A 0 ~~357~~ 527 AF

Date of Calibration	Person Performing Calibration	INITIAL READINGS PH 7	INITIAL READINGS PH 4	INITIAL READINGS COND	INITIAL READINGS DO	INITIAL READINGS ORP	FINAL READINGS PH 7	FINAL READINGS PH 4	FINAL READINGS COND	FINAL READINGS DO	FINAL READINGS ORP	Calibration Standard (Lot No.)	Remarks and Comments
2/2/05	JG	6.97	3.94	1095	10.26	251.6 17.28	7.00	4.00	1000	9.25	237.5 17.27	7.0 4110 8/23/05 4.0 4098 8/18/05	
2/3/05	JG	6.87	3.55	888	11.11	234.7 ~~21.74~~ 14.3	7.00	4.00	1000	9.52	237.4 18.06	SPC ~~4099~~ 4594 7/27/05 ORP 02K 0667	10/05
2/5/05	JG	3.38	7.54	1.53	9.39	11.11 242.6	7.00	4.00	1000	8.84	237.5 19.17	"	
2/6/05	CO	—	—	1014	6.91	236.5 17.01	—	—	1000	8.87	237.6 17.17	"	broken pH probe, replaced DO membrane
2/7/05	JG	—	—	1007	9.15	20.26 237.5	—	—	1000	9.12	20.29 237.5	"	"
2/8/05	JG	—	—	1005	9.42	18.50 236.8			1000	9.10	18.25 237.4	"	

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : NSWC CRANE

INSTRUMENT NAME/MODEL: YSI

SITE NAME: SWMUs 08 &15 & 12

MANUFACTURER: YSI

PROJECT No.: N1245, CTO 0331 6878

SERIAL NUMBER: 01D0956 AA

Date of Calibration	Person Performing Calibration	INITIAL READINGS PH 7	PH 4	COND	DO	ORP	FINAL READINGS PH 7	PH 4	COND	DO	ORP	Calibration Standard (Lot No.)	Remarks and Comments
2/15/05	CD	7.03	3.99	1024	10.32	242.2 16.04	7.00	4.00	1000	9.47	237.7 16.08	4.0 4098 8/18/05 7.0 4594 7/28/06	
2/16/05	CD	6.97	4.03	1007	10.22	238.9 12.97	7.00	4.00	1000	9.75	236.4 13.03	SPC 4599 7/27/05 ORP 03150667	
2/17/05	CD	7.00	3.96	1015	9.38	~~216.1~~ ~~(D) 11.10~~	7.00	4.00	1000	9.48	~~232.5~~ ~~(D) 13.93~~	"	
						237.7 ↑ 14.10					237.2 ↑ 14.43		
2/18/05	CD	7.00	4.01	997	9.43	234.9 12.36	7.00	4.00	1000	9.77	237.3 12.36	"	
2/19/05	CD	6.99	3.97	1007	9.45	241.3 10.57	7.00	4.00	1000	9.90	237.3 10.57	"	
2/20/05	CD	7.00	4.04	1030	7.69	231.2 14.17	7.00	4.00	1000	9.56	237.5 14.17	"	
2/21/05	CD	7.03	3.99	1002	7.43	236.1 16.67	7.00	4.00	1000	9.41	237.5 16.62	"	
2/22/05	CD	7.03	4.01	1014	14.86	233.2 13.47	7.00	4.00	1000	9.55	237.5 13.74	"	
3/2/05	JG	7.02	4.18	1029	4.24	233.7 14.77	7.00	4.00	1000	9.75	237.5 14.78	"	
3/3/05	JG	6.98	3.99	974	8.80	236.3 14.26	7.00	4.00	1000	9.38	237.5 14.20	"	
3/4/05	JG	7.02	4.24	1065	5.78	234.5 17.62	7.00	4.00	1002	9.74	237.5 17.74	"	
3/5/05	JG	7.25	3.78	979	11.74	234.6 16.31	7.00	4.00	1001	9.23	237.5 16.00	"	
3/6/05	JG	6.97	3.94	995	9.25	235.7 16.72	7.00	4.00	1000	9.54	237.5 16.30	"	
3/7/05	JG	7.03	4.03	948	6.38	237.4 17.14	7.00	4.00	1001	9.15	237.5 17.10		

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : NSWC CRANE

INSTRUMENT NAME/MODEL: YSI

SITE NAME: SWMUs 08 &15 & 12

MANUFACTURER: YSI

PROJECT No.: N1245, CTO 0331 & 6876

SERIAL NUMBER: 99K1014 AG

Date of Calibration	Person Performing Calibration	INITIAL READINGS PH 7	PH 4	COND	DO	ORP	FINAL READINGS PH 7	PH 4	COND	DO	ORP	Calibration Standard (Lot No.)	Remarks and Comments
2/15/05	CD	7.10	3.84	1185	5.61	210.5 16.27	7.00	4.00	1000	9.31	252.9 16.37	4.0 4098 8/18/05 7.0 4594 7/28/06	replaced DO membrane
2/16/05	CD	7.07	3.83	1199	8.50	211.4 13.91	7.00	4.00	1000	9.53	252.9 13.73	SPC 4599 7/27/05 ORP 03K0667	
2/17/05	CD	7.00	3.95	1212	7.51	210.1 14.10	7.00	4.00	1000	9.35	252.9 13.93	"	
2/18/05	CD	7.05	3.85	1209	7.92	210.6 13.35	7.00	4.00	1000	9.49	252.9 13.29	"	
2/19/05	CD	7.06	3.90	1196	7.94	210.6 11.94	7.00	4.00	1000	9.63	252.9 11.32	"	
2/20/05	CD	6.98	3.93	1241	7.92	206.3 15.82	7.01	4.00	999	7.89	252.9 15.91	"	
2/21/05	CD	7.01	3.99	1262	8.21	203.2 16.39	7.00	4.00	1000	9.27	252.9 16.40	"	
2/22/05	CD	6.98	3.96	1268	8.88	202.2 14.46	7.00	4.00	1000	9.47	252.9 14.07	"	
3/2/05	JG	6.75	4.06	1305	10.54	201.3 16.95	7.00	4.00	1000	9.70	252.9 16.78	"	
3/3/05	JG	6.92	4.04	926	10.39	198.8 14.26	7.00	4.00	1000	9.33	252.9 14.71		
3/4/05	JG	6.94	4.04	1397	8.83	197.2 16.70	7.00	4.00	1000	9.33	252.9 16.50		

APPENDIX C.10

SWMU 12

FIELD TASK MODIFICATION REQUEST FORMS

TETRA TECH NUS
FIELD TASK MODIFICATION REQUEST FORM

NSWC CRANE
Project/Installation Name

0279 / 9060
CTO & Project Number

#1
Task Mod. Number

QAPP
Modification To (e.g. Work Plan)

SWMU 12
Site/Sample Location

Date

Activity Description: SEE SECTION 3.5.7 REGARDING "LOW - FLOW SAMPLING OF MONITORING WELLS"

Reason for Change: DUE to EXTREMELY SLOW RECHARGE RATES the USE OF bladder pumps IN SOME deep WELLS WAS ABANDONED. SEVERE drawdown occurred during the purge, thus taking hours FOR LIFT OF RECHARGE. Additionally, wells dried out many times during SAMPLE collection - RENDERING bladder pumps useless.

Recommended Disposition: Used disposable teflon bailers to sample selected deep wells (those with EXTREMELY slow RECHARGE RATES). Additionally, minimum SAMPLE volume WAS collected per ANALYSIS and the PARAMETERS collected were prioritized.

Tony Rosik
Field Operations Leader (Signature)

MARCH 2, 2004
Date

Approved Disposition:

Ralph Rosado
Project/Task Order Manager (Signature)

3/2/04
Date

Distribution:

Program/Project File --
Project/Task Order Manager --
Field Operations Leader --

Other: