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LETTER AND RESPONSE TO FLORIDA DEPARTMENT OF ENVIRONMENTAL
PROTECTION COMMENTS ON DRAFT-FINAL SITE ASSESSMENT REPORT SITE 289
REVISION I NS MAYPORT FL
6/7/2013
TETRA TECH



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June 7, 2013

Project Number 112G03576

Naval Facilities Engineering Command, Southeast
ATTN: Mr. Dana Hayworth (OPC 6)
Remedial Project Manager
135 Ajax Street North, Building 135
Naval Air Station Jacksonville
Jacksonville, FL 32212-0030

Reference: CLEAN Contract Number N62470-08-D-1001
Contract Task Order Number JM60

Subject: Draft-Final Site Assessment Report for Site 289, Rev. 1
Naval Station Mayport, Jacksonville, Florida

Dear Mr. Hayworth:

Tetra Tech, Inc. is pleased to submit this letter responding to the comments from the Florida Department of Environmental Protection (FDEP) on the Draft-Final Site Assessment Report for Site 289 at Naval Station (NAVSTA) Mayport, Jacksonville, Florida. The questions and/or comments received by Tetra Tech are addressed below.

FDEP, Mr. John Winters

Comment 1: Groundwater analytical results for MPT-289-MW-03D and MPT-289-PZ02 show PAH exceedances for benzo(a)anthracene, benzo(b)fluoranthene, and indeno(1,2,3-CD)pyrene. In the Summary section of the report, it states, "However, groundwater samples collected from MPT-289-MW-02 and MPT-289-MW-03D installed in the same approximate area show no adverse impacts to shallow and deep interval groundwater quality." Please explain the discrepancy between the text stating that there are no groundwater impacts versus the analytical results for site groundwater samples. Site 289 groundwater impacts should also be discussed at our next Partnering Team meeting.

Response: Groundwater quality data for samples collected in July 2012 from MPT-289-MW-03D showed benzo(a)anthracene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene concentrations exceeding the FDEP Groundwater Cleanup Target Levels (GCTLs). According to the Groundwater Sampling Sheet associated with this sampling event (see Attachment 1), the turbidity readings for stabilization samples were elevated with the lowest reading at stabilization being 24.45 Nephelometric turbidity units (NTUs), and samples were described as "cloudy." Additional samples were collected from MPT-289-MW-03D in November 2012 to verify the previous results apparently impacted by the elevated turbidity in the samples submitted for analyses. According to the Groundwater Sampling Sheet associated with this sampling event (see Attachment 1), the turbidity readings for stabilization samples were less than 5.0 NTUs, with the lowest reading at stabilization being 3.84 NTUs, and samples were described as "yellow." Groundwater quality data for samples collected in November 2012 from MPT-289-MW-03D showed no polynuclear aromatic hydrocarbon (PAH) constituents exceeding FDEP GCTLs.

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Mr. Dana Hayworth
NAVFAC SE
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Similarly, groundwater quality data for samples collected in December 2011 from temporary well MPT-289-PZ-02-20111219 showed PAH constituents exceeding FDEP GCTLs. According to the Groundwater Sampling Sheet associated with this sampling event (see Attachment 1), the turbidity readings for stabilization samples were elevated with the lowest reading at stabilization being 207.1 NTUs, and samples were described as “cloudy.” The elevated turbidity readings appeared to be a trend that would affect future sampling results. Therefore, a new temporary well was installed at the same approximate location as temporary well MPT-289-PZ-02-081612 in August 2012, and samples were collected to verify the previous groundwater quality results. According to the Groundwater Sampling Sheet associated with this sampling event (see Attachment 1), the turbidity readings were much lower with the lowest reading at stabilization being 12.1 NTUs, and samples were described as “clear.” Groundwater quality data for samples collected in August 2012 from temporary well MPT-289-PZ-02-081612 showed no PAH constituents exceeding FDEP GCTLs. The initial and subsequent verification samples at both locations were collected in accordance with FDEP Standard Operating Procedures and delivered to Empirical Laboratories in Nashville, Tennessee for analyses of PAHs using United States Environmental Protection Agency Method 8270. The initial and verification sampling results are summarized in Table 3-4 of the draft-final SAR (see attached).

Tetra Tech understands that the solubility of PAH compounds decreases with increasing molecular weight and that PAHs are hydrophobic and tend to adsorb to particles. Therefore, elevated turbidity readings recorded for stabilization samples collected at both locations apparently resulted in increased accumulation of PAH compounds and yielded analytical results that were not indicative of the site groundwater conditions only, but of the groundwater and suspended particles.

The draft-final SAR will be revised and reissued as Revision 2. Upon FDEP concurrence with the revised draft-final SAR, the final SAR will be issued. The Petroleum SMP date for the final SAR is June 30, 2013. If the Petroleum SMP date cannot be met, Tetra Tech will request a date extension.

If you have any questions with regard to this submittal, please contact me via e-mail at David.Siefken@tetrattech.com or by phone at (904) 730-4669, Extension 226.

Sincerely,

A handwritten signature in blue ink, appearing to read 'D. Siefken'.

David R. Siefken
Project Manager

DRS/lc

Enclosures (2)

c: John Winters, FDEP (electronic only)
Paul Malewicki, NAVSTA Mayport
RMD, (hardcopy and electronic)
CTO JM60 Project File

TABLE 3-4
GROUNDWATER LABORATORY ANALYTICAL RESULTS

**TABLE 3-4
GROUNDWATER LABORATORY ANALYTICAL RESULTS**

Site Assessment Report, Site 289
Naval Station Mayport
Jacksonville, Florida

LOCATION		MPT-289-MW01	MPT-289-MW02		MPT-289-MW03D		MPT-289-MW04	MPT-289-MW05	MPT-289-PZ01	MPT-289-PZ02	MPT-289-PZ02
SAMPLE IDENTIFICATION	FL CTL 62-777 GW-Table I	MPT-289-MW01-20120712	MPT-289-MW02-20120712	MPT-289-MW02-20121101	MPT-289-MW03D-20120712	MPT-289-MW03D-20121101	MPT-289-MW04-20120712	MPT-289-MW05-20120712	PZ-1-20111219	PZ-2-20111219	MPT-289-PZ02-081612
SAMPLE DATE		7/12/2012	7/12/2012	11/1/2012	7/12/2012	11/1/2012	7/12/2012	7/12/2012	12/19/2011	12/19/2011	8/16/2012
SEMIVOLATILES (µg/L)											
1-METHYLNAPHTHALENE	28	0.0463 U	0.814	1.83	4.58	0.522	0.0463 U	0.0463 U	0.0467 U	0.0485 U	--
2-METHYLNAPHTHALENE	28	0.0463 U	0.596	0.206	3.32	0.357	0.0463 U	0.0463 U	0.0467 U	0.0485 U	--
ACENAPHTHENE	20	0.0463 U	0.0706 J	0.049 U	0.435	0.0463 U	0.0463 U	0.0463 U	0.0467 U	0.0485 U	--
BENZO(A)ANTHRACENE	0.05	0.0463 U	0.0463 U	0.049 U	0.1 J	0.0463 U	0.0463 U	0.0463 U	0.0467 U	0.103 J	0.0463 U
BENZO(A)PYRENE	0.2	0.0463 U	0.0463 U	0.049 U	0.0719 J	0.0463 U	0.0463 U	0.0463 U	0.0467 U	0.0778 J	--
BENZO(B)FLUORANTHENE	0.05	0.0463 U	0.0463 U	0.049 U	0.1 J	0.0463 U	0.0463 U	0.0463 U	0.0467 U	0.112 J	0.0463 U
BENZO(G,H,I)PERYLENE	210	0.0463 U	0.0463 U	0.049 U	0.0895 U	0.0463 U	0.0463 U	0.0463 U	0.0467 U	0.145 J	--
BENZO(K)FLUORANTHENE	0.5	0.0463 U	0.0463 U	0.049 U	0.0936 J	0.0463 U	0.0463 U	0.0463 U	0.0467 U	0.101 J	--
CHRYSENE	4.8	0.0463 U	0.0463 U	0.049 U	0.104 J	0.0463 U	0.0463 U	0.0463 U	0.0467 U	0.0987 J	--
DIBENZO(A,H)ANTHRACENE	0.005	0.0463 U	0.0463 U	0.049 U	0.089 U	0.0463 U	0.0463 U	0.0463 U	0.0467 U	0.134 J	0.0463 U
FLUORANTHENE	280	0.0463 U	0.0463 U	0.049 U	0.145 J	0.0463 U	0.0801 J	0.0463 U	0.0467 U	0.0975 J	--
FLUORENE	280	0.0463 U	0.0463 U	0.049 U	0.695	0.0463 U	0.0463 U	0.0463 U	0.0467 U	0.0485 U	--
INDENO(1,2,3-CD)PYRENE	0.05	0.0463 U	0.0463 U	0.049 U	0.0851 J	0.0463 U	0.0463 U	0.0463 U	0.0467 U	0.115 J	0.0463 U
NAPHTHALENE	14	0.0463 U	0.192	0.237	0.518	0.0463 U	0.0463 U	0.0463 U	0.0467 U	0.0485 U	--
PHENANTHRENE	210	0.0926 U	0.148 J	0.049 U	0.736	0.0463 U	0.115 J	0.0926 U	0.0935 U	0.0971 U	--
PYRENE	210	0.0463 U	0.0463 U	0.0711	0.157 J	0.0697	0.0723 J	0.0463 U	0.0467 U	0.0958 J	--
PETROLEUM HYDROCARBONS (mg/L)											
TRPH (C08-C40) (1)	5	0.157 U	2.08	NS	1.04	NS	0.157 U	0.157 U	0.17 U	0.17 U	--

Notes:

(1) = The criteria value for this parameter has been converted to match the reported result.

(2) = The criteria units and the result units for this parameter do not match, and a unit conversion mapping has not been established. Exceedance shading was not performed.

-- = The chemical was not analyzed or no value was available.

Data Qualifiers:

Blank (i.e., no qualifier) = the chemical was detected.

> = The chemical was detected.

J = The chemical was detected but the concentration reported is an estimated value.

U = The chemical was not detected.

< = The chemical was not detected.

R = The chemical was rejected.

ATTACHMENT 1
GROUNDWATER SAMPLING SHEETS

DEP-SOP-001/01
FS 2200 Groundwater Sampling

Form FD 9000-24
GROUNDWATER SAMPLING LOG

SITE NAME: Mayport		SITE LOCATION: Site 289	
WELL NO: MW03 D		SAMPLE ID: MPT-289-MW03 120712	DATE: July 12, 2012

PURGING DATA

WELL DIAMETER (Inches): 1	TUBING DIAMETER (Inches): 3/16	WELL SCREEN INTERVAL DEPTH: 30 feet to 35 feet	STATIC DEPTH TO WATER (feet): 5.40	PURGE PUMP TYPE OR BAILER: Peristaltic
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WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

$$= (40 \text{ gallons}) + (0.0014 \text{ gallons/foot} \times 3.94 \text{ feet}) + 0.25 \text{ L} = 0.97 \text{ L}$$

$$15 - 4.8 = 10.2 \text{ L}$$

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 32.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 32.5	PURGING INITIATED AT: 1055	PURGING ENDED AT: 1115	TOTAL VOLUME PURGED (gallons): 6.0
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TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1055	-	-	300	5.40	-	-	-	-	-	-	-
1100	1.5	1.5	300	5.42	8.53	25.60	947	1.72	25.83	Cloudy	-
1105	1.5	3.0	300	5.42	8.45	25.46	948	1.52	24.88	Cloudy	-
1110	1.5	4.5	300	5.42	8.37	25.45	948	1.44	23.98	Cloudy	-
1115	1.5	6.0	300	5.42	8.26	25.44	947	1.34	24.45	Cloudy	-
1120 - SAMPLE TIME - OVER 5X EQUIPMENT VOL'S PURGED											

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0008; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: K. WETCHERT	SAMPLER(S) SIGNATURE(S): K. WETCHERT	SAMPLING INITIATED AT: 1120	SAMPLING ENDED AT: 1130
PUMP OR TUBING DEPTH IN WELL (feet): 32.5/REPP	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y <input checked="" type="checkbox"/>	FILTER SIZE: ___ µm
FIELD DECONTAMINATION: PUMP Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	TUBING Y <input checked="" type="checkbox"/> N (replaced) <input type="checkbox"/>	DUPLICATE: Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
	3	CG	40 mL	HCL	40 mL	<2	8260	SM	
	2	AG	1 L	H2SO4	1 L	<2	TRPH	PP	
	2	AG	1L	---	1L	<2	8310	PP	

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Revision Date: February 1, 2004

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: Site 289	SITE LOCATION: NAVSTA MAYPORT
WELL NO: MW030	SAMPLE ID: MPT-289-GW-MW030-201010 DATE: 10/01/2012

PURGING DATA

WELL DIAMETER (in):	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 28.3 - 33.3	STATIC DEPTH TO WATER (ft): 6.35	PURGE PUMP TYPE OR BAILER: Peristaltic Pump							
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY <small>only fill out if applicable</small>											
Liters											
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME <small>(only fill out if applicable)</small>											
1.2 Liters (35' x 0.00529) + 1 = 1.2L											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 8	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 8	PURGE INITIATED AT: 1250	PURGE ENDED AT: 1406	TOTAL VOLUME PURGED (Liters): 38							
TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mL/min)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
1250	0	0	500	6.35'	-	-	-	-	-	-	-
1400	35.0	35.0	500	13.23	7.19	23.47	0.840	0.23	4.37	9.9	yellow
1403	1.5	36.5	500	13.24	7.18	23.53	0.840	0.23	4.37	10.0	yellow
1406	1.5	38.0	500	13.25	7.18	23.	0.841	0.22	3.84	9.9	yellow
1410	Sample time										
WELL CAPACITY (Liters Per Foot): 0.75" = 0.0757; 1" = 0.151; 1.25" = 0.227; 2" = 0.605; 3" = 0.37; 4" = 1.40; 5" = 3.861; 6" = 5.564; 12" = 22.25 TUBING INSIDE DIA. CAPACITY (Ltr/Ft.): 1/8" = 0.00227; 3/16" = 0.00529; 1/4" = 0.00984; 5/16" = 0.0151; 3/8" = 0.0227; 1/2" = 0.0378; 5/8" = 0.0605											

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TINUS/ Jeff Krone			SAMPLER(S) SIGNATURES:			SAMPLING INITIATED AT: 1410		SAMPLING ENDED AT: 1420		
PUMP OR TUBING DEPTH IN WELL (feet): 8			SAMPLE PUMP FLOW RATE (mL per minute): 500			TUBING MATERIAL CODE: Teflon				
FIELD DECONTAMINATION: Y <input checked="" type="radio"/> N			FIELD-FILTERED: Y <input checked="" type="radio"/> N			FILTER SIZE: _____ µm		DUPLICATE: Y <input checked="" type="radio"/> N		
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH				
REMARKS:										
MATERIAL CODES: AG = Amber Glass, CG = Clear Glass, PE = Polyethylene, PP = Polypropylene, S = Silicone, T = Teflon, O = Other (Specify)										
SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump, B = Baller, BP = Bladder Pump, ESP = Electric Submersible Pump, PP = Peristaltic Pump, RFPF = Reverse Flow Peristaltic Pump, SM = Straw Method (Tubing Gravity Drain), VT = Vacuum Trap, O = Other (Specify)										

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: SITE 289	SITE LOCATION: NAVSTA-MPT
WELL NO: PZ-2	SAMPLE ID: PZ-2-2011219 DATE: 12/19/2011

PURGING DATA

WELL DIAMETER (in): 3/4"	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH (ft): 0-7.5	STATIC DEPTH TO WATER (ft): 4.10	PURGE PUMP TYPE OR BAILER: Peristaltic Pump
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY only fill out if applicable) 0.3 Liters (7.5 - 4.10) (0.0757)				
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable) Liters				

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 5'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 5.5'	PURGE INITIATED AT: 0905	PURGE ENDED AT: 0929	TOTAL VOLUME PURGED (Liters): 4.4
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TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
0910	1.0	1.0	200	4.67	5.80	20.74	370	2.58	287.6	68.6	Clear/Cloud
0915	1.0	2.0	200	4.72	6.11	20.72	347	2.74	257.3	75.7	" / "
0920	1.0	3.0	200	4.77	6.39	20.73	327	1.57	229.0	63.7	Clear/cloudy
0925	1.0	4.0	200	4.81	6.38	20.74	323	1.54	212.9	67.0	cloudy
0927	0.2	4.2	200	4.83	6.38	20.74	322	1.53	209.1	67.5	Clear
0929	0.2	4.4	200	4.85	6.37	20.75	322	1.53	207.1	67.9	Clear

WELL CAPACITY (Liters Per Foot): 0.75" = 0.0757; 1" = 0.151; 1.25" = 0.227; 2" = 0.605; 3" = 0.37; 4" = 1.40; 5" = 3.861; 6" = 5.564; 12" = 22.25
 TUBING INSIDE DIA. CAPACITY (Ltr./Ft.): 1/8" = 0.00227; 3/16" = 0.00529; 1/4" = 0.00984; 5/16" = 0.0151; 3/8" = 0.0227; 1/2" = 0.0378; 5/8" = 0.0605

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Z. SCRIBNER / ITNUS	SAMPLER(S) SIGNATURES: [Signature]	SAMPLING INITIATED AT: 0930	SAMPLING ENDED AT: 0955
PUMP OR TUBING DEPTH IN WELL (feet): 5.5'	SAMPLE PUMP FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: Tetlon PE	
FIELD DECONTAMINATION: Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	FIELD-FILTERED: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>	FILTER SIZE: — µm	DUPLICATE: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40mL	HCl	40mL (3)	4.2	VOC	RFPP
2	2	AG	1L	HCl	1L (2)		TPPH-FLP20	PP
3	2	AG	1L	—	1L (2)		PAH-LL	PP
4	1	P	250mL	HNO3	250mL		Pb ONLY	PP

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

**Form FD 9000-24
GROUNDWATER SAMPLING LOG**

SITE NAME: 289	SITE LOCATION: MPT-289
WELL NO: PZ-02	SAMPLE ID: MPT-289-PZ02-081612 DATE: 8-16-12

PURGING DATA

WELL DIAMETER (Inches): 1"	TUBING DIAMETER (Inches): 3/16	WELL SCREEN INTERVAL DEPTH: 5 feet to 10 feet	STATIC DEPTH TO WATER (feet): 7.15	PURGE PUMP TYPE OR BAILER: PP
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) x WELL CAPACITY (only fill out if applicable) = (10 - 7.15) (0.04) (3.84 Gal) = 0.48 L *8 = 2.15 L				

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY x TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

= gallons + (gallons/foot x feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 8.1'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 8.1'	PURGING INITIATED AT: 1035	PURGING ENDED AT: 1150	TOTAL VOLUME PURGED (gallons): 18.75 L
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TIME	VOLUME PURGED (gallons/L)	CUMUL. VOLUME PURGED (gallons/L)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) μmhos/cm or μS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1035	-	-	250	7.15	-	-	-	-	-	-	-
1100	6.25	6.25	250	7.23	6.36	20.24	861	1.20	42.35	CLOUDY	-
1115	3.75	10.00	250	7.24	6.34	20.20	799	1.18	31.36	CLOUDY	-
1120	1.25	11.25	250	7.24	6.34	20.19	799	1.18	24.77	CLEAR	-
1130	2.50	13.75	250	7.24	6.33	20.19	797	1.14	19.85	CLEAR	-
1140	2.50	16.25	250	7.24	6.33	20.20	796	1.11	15.72	CLEAR	-
1150	2.50	18.75	250	7.25	6.32	20.18	797	1.10	12.10	CLEAR	-
1200 - SAMPLE TIME - OVER 40 WELL VOLUMES PURGED											

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: K. WEICHERT	SAMPLER(S) SIGNATURE(S): [Signature]	SAMPLING INITIATED AT: 1200	SAMPLING ENDED AT: 1220
PUMP OR TUBING DEPTH IN WELL (feet):	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N)	FILTER SIZE: _____ μm

FIELD DECONTAMINATION: PUMP **Y** (N) TUBING **Y** (N) **replaced** DUPLICATE: **Y** (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
1	2	AG	1L	-	1L	-	SERKET/SVOD/PPM		

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2) optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)