



ARM Group LLC

Engineers and Scientists

January 6, 2020

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Re: NAPL Delineation Completion Report
Area A: Parcel A10 (A10-006-PZ)
Tradepoint Atlantic
Sparrows Point, MD 21219

Dear Ms. Brown:

In July 2016, ARM Group LLC (ARM), on behalf of EnviroAnalytics Group (EAG), completed a Phase II Investigation of a portion of the Tradepoint Atlantic property that has been designated as Area A: Parcel A10 (the Site). On July 7, 2016, while screening the soil cores associated with boring A10-006-SB, strong odors and an amber colored non-aqueous phase liquid (NAPL) were noted in the soil boring from 7 to 8 feet and from 9 to 9.5 feet below ground surface (bgs). An intermediate depth soil sample was collected from the 6 to 7 foot bgs interval (A10-006-SB-7) just above the observed impacts and the water table.

Based on the observation of NAPL, and in accordance with the Phase II Investigation Work Plan, a temporary NAPL screening piezometer (A10-006-PZ) was installed with a screen interval from 4 to 14 feet bgs. After installation, the piezometer was checked for the presence of accumulated NAPL using an oil-water interface probe. The 0-hour, 48-hour, and 30-day gauging events at this location were all absent of measurable or trace NAPL. An additional gauging event was completed approximately one year after the installation on July 31, 2017; NAPL was not detected during this independent gauging event. Static groundwater was measured at an approximate depth of 7 feet bgs on this date.

The MDE provided approval, via an email on February 26, 2018, that the NAPL screening piezometer A10-006-PZ could be abandoned. However, prior to its abandonment, trace NAPL was detected in A10-006-PZ on January 4, 2019. Four delineation piezometers were subsequently installed in January 2019 at approximately 25 feet to the north (A10-006A-PZ), east (A10-006B-PZ), south (A10-006C-PZ), and west (A10-006D-PZ) surrounding A10-006-PZ to delineate the extent of potentially mobile NAPL, and a fifth piezometer (A10-006E-PZ) was installed approximately 25 feet south of A10-006-PZ directly adjacent to A10-006C-PZ due to

the identification of a perched groundwater zone overlying approximately 8.5 feet of clay and subsequently the shallow hydrogeologic zone. Measurable NAPL was identified in the two southern piezometers (A10-006C-PZ and A10-006E-PZ). Following the identification of NAPL in these paired piezometers, an additional three pairs of shallow/perched delineation piezometers (A10-006F-PZ through A10-006K-PZ) were subsequently installed approximately 25 feet to the south, east, and west surrounding A10-006C-PZ/A10-006E-PZ between January 25 and February 11, 2019. The locations of the delineation piezometers are provided on **Figure 1**.

Each piezometer has been periodically monitored to document the presence of any NAPL. The dates of monitoring activities, as well as NAPL thickness measurements and water level measurements, have been included in **Table 1**. This table also includes the installation date of each piezometer, as well as relevant construction details (screen intervals, etc.). Boring logs documenting soil core observations were completed for all delineation piezometers installed in the vicinity of A10-006-PZ. The combined soil boring observation and piezometer construction logs are provided in **Attachment 1**.

As indicated on **Figure 1** and in **Table 1**, NAPL has been detected at three piezometer locations: A10-006-PZ, A10-006C-PZ, and A10-006E-PZ. A thin layer of light NAPL (LNAPL) was identified in piezometer A10-006C-PZ during the 0-hour gauging event, and a significant amount of dense NAPL (DNAPL) was identified during the 48-hour gauging event and subsequent gauging events. The observed thickness of the DNAPL is likely due to the product settling within the screen interval from an overlying NAPL-impacted layer (NAPL was observed in the soil core from roughly 9.5 to 13 feet bgs). While no NAPL was identified in A10-006E-PZ during the 0-hour gauging event, a significant layer of LNAPL was present during the 48-hour gauging event and subsequent gauging events. Only trace amounts of NAPL have been detected in A10-006-PZ since the initial discovery on January 4, 2019, and NAPL was not detected during the most recent event on December 17, 2019.

On August 13, 2019, a pale gray, moderately thick product was observed on the oil-water interface probe upon withdraw from A10-006K-PZ. There was no odor and the oil-water interface probe did not react to the product. A sample of product was removed from A10-006K-PZ using a bailer on August 13, 2019 and placed in a clear unpreserved laboratory sample jar for observation. On October 28, 2019, ARM personnel re-examined the jar of product and observed that there was a separation of water and the unknown product. The unknown product had settled to the bottom of the sample jar; indicating a DNAPL. Photographs of the observations on August 13, 2019 and October 28, 2019 have been included as **Attachment 2**.

Weekly NAPL gauging has occurred at A10-006-PZ and the surrounding delineation piezometers since mid-November 2019. LNAPL has been removed from A10-006E-PZ during each of these gauging events. In addition, the unknown gray product has been removed from A10-006K-PZ during each event. It has not been feasible to remove the DNAPL from A10-



006C-PZ due to the viscosity of the product at this location. The gauging information and approximate quantities removed during each event are provided on **Table 1**. Any NAPL that was removed has been placed in sealed drums stored adjacent to the delineation area. All of the NAPL removed from these piezometers will be characterized and disposed of at an off-site permitted disposal facility.

The NAPL impacts in the vicinity of A10-006-PZ have been adequately defined. Therefore, approval is requested to abandon the piezometers within the delineation area. The NAPL delineation piezometers will be gauged a final time on the abandonment date as recommended by the MDE, and subsequently abandoned in accordance with COMAR 26.04.04.34 through 36. The MDE will be notified if NAPL is detected in any piezometers which were not previously determined to be impacted.

Following the abandonment of the piezometers, test pitting using an excavator is proposed to further investigate the extent of NAPL impacts in the vicinity of A10-006-PZ. It is anticipated that the test pits will extend to a depth of approximately 13 feet bgs (top of clay). The MDE will be notified of any observations of NAPL identified during the test pitting, and a brief letter report will be prepared to summarize these field activities. Any additional response activities or future monitoring will be coordinated with the MDE pending the results of the test pitting investigation.

If you have any questions, or if we can provide any additional information at this time, please do not hesitate to contact ARM Group LLC at 410-290-7775.

Respectfully submitted,
ARM Group LLC



Tyler C. Van Ness
Staff Scientist









Eric S. Magdar, P.G.
Vice President



FIGURES



-  NAPL Piezometer (no detection)
-  NAPL Piezometer (detection)
-  NAPL Piezometer (unknown product)
-  Former Buildings (demolished)

ARM Group LLC
Engineers and Scientists

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Feet

EnviroAnalytics Group
ARM Project 150298M-5

Tradeport Atlantic
Baltimore County, MD

Parcel A10 (A10-006-PZ)
NAPL Delineation Area

January 2, 2020

Figure
1

TABLES

**Table 1 - Parcel A10
NAPL Gauging Activities
Tradepoint Atlantic
Sparrows Point, Maryland**

Sample ID	Installation Date	Well Total Depth (ft bgs)	Screen Interval (ft bgs)	Riser Stick-Up (ft)	7/7/2016				7/11/2016			
					Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)	Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)
A10-006-PZ	7/7/2016	14	4-14	2.88	-	11.78	16.88	-	-	9.82	16.00	-
A10-006A-PZ	1/15/2019	19	3-19	2.5	NA	NA	NA	NA	NA	NA	NA	NA
A10-006B-PZ	1/16/2019	28	5-28	2.37	NA	NA	NA	NA	NA	NA	NA	NA
A10-006C-PZ	1/16/2019	30	4-30	2.92	NA	NA	NA	NA	NA	NA	NA	NA
A10-006D-PZ	1/16/2019	15	3-15	2.45	NA	NA	NA	NA	NA	NA	NA	NA
A10-006E-PZ	1/16/2019	15	3-15	2.58	NA	NA	NA	NA	NA	NA	NA	NA
A10-006F-PZ	1/25/2019	30	15-30	2.95	NA	NA	NA	NA	NA	NA	NA	NA
A10-006G-PZ	1/25/2019	15	3-15	1.74	NA	NA	NA	NA	NA	NA	NA	NA
A10-006H-PZ	2/11/2019	30	15-30	3.02	NA	NA	NA	NA	NA	NA	NA	NA
A10-006I-PZ	2/11/2019	15	3-15	2.82	NA	NA	NA	NA	NA	NA	NA	NA
A10-006J-PZ	2/11/2019	30	15-30	2.81	NA	NA	NA	NA	NA	NA	NA	NA
A10-006K-PZ*	2/11/2019	15	3-15	2.51	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not Applicable

NM = Not Measured

Pink = LNAPL Detection

Blue = DNAPL Detection

Purple = LNAPL & DNAPL Detection

Gray = Gray Product DNAPL Detection

bgs = below ground surface

TOC = Top of Casing

**Table 1 - Parcel A10
NAPL Gauging Activities
Tradepoint Atlantic
Sparrows Point, Maryland**

Sample ID	Installation Date	Well Total Depth (ft bgs)	Screen Interval (ft bgs)	Riser Stick-Up (ft)	8/26/2016				7/31/2017			
					Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)	Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)
A10-006-PZ	7/7/2016	14	4-14	2.88	-	9.75	15.81	-	-	9.74	NM	-
A10-006A-PZ	1/15/2019	19	3-19	2.5	NA	NA	NA	NA	NA	NA	NA	NA
A10-006B-PZ	1/16/2019	28	5-28	2.37	NA	NA	NA	NA	NA	NA	NA	NA
A10-006C-PZ	1/16/2019	30	4-30	2.92	NA	NA	NA	NA	NA	NA	NA	NA
A10-006D-PZ	1/16/2019	15	3-15	2.45	NA	NA	NA	NA	NA	NA	NA	NA
A10-006E-PZ	1/16/2019	15	3-15	2.58	NA	NA	NA	NA	NA	NA	NA	NA
A10-006F-PZ	1/25/2019	30	15-30	2.95	NA	NA	NA	NA	NA	NA	NA	NA
A10-006G-PZ	1/25/2019	15	3-15	1.74	NA	NA	NA	NA	NA	NA	NA	NA
A10-006H-PZ	2/11/2019	30	15-30	3.02	NA	NA	NA	NA	NA	NA	NA	NA
A10-006I-PZ	2/11/2019	15	3-15	2.82	NA	NA	NA	NA	NA	NA	NA	NA
A10-006J-PZ	2/11/2019	30	15-30	2.81	NA	NA	NA	NA	NA	NA	NA	NA
A10-006K-PZ*	2/11/2019	15	3-15	2.51	NA	NA	NA	NA	NA	NA	NA	NA

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NAPL Gauging Activities
Tradepoint Atlantic
Sparrows Point, Maryland**

Sample ID	Installation Date	Well Total Depth (ft bgs)	Screen Interval (ft bgs)	Riser Stick-Up (ft)	1/4/2019				1/15/2019			
					Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)	Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)
A10-006-PZ	7/7/2016	14	4-14	2.88	trace	8.45	15.06	trace	NM	NM	NM	NM
A10-006A-PZ	1/15/2019	19	3-19	2.5	NA	NA	NA	NA	-	11.11	20.17	-
A10-006B-PZ	1/16/2019	28	5-28	2.37	NA	NA	NA	NA	NA	NA	NA	NA
A10-006C-PZ	1/16/2019	30	4-30	2.92	NA	NA	NA	NA	NA	NA	NA	NA
A10-006D-PZ	1/16/2019	15	3-15	2.45	NA	NA	NA	NA	NA	NA	NA	NA
A10-006E-PZ	1/16/2019	15	3-15	2.58	NA	NA	NA	NA	NA	NA	NA	NA
A10-006F-PZ	1/25/2019	30	15-30	2.95	NA	NA	NA	NA	NA	NA	NA	NA
A10-006G-PZ	1/25/2019	15	3-15	1.74	NA	NA	NA	NA	NA	NA	NA	NA
A10-006H-PZ	2/11/2019	30	15-30	3.02	NA	NA	NA	NA	NA	NA	NA	NA
A10-006I-PZ	2/11/2019	15	3-15	2.82	NA	NA	NA	NA	NA	NA	NA	NA
A10-006J-PZ	2/11/2019	30	15-30	2.81	NA	NA	NA	NA	NA	NA	NA	NA
A10-006K-PZ*	2/11/2019	15	3-15	2.51	NA	NA	NA	NA	NA	NA	NA	NA

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Tradepoint Atlantic
Sparrows Point, Maryland**

Sample ID	Installation Date	Well Total Depth (ft bgs)	Screen Interval (ft bgs)	Riser Stick-Up (ft)	1/16/2019				1/17/2019			
					Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)	Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)
A10-006-PZ	7/7/2016	14	4-14	2.88	NM	NM	NM	NM	NM	NM	NM	NM
A10-006A-PZ	1/15/2019	19	3-19	2.5	NM	NM	NM	NM	-	10.50	16.15	-
A10-006B-PZ	1/16/2019	28	5-28	2.37	-	15.88	30.32	-	NM	NM	NM	NM
A10-006C-PZ	1/16/2019	30	4-30	2.92	17.74	17.76	29.98	0.02	NM	NM	NM	NM
A10-006D-PZ	1/16/2019	15	3-15	2.45	-	dry	16.73	-	NM	NM	NM	NM
A10-006E-PZ	1/16/2019	15	3-15	2.58	-	11.05	17.02	-	NM	NM	NM	NM
A10-006F-PZ	1/25/2019	30	15-30	2.95	NA	NA	NA	NA	NA	NA	NA	NA
A10-006G-PZ	1/25/2019	15	3-15	1.74	NA	NA	NA	NA	NA	NA	NA	NA
A10-006H-PZ	2/11/2019	30	15-30	3.02	NA	NA	NA	NA	NA	NA	NA	NA
A10-006I-PZ	2/11/2019	15	3-15	2.82	NA	NA	NA	NA	NA	NA	NA	NA
A10-006J-PZ	2/11/2019	30	15-30	2.81	NA	NA	NA	NA	NA	NA	NA	NA
A10-006K-PZ*	2/11/2019	15	3-15	2.51	NA	NA	NA	NA	NA	NA	NA	NA

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NAPL Gauging Activities
Tradepoint Atlantic
Sparrows Point, Maryland**

Sample ID	Installation Date	Well Total Depth (ft bgs)	Screen Interval (ft bgs)	Riser Stick-Up (ft)	1/18/2019				1/23/2019			
					Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)	Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)
A10-006-PZ	7/7/2016	14	4-14	2.88	NM	NM	NM	NM	trace	9.89	15.58	trace
A10-006A-PZ	1/15/2019	19	3-19	2.5	NM	NM	NM	NM	-	10.50	16.14	-
A10-006B-PZ	1/16/2019	28	5-28	2.37	-	14.92	29.43	-	-	14.68	29.51	-
A10-006C-PZ	1/16/2019	30	4-30	2.92	14.09	-	29.85	18.83	13.92	12.64	28.59	19.00
A10-006D-PZ	1/16/2019	15	3-15	2.45	-	14.45	16.73	-	-	7.48	16.71	-
A10-006E-PZ	1/16/2019	15	3-15	2.58	8.65	14.20	16.32	5.55	9.76	13.65	16.29	3.89
A10-006F-PZ	1/25/2019	30	15-30	2.95	NA	NA	NA	NA	NA	NA	NA	NA
A10-006G-PZ	1/25/2019	15	3-15	1.74	NA	NA	NA	NA	NA	NA	NA	NA
A10-006H-PZ	2/11/2019	30	15-30	3.02	NA	NA	NA	NA	NA	NA	NA	NA
A10-006I-PZ	2/11/2019	15	3-15	2.82	NA	NA	NA	NA	NA	NA	NA	NA
A10-006J-PZ	2/11/2019	30	15-30	2.81	NA	NA	NA	NA	NA	NA	NA	NA
A10-006K-PZ*	2/11/2019	15	3-15	2.51	NA	NA	NA	NA	NA	NA	NA	NA

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NAPL Gauging Activities
Tradepoint Atlantic
Sparrows Point, Maryland**

Sample ID	Installation Date	Well Total Depth (ft bgs)	Screen Interval (ft bgs)	Riser Stick-Up (ft)	1/25/2019				1/28/2019			
					Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)	Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)
A10-006-PZ	7/7/2016	14	4-14	2.88	NM	NM	NM	NM	NM	NM	NM	NM
A10-006A-PZ	1/15/2019	19	3-19	2.5	NM	NM	NM	NM	NM	NM	NM	NM
A10-006B-PZ	1/16/2019	28	5-28	2.37	NM	NM	NM	NM	NM	NM	NM	NM
A10-006C-PZ	1/16/2019	30	4-30	2.92	NM	NM	NM	NM	NM	NM	NM	NM
A10-006D-PZ	1/16/2019	15	3-15	2.45	NM	NM	NM	NM	NM	NM	NM	NM
A10-006E-PZ	1/16/2019	15	3-15	2.58	NM	NM	NM	NM	NM	NM	NM	NM
A10-006F-PZ	1/25/2019	30	15-30	2.95	-	14.56	32.50	-	-	15.15		-
A10-006G-PZ	1/25/2019	15	3-15	1.74	-	dry	16.78	-	-	7.04		-
A10-006H-PZ	2/11/2019	30	15-30	3.02	NA	NA	NA	NA	NA	NA	NA	NA
A10-006I-PZ	2/11/2019	15	3-15	2.82	NA	NA	NA	NA	NA	NA	NA	NA
A10-006J-PZ	2/11/2019	30	15-30	2.81	NA	NA	NA	NA	NA	NA	NA	NA
A10-006K-PZ*	2/11/2019	15	3-15	2.51	NA	NA	NA	NA	NA	NA	NA	NA

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NAPL Gauging Activities
Tradepoint Atlantic
Sparrows Point, Maryland**

Sample ID	Installation Date	Well Total Depth (ft bgs)	Screen Interval (ft bgs)	Riser Stick-Up (ft)	2/11/2019				2/14/2019			
					Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)	Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)
A10-006-PZ	7/7/2016	14	4-14	2.88	NM	NM	NM	NM	NM	NM	NM	NM
A10-006A-PZ	1/15/2019	19	3-19	2.5	NM	NM	NM	NM	NM	NM	NM	NM
A10-006B-PZ	1/16/2019	28	5-28	2.37	NM	NM	NM	NM	NM	NM	NM	NM
A10-006C-PZ	1/16/2019	30	4-30	2.92	NM	NM	NM	NM	NM	NM	NM	NM
A10-006D-PZ	1/16/2019	15	3-15	2.45	NM	NM	NM	NM	NM	NM	NM	NM
A10-006E-PZ	1/16/2019	15	3-15	2.58	NM	NM	NM	NM	NM	NM	NM	NM
A10-006F-PZ	1/25/2019	30	15-30	2.95	NM	NM	NM	NM	NM	NM	NM	NM
A10-006G-PZ	1/25/2019	15	3-15	1.74	NM	NM	NM	NM	NM	NM	NM	NM
A10-006H-PZ	2/11/2019	30	15-30	3.02	-	15.73	27.72	-	-	15.00		-
A10-006I-PZ	2/11/2019	15	3-15	2.82	-	9.61	15.08	-	-	8.59		-
A10-006J-PZ	2/11/2019	30	15-30	2.81	-	13.24	32.08	-	-	13.94		-
A10-006K-PZ*	2/11/2019	15	3-15	2.51	-	7.85	16.42	-	-	7.53		-

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**Table 1 - Parcel A10
NAPL Gauging Activities
Tradepoint Atlantic
Sparrows Point, Maryland**

Sample ID	Installation Date	Well Total Depth (ft bgs)	Screen Interval (ft bgs)	Riser Stick-Up (ft)	2/18/2019				2/26/2019			
					Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)	Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)
A10-006-PZ	7/7/2016	14	4-14	2.88	NM	NM	NM	NM	NM	NM	NM	NM
A10-006A-PZ	1/15/2019	19	3-19	2.5	-	10.40	15.09	-	NM	NM	NM	NM
A10-006B-PZ	1/16/2019	28	5-28	2.37	-	14.59	29.33	-	NM	NM	NM	NM
A10-006C-PZ	1/16/2019	30	4-30	2.92	16.04	13.59	21.92	16.88	NM	NM	NM	NM
A10-006D-PZ	1/16/2019	15	3-15	2.45	-	7.47	16.72	-	NM	NM	NM	NM
A10-006E-PZ	1/16/2019	15	3-15	2.58	8.61	11.70	15.95	3.09	NM	NM	NM	NM
A10-006F-PZ	1/25/2019	30	15-30	2.95	NM	NM	NM	NM	-	15.08	32.24	-
A10-006G-PZ	1/25/2019	15	3-15	1.74	NM	NM	NM	NM	-	6.26	16.27	-
A10-006H-PZ	2/11/2019	30	15-30	3.02	NM	NM	NM	NM	NM	NM	NM	NM
A10-006I-PZ	2/11/2019	15	3-15	2.82	NM	NM	NM	NM	NM	NM	NM	NM
A10-006J-PZ	2/11/2019	30	15-30	2.81	NM	NM	NM	NM	NM	NM	NM	NM
A10-006K-PZ*	2/11/2019	15	3-15	2.51	NM	NM	NM	NM	NM	NM	NM	NM

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Gray = Gray Product DNAPL Detection

bgs = below ground surface

TOC = Top of Casing

**Table 1 - Parcel A10
 NAPL Gauging Activities
 Tradepoint Atlantic
 Sparrows Point, Maryland**

Sample ID	Installation Date	Well Total Depth (ft bgs)	Screen Interval (ft bgs)	Riser Stick-Up (ft)	2/28/2019				8/8/2019			
					Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)	Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)
A10-006-PZ	7/7/2016	14	4-14	2.88	NM	NM	NM	NM	NM	NM	NM	NM
A10-006A-PZ	1/15/2019	19	3-19	2.5	-	10.45	15.73	-	-	10.68	15.36	-
A10-006B-PZ	1/16/2019	28	5-28	2.37	-	11.58	29.03	-	NM	NM	NM	NM
A10-006C-PZ	1/16/2019	30	4-30	2.92	NM	NM	NM	NM	NM	NM	NM	NM
A10-006D-PZ	1/16/2019	15	3-15	2.45	-	7.47	16.88	-	-	8.10	16.73	-
A10-006E-PZ	1/16/2019	15	3-15	2.58	NM	NM	NM	NM	NM	NM	NM	NM
A10-006F-PZ	1/25/2019	30	15-30	2.95	-	15.12	31.28	-	NM	NM	NM	NM
A10-006G-PZ	1/25/2019	15	3-15	1.74	-	6.74	16.76	-	NM	NM	NM	NM
A10-006H-PZ	2/11/2019	30	15-30	3.02	-	15.18	32.69	-	NM	NM	NM	NM
A10-006I-PZ	2/11/2019	15	3-15	2.82	-	8.79	15.74	-	NM	NM	NM	NM
A10-006J-PZ	2/11/2019	30	15-30	2.81	-	14.02	32.07	-	NM	NM	NM	NM
A10-006K-PZ*	2/11/2019	15	3-15	2.51	-	7.74	16.03	-	NM	NM	NM	NM

NA = Not Applicable

NM = Not Measured

Pink = LNAPL Detection

Blue = DNAPL Detection

Purple = LNAPL & DNAPL Detection

Gray = Gray Product DNAPL Detection

bgs = below ground surface

TOC = Top of Casing

**Table 1 - Parcel A10
NAPL Gauging Activities
Tradepoint Atlantic
Sparrows Point, Maryland**

Sample ID	Installation Date	Well Total Depth (ft bgs)	Screen Interval (ft bgs)	Riser Stick-Up (ft)	8/13/2019				11/19/2019				
					Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)	Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)	NAPL Removed (gallons)
A10-006-PZ	7/7/2016	14	4-14	2.88	-	10.42	15.54	-	trace	10.44	15.41	trace	NA
A10-006A-PZ	1/15/2019	19	3-19	2.5	-	10.77	15.50	-	-	10.79	15.23	-	NA
A10-006B-PZ	1/16/2019	28	5-28	2.37	-	15.95	28.70	-	-	15.59	28.55	-	NA
A10-006C-PZ	1/16/2019	30	4-30	2.92	14.03	13.55	28.43	18.89	trace LNAPL/ 15.22 DNAPL	13.41	28.38	17.70	NA
A10-006D-PZ	1/16/2019	15	3-15	2.45	-	8.41	16.75	-	-	8.20	10.08	-	NA
A10-006E-PZ	1/16/2019	15	3-15	2.58	8.70	12.91	15.87	4.21	9.00	11.95	15.85	2.95	0.12
A10-006F-PZ	1/25/2019	30	15-30	2.95	-	16.58	30.76	-	-	16.33	30.62	-	NA
A10-006G-PZ	1/25/2019	15	3-15	1.74	-	8.36	16.28	-	-	8.44	10.12	-	NA
A10-006H-PZ	2/11/2019	30	15-30	3.02	-	16.17	32.02	-	-	15.53	31.57	-	NA
A10-006I-PZ	2/11/2019	15	3-15	2.82	-	9.75	15.50	-	-	9.80	15.01	-	NA
A10-006J-PZ	2/11/2019	30	15-30	2.81	-	15.44	31.99	-	-	15.24	31.86	-	NA
A10-006K-PZ*	2/11/2019	15	3-15	2.51	7.98	7.98	12.02	9.53	10.12	7.90	10.12	7.39	0.30

NA = Not Applicable

NM = Not Measured

Pink = LNAPL Detection

Blue = DNAPL Detection

Purple = LNAPL & DNAPL Detection

Gray = Gray Product DNAPL Detection

bgs = below ground surface

TOC = Top of Casing

* A10-006K-PZ contained a pale gray, moderately thick product throughout the water column. No odor was evident and the oil-water interface probe was not reactive to the product. A sample of product was removed from the piezometer using a bailer and stored in a glass jar for observation.

**Table 1 - Parcel A10
NAPL Gauging Activities
Tradepoint Atlantic
Sparrows Point, Maryland**

Sample ID	Installation Date	Well Total Depth (ft bgs)	Screen Interval (ft bgs)	Riser Stick-Up (ft)	12/2/2019					12/9/2019				
					Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)	NAPL Removed (gallons)	Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)	NAPL Removed (gallons)
A10-006-PZ	7/7/2016	14	4-14	2.88	trace	10.31	15.34	trace	NA	-	10.26	15.32	-	NA
A10-006A-PZ	1/15/2019	19	3-19	2.5	-	10.61	15.30	-	NA	-	10.59	15.27	-	NA
A10-006B-PZ	1/16/2019	28	5-28	2.37	-	15.77	28.61	-	NA	-	15.74	28.44	-	NA
A10-006C-PZ	1/16/2019	30	4-30	2.92	15.26	15.21	28.11	17.66	NA	trace LNAPL/ 16.20 DNAPL	14.92	28.05	16.72	NA
A10-006D-PZ	1/16/2019	15	3-15	2.45	-	2.40	18.11	-	NA	-	8.00	16.74	-	NA
A10-006E-PZ	1/16/2019	15	3-15	2.58	9.00	10.41	15.92	1.41	0.06	8.99	9.80	15.91	0.81	0.03
A10-006F-PZ	1/25/2019	30	15-30	2.95	-	16.12	30.69	-	NA	-	16.25	30.62	-	NA
A10-006G-PZ	1/25/2019	15	3-15	1.74	-	5.37	16.30	-	NA	-	8.23	10.12	-	NA
A10-006H-PZ	2/11/2019	30	15-30	3.02	-	15.58	31.44	-	NA	-	15.76	31.30	-	NA
A10-006I-PZ	2/11/2019	15	3-15	2.82	-	9.11	15.04	-	NA	-	9.47	15.02	-	NA
A10-006J-PZ	2/11/2019	30	15-30	2.81	-	15.05	27.59	-	NA	-	15.18	31.86	-	NA
A10-006K-PZ*	2/11/2019	15	3-15	2.51	10.81	7.70	10.81	6.70	0.27	10.00	7.86	10.68	7.51	0.31

NA = Not Applicable

NM = Not Measured

Pink = LNAPL Detection

Blue = DNAPL Detection

Purple = LNAPL & DNAPL Detection

Gray = Gray Product DNAPL Detection

bgs = below ground surface

TOC = Top of Casing

* A10-006K-PZ contained a pale gray, moderately thick product throughout the water column. No odor was evident and the oil-water interface probe was not reactive to the product. A sample of product was removed from the piezometer using a bailer and stored in a glass jar for observation.

**Table 1 - Parcel A10
NAPL Gauging Activities
Tradepoint Atlantic
Sparrows Point, Maryland**

Sample ID	Installation Date	Well Total Depth (ft bgs)	Screen Interval (ft bgs)	Riser Stick-Up (ft)	12/17/2019				
					Depth to NAPL (ft TOC)	Depth to Water (ft TOC)	Measured Depth to Bottom (ft TOC)	NAPL Thickness (ft)	NAPL Removed (gallons)
A10-006-PZ	7/7/2016	14	4-14	2.88	-	10.00	15.39	-	NA
A10-006A-PZ	1/15/2019	19	3-19	2.5	-	10.31	15.23	-	NA
A10-006B-PZ	1/16/2019	28	5-28	2.37	-	15.06	28.42	-	NA
A10-006C-PZ	1/16/2019	30	4-30	2.92	14.62	14.11	29.92	18.30	NA
A10-006D-PZ	1/16/2019	15	3-15	2.45	-	7.70	10.11	-	NA
A10-006E-PZ	1/16/2019	15	3-15	2.58	8.78	10.21	16.91	1.43	0.06
A10-006F-PZ	1/25/2019	30	15-30	2.95	-	15.62	30.64	-	NA
A10-006G-PZ	1/25/2019	15	3-15	1.74	-	4.84	10.12	-	NA
A10-006H-PZ	2/11/2019	30	15-30	3.02	-	15.33	17.79	-	NA
A10-006I-PZ	2/11/2019	15	3-15	2.82	-	8.68	15.00	-	NA
A10-006J-PZ	2/11/2019	30	15-30	2.81	-	14.56	27.57	-	NA
A10-006K-PZ*	2/11/2019	15	3-15	2.51	-	7.76	10.13	-	NA

NA = Not Applicable

NM = Not Measured

Pink = LNAPL Detection

Blue = DNAPL Detection

Purple = LNAPL & DNAPL Detection

Gray = Gray Product DNAPL Detection

bgs = below ground surface

TOC = Top of Casing

Attachment 1



Client : EnviroAnalytics Group
 ARM Project No. : 150298M-5-3
 Project Description : Sparrows Point - Parcel A10
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : M. Replogle, E.I.T.
 Drilling Company : Green Services, Inc.
 Driller : Don Marchese
 Drilling Equipment : Geoprobe 7822DT

Soil Boring Installation Date : 7/7/2016
 Piezometer Installation Date : 7/7/2016
 Casing/Riser/Screen Type : PVC
 Borehole Diameter : 2.25"
 Riser/Screen Diameter : 1"
 Northing (US ft) : 571203.33
 Easting (US ft) : 1464836.17
 0-Hr DTW : 11.78' TOC
 48-Hr DTW : 9.82' TOC
 No LNAPL or DNAPL at 0 or 48 hours

Boring ID: A10-006-SB/PZ

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0		-	A10-006-SB-1	(0-0.5') CONCRETE, loose, white, dry, non plastic, non cohesive	-	<p>Wet at 7' bgs High sheen and low viscosity product from 7-8' and 9-9.5' bgs, strong odor, amber color</p>
4.6				(0.5-1.5') SILT with GRAVEL, soft, red then brownish yellow, dry, non plastic, non cohesive	ML	
90		4.2		(1.5-2.5') SAND, fine to coarse grained, loose, black, dry, non plastic, non cohesive	SW	
3.7				(2.5-5') CLAY, firm, yellowish brown, dry to moist, medium plasticity to high plasticity, cohesive	CL	
5		2.3				
11.3				(5-7') CLAY grading to SANDY CLAY, firm to soft, yellowish brown, dry to very moist, medium plasticity, cohesive	CL	
127.0			A10-006-SB-7			
100		12.6		(7-7.5') SAND, fine grained, loose, brown, wet, non plastic, non cohesive	SP	
110.8				(7.5-9') CLAY, very firm, yellowish brown, dry, high plasticity, cohesive	CL	
133.5				(9-9.5') SAND, fine grained, loose, yellowish brown, non plastic, non cohesive	SP	
				(9.5-10') CLAYEY SAND, dense, yellowish brown, dry, non plastic, non cohesive	SP-SC	
				(10-15') CLAY, firm to very firm, yellowish brown grading to yellowish red and yellowish brown mottling, moist to dry, medium plasticity, cohesive	CL	
15				End of Boring		

Boring terminated at 15' bgs due to water and piezometer installation.
 TOC: Top of PVC casing
 DTW: Depth to water
 bgs: Below ground surface
 AMSL: Above mean sea level

Riser Stickup: 2.88'
 Riser: 0 - 4' bgs
 Screen: 4 - 14' bgs [Slot Size: 0.010"]
 Sand Pack: 2 - 14' bgs [Grain Size: WG #2]
 Bentonite Seal: 0 - 2' bgs [Grain Size: Granular/3/8" chips]



Client : EnviroAnalytics Group
 ARM Project No. : 150298M-5-3
 Project Description : Sparrows Point - Parcel A10
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : M. Replogle, EIT
 Drilling Company : Allied Well Drilling
 Driller : Tim Moyer
 Drilling Equipment : Geoprobe 77DT

Soil Boring Installation Date : 01/15/2019
 Piezometer Installation Date : 01/15/2019
 Casing/Riser/Screen Type : PVC
 Borehole Diameter : 2.25"
 Riser/Screen Diameter : 1"
 Northing (US ft) : 571228.33
 Easting (US ft) : 1464836.17
 0-Hr DTW : 11.11' TOC
 48-Hr DTW : 10.50' TOC
 No LNAPL or DNAPL at 0 or 48 hours

Boring ID: A10-006A-SB/PZ

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0	-	-		(0-0.5') CONCRETE, SAND and GRAVEL-sized, with trace BRICK, medium dense, very pale brown with some red, very moist, non-plastic, non-cohesive	NA	<p>Bentonite seal 1" PVC Riser Sand Pack 1" PVC Screen</p> <p>Wet at 12.5' bgs</p>
60	9.0	24.3		(0.5-8') Non-native SAND, fine to coarse, with SLAG, SAND and GRAVEL-sized, fine to coarse, medium dense, very dark brown and gray, dry, non-plastic, non-cohesive	SW/GW	
5	-	31.3				
76	3.2	0.6		(8-9') SANDY CLAY, very firm, brownish gray, dry then very moist at 8.5' bgs, low plasticity, cohesive, trace sand at 8.5' bgs	CL	
10	-	2.2	None Collected	(9-10.5') CLAY with SAND, very firm, reddish yellow, dry, low plasticity, cohesive	CL	
80	0.0	0.0		(10.5-12.5') CLAYEY SAND, dense, very pale brown, very moist, non-plastic, non-cohesive	SC	
15	0.0	0.0		(12.5-15.2') SAND with CLAY, fine to medium, dense to medium dense, very pale brown and very light brownish gray, wet, non-plastic, non-cohesive	SW-SC	
90	0.0	0.2		(15.2-19.3') CLAY with trace SAND, very firm, very pale brown and light gray, moist, low plasticity, cohesive	CL	
20	0.0	0.0		(19.3-20') CLAYEY SAND, fine to coarse, medium dense, gray and yellowish red, wet, non-plastic, non-cohesive	SC	
				End of Boring		

Boring terminated at 20' bgs due to water and piezometer installation.

TOC: Top of PVC casing
 DTW: Depth to water
 bgs: Below ground surface
 AMSL: Above mean sea level

Riser Stickup: 2.5'
 Riser: 0 - 3' bgs
 Screen: 3 - 19' bgs [Slot Size: 0.010"]
 Sand Pack: 2 - 19' bgs [Grain Size: WG #2]
 Bentonite Seal: 0 - 2' bgs [Grain Size: 3/8" chips]



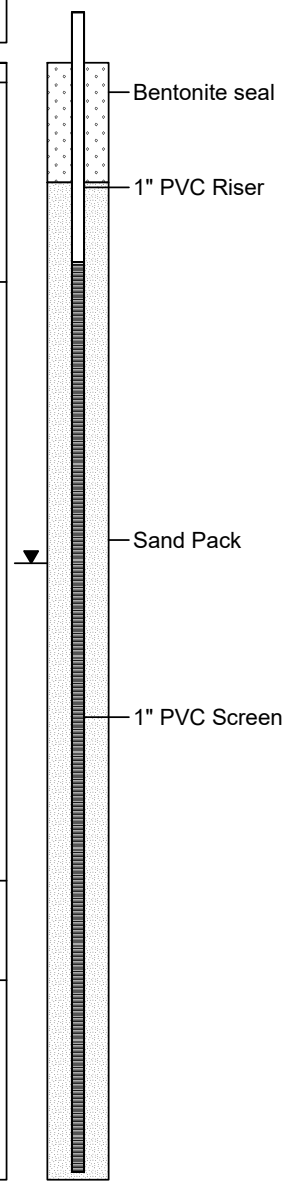
Client : EnviroAnalytics Group
 ARM Project No. : 150298M-5-3
 Project Description : Sparrows Point - Parcel A10
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : M. Replogle, EIT
 Drilling Company : Allied Well Drilling
 Driller : Tim Moyer
 Drilling Equipment : Geoprobe 77DT

Soil Boring Installation Date : 01/15/2019
 Piezometer Installation Date : 01/16/2019
 Casing/Riser/Screen Type : PVC
 Borehole Diameter : 2.25"
 Riser/Screen Diameter : 1"
 Northing (US ft) : 571203.33
 Easting (US ft) : 1464861.17
 0-Hr DTW : 15.88' TOC
 48-Hr DTW : 14.92' TOC
 No LNAPL or DNAPL at 0 or 48 hours

Boring ID: A10-006B-SB/PZ

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0	-	-		(0-0.5') CONCRETE	NA	
0	0	-		(0.5-5.5') SANDY CLAY, soft, gray and yellowish red, very moist, low plasticity, cohesive	CL	
5	-	-		(5.5-20.5') CLAY, very firm, reddish yellow with some gray mottling grading to pale brown with reddish yellow, dry to moist, low plasticity, cohesive	CL	
60	3.5	0.0		None Collected	CL	Wet at 21' bgs
10	0.0	0.0				
74	0.1	0.1				
15	0.1	0.1				
80	0.0	0.0		(20.5-23') CLAYEY SAND, medium dense, light brownish gray, wet, non-plastic, non-cohesive	SC	
25	0.0	0.0		(23-28') SAND, fine to coarse, medium dense, reddish yellow and yellowish red, wet, non-plastic, non-cohesive	SW	
30	-	-		End of Boring		



Boring terminated at 28' bgs due to water and piezometer installation.
 TOC: Top of PVC casing
 DTW: Depth to water
 bgs: Below ground surface
 AMSL: Above mean sea level

Riser Stickup: 2.37'
 Riser: 0 - 5' bgs
 Screen: 5 - 28' bgs [Slot Size: 0.010"]
 Sand Pack: 3 - 28' bgs [Grain Size: WG #2]
 Bentonite Seal: 0 - 3' bgs [Grain Size: 3/8" chips]



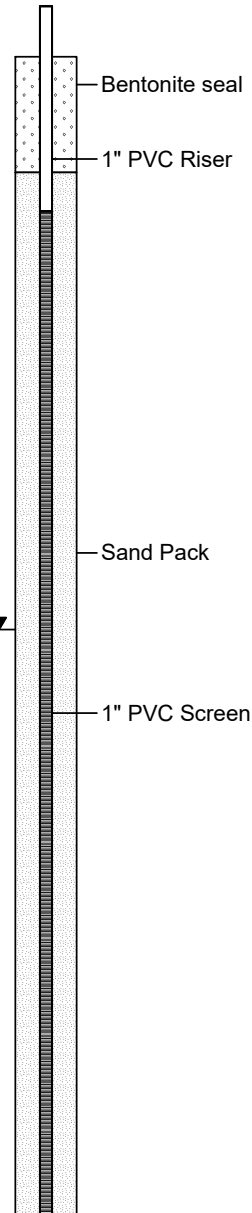
Client : EnviroAnalytics Group
 ARM Project No. : 150298M-5-3
 Project Description : Sparrows Point - Parcel A10
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : M. Replogle, EIT
 Drilling Company : Allied Well Drilling
 Driller : Tim Moyer
 Drilling Equipment : Geoprobe 77DT

Soil Boring Installation Date : 01/16/2019
 Piezometer Installation Date : 01/16/2019
 Casing/Riser/Screen Type : PVC
 Borehole Diameter : 2.25"
 Riser/Screen Diameter : 1"
 Northing (US ft) : 571178.33
 Easting (US ft) : 1464836.17
 0-Hr DTW : 17.76' TOC
 48-Hr DTW : NA
 LNAPL / DNAPL: 0hr-17.74' TOC 48hr-14.09' TOC

Boring ID: A10-006C-SB/PZ

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0	-	-		(0-0.2') CONCRETE, SAND and GRAVEL-sized, loose, pale yellow, dry, non-plastic, non-cohesive	SP	Light sheen with light odor 3.2-3.5' bgs
40	-	-		(0.2-1') SLAG GRAVEL, fine, loose, very dark brown, wet, non-plastic, non-cohesive		
5	1.2	9.9		(1-11.5') SANDY CLAY, soft, light grayish brown, very moist, low plasticity, cohesive	CL	
50	-	-				Very light product at 9.5' bgs Trace NAPL 11-13' bgs
10	8.1	3.5		(11.5-13') CLAYEY SAND, dense, very light brown and light brownish gray, moist, non-plastic, non-cohesive	SC	
80	-	-				Wet at 24' bgs
15	4.1	7.4	None Collected	(13-21.5') CLAY with trace SAND, very firm, light grayish brown and reddish yellow, moist, low plasticity, cohesive	CL	
20	1.6	3.3		(21-24') SILT, very firm, gray, moist, low plasticity, cohesive	ML	
25	3.4	4.2		(24-30') SAND, fine to coarse, dense, reddish yellow and yellowish red then very pale brown at 28' bgs, wet, non-plastic, non-cohesive	SW	
30	2.4	1.8		End of Boring		



Boring terminated at 30' bgs due to water and piezometer installation.
 TOC: Top of PVC casing
 DTW: Depth to water
 bgs: Below ground surface
 AMSL: Above mean sea level

Riser Stickup: 2.92'
 Riser: 0 - 4' bgs
 Screen: 4 - 30' bgs [Slot Size: 0.010"]
 Sand Pack: 3 - 30' bgs [Grain Size: WG #2]
 Bentonite Seal: 0 - 3' bgs [Grain Size: 3/8" chips]



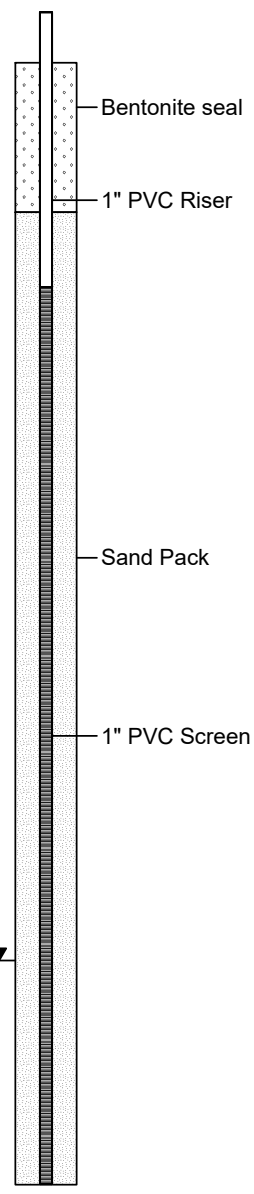
Client : EnviroAnalytics Group
 ARM Project No. : 150298M-5-3
 Project Description : Sparrows Point - Parcel A10
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : M. Replogle, EIT
 Drilling Company : Allied Well Drilling
 Driller : Tim Moyer
 Drilling Equipment : Geoprobe 77DT

Soil Boring Installation Date : 01/16/2019
 Piezometer Installation Date : 01/16/2019
 Casing/Riser/Screen Type : PVC
 Borehole Diameter : 2.25"
 Riser/Screen Diameter : 1"
 Northing (US ft) : 571203.33
 Easting (US ft) : 1464811.17
 0-Hr DTW : DRY
 48-Hr DTW : 14.45' TOC
 No LNAPL or DNAPL at 0 or 48 hours

Boring ID: A10-006D-SB/PZ

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0	-	-		(0-7') SLAG, SAND and GRAVEL-sized, medium dense to loose, very dark brown, dry to moist, non-plastic, non-cohesive		
8	-	-			SW/GP	
5	-	0.0				
70	-	4.3	None Collected	(7-15') CLAY with SAND grading to CLAY, very firm, light brown to light brownish gray with reddish yellow, dry to moist, low plasticity, cohesive		
10	-	0.0			CL	
100	-	0.0				
15	-	0.0		End of Boring		



No water encountered

Boring terminated at 15' bgs due to water and piezometer installation.
 TOC: Top of PVC casing
 DTW: Depth to water
 bgs: Below ground surface
 AMSL: Above mean sea level

Riser Stickup: 2.45'
 Riser: 0 - 3' bgs
 Screen: 3 - 15' bgs [Slot Size: 0.010"]
 Sand Pack: 2 - 15' bgs [Grain Size: WG #2]
 Bentonite Seal: 0 - 2' bgs [Grain Size: 3/8" chips]



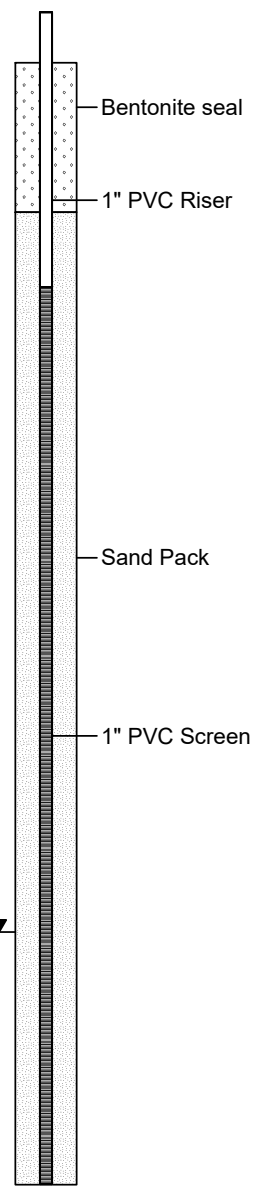
Client : EnviroAnalytics Group
 ARM Project No. : 150298M-5-3
 Project Description : Sparrows Point - Parcel A10
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : M. Replogle, EIT
 Drilling Company : Allied Well Drilling
 Driller : Tim Moyer
 Drilling Equipment : Geoprobe 77DT

Soil Boring Installation Date : 01/16/2019
 Piezometer Installation Date : 01/16/2019
 Casing/Riser/Screen Type : PVC
 Borehole Diameter : 2.25"
 Riser/Screen Diameter : 1"
 Northing (US ft) : 571180.46
 Easting (US ft) : 1464834.90
 0-Hr DTW : 11.05' TOC
 48-Hr DTW : 14.20' TOC
 LNAPL / DNAPL: 0hr-Trace 48hr-8.65' TOC

Boring ID: A10-006E-SB/PZ

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0	-	-		(0-0.2) CONCRETE, SAND-sized, loose, pale yellow, dry, non-plastic, non-cohesive	NA	
	-	-		(0.2-8') CLAY with SAND and fine SLAG GRAVEL, very firm then soft at 7' bgs, greenish brown and light brown, dry to moist, low plasticity, cohesive	CL/GP	
60	0.0					Light odor 2.2-10' bgs
						No water encountered
						Light to moderate NAPL 6-7.5' bgs
5	-		None Collected			
				(8-9') SANDY CLAY, soft, very light brown, very moist, low plasticity, cohesive	CL	
				(9-13') CLAYEY SAND, dense, very moist to moist, light grayish brown with reddish yellow, non-plastic, non-cohesive	SC	Trace NAPL 10-13' bgs
10	48.6					
				(13-15') CLAY with fine SAND, very firm, light grayish brown and reddish yellow, moist, low plasticity, cohesive	CL	
15	5.2			End of Boring		



Boring terminated at 15' bgs due to maximum depth and piezometer installation.
 TOC: Top of PVC casing
 DTW: Depth to water
 bgs: Below ground surface
 AMSL: Above mean sea level

Riser Stickup: 2.58'
 Riser: 0 - 3' bgs
 Screen: 3 - 15' bgs [Slot Size: 0.010"]
 Sand Pack: 2 - 15' bgs [Grain Size: WG #2]
 Bentonite Seal: 0 - 2' bgs [Grain Size: 3/8" chips]



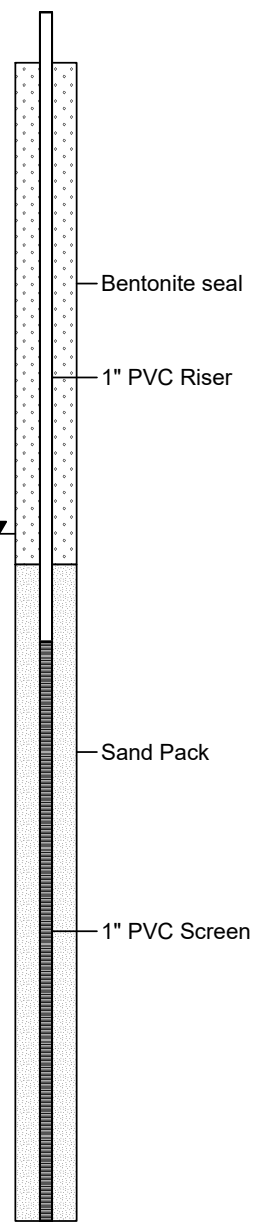
Client : EnviroAnalytics Group
 ARM Project No. : 150298M-5-3
 Project Description : Sparrows Point - Parcel A10
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : M. Replogle, EIT
 Drilling Company : Allied Well Drilling
 Driller : Tim Moyer
 Drilling Equipment : Geoprobe 77DT

Soil Boring Installation Date : 01/25/2019
 Piezometer Installation Date : 01/25/2019
 Casing/Riser/Screen Type : PVC
 Borehole Diameter : 2.25"
 Riser/Screen Diameter : 1"
 Northing (US ft) : 571178.97
 Easting (US ft) : 1464861.01
 0-Hr DTW : 14.56' TOC
 48-Hr DTW : 15.15' TOC
 No LNAPL or DNAPL at 0 or 48 hours

Boring ID: A10-006F-SB/PZ

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0	-	-		(0-0.3') CONCRETE	NA	
	-	-		(0.3-2.5') SLAG GRAVEL, fine, dense, dark brown, wet, non-plastic, non-cohesive	GP	
50	0.0	0.0		(2.5-10.5') CLAY, soft then hard at 7.5' bgs, light grayish brown then reddish yellow with light grayish brown at 7.5+ ' bgs, moist then dry at 7.5' bgs, low plasticity, cohesive, with SAND 9-10' bgs	CL	
5	-	0.0				
50	0.0	0.0				
10	-	0.0		(10.5-12.5') CLAYEY SAND, dense, reddish yellow, very moist, non-plastic, non-cohesive	SC	
80	0.0	0.0		(12.5-19') CLAY with SAND, very firm, reddish yellow with light grayish brown, moist, low plasticity, cohesive	CL	
15	-	0.0	None Collected			
90	0.0	0.0		(19-22.5') SANDY SILT, soft, light brownish gray, moist, low plasticity, cohesive	ML	
20	-	0.0		(22.5-30') SAND, fine to medium, medium dense, yellowish red, wet, non-plastic, non-cohesive	SW	
80	0.0	0.0				
25	-	0.0				
30	-	0.0				
30	-	0.0		End of Boring		



Wet at 22.5' bgs

Boring terminated at 30' bgs due to water and piezometer installation.
 TOC: Top of PVC casing
 DTW: Depth to water
 bgs: Below ground surface
 AMSL: Above mean sea level

Riser Stickup: 2.95'
 Riser: 0 - 15' bgs
 Screen: 15 - 30' bgs [Slot Size: 0.010"]
 Sand Pack: 13 - 30' bgs [Grain Size: WG #2]
 Bentonite Seal: 0 - 13' bgs [Grain Size: 3/8" chips]



Client : EnviroAnalytics Group
 ARM Project No. : 150298M-5-3
 Project Description : Sparrows Point - Parcel A10
 Site Location : Sparrows Point, MD
 ARM Representative : L. Perrin
 Checked by : M. Replogle, EIT
 Drilling Company : Allied Well Drilling
 Driller : Tim Moyer
 Drilling Equipment : Geoprobe 77DT

Soil Boring Installation Date : 01/25/2019
 Piezometer Installation Date : 01/25/2019
 Casing/Riser/Screen Type : PVC
 Borehole Diameter : 2.25"
 Riser/Screen Diameter : 1"
 Northing (US ft) : 571178.97
 Easting (US ft) : 1464861.01
 0-Hr DTW : DRY
 48-Hr DTW : 7.04' TOC
 No LNAPL or DNAPL at 0 or 48 hours

Boring ID: A10-006G-SB/PZ

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0	-	-		(0-0.3') CONCRETE	NA	<p>Bentonite seal 1" PVC Riser Sand Pack 1" PVC Screen</p> <p>No water encountered</p>
	-	-		(0.3-2.5') SLAG GRAVEL, fine, dense, very dark brown, wet, non-plastic, non-cohesive	GP	
50	-	0.0		(2.5-10.5') CLAY, firm to hard, light brownish gray and reddish yellow, moist, low plasticity, cohesive, with SAND 9-10' bgs	CL	
5	-	0.0			CL	
60	0.7	0.0	None Collected		CL	
10	-	0.0			CL	
	-	0.1		(10.5-11.3') CLAYEY SAND, medium dense to dense, pale brown, very moist, non-plastic, non-cohesive	SC	
88	0.0	0.0		(11.3-15') CLAY with SAND, very firm, reddish yellow with light brownish gray, moist, low plasticity, cohesive	CL	
15	-	0.0		End of Boring		

Boring terminated at 15' bgs due to maximum depth and piezometer installation.
 TOC: Top of PVC casing
 DTW: Depth to water
 bgs: Below ground surface
 AMSL: Above mean sea level

Riser Stickup: 1.74'
 Riser: 0 - 3' bgs
 Screen: 3 - 15' bgs [Slot Size: 0.010"]
 Sand Pack: 2- 15' bgs [Grain Size: WG #2]
 Bentonite Seal: 0 - 2' bgs [Grain Size: 3/8" chips]



Client : EnviroAnalytics Group
 ARM Project No. : 150298M-5-3
 Project Description : Sparrows Point - Parcel A10
 Site Location : Sparrows Point, MD
 ARM Representative : L. Glumac
 Checked by : M. Replogle, EIT
 Drilling Company : Allied Well Drilling
 Driller : Tim Moyer
 Drilling Equipment : Geoprobe 77DT

Soil Boring Installation Date : 02/11/2019
 Piezometer Installation Date : 02/11/2019
 Casing/Riser/Screen Type : PVC
 Borehole Diameter : 2.25"
 Riser/Screen Diameter : 1"
 Northing (US ft) : 571153.00
 Easting (US ft) : 1464835.90
 0-Hr DTW : 15.73' TOC
 72-Hr DTW : 15.00' TOC
 No LNAPL or DNAPL at 0 or 48 hours

Boring ID: A10-006H-SB/PZ

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0	-	0.0		(0-0.5') SLAG, medium dense, black, dry, non-plastic, non-cohesive	GW	<p>Bentonite seal 1" PVC Riser Sand Pack 1" PVC Screen</p>
0.5	70	0.0		(0.5-5.5') SANDY SILT, medium dense, light gray and light brown, dry, low plasticity, cohesive	ML	
5	-	0.0		(5.5-10.6') SILTY SAND, medium dense, reddish yellow, dry, low plasticity, cohesive	SM	
5.5	68	0.0		(10.6-15.2') CLAY, dense, reddish yellow, low plasticity, cohesive	CL	
10	-	0.0	None Collected	(15.2-17') CLAYEY SAND, medium dense, reddish yellow, dry, non-plastic, non-cohesive	SC	
15	92	0.0		(17-17.7') SAND, dense, reddish yellow, wet, non-plastic, non-cohesive	SP	
17	-	0.0		(17.7-21.5) CLAYEY SAND, medium dense, reddish yellow, dry, non-plastic, non-cohesive	SC	
20	96	0.0		(21.5-24') CLAY, soft, dark gray, moist, low plasticity, cohesive	CL	
25	20	0.0		(24-30') SAND, dense, yellowish red, wet, non-plastic, non-cohesive		
30	-	0.0		End of Boring		

Wet at 17' bgs

Boring terminated at 30' bgs due to water and piezometer installation.
 TOC: Top of PVC casing
 DTW: Depth to water
 bgs: Below ground surface
 AMSL: Above mean sea level

Riser Stickup: 3.02'
 Riser: 0 - 15' bgs
 Screen: 15 - 30' bgs [Slot Size: 0.010"]
 Sand Pack: 13 - 30' bgs [Grain Size: WG #2]
 Bentonite Seal: 0 - 13' bgs [Grain Size: 3/8" chips]



Client : EnviroAnalytics Group
 ARM Project No. : 150298M-5-3
 Project Description : Sparrows Point - Parcel A10
 Site Location : Sparrows Point, MD
 ARM Representative : L. Glumac
 Checked by : M. Replogle, EIT
 Drilling Company : Allied Well Drilling
 Driller : Tim Moyer
 Drilling Equipment : Geoprobe 77DT

Soil Boring Installation Date : 02/11/2019
 Piezometer Installation Date : 02/11/2019
 Casing/Riser/Screen Type : PVC
 Borehole Diameter : 2.25"
 Riser/Screen Diameter : 1"
 Northing (US ft) : 571153.00
 Easting (US ft) : 1464835.90
 0-Hr DTW : 9.61' TOC
 72-Hr DTW : 8.59' TOC
 No LNAPL or DNAPL at 0 or 48 hours

Boring ID: A10-006I-SB/PZ

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Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0	-	-		(0-0.5') SLAG, medium dense, black, dry, non-plastic, non-cohesive	GW	<p>Bentonite seal 1" PVC Riser Sand Pack 1" PVC Screen</p> <p>No water encountered</p>
	-	-		(0.5-3.5') SLAG and SILT, medium dense, black, dry, non-plastic, non-cohesive	GW/ML	
50	-	0.0		(3.5-5.5') SILTY SAND, medium dense, yellowish red, dry, non-plastic, non-cohesive	SM	
5	-	0.0		(5.5-10') SANDY SILT, medium dense, reddish yellow, dry, non-plastic, non-cohesive	ML	
74	0.0	0.0	None Collected		ML	
10	0.0	0.0		(10-11') SANDY CLAY, medium dense, reddish yellow, dry, low plasticity, cohesive	CL	
	0.0	0.0		(11-11.7') SAND, fine, dense, reddish yellow to light brown, very moist, non-plastic, non-cohesive	SP	
98	0.0	0.0		(11.7-13.1') SANDY CLAY, medium dense, reddish yellow, dry, low plasticity, cohesive	CL	
	0.0	0.0		(13.1-15') SILT, medium dense, yellowish red to light brown, moist, low plasticity, cohesive	ML	
15	1.1	0.0		End of Boring		

Boring terminated at 15' bgs due to maximum depth and piezometer installation.
 TOC: Top of PVC casing
 DTW: Depth to water
 bgs: Below ground surface
 AMSL: Above mean sea level

Riser Stickup: 2.82'
 Riser: 0 - 3' bgs
 Screen: 3 - 15' bgs [Slot Size: 0.010"]
 Sand Pack: 2- 15' bgs [Grain Size: WG #2]
 Bentonite Seal: 0 - 2' bgs [Grain Size: 3/8" chips]



Client : EnviroAnalytics Group
 ARM Project No. : 150298M-5-3
 Project Description : Sparrows Point - Parcel A10
 Site Location : Sparrows Point, MD
 ARM Representative : L. Glumac
 Checked by : M. Replogle, EIT
 Drilling Company : Allied Well Drilling
 Driller : Tim Moyer
 Drilling Equipment : Geoprobe 77DT

Soil Boring Installation Date : 02/11/2019
 Piezometer Installation Date : 02/11/2019
 Casing/Riser/Screen Type : PVC
 Borehole Diameter : 2.25"
 Riser/Screen Diameter : 1"
 Northing (US ft) : 571178.57
 Easting (US ft) : 1464809.90
 0-Hr DTW : 13.24' TOC
 72-Hr DTW : 13.94' TOC
 No LNAPL or DNAPL at 0 or 48 hours

Boring ID: A10-006J-SB/PZ

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0	-	-		(0-5') SLAG, SAND and GRAVEL-sized, loose, black to dark brown with some yellowish red, dry, non-plastic, non-cohesive	SW/GW	<p>Bentonite seal 1" PVC Riser Sand Pack 1" PVC Screen</p>
5	-	-		(5-15) SANDY CLAY, medium dense, reddish yellow 5.4-10.1' bgs, then light gray 10.1-15' bgs, dry, low plasticity, cohesive	CL	
10	-	-		(15-24.4') SANDY CLAY, soft to medium soft, gray, very moist, low plasticity, cohesive	CL	
15	-	-	None Collected	(24.4-30') SAND, fine, dense, dark brown to light brown then reddish yellow at 25' bgs, wet, non-plastic, non-cohesive	SP	
20	-	-				
25	-	-				
30	-	-		End of Boring		

Wet at 24.4' bgs

Boring terminated at 30' bgs due to water and piezometer installation.
 TOC: Top of PVC casing
 DTW: Depth to water
 bgs: Below ground surface
 AMSL: Above mean sea level

Riser Stickup: 2.81'
 Riser: 0 - 15' bgs
 Screen: 15 - 30' bgs [Slot Size: 0.010"]
 Sand Pack: 13 - 30' bgs [Grain Size: WG #2]
 Bentonite Seal: 0 - 13' bgs [Grain Size: 3/8" chips]



Client : EnviroAnalytics Group
 ARM Project No. : 150298M-5-3
 Project Description : Sparrows Point - Parcel A10
 Site Location : Sparrows Point, MD
 ARM Representative : L. Glumac
 Checked by : M. Replogle, EIT
 Drilling Company : Allied Well Drilling
 Driller : Tim Moyer
 Drilling Equipment : Geoprobe 77DT

Soil Boring Installation Date : 02/11/2019
 Piezometer Installation Date : 02/11/2019
 Casing/Riser/Screen Type : PVC
 Borehole Diameter : 2.25"
 Riser/Screen Diameter : 1"
 Northing (US ft) : 571178.57
 Easting (US ft) : 1464809.90
 0-Hr DTW : 7.85' TOC
 72-Hr DTW : 7.53' TOC
 No LNAPL or DNAPL at 0 or 48 hours

Boring ID: A10-006K-SB/PZ

(page 1 of 1)

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample ID/Interval	DESCRIPTION	USCS	REMARKS
0	-	-		(0-6') SLAG, SAND and GRAVEL-sized, loose, black with some yellowish red, dry, non-plastic, non-cohesive		<p>Bentonite seal 1" PVC Riser Sand Pack 1" PVC Screen</p>
50	-	-			SW/GW	
5	-	-		(6-9') SANDY CLAY, medium dense, reddish yellow, dry, low plasticity, cohesive		
60	0.4	0.8	None Collected		CL	
10	-	-		(9-10.6') SILTY SAND, medium dense, reddish yellow, moist, non-plastic, non-cohesive	SM	No water encountered
68	0.0	0.4		(10.6-15') SANDY CLAY, medium dense, light gray, very moist, low plasticity, cohesive	CL	
15	-	-		End of Boring		

Boring terminated at 15' bgs due to maximum depth and piezometer installation.
 TOC: Top of PVC casing
 DTW: Depth to water
 bgs: Below ground surface
 AMSL: Above mean sea level

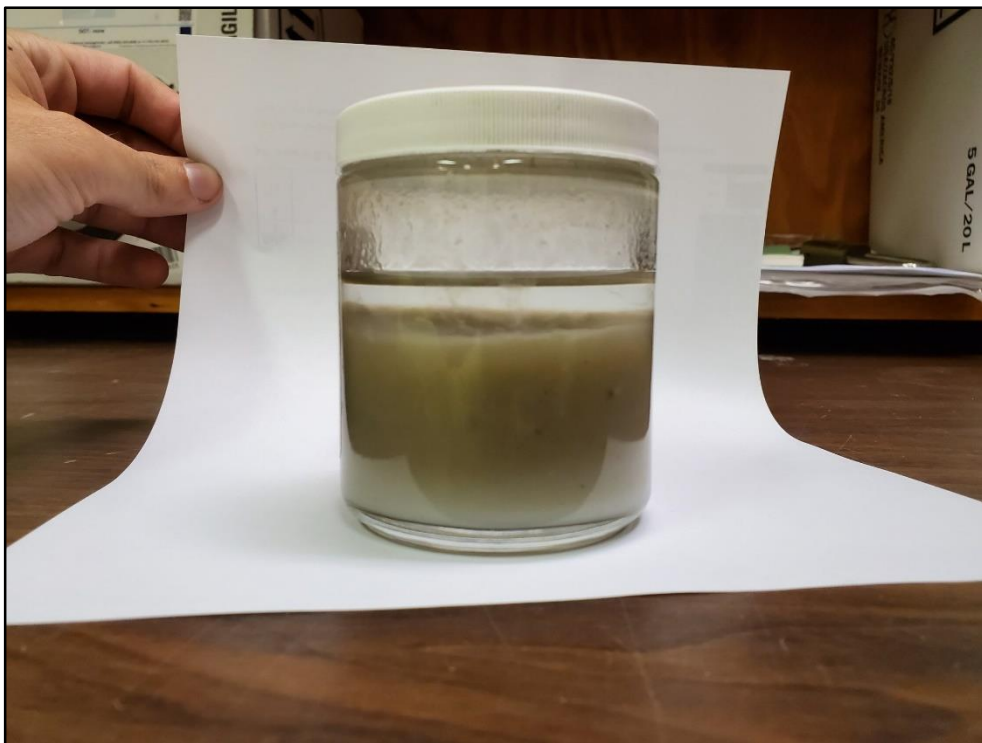
Riser Stickup: 2.51'
 Riser: 0 - 3' bgs
 Screen: 3 - 15' bgs [Slot Size: 0.010"]
 Sand Pack: 2- 15' bgs [Grain Size: WG #2]
 Bentonite Seal: 0 - 2' bgs [Grain Size: 3/8" chips]

Attachment 2

**Parcel A10 – Photographs of Unknown Product
Former Sparrows Point Steel Mill
Sparrows Point, Maryland**



Photograph 1: Unknown product extracted from temporary piezometer A10-006K-PZ. Product is pale gray and moderately thick. Photograph was taken in the field immediately after removal using a bailer.



Photograph 2: Unknown product extracted from temporary piezometer A10-006K-PZ. Product has settled to bottom of sample jar (appears to be a DNAPL). Photograph was taken several weeks after removal via bailer.