2017 ANNUAL MONITORING / INSPECTION REPORT

SNPE- VDM Creek Bank Corrective Actions

VanDeMark Chemical Inc. – Lockport, New York

Order on Consent: R9-20080205-5

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1.0 INTRODUCTION

Golder Associates Inc. (Golder) under contract to SNPE Inc. (SNPE) and in close cooperation with VanDeMark Chemical Inc. (VDM), the Site owner, has prepared this annual monitoring and inspection summary report for 2017, in support of the Operations and Maintenance Plan (OMP) that was prepared for the VDM Lockport facility by Golder (Golder, April 2013). This summary report describes the activities that were undertaken during 2017 to maintain and monitor the effectiveness of the remedial system that was implemented at the VDM site along a portion of VDM's property adjacent to the north bank of Eighteen Mile Creek Bank (hereafter referred to as the "Creek Bank Area") and associated groundwater/DNAPL impacts at VDM's manufacturing facility in Lockport, New York. The VDM facility is located in the north central sector of the City of Lockport city limits, as shown on Figure 1-1.

The purpose of the constructed remedial system was twofold: create a barrier to restrict and contain the migration of dense non-aqueous phase liquid (DNAPL) consisting of coal tar residuals that have been exiting the fractured bedrock formation at, or near, the toe of the Creek Bank Area slope; and promote the collection of the DNAPL in a defined permeable trench for subsequent mechanical removal, if required. This annual monitoring/inspection report documents the extent to which these objectives are being met based on the following primary activities that were conducted throughout the 2017 monitoring period:

- Two visual inspections for presence of DNAPL in the passive upgradient permeable collection trench installed along the grout cutoff wall alignment;
- Two visual inspections for presence of DNAPL along the Eighteen Mile Creek bank areas where coal tar residuals have previously been observed;
- Semi-annual groundwater sampling of the four piezometers installed upgradient and downgradient of the grout cutoff wall;
- Semi-annual sampling of the water discharge from the collection trench Filter Sump overflow chamber;
- Semi-annual groundwater sampling of one representative monitoring well located within the VDM Plant at the top of the Niagara Escarpment;
- Visual inspection of the Filter Sump media (i.e., filter sand and activated carbon) and sump chamber;
- Visual inspection of the passive collection trench for the presence of DNAPL residuals; and,
- Visual inspection of the collection trench permeable stone media and DNAPL observation sumps.

Figure 1-2 shows the locations of the areas both within the active VDM facility and to the south along the Creek Bank Area that were monitored as part of this annual report.

The following sections present details on the frequency and methodologies employed for the inspections, monitoring and maintenance activities described above. The documentation and reporting associated with these activities are also described and provided.

2.0 SEMI-ANNUAL MONITORING AND INSPECTIONS

On March 18, 2015, the NYSDEC approved the petition dated March 5, 2015 from SNPE to reduce annual inspections from quarterly to semi-annually to coincide with the semi-annual groundwater sampling events. This inspection frequency was continued for the 2017 O & M reporting period.

2.1 Passive DNAPL Collection Trench

Golder personnel performed visual inspections of the DNAPL collection trench in May and November 2017. The following observations were recorded and summarized on written inspection reports, included in this report as Appendix A. Photos taken during the inspections were also recorded and are included as Appendix B

2.1.1 May 2017 Inspection

DNAPL accumulation was not observed during the May 2017 inspection period within the observation sumps located within the DNAPL collection trench. Golder visually inspected and inserted a wooden probe to the bottom of four, 4-inch diameter PVC DNAPL observation sumps (OS-1, OS-2, OS-3 and OS-4). Sumps OS-1, and OS-3 were dry, while OS-2 (1-2" water), and OS-4 (filled to top) contained ground water without a sheen or odor. No evidence of DNAPL accumulation was observed on the up- and down-gradient slopes, however thick vegetative growth limited ground visibility.

2.1.2 November 2017 Inspection

DNAPL accumulation was not observed during the November 2017 inspection period within the DNAPL observation sumps located within the DNAPL collection trench. Golder performed a visual inspection using a wood probe inserted to the bottom of four, 4-inch diameter PVC DNAPL observation sumps (OS-1, OS-2, OS-3 and OS-4). Groundwater was encountered in OS-1 (approx. 50” total) and OS-3 (approx. 11” total), while OS-2 and OS-4 were dry.

2.2 Creek Bank Area

Visual inspections were performed along approximately 300 feet of the Creek Bank Area down gradient of the DNAPL collection trench in May and November, 2017. The following observations were recorded and summarized on written inspection reports, included in this report as Appendix A. Photos taken during the inspections were also recorded and are included as Appendix B.

2.2.1 May 2017 Inspection

Golder personnel inspected both the up-gradient slope (north of the DNAPL collection trench) and down-gradient slope (south of the collection trench) for signs of DNAPL accumulation. DNAPL accumulations were observed along a 10 to 15 foot section of the steeply graded edge of the creek bank south of PZ-1. This area appears to be the southwest side of the buried stone mill race structure adjacent to the creek

where other DNAPL residuals have been observed and removed over the past several years. The accumulations were intermittent within the area of observation. Three (3) 5-gallon buckets of DNAPL were manually removed from this location.

2.2.2 November 2017 Inspection

A small number of new DNAPL outbreaks/accumulations were observed during the November 2017 inspection period along an approximately 15-20 foot section of the steeply graded edge of creek bank south of PZ-1. This area appears to be the northwest side of the buried stone mill race adjacent to the creek where other DNAPL residuals have historically been observed. The accumulations were intermittent within the area of observation. Two (2) 5-gallon buckets of DNAPL residuals were removed from this location. Further removal of these deposits will be manually performed during the Spring 2018 monitoring and inspection event, as necessary.

2.3 Collection Trench Overflow Filter Sump Structure

Inspections of the collection trench drainage/filtration system including the Filter Sump and gravel filled sump drain were performed during the May and November, 2017 inspections. Visual observations included noting the general condition of the drainage sump filter media and any evidence of excessive solids accumulation, presence of DNAPL residuals, or filter media washout. The following observations were recorded and summarized on written inspection reports, included in this report as Appendix A. Photos taken during the inspections were also recorded and are included as Appendix B

2.3.1 May 2017 Inspection

No DNAPL, nor other evidence of contamination, was present on the surface of accumulated water or filter media in the filter sump. There was no erosion or disturbance of the drainage sump filter media, with only minor sediment present on the top of the sand media. The overflow section (filtered water discharge chamber) of the sump structure was clear and free of any sediment or solids. Continuous overflow to the chamber outfall was observed at the time of inspection, due to unusually heavy precipitation during the month of May preceding this inspection event.

The gravel filled sump drainage area adjacent to the filter sump was observed to be in good condition with no evidence of surficial water overflow, silting or DNAPL.

2.3.2 November 2017 Inspection

During the November 2017 inspection period, DNAPL or other signs of contamination were not present on the surface of accumulated water or filter media in the filter sump. There was no erosion or disturbance of the drainage sump filter media, with only a small (typical) amount sediment present on the top of the sand media. The overflow section (filtered water discharge chamber) of the sump structure was clear and free of

any sediment or solids. Minimal water overflow to the discharge pipe was observed at time of visual inspection.

The gravel filled sump drainage area adjacent to the filter sump was observed to be in good condition with no evidence of surficial water overflow, silting or DNAPL. Some minor vegetative growth was removed from the overflow drainage area.

3.0 SEMI-ANNUAL GROUNDWATER MONITORING

3.1 Introduction

A total of four (4) piezometers located in the Creek Bank Area were installed in 2012 and two (2) bedrock monitoring wells located at the top of the escarpment within the VDM plant site and installed in 1999 and 2006 were monitored to establish a groundwater quality baseline data set at the site as described below. A table summarizing the piezometer, monitoring well and DNAPL Observation Sump installation information (Table 3-1) was provided in the Operations & Maintenance Plan (OMP) report previously submitted by Golder (Golder, April 2013).

3.2 Creek Bank Piezometers

Piezometer development and semi-annual groundwater sampling were performed on the four (4) piezometers (PZ-1, PZ-2, PZ-3 and PZ-4) installed as part of the Creek Bank Corrective Measures in 2012 (refer to Figure 3-1) as described below.

3.2.1 Piezometer Development

The 1-inch diameter piezometers were purged prior to both the May and November 2017 sampling events. Purging methods implored by Golder personnel involved the use of dedicated polyethylene bailers to remove standing water and sediment trapped in well screens to insure representative samples of groundwater at each location. Purging of piezometers continued until extraction of three well volumes was complete and field measurements for turbidity, pH, specific conductivity and temperature stabilized.

Well purging data, including the duration of the development process, methods employed, and the volume of water removed, are included on the Sample Collection Field Logs provided in Appendix C. Water purged from the piezometers during the development process was collected by Golder personnel in appropriate containers and discharged into VDM's process sewer manhole.

3.2.2 Piezometer Sampling & Analytical Results

Following development, groundwater samples were collected from each of the piezometers to assess the general groundwater quality up gradient and down gradient of the grout wall and bedrock cutoff system. Pre-sampling activities included determining the piezometer's water elevation, a piezometer-maintenance check, and non-aqueous phase liquid (NAPL) determination. All piezometers were measured, however piezometer PZ-1 was found to be dry during sampling activities and no measurements could be obtained. After completion of these pre-sampling activities, the piezometers were purged of three well volumes (or until dry). During the November event, a sample of the third well volume was measured for the following field parameters: pH, temperature, and specific conductivity.

Groundwater samples were then collected for chemical analysis using dedicated polyethylene bailers. The groundwater samples were shipped via courier under proper preservation and chain of custody procedures to TestAmerica Laboratories, Inc. (TestAmerica) in Buffalo, New York, a New York State Department of Health Environmental Laboratory Accreditation Program (ELAP) certified laboratory, within 24 hours of collection. Water purged from the piezometers during the sampling activities was collected in appropriate containers by Golder personnel and discharged into VDM's process sewer manhole. At the conclusion of each semi-annual sampling event, the physical condition of the piezometers and protective casings/locks was also noted and any recommended repairs or maintenance required (if necessary) was documented on the sample collection field logs provided in Appendix C.

All piezometer groundwater samples collected were analyzed for TCL Volatile Organic Compounds (VOCs) in accordance with USEPA Method 8260B and TCL Semi-volatile Organic Compounds (SVOCs) in accordance with USEPA Method 8270C and the analytical results are presented in Table 3-1. This is the fifth year of Site monitoring following the completion of the Corrective Measures. The 2017 sample results are presented in Table 3-2 comparing this year's analytical results to the 2015 and 2016 groundwater sampling events analytical results.

The results of the piezometer sampling and analyses identified two SVOCs, phenol and naphthalene, in PZ-3, as exceeding the NYSDEC Part 703 groundwater quality standards (GWQS). Phenol was detected during the May 12, 2017 sampling event at a concentration of 7.2 ug/L and was not detected in the results November 8, 2017 event. Overall, the concentration of phenol in PZ-3 has declined since monitoring began in 2013. Naphthalene was detected during the November 8, 2017 event at a concentration of 15 ug/L and was not detected during the May 12, 2017 event. Overall, the concentration of naphthalene in PZ-3 has been well below the GWQS since monitoring began in 2013, with the exception of the November 2017 sampling event. No other compounds were detected above the GWQS in the piezometers. Golder will continue to assess the piezometer groundwater data for trends and evaluate the effectiveness of the Corrective Measures as additional analytical data is collected during future annual monitoring events. The data collected to date from all annual monitoring events demonstrates that the corrective measures are performing as intended and the DNAPL source in the up-gradient fractured bedrock is not contributing to groundwater impacts to the creek.

3.3 Plant Monitoring Well Sampling & Analytical Results

Semi-annual groundwater sampling was performed on only one (1) existing monitoring well, MW-7D, located within the operational portion of the VDM facility at the top of the escarpment, to assess the general groundwater quality at these up gradient locations on the top of the escarpment. Monitoring Well MW-7D was installed in 2006 by Benchmark as part of voluntary site investigations associated with the sale of the facility. During the June 2014 sampling event MW-3D, installed in 1999 by Dames and Moore and located within the operational portion of the VDM facility, was noted as being damaged by plant snow removal

activities the previous winter/spring, therefore no samples were obtained from MW-3D during sampling events since 2014 and a replacement well was not identified for sampling. Location of the wells is presented on Figure 1-2.

Pre-sampling activities included measuring the well's water elevation, a well-maintenance check, and non-aqueous phase liquid (NAPL) determination. After completion of these pre-sampling activities, the wells were purged of three well volumes (or until dry). During the November 8, 2017 event, a sample of the third well volume was measured for the following field parameters: pH, temperature, and specific conductivity. Groundwater samples were then collected for chemical analysis using dedicated polyethylene bailers. The groundwater samples were shipped via courier under proper preservation and chain of custody procedures to Test America within 24 hours of collection. Water purged from the wells during the sampling activities was collected in appropriate containers by Golder personnel and discharged into VDM's process sewer manhole.

All monitoring well groundwater samples collected were analyzed for TCL Volatile Organic Compounds (VOCs) in accordance with USEPA Method 8260B and TCL Semi-volatile Organic Compounds (SVOCs) in accordance with USEPA Method 8270C and the analytical results are presented in Table 3-1. This is the fifth year of Site monitoring following the completion of the Corrective Measures. Table 3-2 presents the 2017 analytical results alongside results from the 2014 through 2016 groundwater sampling events for comparison purposes.

The results of the monitoring well sampling and analyses identified six VOCs in the spring and fall 2017 monitoring events as exceeding the NYSDEC Part 703 GWQS. Four SVOCs above the GWQS were detected in monitoring well MW-7D during the May 2017 sampling event. During the November 2017 event, only two SVOCs, acenaphthene & naphthalene, were detected in MW-7D.

VOCs detected in MW-7D within the operational portion of the VDM facility were not detected in down-gradient piezometers. Golder will continue to assess Plant monitoring well groundwater data for trends and evaluate potential impacts of the up-gradient groundwater on the Corrective Measures as additional analytical data is collected from future annual monitoring events. However, the contaminants detected in the MW-7 groundwater have not been detected in the downgradient Creek Bank piezometers and are not impacting the creek.

At the conclusion of each semi-annual sampling event, the physical condition of the monitoring wells and protective casings or covers was noted and any recommended repairs or maintenance required (if necessary) was documented on the sample collection field logs provided in Appendix C. No condition issues were identified in the 2017 inspections.

3.4 Filter Sump Structure Sampling & Analytical Results

Semi-annual sampling was performed on the collection trench drainage/filtration system overflow chamber (Filter Sump) as part of the annual site inspection activities in 2017. One aqueous sample was collected from the overflow chamber of the Filter Sump to assess the general performance of the grout wall and bedrock cutoff system. Pre-sampling activities included inspection of the vault filter media, a vault-maintenance check, and non-aqueous phase liquid (NAPL) determination.

After completion of these pre-sampling activities, during the November 8, 2017 event a sample of the Filter Sump effluent water was measured for the following field parameters: pH, temperature, and specific conductivity. Aqueous samples were then collected for chemical analysis by direct fill methods. The aqueous samples were delivered to Test America under proper preservation and chain of custody procedures within eight hours of collection.

Samples collected from the Filter Sump overflow chamber were analyzed for TCL Volatile Organic Compounds (VOCs) in accordance with USEPA Method 8260B and TCL Semi-volatile Organic Compounds (SVOCs) in accordance with USEPA Method 8270C. Analytical results are presented in Table 3-1. This is the fifth year of Site monitoring following the completion of the Corrective Measures. Table 3-2 presents the 2017 results alongside results from the 2015 and 2016 Filter Sump sampling for comparison purposes.

One VOC, chloroform, was detected in the Filter Sump above the GWQS during the spring and fall sampling events. Chloroform was detected at a level of 16 ug/L during the May 12, 2017 event, and 27 ug/L during the November 8, 2017 event. No other compounds were detected above the GWQS. Golder will continue to assess the Filter Sump system overflow chamber data for trends and evaluate the effectiveness of the Corrective Measures as appropriate.

At the conclusion of each semi-annual sampling event, the physical condition of the Filter Vault was noted and any recommended repairs or maintenance required (if necessary) was documented on the sample collection field logs provided in Appendix C. No condition issues with the Filter Vault were identified in the 2017 inspections.

4.0 MAINTENANCE AND CLEAN-OUT ACTIVITIES

As described in Section 2.0 above, the inspections conducted in 2017 did not find evidence of DNAPL impacts to the DNAPL Collection Trench or Filter Sump, therefore maintenance or clean-out activities were not necessary or performed on these components of the Creek Bank Area remedial system. Repairs to the piezometers and monitoring wells were not required since no damage was observed to the protective casings, locks or the monitoring well or piezometer risers.

5.0 REFERENCES

1.) Golder Associates Inc., *SNPE-VanDeMark Corrective Actions, Operation & Maintenance Plan*, prepared for SNPE Inc., April 2013.

At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

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TABLES

SNPE-VANDEMARK SITE
2017 GROUNDWATER AND VAULT MONITORING RESULTS
LOCKPORT, NY

Lab ID	NYSDEC Part 703 Groundwater Quality Standards	480-117975-4	480-127262-4	480-117975-5	480-127262-5	480-117975-1	480-127262-1	480-117975-2	480-127262-2	480-117975-3	480-127262-3	480-117975-6	480-127262-6
Sample Date		5/12/2017	11/8/2017	5/12/2017	11/8/2017	5/12/2017	11/8/2017	5/12/2017	11/8/2017	5/12/2017	11/8/2017	5/12/2017	11/8/2017
Sample ID		Vault Effluent	Vault Effluent	MW-7D	MW-7D	PZ-2	PZ-2	PZ-3	PZ-3	PZ-4	PZ-4	Dup (MW-7D)	Dup (Vault)
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Volatile Organics by GC/MS (US EPA Method 8260B)													
1,1,1-Trichloroethane	5	-	-	**36**	**64**	-	-	-	-	-	-	**34**	-
1,1-Dichloroethane	5	-	-	**150**	**210**	-	-	-	-	-	-	**140**	-
1,1-Dichloroethene	5	-	-	**50**	**80**	-	-	-	-	-	-	**47**	-
1,2-Dichloroethane	0.6	-	-	**3.6** J	**5.5**	-	-	-	-	-	-	**3.1**	-
2-Butanone	NV	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	NV	-	-	-	5.7 J	-	-	-	4.1 J	-	-	-	2.9 J
Benzene	1	-	-	-	0.33 J	-	-	-	-	-	-	-	
Carbon disulfide	60	-	-	-	-	-	-	0.58 J	0.7 J	-	-	-	0.79 J
Carbon tetrachloride	5	-	-	-	0.29 J	-	-	-	-	-	-	-	-
Chlorobenzene	5	-	-	-	0.62 J	-	-	-	-	-	-	-	-
Chloroethane	5	-	-	**54**	**88**	-	-	-	-	-	-	**61**	-
Chloroform	7	**16**	**27**	-	0.49 J	1.5	0.3 J	-	-	-	-	0.55 J	-
cis-1,2-Dichloroethene	5	-	-	-	1.0	-	-	-	-	-	-	1.0	-
Ethylbenzene	5	-	-	4.2	1.6	-	0.28 J	-	0.24 J	-	-	4.4	0.23 J
Trichloroethene	5	-	-	-	0.88 J	-	-	-	-	-	-	0.63 J	-
Vinyl chloride	2	-	-	**16**	**26**	-	-	-	-	-	-	**16**	-
Semivolatile Organics by GC/MS (US EPA Method 8270C)													
Biphenyl	5	-	-	**77**	-	-	-	-	0.69 J	-	-	**65**	-
2,4-Dimethylphenol	5	-	-	-	-	-	1.6 J	-	0.85 J	-	-	-	-
2-Methylphenol	5	-	-	-	-	-	-	0.45 J H	0.44 J	-	-	-	-
2-Methylnaphthalene	NV	-	-	72	3.6 J	-	-	-	4.6 J	-	-	47 J	3.4 J
2-Nitroaniline	5	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	5	-	-	-	-	-	-	-	3.3 J	-	-	-	2.5 J
4-Methylphenol & 3-Methlyphenol	5	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	20	-	-	**260**	**38**	3.9 J	7.8	1.2 J	5.5	-	-	**260**	4.0 J
Acenaphthylene	NV	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	NV	-	-	26	-	0.54 J	0.97 J	-	-	-	-	29 J	-
Benzaldehyde	NV	-	-	-	-	-	-	-	0.39 J	-	-	-	0.33 J
Benzo(a)anthracene	NV	-	-	8.0 J	-	-	-	-	-	-	-	9.9 J	-
Benzo(a)pyrene	NV	-	-	3.6 J	-	-	-	-	-	-	-	5.5 J	-
Benzo(b)fluoranthene	NV	-	-	4.9 J	-	-	-	-	-	-	-	7.7 J	-
Benzo(g,h,i)perylene	NV	-	-	-	-	-	-	-	-	-	-	-	-
Bis(2-ethylhexyl)phthalate	5	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzyl phthalate	5	-	-	-	-	-	-	-	-	-	-	-	-
Caprolactam	NV	-	-	-	27	-	-	-	-	-	-	-	-
Carbazole	NV	-	-	14 J	5.7 J	1.0 J	2.5 J	0.39 J	1.2 J	-	-	11 J	1.0 J
Chrysene	NV	-	-	7.4 J	-	-	-	-	-	-	-	9.3 J	-
Dibenzofuran	NV	-	-	**230**	25 J	-	0.55 J	-	-	-	-	**220**	-
Di-n-butyl phthalate	50	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate	NV	-	-	-	-	-	-	-	0.77 J	-	0.77 J	-	1.1 J
Diethyl phthalate	NV	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	NV	-	-	**100**	5.2 J	0.72 J	0.89 J	-	-	-	-	**120**	-
Fluorene	NV	-	-	**200**	17 J	1.4 J	3.0 J	-	1.2 J	-	-	**200**	0.97 J
Isophorone	NV	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	NV	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	10	-	-	**190**	**59** F1	-	1.6 J	-	**15**	-	-	**98**	**11**
Nitrobenzene	0.4	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	50	-	-	**420**	9.2 J	2.5 J	4.5 J	0.44 J	0.73 J	-	-	**390**	0.53 J
Phenol	1*	-	-	-	-	-	-	**7.2**	-	-	-	-	
Pyrene	NV	-	-	**59**	3.6 J	0.96 J	1.3 J	-	-	-	-	**69**	-

Key:

Vault Effluent Sample Results
Plant Monitoring Well Sample Results
Piezometer Sample Results

Footnotes:

- Compound not detected above the Analytical Method Detection Limit
BOLD = Value exceed the groundwater quality standards.
* = The sum of all phenols
NV = No GW Quality Standard

Qualifications:

J = Analyte detected at a level less that Reporting Limit and greater than or equal to the Method Detection Limit.
B = Analyte detected in the method blank.
F1 = MS and/or MSD Recovery is outside acceptance limits.
F2 = F2 MS/MSD RPD exceeds control limits

SNPE-VANDEMARK SITE
HISTORIC GROUNDWATER AND VAULT MONITORING RESULTS
LOCKPORT, NY

Lab ID	NYSDEC Part 703 Groundwater Quality Standards	480-80722-4	480-90488-4	480-101786-4	480-109820-4	480-117975-4	480-127262-4	130617007-003	130930005-001B	-	130617007-002	130930005-002B	480-80722-5	480-90488-5	480-101786-5	480-109820-5	480-117975-5	480-127262-5	480-80722-1	480-90488-1	480-101786-1	480-109820-1
Sample Date		5/20/2015	11/4/2015	6/16/2016	11/17/2016	5/12/2017	11/8/2017	6/13/2013	9/26/2013	-	6/13/2013	9/26/2013	5/20/2015	11/4/2015	6/16/2016	11/17/2016	5/12/2017	11/8/2017	5/20/2015	11/4/2015	6/16/2016	11/17/2016
Sample ID		Filter Sump	Filter Sump	Filter Sump	Filter Sump	Filter Sump	Filter Sump	MW-3D	MW-3D	MW-3D+	MW-7D±	MW-7D	MW-7D	MW-7D	MW-7D	MW-7D	MW-7D	MW-7D	PZ-2	PZ-2	PZ-2	PZ-2
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Volatile Organics by GC/MS (US EPA Method 8260B)																						
1,1,1-Trichloroethane	5	-	-	-	-	-	-	**11**	**13**		**19**	**71**	**52**	**59**	**71**	**41**	**36**	**64**	-	-	-	-
1,1-Dichloroethane	5	-	-	-	-	-	-	**87**	**120**		**79**	**260**	**180**	**210**	**230**	**140**	**150**	**210**	-	-	-	-
1,1-Dichloroethene	5	-	-	-	-	-	-	**27**	**38**		**21**	**70**	**54**	**60**	**76**	**48**	**50**	**80**	-	-	-	-
1,2-Dichloroethane	0.6	-	-	-	-	-	-	**17**	**23**		**2** J	-	**3.6** J	**4.2** J	**4.9** J	**3.5** J	**3.6** J	**5.5**	-	-	-	-
2-Butanone	NV	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
Acetone	NV	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	5.7 J	-	-	-	-
Benzene	1	-	-	-	-	-	-						-	-	-	-	-	0.33 J	-	-	-	-
Carbon disulfide	60	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	5	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	0.29 J	-	-	-	-
Chlorobenzene	6	-	-	-	-	-	-						-	-	-	-	-	0.62 J	-	-	-	-
Chloroethane	5	-	-	-	-	-	-	-	-		**20**	**58**	**68**	**110**	**95**	**88** F1	**54**	**88**	-	-	-	-
Chloroform	7	2.4	**11**	1.7	3.6	**16**	**27**	-	-		-	-	-	-	-	-	-	0.49 J	1.6	0.54 J	0.75 J	0.9 J
cis-1,2-Dichloroethene	5	-	-	-	-	-	-	-	-		-	-	-	-	-	0.12 J	-	1.0	-	-	-	-
Ethylbenzene	5	-	-	-	-	-	-	-	-		2.9 J	-	-	-	-	2.0	4.2	1.6	-	-	-	-
Trichloroethene	5	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	0.88 J	-	-	-	-
Vinyl chloride	2	-	-	-	-	-	-	**17**	**26**		**5.3** J	**23**	**13**	**15**	**23**	**21** F1	**16**	**26**	-	-	-	-
Semivolatile Organics by GC/MS (US EPA Method 8270C)																						
Biphenyl	5	-	-	-	-	-	-	-	-		-	-	3.3 J	-	**18** F1	-	**77**	-	-	-	0.86 J	0.65
2,4-Dimethylphenol	5	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	0.56 J	2.6 J	1.7 J
2-methylphenol	5	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	NV	-	-	-	-	-	-	-	-		-	1.1 J	-	-	24 F1	-	72	3.6 J	-	-	1.5 J	0.94
2-Nitroaniline	5	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	5	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol & 3-Methlyphenol	5	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	20	-	-	-	-	-	-	2.5 J	2.9 J		**27**	**28**	**42** DL	-	**87** J	**71**	**260**	**38**	3.5 J	5	11	11
Acenaphthylene	NV	-	-	-	-	-	-	-	-		1.2 J	-	0.54 J	-	-	-	-	-	-	-	-	-
Anthracene	NV	-	-	-	-	-	-	-	-		-	-	0.84 J	-	3 J	7.2 J F1	26	-	0.75 J	-	1.6 J	1.3
Benzaldehyde	NV	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	0.26 J	-	- J
Benzo(a)anthracene	NV	-	-	-	-	-	-	-	-		-	-	-	-	1.5 J	4.8 J F1	8.0 J	-	-	-	-	-
Benzo(a)pyrene	NV	-	-	-	-	-	-	-	-		-	-	-	-	0.53 J	-	3.6 J	-	-	-	-	-
Benzo(b)fluoranthene	NV	-	-	-	-	-	-	-	-		-	-	-	-	1 J	4.7 J F2 F1	4.9 J	-	-	-	-	-
Benzo(g,h,i)perylene	NV				-		-								0.36 J	-	-	-				-
Bis(2-ethylhexyl)phthalate	5	**7.9**	3.2 J	-	-	-	-	-	-		-	2.5 J	-	-	-	-	-	-	-	1.8 J	-	3.5 JB
Butyl benzyl phthalate	5	-	0.47 JB	-	-	-	-	-	-		-	-	0.48 J	-	-	-	-	-	-	0.47 JB	-	-
Caprolactam	NV	-	-	-	-	-	-	-	-		-	-	-	2200	-	-	-	27	-	140 DL	-	-
Carbazole	NV	-	-	-	-	-	-	-	1.2 J		2.3 J	5.1	5.2	-	7	-	14 J	5.7 J	0.88 J	1.2 J	2.8 J	2.7 J
Chrysene	NV	-	-	-	-	-	-	-	-		-	-	-	-	1.6 J F1	4.7 J F1	7.4 J	-	0.42 J	0.33 J	-	-
Dibenzofuran	NV	-	-	-	-	-	-	-	1.2 J		16	18	32	-	71 J	49 J F1	230	25 J	-	0.51 J	0.72 J	0.73 J
Di-n-butyl phthalate	50	-	-	-	-	-	-	2 J, B	1.4 J		1.5 J, B	2.5 J	-	-	-	-	-	-	0.48 JB	-	-	-
Di-n-octyl phthalate	NV			-	-	-	-									-	-	-				-
Diethyl phthalate	NV			-	-	-	-	1 J							0.25 J	-	-	-				-
Fluoranthene	NV	-	-	-	-	-	-	-	-		-	1.5 J	1.2 J	-	19 F1	36 J F2 F1	100	5.2 J	0.96 J	1.4 J	1.6 J	1.3 J
Fluorene	NV	-	-	-	-	-	-	-	-		8.9	9.7	22	-	46 J	41 J F1	200	17 J	1.5 J	2.2 J	4.2 J	4.2 J
Isophorone	NV	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	NV	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	1 J	-
Naphthalene	10	-	-	-	-	-	-	-	-		8.2	9.8	1.4 JB	-	**70** J	11 J F2 F1	**190**	**59** F1	2.4 JB	1.4 J	3.7 J	2.3 J
Nitrobenzene	0.4	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	50	-	-	-	-	-	-	-	-		1.8 J	4.2 J	6.2	-	**76** J	62 F2 F1	**420**	9.2 J	3.1 J	6.1	8.6	6.8
Phenol	1*	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	NV	-	-	-	-	-	-	-	-		-	1.1 J	0.47 J	-	11 F1	21 J F2 F1	59	3.6 J	1.7 J	2 J	2.2 J	1.9 J

SNPE-VANDEMARK SITE
HISTORIC GROUNDWATER AND VAULT MONITORING RESULTS
LOCKPORT, NY

Lab ID	NYSDEC Part 703 Groundwater Quality Standards	480-117975-1	480-127262-1	480-80722-2	480-90488-2	480-101786-2	480-109820-2	480-117975-2	480-127262-2	480-80722-3	480-90488-3	480-101786-3	480-109820-3	480-117975-3	480-127262-3	480-117975-6	480-127262-6
Sample Date		5/12/2017	11/8/2017	5/20/2015	11/4/2015	6/16/2016	11/17/2016	5/12/2017	11/8/2017	5/20/2015	11/4/2015	6/16/2016	11/17/2016	5/12/2017	11/8/2017	5/12/2017	11/8/2017
Sample ID		PZ-2	PZ-2	PZ-3	PZ-3	PZ-3	PZ-3	PZ-3	PZ-3	PZ-4	PZ-4	PZ-4	PZ-4	PZ-4	PZ-4	Dup (MW-7D)	Dup (Vault)
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Volatile Organics by GC/MS (US EPA Method 8260B)																	
1,1,1-Trichloroethane	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**34**	-
1,1-Dichloroethane	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**140**	-
1,1-Dichloroethene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**47**	-
1,2-Dichloroethane	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**3.1**	-
2-Butanone	NV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	NV	-	-	9.1 J	4.9 J	5.4 J	-	-	4.1 J	-	-	3.1 J	-	-	-	-	2.9 J
Benzene	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	60	-	-	-	3.0	-	-	0.58 J	0.7 J	-	-	-	-	-	-	-	0.79 J
Carbon tetrachloride	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**61**	-
Chloroform	7	**1.5**	0.3 J	-	-	-	-	-	-	-	-	-	-	-	-	0.55 J	-
cis-1,2-Dichloroethene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	-
Ethylbenzene	5	-	0.28 J	-	-	-	-	-	0.24 J	-	-	-	-	-	-	**4.4**	0.23 J
Trichloroethene	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.63 J	-
Vinyl chloride	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**16**	-
Semivolatile Organics by GC/MS (US EPA Method 8270																	
Biphenyl	5	-	-	-	-	-	-	-	0.69 J	-	-	-	-	-	-	**65**	-
2,4-Dimethylphenol	5	-	1.6 J	-	-	-	-	-	0.85 J	-	-	-	-	-	-	-	-
2-methylphenol	5	-	-	-	-	-	-	0.45 J H	0.44 J	-	-	-	-	-	-	-	-
2-Methylnaphthalene	NV	-	-	1.9 J	2.0 J	0.72 J	-	-	4.6 J	-	-	-	-	-	-	47 J	3.4 J
2-Nitroaniline	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	5	-	-	1.5 J	1.4 J	0.49 J	-	-	3.3 J	-	-	-	-	-	-	-	2.5 J
4-Methylphenol & 3-Methlyphenol	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	20	3.9 J	7.8	4.2 J	3.7 J	1.0 J	-	1.2 J	5.5	-	-	-	-	-	-	**260**	4.0 J
Acenaphthylene	NV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	NV	0.54 J	0.97 J	0.32 J	0.38 J	-	-	-	-	-	-	-	-	-	-	29 J	-
Benzaldehyde	NV	-	-	-	-	0.33 J	-	-	0.39 J	-	-	-	-	-	-	-	0.33 J
Benzo(a)anthracene	NV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.9 J	-
Benzo(a)pyrene	NV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.5 J	-
Benzo(b)fluoranthene	NV	-	-	-	-	-	0.44 JK	-	-	-	-	-	-	-	-	7.7 J	-
Benzo(g,h,i)perylene	NV	-	-			-	-	-	-			-	-	-	-	-	-
Bis(2-ethylhexyl)phthalate	5	-	-	-	2.7 j	-	-	-	-	-	1.7 J	-	-	-	-	-	-
Butyl benzyl phthalate	5	-	-	-	0.48 J B	-	-	-	-	-	0.61 JB	-	-	-	-	-	-
Caprolactam	NV	-	-	-	280	3.9 J	-	-	-	-	110	-	-	-	-	-	-
Carbazole	NV	1 J	2.5 J	0.62 J	0.48 J	-	-	0.39 J	1.2 J	-	-	-	-	-	-	11 J	1.0 J
Chrysene	NV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.3 J	-
Dibenzofuran	NV	-	0.55 J	-	-	-	-	-	-	-	-	-	-	-	-	220	-
Di-n-butyl phthalate	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate	NV	-	-			1 J	-	-	0.77 J			1 J	-	-	0.77 J	-	1.1 J
Diethyl phthalate	NV	-	-			1 J	-	-	-			-	-	-	-	-	-
Fluoranthene	NV	0.72 J	0.89 J	-	-	-	0.52 J	-	-	-	-	-	-	-	-	120	-
Fluorene	NV	1.4 J	3.0 J	1.1 J	0.76 J	-	-	-	1.2 J	-	-	-	-	-	-	200	0.97 J
Isophorone	NV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	NV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	10	-	1.6 J	7 B	6.6 B	2.2 J	1.3 J	-	**15**	-	-	-	-	-	-	**98**	**11**
Nitrobenzene	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	50	2.5 J	4.5 J	1.6 J	1.5 J	-	0.89 J	0.44 J	0.73 J	-	-	-	-	-	-	**390**	0.53 J
Phenol	1*	-	-	**50**	**73**	**19**	-	**7.2**	-	-	-	-	-	-	-	-	
Pyrene	NV	0.96 J	1.3 J	-	0.46 J	-	0.65 J	-	-	-	-	-	-	-	-	69	-

Key:

Vault Effluent Sample Results
Plant Monitoring Well Sample Results
Piezometer Sample Results

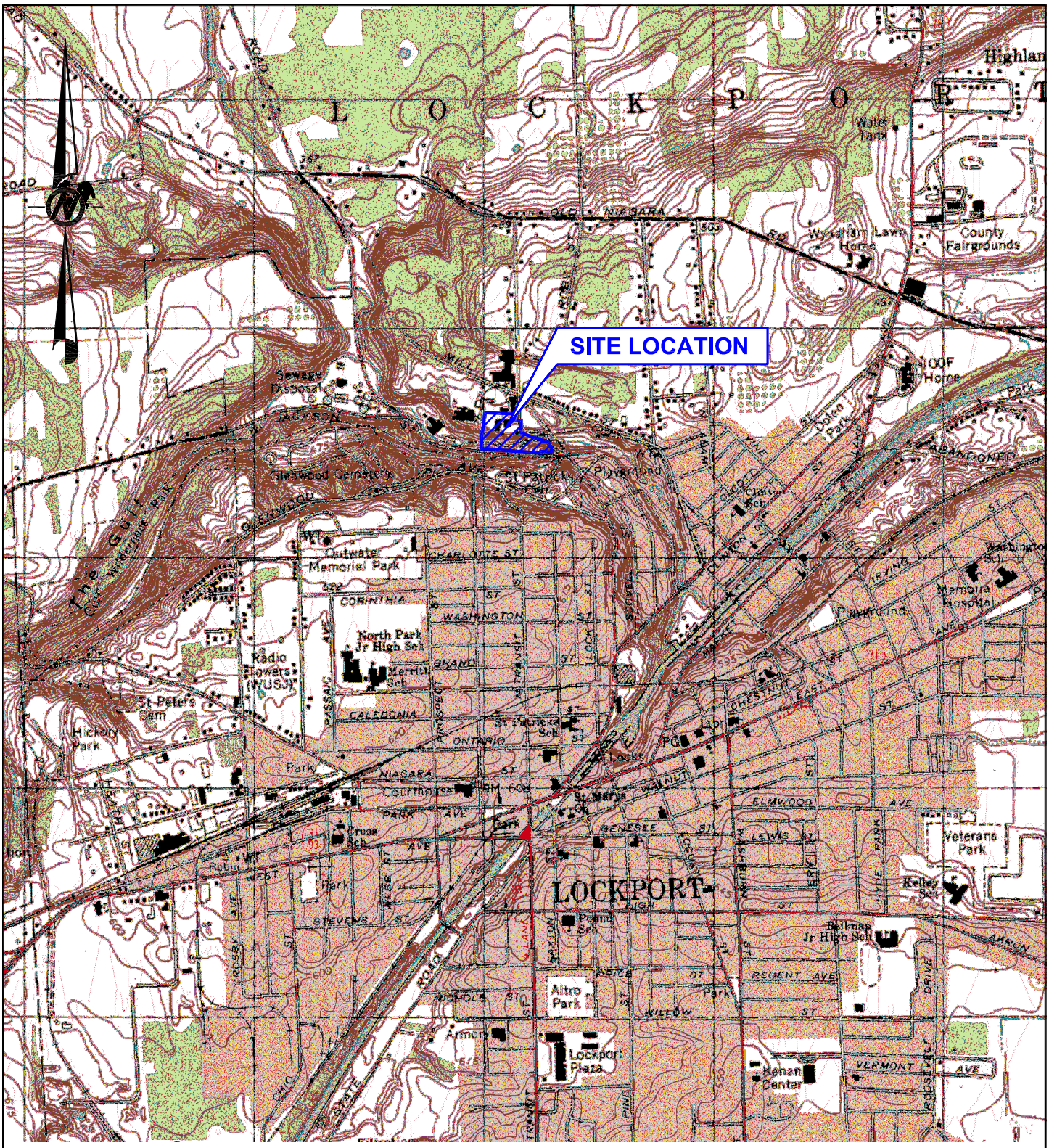
Footnotes:

- Compound not detected above the Analytical Method Detection Limit
BOLD = Value exceed the groundwater quality standards.
+ = This well was damaged and unable to be sampled.
± In 2013 this sample was incorrectly labeled as MW-2D on chain of custody and laboratory report
* = The sum of all phenols
NV = No GW Quality Standard

Qualifications:

J = Analyte detected at a level less that Reporting Limit and greater than or equal to the Method Detection Limit. Concentrations in this range are estimated.
B = Analyte detected in the method blank.

FIGURES



REFERENCES

1.) BASE MAP TAKEN FROM U.S.G.S. 7.5 MINUTE QUADRANGLE OF LOCKPORT, NEW YORK DATED 1980.

2000 0 2000
SCALE FEET

NJ Authorization #24GA28029100

Golder Associates
Buffalo, New York

SCALE	AS SHOWN
DATE	02/04/11
DESIGN	AML
CADD	GLS
CHECK	
REVIEW	

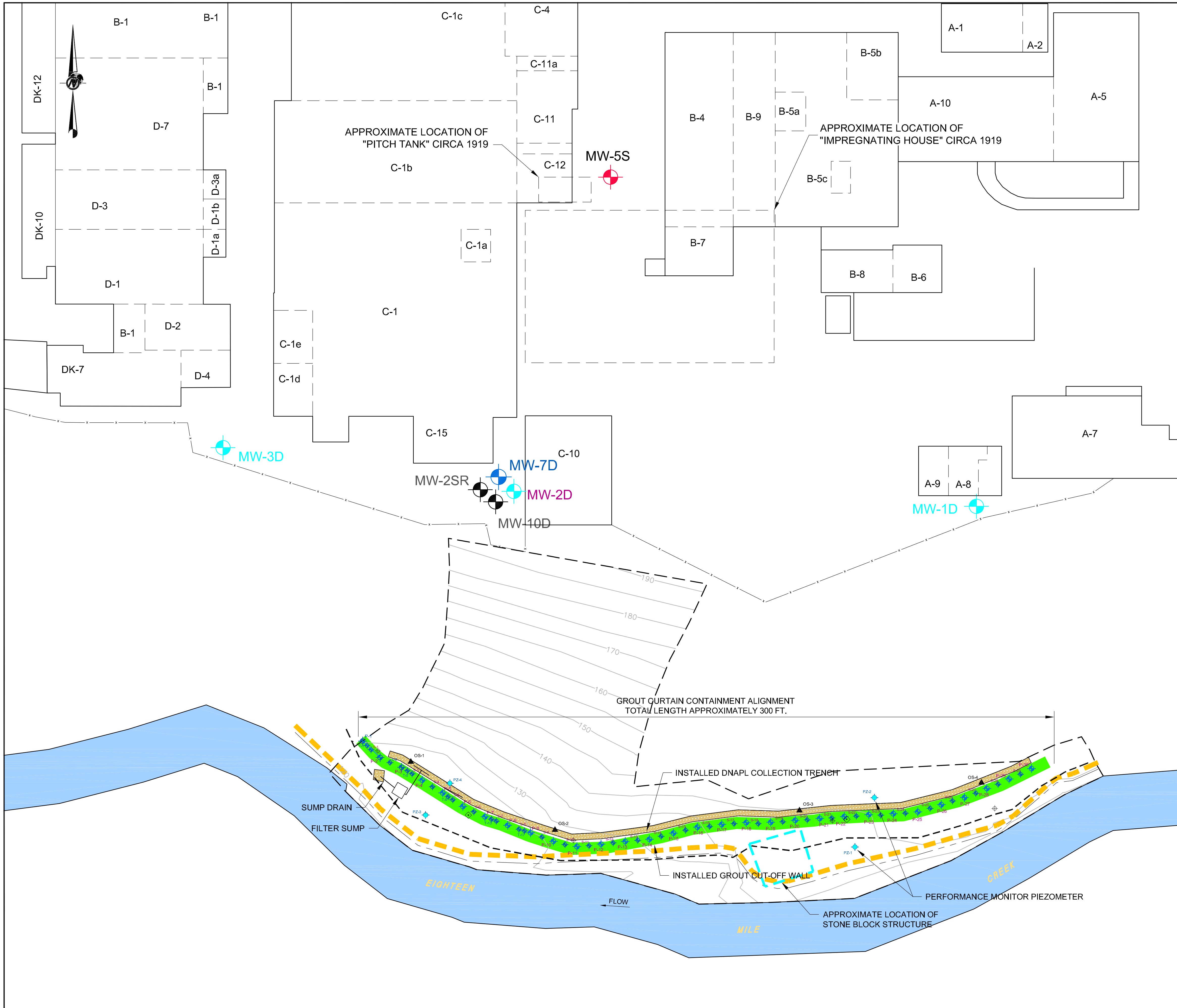
FILE No. 09389168A011
PROJECT No. 093-89168 REV. 0

TITLE

SITE LOCATION MAP

SNPE - VANDEMARK CHEMICAL

FIGURE 1-1



LEGEND

Symbol	Description
— x —	FENCE
— — —	SILT FENCE
(orange dashed)	STRAW BALES
(black dashed)	SAND BAGS
(green)	FLOWABLE FILL AND CEMENT GROUT
(tan)	No. 2 WASHED STONE
(diamond)	IN-SITU GROUT WALL PERMEABILITY SAMPLE LOCATION
OS-2 (triangle)	4-INCH DNAPL OBSERVATION SUMP (IN COLLECTION TRENCH)
PZ-1	1-INCH PERFORMANCE MONITORING PIEZOMETER
(red)	1999 INVESTIGATION OVERBURDEN MONITORING WELL
(cyan)	1999 INVESTIGATION BEDROCK MONITORING WELL
(blue)	2006 BEDROCK MONITORING WELL
(black)	MONITORING WELL (UNKNOWN INSTALLATION DATE)
(light blue)	EIGHTEEN-MILE CREEK

REFERENCE

1.) TOPOGRAPHY SHOWN ON THIS PLAN WAS TAKEN FROM SURVEY FILE xve-vandemark base.dwg, DATED 06-21-2010.

2.) BOREHOLE AND CORE LOCATIONS SHOWN ON THIS PLAN ARE APPROXIMATE.

3.) MAP DIGITIZED FROM HARD COPY OF FIGURE 1 ENTITLED "SITE PLAN," PREPARED BY BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC.

4.) CONCRETE VAULT, PIEZOMETERS, GRAVEL COLLECTION TRENCH, OBSERVATION SUMPS, AND FRENCH DRAIN FROM 121205 FIELD DATA REVISED.XLSX, PREPARED BY WENDEL IN NOVEMBER 30, 2012.

20 0 20 40
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1	09/30/13	AML	Corrected the layout and IDs of several GW wells west of Building C-10	AML	PTM	PTM

PROJECT
SNPE - VANDEMARK
CREEK BANK AREA CORRECTION MEASURES PROJECT
LOCKPORT, NEW YORK

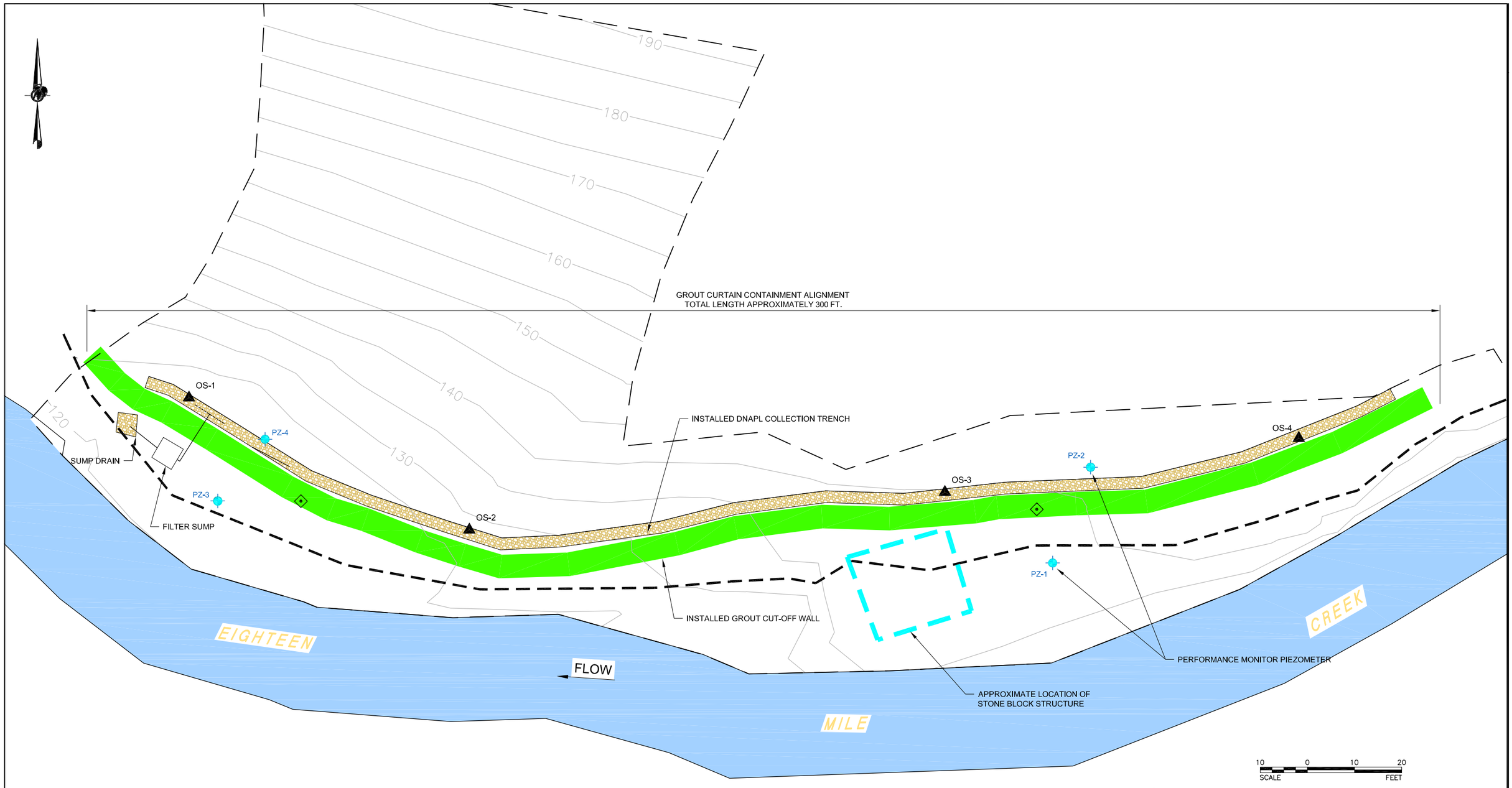
TITLE
OMP SITE PLAN - VDM PLANT & CREEK BANK AREA

NJ Authorization #24GA28029100
Golder Associates
Mt. Laurel, New Jersey

PROJECT No.		093–89168
DESIGN	PTM	04/16/13
CADD	MJS	04/16/13
CHECK	AML	04/17/13
REVIEW		

FILE No. 09389168A030
SCALE AS SHOWN REV. 0

FIGURE 1-2



LEGEND

- APPROXIMATE LOCATION OF EROSION CONTROL MEASURES (SILT FENCE, STRAW BALES, AND SAND BAGS). TO REMAIN IN PLACE UNTIL SPRING OF 2013
- PZ-1 — PERFORMANCE MONITORING PIEZOMETER
- OBSERVATION SUMPS
- IN-SITU GROUT WALL PERMEABILITY SAMPLE LOCATION
- FLOWABLE FILL AND CEMENT GROUT
- No. 2 WASHED STONE
- EIGHTEEN-MILE CREEK

REFERENCE

1.) TOPOGRAPHY SHOWN ON THIS PLAN WAS TAKEN FROM SURVEY FILE xve-vandemark base.dwg, DATED 06-21-2010.

2.) CORE LOCATIONS SHOWN ON THIS PLAN ARE APPROXIMATE.

3.) MAP DIGITIZED FROM HARD COPY OF FIGURE 1 ENTITLED "SITE PLAN," PREPARED BY BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC.

4.) CONCRETE VAULT, PIEZOMETERS, GRAVEL COLLECTION TRENCH, OBSERVATION SUMPS, AND FRENCH DRAIN FROM 121205 FIELD DATA REVISED.XLSX, PREPARED BY WENDEL IN NOVEMBER 30, 2012.

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

SNPE - VANDEMARK
CREEK BANK AREA CORRECTION MEASURES PROJECT
LOCKPORT, NEW YORK

TITLE

CREEK BANK AREA SITE PLAN OPERATION & MAINTENANCE PLAN

NJ Authorization #24GA28029100

Golder Associates
Mt. Laurel, New Jersey

PROJECT No.		093-89168	FILE No.		09389168A028
DESIGN	PTM	12/11/12	SCALE	AS SHOWN	REV. 0
CADD	AML	03/28/13			
CHECK	PTM				
REVIEW	DCW				

FIGURE 3-1

APPENDIX A

OPERATIONS AND MONITORING
SUMMARY INSPECTION FORMS

OPERATIONS & MONITORING SUMMARY

SHEET 1 OF 2

PROJECT NUMBER: 093-89168
PROJECT TITLE: Creek Bank Corrective Measures -Site No. 932149
OWNER: SNPE - VanDeMark Chemical
CONTRACTOR:
LOCATION: Lockport, New York
SUB CONTRACTOR(S):

DATE: 05/12/17

WEATHER: TEMPERATURE: LOW: 50 @ 8:30 HIGH 60 @ 11:00 AM
CLOUD COVER Partly Cloudy PRECIPITATION N/A WIND

GOLDER PERSONNEL ON SITE:

Patricia Martin / Josh Vernold / Alex Frame

SUMMARY OF FIELD INSPECTION OBSERVATIONS:

This inspection was coordinated w/ Stan Radon of Region 9 NYSDEC

(1) Effluent Vault: Water was clear, continuous overflow was observed to chamber outfall (due to recent heavy precip.). No evidence of a sheen or DNAPL observed on top of filter media. Minor sediment accumulation on top of sand bed.

(2) Observation Sumps:

OS-1: Dry - no DNAPL
OS-2: 1-2" water - no DNAPL, minor sediment accum. at bottom
OS-3: Dry - no DNAPL
OS-4: Filled to top w/ water - no DNAPL or sheen on water, minor sediment accum. at bottom.

(3) Upgradient slope observations (area of creek bank north of DNAPL collection trench): No new DNAPL accumulations observed. Vegetation growth was moderate allowing for good inspection conditions.

(4) Down gradient slope observations (area south of DNAPL trench): DNAPL accumulations observed in Fall of 2016 in area south of P2-1 were partially removed (3x 5 gal buckets). Remaining accumulations were on steep portion of bank close to water and will be removed during Fall event when additional safety gear can be employed (harness ; rope).

GOLDER ACTIVITIES AND TEST RESULTS:

- Blind dup collected from MW-70

Golder Associates

SUBMITTED BY:

Patrick J. Martin

May 12, 2017

GOLDER FORM R4-0699
(JANUARY 2005)

GOLDER ASSOCIATES INC.

OPERATIONS & MONITORING SUMMARY

SHEET 1 OF 2

PROJECT NUMBER: 093-89168
PROJECT TITLE: Creek Bank Corrective Measures -Site No. 932149
OWNER: SNPE - VanDeMark Chemical
CONTRACTOR:
LOCATION: Lockport, New York
SUB CONTRACTOR(S):

DATE: 11/8/17

WEATHER: CLEAR TEMPERATURE: LOW: 30 @ 8:30 HIGH _____ @ _____
CLOUD COVER RARELY PRECIPITATION N/A WIND _____

GOLDER PERSONNEL ON SITE:

JOSH VERNOLD / PAT MARTIN

SUMMARY OF FIELD INSPECTION OBSERVATIONS:

THIS INSPECTION WAS COORDINATED W/ STAN RADON OF NYSDEC

(1) EFFLUENT VAULT: WATER IS CLEAR IN SAND FILTER SECTION, MINIMAL OVERFLOW TO DISCHARGE CHAMBER. MINOR SEDIMENT ACCUMULATION ON TOP OF SAND BED. NO SHEEN OR DNAPL OBSERVED ON WATER OR ON TOP OF FILTER MEDIA.

(2) OBSERVATION SUMPS:

OS-1: APPROX. 50" OF WATER, NO SEDIMENT, SHEEN OR ODOR
OS-2: DRY, NO DNAPL PRESENT
OS-3: APPROX 11" WATER, SMALL SEDIMENT ACCUM, NO ODOR OR DNAPL
OS-4: DRY, NO DNAPL PRESENT

(3) UPGRADIENT SLOPE OBSERVATIONS (NORTH OF DNAPL TRENCH): NO NEW DNAPL ACCUMULATIONS OBSERVED. HEAVY ACCUMULATION OF DEAD LEAVES, ETC. ON GROUND.

(4) DOWNGRADIENT SLOPE OBSERVATIONS (SOUTH OF DNAPL TRENCH): SEVERAL SMALL DNAPL OUTBREAKS WERE OBSERVED SOUTH OF PZ-1 CLOSE TO THE EDGE OF CREEK. TOTAL AREA WHERE THESE WERE OBSERVED WAS APPROX 15-20' IN TOTAL. NO OTHER OUTBREAKS OBSERVED

GOLDER ACTIVITIES AND TEST RESULTS:

- MET W/ STAN RADON OF NYSDEC & CHRIS BANACH OF VDM TO REVIEW SITE STATUS
- TWO 5-GALLON PAILS OF COAL TAR RESIDUALS WERE REMOVED FROM ISOLATED SEEP AREAS ON THE SOUTH SIDE OF BURIED STONE MILLRACE STRUCTURE ALONG CREEK BANK.

Golder Associates

SUBMITTED BY: Patrick T Martin
NOV. 8, 2017

GOLDER FORM: R4-0699
(JANUARY 2005)

GOLDER ASSOCIATES INC.

APPENDIX B

INSPECTION PHOTOGRAPHS

2017 Annual Report: VanDeMark Chemical Creek Bank Operations & Monitoring Plan	
PHOTO 1 Looking East- upper creek bank area near OS-1 (May)	
PHOTO 2 Filter vault sump drain (May)	

PHOTO 3 Interior of Filter Vault – top of sand filter bed (May)	
PHOTO 4 Looking east – filter vault and PZ-3 and PZ-4 (May)	

PHOTO 5 Looking east at exposed portion of buried stone structure (May)	
PHOTO 6 Looking southwest along edge of creek – lower Creek Bank area (May)	

PHOTO 7 Creek bank edge of the lower creek bank area (May)	
PHOTO 8 Looking West – PZ-3 and Filter Vault (May)	

PHOTO 9 West view – Upper creek bank area (May)	
PHOTO 10 Looking West – toward lower creek bank area (Nov)	

PHOTO 11 PZ-4 (Nov)	
PHOTO 12 Interior of Filter Vault – top of sand filter bed (Nov)	

PHOTO 13 Looking east along edge of creek – lower Creek Bank area (Nov)	
PHOTO 14 Filter vault sump drain (Nov)	

PHOTO 15 Looking East- upper creek bank area near OS-1 (Nov)	
PHOTO 16 Looking southwest along edge of creek – lower Creek Bank area (Nov)	

PHOTO 17 Looking north at slope toward OS-2 (Nov)	
PHOTO 18 Looking east at exposed portion of buried stone structure. (Nov)	

APPENDIX C

WELL/PIEZOMETER SAMPLE COLLECTION FORMS

SAMPLE COLLECTION INFORMATION FORM

GAI PROJECT NAME: SNPE/VDM Semi-Annual Sampling GAI PROJECT NO.: 093 - 89168

WELL ID.: PZ-1 (PZ-1 is typically dry) SOURCE CODES: RIVER OR STREAM, WELL, SOIL, OTHER (CIRCLE ONE)

PURGING INFORMATION (IF APPLICABLE)

PURGE DATE (yy/mm/dd)	05/12/17	TIME (24 HR CLOCK)	_____	ELAPSED HRS.	_____
CASING VOL.(Gal.)	DRY	GAL. PURGED (Gal.)	_____		
PURGING DEVICE (SEE BELOW)	_____	PURGING DEVICE MATERIAL		DEDICATED (Y/N)	

Well was DRY

SAMPLE COLLECTION INFORMATION

SAMPLING DATE (yy/mm/dd)	___/___/___	TIME (24 HR CLOCK)	_____	MATRIX	_____
SAMPLING DEVICE (SEE BELOW)	_____	DEDICATED (Y/N)		FILTERED (Y/N)	
SAMPLING DEVICE MATERIAL	_____	SAMPLE TYPE - GRAB/COMPOSITE (CIRCLE ONE)			

(A) AIR-LIFT PUMP (B) BLADDER PUMP (C) PERISTALTIC PUMP (D) SCOOP/SHOVEL (E) BAILER (F) OTHER (SPECIFY)

WELL INFORMATION (IF APPLICABLE)

REFERENCE POINT	_____	LAND ELEVATION (FT./MSL)	_____.___
REF. PT. ELEV.(FT. MSL)	_____.___	WELL DEPTH (FT.)	10.60
DEPTH TO WATER (REF. PT.)	_____.___	STICKUP (FT.)	_____.___
GW. ELEV.(FT. MSL.)	_____.___	WELL DIAMETER (INCHES)	_____.___

FIELD MEASURMENTS (FOUR REPLICATES)

	Initial Purge	Final Purge	Initial Sample	Final Sample
pH (STD)	_____	_____	_____	_____
SPEC. COND.(uS)	_____	_____	_____	_____
TEMPERATURE (C)	_____	_____	_____	_____
OTHER (SPECIFY)	_____	_____	_____	_____

COMMENTS/CALCULATIONS

WEATHER CONDITIONS: 50°F overcast

SAMPLE APPEARANCE

1" DIA. CASING CONTAINS .041 Gal./Ft.

2" DIA. CASING CONTAINS .163 Gal./Ft.

4" DIA. CASING CONTAINS .652 Gal./Ft.

PLEASE INCLUDE SAMPLE BOTTLE SIZE, BOTTLE COLOR, BOTTLE MATERIAL, PRESERVATIVES AND ANALYTICAL METHODS ON LABORATORY CUSTODY FORMS.

SAMPLER SIGNATURE: [signature] DATE: 5/12/17

SAMPLE COLLECTION INFORMATION FORM

GAI PROJECT NAME: SNPE/VDM Semi-Annual Sampling | GAI PROJECT NO.: 093 - 89168

WELL ID.: PZ-2 | SOURCE CODES: RIVER OR STREAM, WELL, SOIL, OTHER (CIRCLE ONE)

PURGING INFORMATION (IF APPLICABLE)

PURGE DATE (yy/mm/dd)	05/12/17	TIME (24 HR CLOCK)	0919	ELAPSED HRS.	____
CASING VOL.(Gal.)	0.184	GAL. PURGED (Gal.)	____		
PURGING DEVICE (SEE BELOW)	PVC bailer	PURGING DEVICE MATERIAL		DEDICATED (Y/N)	

SAMPLE COLLECTION INFORMATION

SAMPLING DATE (yy/mm/dd)	05/12/17	TIME (24 HR CLOCK)	0919	MATRIX	Aq
SAMPLING DEVICE (SEE BELOW)	E	DEDICATED-(Y/N)		FILTERED (Y/N)	
SAMPLING DEVICE MATERIAL	PVC	SAMPLE TYPE - GRAB/COMPOSITE (CIRCLE ONE)			

(A) AIR-LIFT PUMP (B) BLADDER PUMP (C) PERISTALTIC PUMP (D) SCOOP/SHOVEL (E) BAILER (F) OTHER (SPECIFY)

WELL INFORMATION (IF APPLICABLE)

REFERENCE POINT	PZ-2	LAND ELEVATION (FT./MSL)	____.__
REF. PT. ELEV.(FT. MSL)	____	WELL DEPTH (FT.)	11.02'
DEPTH TO WATER (REF. PT.)	6.53	STICKUP (FT.)	____.__
GW. ELEV.(FT. MSL.)	____.__	WELL DIAMETER (INCHES)	1.00"

FIELD MEASURMENTS (FOUR REPLICATES)

	Initial Purge	Final Purge	Initial Sample	Final Sample
pH (STD)				
SPEC. COND.(uS)				
TEMPERATURE (C)				
OTHER (SPECIFY)				

COMMENTS/CALCULATIONS

WEATHER CONDITIONS: 50°F, overcast, calm

SAMPLE APPEARANCE

1" DIA. CASING CONTAINS .041 Gal./Ft. 11.02 - 6.53 = 4.49 x 0.041 = 0.184 Gal per casing

2" DIA. CASING CONTAINS .163 Gal./Ft.

4" DIA. CASING CONTAINS .652 Gal./Ft.

Sample appearance: Brown, turbid, aqueous

PLEASE INCLUDE SAMPLE BOTTLE SIZE, BOTTLE COLOR, BOTTLE MATERIAL, PRESERVATIVES AND ANALYTICAL METHODS ON LABORATORY CUSTODY FORMS.

SAMPLER SIGNATURE: [signature] DATE: 5/12/17

SAMPLE COLLECTION INFORMATION FORM

GAI PROJECT NAME: SNPE/VDM Semi-Annual Sampling | GAI PROJECT NO.: 093 - 89168

WELL ID.: PZ-3 | SOURCE CODES: RIVER OR STREAM, (WELL), SOIL, OTHER (CIRCLE ONE)

PURGING INFORMATION (IF APPLICABLE)

PURGE DATE (yy/mm/dd)	__/__/__	TIME (24 HR CLOCK)	_____	ELAPSED HRS.	_____
CASING VOL.(Gal.)	_____	GAL. PURGED (Gal.)	_____		
PURGING DEVICE (SEE BELOW)	_____	PURGING DEVICE MATERIAL		DEDICATED (Y/N)	

SAMPLE COLLECTION INFORMATION

SAMPLING DATE (yy/mm/dd)	05/12/17	TIME (24 HR CLOCK)	1005	MATRIX	Aq.
SAMPLING DEVICE (SEE BELOW)	E	DEDICATED (Y/N)		FILTERED (Y/N)	
SAMPLING DEVICE MATERIAL	PVC Bailer	SAMPLE TYPE - GRAB/COMPOSITE (CIRCLE ONE)			

(A) AIR-LIFT PUMP (B) BLADDER PUMP (C) PERISTALTIC PUMP (D) SCOOP/SHOVEL (E) BAILER (F) OTHER (SPECIFY)

WELL INFORMATION (IF APPLICABLE)

REFERENCE POINT	PZ-3	LAND ELEVATION (FT./MSL)	_____.__
REF. PT. ELEV.(FT. MSL)	_____.__	WELL DEPTH (FT.)	9.65'
DEPTH TO WATER (REF. PT.)	4.68	STICKUP (FT.)	_____.__
GW. ELEV.(FT. MSL.)	_____.__	WELL DIAMETER (INCHES)	1.00"

FIELD MEASURMENTS (FOUR REPLICATES)

	Initial Purge	Final Purge	Initial Sample	Final Sample
pH (STD)				
SPEC. COND.(uS)				
TEMPERATURE (C)				
OTHER (SPECIFY)				

COMMENTS/CALCULATIONS

WEATHER CONDITIONS: 50°F, Overcast

SAMPLE APPEARANCE

1" DIA. CASING CONTAINS .041 Gal./Ft. 9.65 − 4.68 = 4.97 x 0.41 = 0.203 gal

2" DIA. CASING CONTAINS .163 Gal./Ft.

4" DIA. CASING CONTAINS .652 Gal./Ft.

Sample appearance: clear, aq, no odor → white particles in suspension

PLEASE INCLUDE SAMPLE BOTTLE SIZE, BOTTLE COLOR, BOTTLE MATERIAL, PRESERVATIVES AND ANALYTICAL METHODS ON LABORATORY CUSTODY FORMS.

SAMPLER SIGNATURE: [signature] DATE: 5/12/17

SAMPLE COLLECTION INFORMATION FORM

GAI PROJECT NAME: SNPE/VDM Semi-Annual Sampling | GAI PROJECT NO.: 093 - 89168

WELL ID.: PZ-4 | SOURCE CODES: RIVER OR STREAM, WELL, SOIL, OTHER (CIRCLE ONE)

PURGING INFORMATION (IF APPLICABLE)

PURGE DATE (yy/mm/dd)	___/___/___	TIME (24 HR CLOCK)	_____	ELAPSED HRS.	_____
CASING VOL.(Gal.)	_____	GAL. PURGED (Gal.)	_____		
PURGING DEVICE (SEE BELOW)	_____	PURGING DEVICE MATERIAL		DEDICATED (Y/N)	

SAMPLE COLLECTION INFORMATION

SAMPLING DATE (yy/mm/dd)	05/12/17	TIME (24 HR CLOCK)	1026	MATRIX	Aqueous
SAMPLING DEVICE (SEE BELOW)	E	DEDICATED (Y/N)		FILTERED (Y/N)	
SAMPLING DEVICE MATERIAL	PVC Bailer	SAMPLE TYPE - GRAB/COMPOSITE (CIRCLE ONE)			

(A) AIR-LIFT PUMP (B) BLADDER PUMP (C) PERISTALTIC PUMP (D) SCOOP/SHOVEL (E) BAILER (F) OTHER (SPECIFY)

WELL INFORMATION (IF APPLICABLE)

REFERENCE POINT	PZ-4	LAND ELEVATION (FT./MSL)	_____.___
REF. PT. ELEV.(FT. MSL)	_____.___	WELL DEPTH (FT.)	10.81'
DEPTH TO WATER (REF. PT.)	___4.49	STICKUP (FT.)	_____.___
GW. ELEV.(FT. MSL.)	_____.___	WELL DIAMETER (INCHES)	1.00"

FIELD MEASURMENTS (FOUR REPLICATES)

	Initial Purge	Final Purge	Initial Sample	Final Sample
pH (STD)	_____	_____	_____	_____
SPEC. COND.(uS)	_____	_____	_____	_____
TEMPERATURE (C)	_____	_____	_____	_____
OTHER (SPECIFY)	_____	_____	_____	_____

COMMENTS/CALCULATIONS

WEATHER CONDITIONS: 50°, overcast

SAMPLE APPEARANCE

1" DIA. CASING CONTAINS .041 Gal./Ft. 10.81 - 4.49 = 6.32 x 0.041 = 0.259 gal

2" DIA. CASING CONTAINS .163 Gal./Ft.

4" DIA. CASING CONTAINS .652 Gal./Ft.

Sample appearance: clear, aq, no odor → white particles in suspension

PLEASE INCLUDE SAMPLE BOTTLE SIZE, BOTTLE COLOR, BOTTLE MATERIAL, PRESERVATIVES AND ANALYTICAL METHODS ON LABORATORY CUSTODY FORMS.

SAMPLER SIGNATURE: [signature] | DATE: 5/12/17

SAMPLE COLLECTION INFORMATION FORM

GAI PROJECT NAME: SNPE/VDM Semi-Annual Sampling GAI PROJECT NO.: 093 - 89168

WELL ID.: MW-7D SOURCE CODES: RIVER OR STREAM, WELL, SOIL, OTHER (CIRCLE ONE)

PURGING INFORMATION (IF APPLICABLE)

PURGE DATE (yy/mm/dd)	05/12/17	TIME (24 HR CLOCK)	1110	ELAPSED HRS.	____
CASING VOL.(Gal.)	3.15	GAL. PURGED (Gal.)	____		
PURGING DEVICE (SEE BELOW)	PVC bailer	PURGING DEVICE MATERIAL		DEDICATED (Y/N)	

SAMPLE COLLECTION INFORMATION

SAMPLING DATE (yy/mm/dd)	05/12/17	TIME (24 HR CLOCK)	1204	MATRIX	Aq
SAMPLING DEVICE (SEE BELOW)	Same	DEDICATED (Y/N)		FILTERED (Y/N)	
SAMPLING DEVICE MATERIAL		SAMPLE TYPE - GRAB/COMPOSITE (CIRCLE ONE)			

(A) AIR-LIFT PUMP (B) BLADDER PUMP (C) PERISTALTIC PUMP (D) SCOOP/SHOVEL (E) BAILER (F) OTHER (SPECIFY)

WELL INFORMATION (IF APPLICABLE)

REFERENCE POINT	MW-7D	LAND ELEVATION (FT./MSL)	____
REF. PT. ELEV.(FT. MSL)	____	WELL DEPTH (FT.)	~~71.02'~~ 49.67
DEPTH TO WATER (REF. PT.)	30.33	STICKUP (FT.)	N/A - flush mount
GW. ELEV.(FT. MSL.)	____	WELL DIAMETER (INCHES)	2.00"

FIELD MEASURMENTS (FOUR REPLICATES)

	Initial Purge	Final Purge	Initial Sample	Final Sample
pH (STD)				
SPEC. COND.(uS)				
TEMPERATURE (C)				
OTHER (SPECIFY)				

COMMENTS/CALCULATIONS

WEATHER CONDITIONS: 53°F, cloudy, calm

SAMPLE APPEARANCE

Blind DUP sampled @ MW-7D

1" DIA. CASING CONTAINS .041 Gal./Ft.

2" DIA. CASING CONTAINS .163 Gal./Ft.

4" DIA. CASING CONTAINS .652 Gal./Ft.

49.67' - 30.33' = 19.34' x 0.163 = 3.15 Gal x 3 = 9.5 Gal / 3 casings

previous bailer rope broke, plastic bailer dropped into well.

* NEED TO BRING HOOK TO RETRIEVE BAILER NEXT TIME.

PLEASE INCLUDE SAMPLE BOTTLE SIZE, BOTTLE COLOR, BOTTLE MATERIAL, PRESERVATIVES AND ANALYTICAL METHODS ON LABORATORY CUSTODY FORMS.

SAMPLER SIGNATURE: [signature] DATE: 5/12/17

Sample Appearance
Aqueus, Brown, turbid
oil sheen / NAPL layer @ top

SAMPLE COLLECTION INFORMATION FORM

GAI PROJECT NAME: SNPE/VDM Semi-Annual Sampling

GAI PROJECT NO.: 093 - 89168

WELL ID.: OBSERVATION VAULT

SOURCE CODES: RIVER OR STREAM, WELL, SOIL, OTHER (CIRCLE ONE)

Filter Vault

PURGING INFORMATION (IF APPLICABLE)

PURGE DATE (yy/mm/dd)	___/___/___	TIME (24 HR CLOCK)	ELAPSED HRS.
CASING VOL.(Gal.)		GAL. PURGED (Gal.)	
PURGING DEVICE (SEE BELOW)		PURGING DEVICE MATERIAL	DEDICATED (Y/N)

SAMPLE COLLECTION INFORMATION

SAMPLING DATE (yy/mm/dd)	05/12/17	TIME (24 HR CLOCK) 0950	MATRIX Aq.
SAMPLING DEVICE (SEE BELOW)	*F	DEDICATED-(Y/N) N/A	FILTERED (Y/N)
SAMPLING DEVICE MATERIAL		SAMPLE TYPE - GRAB/COMPOSITE (CIRCLE ONE)	

(A) AIR-LIFT PUMP (B) BLADDER PUMP (C) PERISTALTIC PUMP (D) SCOOP/SHOVEL (E) BAILER (F) OTHER (SPECIFY)

* Dipped Amber bottles to sample

WELL INFORMATION (IF APPLICABLE)

REFERENCE POINT	Observation Vault	LAND ELEVATION (FT./MSL)	
REF. PT. ELEV.(FT. MSL)		WELL DEPTH (FT.)	
DEPTH TO WATER (REF. PT.)		STICKUP (FT.)	
GW. ELEV.(FT. MSL.)		WELL DIAMETER (INCHES)	

FIELD MEASURMENTS (FOUR REPLICATES)

	Initial Purge	Final Purge	Initial Sample	Final Sample
pH (STD)				
SPEC. COND.(uS)				
TEMPERATURE (C)				
OTHER (SPECIFY)				

COMMENTS/CALCULATIONS

WEATHER CONDITIONS: MS + MSD sampled @ observation vault

SAMPLE APPEARANCE

1" DIA. CASING CONTAINS .041 Gal./Ft.

2" DIA. CASING CONTAINS .163 Gal./Ft.

4" DIA. CASING CONTAINS .652 Gal./Ft.

Sample Appearance: Clear, aqueous, no odor

PLEASE INCLUDE SAMPLE BOTTLE SIZE, BOTTLE COLOR, BOTTLE MATERIAL, PRESERVATIVES AND ANALYTICAL METHODS ON LABORATORY CUSTODY FORMS.

SAMPLER SIGNATURE: [signature]

DATE: 5/12/17

SAMPLE COLLECTION INFORMATION FORM

GAI PROJECT NAME: SNPE/VDM Semi-Annual Sampling GAI PROJECT NO.: 093 - 89168

WELL ID.: Blind Duplicate @ MW-7D SOURCE CODES: RIVER OR STREAM, WELL, SOIL, OTHER (CIRCLE ONE)

PURGING INFORMATION (IF APPLICABLE)

PURGE DATE (yy/mm/dd)	___/___/___	TIME (24 HR CLOCK)	_____	ELAPSED HRS.	_____
CASING VOL.(Gal.)	_____	GAL. PURGED (Gal.)	_____		
PURGING DEVICE (SEE BELOW)	_____	PURGING DEVICE MATERIAL		DEDICATED (Y/N)	

SAMPLE COLLECTION INFORMATION

SAMPLING DATE (yy/mm/dd)	___/___/___	TIME (24 HR CLOCK)	_____	MATRIX	_____
SAMPLING DEVICE (SEE BELOW)	_____	DEDICATED-(Y/N)		FILTERED (Y/N)	
SAMPLING DEVICE MATERIAL	_____	SAMPLE TYPE - GRAB/COMPOSITE (CIRCLE ONE)			

(A) AIR-LIFT PUMP (B) BLADDER PUMP (C) PERISTALTIC PUMP (D) SCOOP/SHOVEL (E) BAILER (F) OTHER (SPECIFY)

WELL INFORMATION (IF APPLICABLE)

REFERENCE POINT	_____	LAND ELEVATION (FT./MSL)	_____.___
REF. PT. ELEV.(FT. MSL)	_____.___	WELL DEPTH (FT.)	_____.___
DEPTH TO WATER (REF. PT.)	_____.___	STICKUP (FT.)	_____.___
GW. ELEV.(FT. MSL.)	_____.___	WELL DIAMETER (INCHES)	_____.___

FIELD MEASURMENTS (FOUR REPLICATES)

	Initial Purge	Final Purge	Initial Sample	Final Sample
pH (STD)	_____	_____	_____	_____
SPEC. COND.(uS)	_____	_____	_____	_____
TEMPERATURE (C)	_____	_____	_____	_____
OTHER (SPECIFY)	_____	_____	_____	_____

COMMENTS/CALCULATIONS

WEATHER CONDITIONS: 53°F, cloudy, calm

SAMPLE APPEARANCE

1" DIA. CASING CONTAINS .041 Gal./Ft.

2" DIA. CASING CONTAINS .163 Gal./Ft.

4" DIA. CASING CONTAINS .652 Gal./Ft.

Blind Dup sampled @ MW-7D.
See MW-7D form for purge/sample details

PLEASE INCLUDE SAMPLE BOTTLE SIZE, BOTTLE COLOR, BOTTLE MATERIAL, PRESERVATIVES AND ANALYTICAL METHODS ON LABORATORY CUSTODY FORMS.

SAMPLER SIGNATURE: [signature] DATE: 5/12/17

SAMPLE COLLECTION INFORMATION FORM

GAI PROJECT NAME: SNPE/VDM Semi-Annual Sampling GAI PROJECT NO.: 093 - 89168

WELL ID.: PZ-1 SOURCE CODES: ~~RIVER OR STREAM,~~ WELL, ~~SOIL, OTHER~~ (CIRCLE ONE)

PURGING INFORMATION (IF APPLICABLE)

PURGE DATE (yy/mm/dd)	11/8/2017	TIME (24 HR CLOCK)		ELAPSED HRS.	
CASING VOL.(Gal.)		GAL. PURGED (Gal.)			
PURGING DEVICE (SEE BELOW)		PURGING DEVICE MATERIAL		DEDICATED (Y/N)	

SAMPLE COLLECTION INFORMATION

SAMPLING DATE (yy/mm/dd)		TIME (24 HR CLOCK)		MATRIX	
SAMPLING DEVICE (SEE BELOW)		DEDICATED-(Y/N)		FILTERED (Y/N)	
SAMPLING DEVICE MATERIAL		SAMPLE TYPE - GRAB/COMPOSITE (CIRCLE ONE)			

(A) AIR-LIFT PUMP (B) BLADDER PUMP (C) PERISTALTIC PUMP (D) SCOOP/SHOVEL (E) BAILER (F) OTHER (SPECIFY)

WELL INFORMATION (IF APPLICABLE)

REFERENCE POINT		LAND ELEVATION (FT./MSL)	
REF. PT. ELEV.(FT. MSL)		WELL DEPTH (FT.)	10.60
DEPTH TO WATER (REF. PT.)	DRY	STICKUP (FT.)	
GW. ELEV.(FT. MSL.)		WELL DIAMETER (INCHES)	

FIELD MEASURMENTS (FOUR REPLICATES)

	Initial Purge	Final Purge	Initial Sample	Final Sample
pH (STD)				
SPEC. COND.(uS)				
TEMPERATURE (C)				
OTHER (SPECIFY)				

COMMENTS/CALCULATIONS

WEATHER CONDITIONS

SAMPLE APPEARANCE

1" DIA. CASING CONTAINS .041 Gal./Ft.

2" DIA. CASING CONTAINS .163 Gal./Ft.

4" DIA. CASING CONTAINS .652 Gal./Ft.

PZ-1 WAS DRY, UNABLE TO SAMPLE

PLEASE INCLUDE SAMPLE BOTTLE SIZE, BOTTLE COLOR, BOTTLE MATERIAL, PRESERVATIVES AND ANALYTICAL METHODS ON LABORATORY CUSTODY FORMS.

SAMPLER SIGNATURE DATE

SAMPLE COLLECTION INFORMATION FORM

GAI PROJECT NAME: SNPE/VDM Semi-Annual Sampling | GAI PROJECT NO.: 093 - 89168

WELL ID.: PZ-2 | SOURCE CODES: WELL

PURGING INFORMATION (IF APPLICABLE)

PURGE DATE (yy/mm/dd)	11/8/2017	TIME (24 HR CLOCK)	0918 Hrs	ELAPSED HRS.	0:08
CASING VOL.(Gal.)	0.19	GAL. PURGED (Gal.)	0.424		
PURGING DEVICE (SEE BELOW)	same as below	PURGING DEVICE MATERIAL	same as below	DEDICATED	same as below

SAMPLE COLLECTION INFORMATION

SAMPLING DATE (yy/mm/dd)	11/8/2017	TIME (24 HR CLOCK)	0918 hrs	MATRIX	Aqueous
SAMPLING DEVICE (SEE BELOW)	Bailer	DEDICATED -	YES	FILTERED	NO
SAMPLING DEVICE MATERIAL	HD Polyethylene	SAMPLE TYPE -	GRAB		

(A) AIR-LIFT PUMP (B) BLADDER PUMP (C) PERISTALTIC PUMP (D) SCOOP/SHOVEL (E) BAILER (F) OTHER (SPECIFY)

WELL INFORMATION (IF APPLICABLE)

REFERENCE POINT	PZ-2	LAND ELEVATION (FT./MSL)	____.__
REF. PT. ELEV.(FT. MSL)	____.__	WELL DEPTH (FT.)	11.02'
DEPTH TO WATER (REF. PT.)	6.48'	STICKUP (FT.)	____.__
GW. ELEV.(FT. MSL.)	____.__	WELL DIAMETER (INCHES)	1.00"

FIELD MEASURMENTS (FOUR REPLICATES)

	Initial Purge	Final Purge	Initial Sample	Final Sample
pH (STD)				7.90
SPEC. COND.(uS)				
TEMPERATURE (C)				11.6
OTHER (SPECIFY)				

COMMENTS/CALCULATIONS

WEATHER CONDITIONS: 35*F, clear, calm

SAMPLE APPEARANCE: Lt brown/orangish, turbid, particles in suspension, no odor, aqueous

1" DIA. CASING CONTAINS .041 Gal./Ft. — 11.02'-6.48'= 4.54' x 0.041 = 0.19 GAL

2" DIA. CASING CONTAINS .163 Gal./Ft. — 1 full bailer = 0.053 GAL

4" DIA. CASING CONTAINS .652 Gal./Ft. — 11 bailers purged = 0.58 GAL or 3.0 casings

PLEASE INCLUDE SAMPLE BOTTLE SIZE, BOTTLE COLOR, BOTTLE MATERIAL, PRESERVATIVES AND ANALYTICAL METHODS ON LABORATORY CUSTODY FORMS.

SAMPLER SIGNATURE _____ DATE _____

SAMPLE COLLECTION INFORMATION FORM

GAI PROJECT NAME: SNPE/VDM Semi-Annual Sampling | GAI PROJECT NO.: 093 - 89168

WELL ID.: PZ-3 | SOURCE CODES: WELL

PURGING INFORMATION (IF APPLICABLE)

PURGE DATE (yy/mm/dd)	11/8/2017	TIME (24 HR CLOCK)	0950 Hrs	ELAPSED HRS.	0:10
CASING VOL.(Gal.)	0.16	GAL. PURGED (Gal.)	0.53		
PURGING DEVICE (SEE BELOW)	same as below	PURGING DEVICE MATERIAL	same as below	DEDICATED	same as below

SAMPLE COLLECTION INFORMATION

SAMPLING DATE (yy/mm/dd)	11/8/2017	TIME (24 HR CLOCK)	1002 Hrs	MATRIX	Aqueous
SAMPLING DEVICE (SEE BELOW)	Bailer	DEDICATED -	YES	FILTERED	NO
SAMPLING DEVICE MATERIAL	HD Polyethylene	SAMPLE TYPE -	GRAB		

(A) AIR-LIFT PUMP (B) BLADDER PUMP (C) PERISTALTIC PUMP (D) SCOOP/SHOVEL (E) BAILER (F) OTHER (SPECIFY)

WELL INFORMATION (IF APPLICABLE)

REFERENCE POINT	PZ-3	LAND ELEVATION (FT./MSL)	____.__
REF. PT. ELEV.(FT. MSL)	____.__	WELL DEPTH (FT.)	9.12'
DEPTH TO WATER (REF. PT.)	5.24'	STICKUP (FT.)	____.__
GW. ELEV.(FT. MSL.)	____.__	WELL DIAMETER (INCHES)	1.00"

FIELD MEASURMENTS (FOUR REPLICATES)

	Initial Purge	Final Purge	Initial Sample	Final Sample
pH (STD)	____	____	____	10.64
SPEC. COND.(uS)	____	____	____	____
TEMPERATURE (C)	____	____	____	9.8
OTHER (SPECIFY)	____	____	____	____

COMMENTS/CALCULATIONS

WEATHER CONDITIONS: 38*F, clear, calm

SAMPLE APPEARANCE: Clear, Aqueous, faint odor — sample effervesced when added to HCl VOAs

1" DIA. CASING CONTAINS .041 Gal./Ft. — 9.12'-5.24'= 3.88' x 0.041 = 0.16 GAL

2" DIA. CASING CONTAINS .163 Gal./Ft. — 1 full bailer = 0.053 GAL

4" DIA. CASING CONTAINS .652 Gal./Ft. — 10 bailers purged = 0.53 GAL or 3.3 casings

Blind DUP sampled at PZ-3

PLEASE INCLUDE SAMPLE BOTTLE SIZE, BOTTLE COLOR, BOTTLE MATERIAL, PRESERVATIVES AND ANALYTICAL METHODS ON LABORATORY CUSTODY FORMS.

SAMPLER SIGNATURE _____ DATE _____

SAMPLE COLLECTION INFORMATION FORM

GAI PROJECT NAME: SNPE/VDM Semi-Annual Sampling | GAI PROJECT NO.: 093 - 89168

WELL ID.: PZ-4 | SOURCE CODES: WELL

PURGING INFORMATION (IF APPLICABLE)

PURGE DATE (yy/mm/dd)	11/8/2017	TIME (24 HR CLOCK)	1015 Hrs	ELAPSED HRS.	0:16
CASING VOL.(Gal.)	0.22	GAL. PURGED (Gal.)	0.424		
PURGING DEVICE (SEE BELOW)	same as below	PURGING DEVICE MATERIAL	same as below	DEDICATED	same as below

SAMPLE COLLECTION INFORMATION

SAMPLING DATE (yy/mm/dd)	11/8/2017	TIME (24 HR CLOCK)	1031 Hrs	MATRIX	Aqueous
SAMPLING DEVICE (SEE BELOW)	Bailer	DEDICATED -	YES	FILTERED	NO
SAMPLING DEVICE MATERIAL	HD Polyethylene	SAMPLE TYPE -	GRAB		

(A) AIR-LIFT PUMP (B) BLADDER PUMP (C) PERISTALTIC PUMP (D) SCOOP/SHOVEL (E) BAILER (F) OTHER (SPECIFY)

WELL INFORMATION (IF APPLICABLE)

REFERENCE POINT	PZ-4	LAND ELEVATION (FT./MSL)	____.__
REF. PT. ELEV.(FT. MSL)	____.__	WELL DEPTH (FT.)	10.33'
DEPTH TO WATER (REF. PT.)	4.88'	STICKUP (FT.)	____.__
GW. ELEV.(FT. MSL.)	____.__	WELL DIAMETER (INCHES)	1.00"

FIELD MEASURMENTS (FOUR REPLICATES)

	Initial Purge	Final Purge	Initial Sample	Final Sample
pH (STD)	____	____	____	7.20
SPEC. COND.(uS)	____	____	____	____
TEMPERATURE (C)	____	____	____	11.8
OTHER (SPECIFY)	____	____	____	____

COMMENTS/CALCULATIONS

WEATHER CONDITIONS: 39*F, clear, calm

SAMPLE APPEARANCE: Clear, Aqueous, No odor

1" DIA. CASING CONTAINS .041 Gal./Ft.	10.33'-4.88'= 5.45' x 0.041 = 0.22 GAL
2" DIA. CASING CONTAINS .163 Gal./Ft.	1 full bailer = 0.053 GAL
4" DIA. CASING CONTAINS .652 Gal./Ft.	14 bailers purged = 0.74 GAL or 3.4 casings

PLEASE INCLUDE SAMPLE BOTTLE SIZE, BOTTLE COLOR, BOTTLE MATERIAL, PRESERVATIVES AND ANALYTICAL METHODS ON LABORATORY CUSTODY FORMS.

SAMPLER SIGNATURE _____ DATE _____

SAMPLE COLLECTION INFORMATION FORM

GAI PROJECT NAME: SNPE/VDM Semi-Annual Sampling | GAI PROJECT NO.: 093 - 89168

WELL ID.: MW-7D | SOURCE CODES: RIVER OR STREAM, WELL, SOIL, OTHER (CIRCLE ONE)

PURGING INFORMATION (IF APPLICABLE)

PURGE DATE (yy/mm/dd)	11/8/2017	TIME (24 HR CLOCK)	1245 Hrs	ELAPSED HRS.	0:40
CASING VOL.(Gal.)	2.45	GAL. PURGED (Gal.)	0.424		
PURGING DEVICE (SEE BELOW)	same as below	PURGING DEVICE MATERIAL	same as below	DEDICATED	same as below

SAMPLE COLLECTION INFORMATION

SAMPLING DATE (yy/mm/dd)	11/8/2017	TIME (24 HR CLOCK)	1329 Hrs	MATRIX	Aqueous
SAMPLING DEVICE (SEE BELOW)	Bailer	DEDICATED -	YES	FILTERED	NO
SAMPLING DEVICE MATERIAL	HD Polyethylene	SAMPLE TYPE -	GRAB		

(A) AIR-LIFT PUMP (B) BLADDER PUMP (C) PERISTALTIC PUMP (D) SCOOP/SHOVEL (E) BAILER (F) OTHER (SPECIFY)

WELL INFORMATION (IF APPLICABLE)

REFERENCE POINT	MW-7D	LAND ELEVATION (FT./MSL)	____.__
REF. PT. ELEV.(FT. MSL)	____.__	WELL DEPTH (FT.)	45.85'
DEPTH TO WATER (REF. PT.)	30.83'	STICKUP (FT.)	N/A - flush mount
GW. ELEV.(FT. MSL.)	____.__	WELL DIAMETER (INCHES)	2.00"

FIELD MEASURMENTS (FOUR REPLICATES)

	Initial Purge	Final Purge	Initial Sample	Final Sample
pH (STD)				7.15
SPEC. COND.(uS)				
TEMPERATURE (C)				11.6
OTHER (SPECIFY)				

COMMENTS/CALCULATIONS

WEATHER CONDITIONS: 46*F, sunny, minimal breeze

SAMPLE APPEARANCE: Clear, Aqueous, No odor

1" DIA. CASING CONTAINS .041 Gal./Ft.

2" DIA. CASING CONTAINS .163 Gal./Ft. 45.85'-30.83'= 15.02' x 0.163 = 2.45 GAL

4" DIA. CASING CONTAINS .652 Gal./Ft. x 3 = 7.3 GAL/3 Casings

7.3 GAL purged, or 3.0 casings

MS and MSD were sampled at MW-7D

See MW-7D MS and MW-7D MSD

PLEASE INCLUDE SAMPLE BOTTLE SIZE, BOTTLE COLOR, BOTTLE MATERIAL, PRESERVATIVES AND ANALYTICAL METHODS ON LABORATORY CUSTODY FORMS.

SAMPLER SIGNATURE DATE

SAMPLE COLLECTION INFORMATION FORM

GAI PROJECT NAME: SNPE/VDM Semi-Annual Sampling | GAI PROJECT NO.: 093 - 89168

WELL ID.: FILTER VAULT EFF | SOURCE CODES: OTHER (Filter Vault)

~~PURGING INFORMATION (IF APPLICABLE)~~

~~PURGE DATE (yy/mm/dd)~~	___/___/___	~~TIME (24 HR CLOCK)~~	____	~~ELAPSED HRS.~~	____
~~CASING VOL.(Gal.)~~	____	~~GAL. PURGED (Gal.)~~	____		
~~PURGING DEVICE (SEE BELOW)~~	_____	~~PURGING DEVICE MATERIAL~~		~~DEDICATED (Y/N)~~	

SAMPLE COLLECTION INFORMATION

SAMPLING DATE (yy/mm/dd)	11/8/2017	TIME (24 HR CLOCK)	1046 Hrs	MATRIX	Aqueous
SAMPLING DEVICE (SEE BELOW)	Dipped bottles	DEDICATED -	YES	FILTERED	NO
SAMPLING DEVICE MATERIAL	Amber glass (unpreserved)	SAMPLE TYPE -	GRAB		

(A) AIR-LIFT PUMP (B) BLADDER PUMP (C) PERISTALTIC PUMP (D) SCOOP/SHOVEL (E) BAILER (F) OTHER (SPECIFY)

WELL INFORMATION (IF APPLICABLE)

REFERENCE POINT	Observation Vault	~~LAND ELEVATION (FT./MSL)~~	____.__
~~REF. PT. ELEV.(FT. MSL)~~	____.__	~~WELL DEPTH (FT.)~~	____.__
~~DEPTH TO WATER (REF. PT.)~~	____.__	~~STICKUP (FT.)~~	____.__
~~GW. ELEV.(FT. MSL.)~~	____.__	~~WELL DIAMETER (INCHES)~~	____.__

FIELD MEASURMENTS (FOUR REPLICATES)

	Initial Purge	Final Purge	Initial Sample	Final Sample
pH (STD)	____	____	____	7.33
SPEC. COND.(uS)	____	____	____	____
TEMPERATURE (C)	____	____	____	10.4
OTHER (SPECIFY)	____	____	____	____

COMMENTS/CALCULATIONS

WEATHER CONDITIONS: 39*F, clear, calm

SAMPLE APPEARANCE: Clear, Aqueous, No odor

1" DIA. CASING CONTAINS .041 Gal./Ft.

2" DIA. CASING CONTAINS .163 Gal./Ft.

4" DIA. CASING CONTAINS .652 Gal./Ft.

PLEASE INCLUDE SAMPLE BOTTLE SIZE, BOTTLE COLOR, BOTTLE MATERIAL, PRESERVATIVES AND ANALYTICAL METHODS ON LABORATORY CUSTODY FORMS.

SAMPLER SIGNATURE | DATE