MEMO

ARCADIS Design & Consultancy for natural and built assets

To:
Mr. Harry Warner, PE
Region 7 Regional Remediation Engineer
New York State Department of Environmental Conservation
615 Erie Boulevard West
Syracuse, NY 13204

From:
Vin Maresco

Arcadis U.S., Inc.
One Lincoln Center
110 West Fayette Street
Suite 300
Syracuse
New York 13202
Tel 315 446 9120
Fax 315 449 0017

Date:
January 29, 2019

Arcadis Project No.:
B0090004.0008

Subject:
Fourth Quarter Groundwater Sampling Summary
Northern Cold Spring Terminal
Hillside Road, Lysander, New York

Arcadis U.S., Inc. (Arcadis) is pleased to submit this groundwater monitoring memorandum and supporting attachments for the above-referenced site for the 2018 fourth quarter groundwater sampling event. The site location is shown on **Figure 1**.

The groundwater monitoring field event was completed by Arcadis personnel December 3 through 5, 2018. Quarterly groundwater monitoring events at the subject site began in May 2018 and are conducted in compliance with the Arcadis Supplemental Characterization and Interim Remedial Action Work Plan dated February 21, 2018. Included herein are summaries of the field activities, field observations, and analytical results for groundwater sampling completed during the December 2018 event.

FIELD ACTIVITIES

During the December 2018 event, Arcadis completed groundwater monitoring and gauging. A liquid level meter, that is able to detect non-aqueous phase liquid (NAPL), was used to gauge each well for NAPL and measure groundwater levels at each monitoring well identified in the Work Plan with an accuracy of approximately 0.01 feet. The following 21 monitoring well locations were scheduled to be sampled: BMW2, BMW3, BMW5, BMW6, BMW7, BMW8, BMW9, BMW13, BMW14R, MW-201, MW-202, MW-203, MW-204, MW-205, MW-206, MW-207, MW-208, MW-209, MW-210, MW-211, PZ106S (shown on **Figure 2**). A total of 15 monitoring wells were sampled. The following six wells were not able to be sampled: BMW5, BMW6, BMW7, MW-201, MW-202, and MW-203. BMW5 had NAPL present, and the other five locations did not have sufficient groundwater to collect a sample. The remaining 15 monitoring wells were purged and sampled using disposable bailers and a three-volume purge technique. Purge water and equipment rinse water was containerized and sent for off-site disposal at Covanta Environmental Solutions – Mohawk located at 120 Dry Road Oriskany, New York (Formally Industrial Oil Services). Following collection, all samples were packed on ice and submitted to Pace Analytical in accordance with chain-of-custody procedures. Groundwater samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), carbon dioxide, sulfate, alkalinity, ferrous iron, and manganese.

RESULTS

Groundwater Flow Conditions

A summary of the groundwater elevation data is provided in **Table 1** and illustrated on **Figure 3**. Groundwater flow across the site is generally towards the south during the data collection event.

Groundwater Analytical Results

Current and historical groundwater laboratory analytical results for benzene, toluene, ethylbenzene, and xylenes (BTEX), total VOCs and total SVOCs are summarized in **Table 2**. The detailed fourth quarter groundwater analytical data are presented in **Table 3**. Current and historical groundwater results and Total VOCs and Total SVOCs are illustrated on **Figure 4**. The complete laboratory report for the sampling event is included as **Attachment A**.

During the December 2018 sampling event, samples collected from three of the 15 monitoring wells sampled (BMW13, BMW14R, and MW-208) exhibited one or more BTEX constituents at concentrations greater than NYSDEC ambient water quality standards and guidance values presented in NYSDEC's Technical and Operational Guidance Series (TOGS) 1.1.1. Samples collected from monitoring wells BMW2, BMW3, BMW8, BMW13, BMW14R, MW-204, MW-208, MW-209, MW-211, and PZ106S exhibited concentrations of manganese greater than NYSDEC ambient water quality standards and guidance values presented in NYSDEC's Technical and Operational Guidance Series (TOGS) 1.1.1.

The results from the second quarter, third quarter, and fourth quarter 2018 sampling events were generally consistent.

SUMMARY AND FUTURE PLANNED ACTIVITES

Groundwater samples were collected from a total of 15 monitoring wells during the December 2018 sampling event to provide a representation of current dissolved constituent concentration at the subject site and to monitor NAPL thicknesses and location. One or more individual dissolved phase BTEX concentrations above TOGS 1.1.1 were detected at three of the 15 monitoring wells. During the pre-sampling groundwater gauging event, NAPL was detected at BMW5. No other monitoring well gauged during this event indicated NAPL.

Groundwater sample collection and associated reporting will continue quarterly throughout 2019. Following the fourth quarter 2019 sampling event data will be reviewed for trends and for mapping future actions at the site.

If there are any questions regarding this memorandum, please contact Vin Maresco of Arcadis at 315.671.9256.

Copies:
Michael Belveg, NYSDEC (hard and electronic copy)
Benjamin Conlon, NYSDEC (electronic copy)
Krista Manley, Buckeye (electronic copy)
Stephen Gonzalski, BP (electronic copy)
Michael Teeling, PG, Woodard & Curran (electronic copy)
Joseph Finnerty, Esq., Barclay Damon LLP (Tennessee Gas Pipeline Company, Tenneco, Inc., and Tenneco Oil Company) (hard and electronic copy)
Steven Lucks, Esq., The Legal Center (Ashland LLC) (hard and electronic copies)
Richard L. Williams, Chief Counsel, Environmental Litigation and Real Estate, Ashland LLC (hard and electronic copy)
Thomas Smith, Esq., Bond Schoeneck & King PLLC (Corning Incorporated) (hard and electronic copy)
Laurence Kirsch, Esq., Goodwin Procter LLP (TransMontaigne Product Services, Inc.) (hard and electronic copy)
Supreme Energy, LLC (electronic copy)
Cold Springs Terminal, LLC (electronic copy)
Frederick Karam (electronic copy)

Attachments:

Tables

Table 1 – 2018 Groundwater Measurements
Table 2 – 2018 Historical Summary of Groundwater Constituents of Concern
Table 3 – Groundwater Analytical Data

Figures

Figure 1 – Site Location Map
Figure 2 – Northern Terminal Groundwater Monitoring Well Network
Figure 3 – Groundwater Contour- 2018- Fourth Quarter
Figure 4 – Total VOC and SVOC Concentrations

Attachments

Attachment A – Laboratory Reports

TABLES

Table 1
2018 Groundwater Measurements

ARCADIS Design & Consultancy for natural and built assets

Groundwater Sampling Summary 2018 - Fourth Quarter
Northern Cold Springs Terminal
Lysander, New York

Well ID	Northing	Easting	Measuring Point	Diameter (inches)	Screen Interval (ft bgs)	DTP (bmp)	DTW* (bmp)	Apparent Product Thickness	GWE	Corrected GWE	Notes
BMW2	1141472.09	909051.25	396.65	2	15.3-34.0	ND	7.66	ND	388.99	388.99	
BMW3	1141323.86	908969.02	395.30	2	3.5-29.0	ND	23.21	ND	372.09	372.09	
BMW5	1141248.92	908820.46	389.50	2	10.0-30.0	24.39	25.48	1.09	364.02	364.88	No sample collected due to the presence of NAPL.
BMW6	1141286.17	908914.24	394.88	2	10.0-30.0	ND	36.26	ND	358.62	358.62	No sample collected. The well purged dry and did not recharge; LL collected prior to purge.
BMW7	1141347.84	908824.60	397.61	2	5.0-15.0	ND	16.83	ND	380.78	380.78	No sample collected. The well purged dry and did not recharge; LL collected prior to purge.
BMW8	1141420.52	908826.55	399.86	2	5.0-20.0	ND	7.75	ND	392.11	392.11	
BMW9	1141334.24	909181.88	380.15	2	5.0-15.0	ND	2.22	ND	377.93	377.93	
BMW13	1141243.20	909014.31	382.60	4	UK	ND	17.93	ND	364.67	364.67	
BMW14R	1141257.52	909096.329	379.82	2	5.0-20.0	ND	15.05	ND	364.77	364.77	
MW-201	1141290.74	908861.62	395.24	2	14.0-24.0	ND	Dry	ND	Dry	Dry	No sample collected, well was dry.
MW-202	1141329.17	908898.17	395.25	2	6.0-16.5	ND	18.15	ND	377.10	377.10	No sample collected, insufficient water to sample. LL collected.
MW-203	1141307.55	909013.86	394.31	2	5.0-20.0	ND	18.77	ND	375.54	375.54	No sample collected. The well purged dry and did not recharge; LL collected prior to purge.
MW-204	1141427.24	908980.08	394.95	2	5.0-20.0	ND	3.21	ND	391.74	391.74	
MW-205	1141543.83	908866.84	397.79	2	10.0-20.0	ND	5.64	ND	392.15	392.15	
MW-206	1141541.04	908921.18	397.68	2	5.0-20.0	ND	2.05	ND	395.63	395.63	
MW-207	1141519.38	908997.73	398.50	2	5.0-20.0	ND	4.03	ND	394.47	394.47	
MW-208	1141526.88	909080.26	397.09	2	5.0-20.0	ND	3.49	ND	393.60	393.60	
MW-209	1141600.72	909076.11	399.62	2	5.0-20.0	ND	3.80	ND	395.82	395.82	
MW-210	1141345.09	909129.64	386.60	2	8.0-18.0	ND	5.65	ND	380.95	380.95	
MW-211	1141377.65	909200.72	387.45	2	5.0-15.0	ND	7.08	ND	380.37	380.37	
PZ106S	1141279.48	909152.97	374.02	2	5.5-UK	ND	4.67	ND	369.35	369.35	

Notes:
* DTW was above the screened interval for the following wells: BMW2, BMW9, MW-204, MW-205, MW-206, MW-207, MW-208, MW-209, MW-210, MW-211, and PZ106S.
Corrected GWE = GWE + (NAPL Specific density (0.79) x Product thickness)
bmp = Below measuring point
DTB = Depth to bottom
DTP = Depth to product
DTW = Depth to water
ft bgs = Feet below ground surface
GWE = Groundwater elevation
LL = Liquid level
NAPL = Nonaqueous phase liquid
ND = No detection
TOC = Top of casing
TOS = Top of screen
UK = Unknown.

Table 2
2018 Historical Summary of Groundwater Constituents of Concern

ARCADIS Design & Consultancy for natural and built assets

Groundwater Sampling Summary 2018 - Fourth Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID	Date Collected	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	m&p-Xylene (µg/L)	Total VOCs (µg/L)	Total SVOCs (µg/L)
NYSDEC TOGS 1.1.1 (GA Groundwater):		1	5	5	5	---	---
BMW2	5/17/2018	1 U	1 U	1 U	2 U	200 U	0.099 U
BMW2	9/25/2018	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW2	12/4/2018	1 U	1 U	1 U	2 U	200 U	0.098 U
BMW3	5/15/2018	1 U	1 U	1 U	2 U	200 U	0.099 U
BMW3	9/25/2018	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW3	12/4/2018	1 U	1 U	1 U	2 U	200 U	0.11 U
BMW5	5/15/2018	NAPL Present					
BMW5	9/25/2018	NAPL Present					
BMW5	12/3/2019	NAPL Present					
BMW6	5/16/2018	1 U	2.2	1 U	2 U	4.8	26.2
BMW6	9/25/2018	Dry					
BMW6	12/3/2019	Dry					
BMW7	5/14/2018	1 U	1 U	1 U	2 U	200 U	0.099 U
BMW7	9/25/2018	Dry					
BMW7	12/3/2019	Dry					
BMW8	5/14/2018	1 U	1 U	1 U	2 U	200 U	0.099 U
BMW8	9/25/2018	1 U	1 U	1 U	2 U	200 U	0.098 U
BMW8	12/4/2018	1 U	1 U	1 U	2 U	200 U	0.099 U
BMW9	5/17/2018	1 U	1 U	1 U	2 U	1.3	0.097 U
BMW9	9/25/2018	Dry					
BMW9	12/4/2018	1 U	1 U	1 U	2 U	200 U	0.098 U
BMW13	5/17/2018	**4,890**	**14,600**	**1,390**	**7,340**	25,838	8.8
BMW13	9/25/2018	NAPL Present					
BMW13	12/5/2018	**6,220**	**17,300**	**1,250**	**7,130**	38,276.9	2.05
BMW14R	8/6/2018	1 U	1.2	**229**	**843**	2,979.7	1.53
BMW14R	9/25/2018	1 U	1.1	**187**	**796**	4,757.6	6.82
BMW14R	12/5/2018	**2.5**	**17.6**	**149**	**678**	4,345.8	0.93
MW-201	5/15/2018	Not Installed					
MW-201	9/25/2018	Dry					
MW-201	12/3/2018	Dry					
MW-202	5/15/2018	Not Installed					
MW-202	9/25/2018	Dry					
MW-202	12/3/2018	Dry					
MW-203	5/15/2018	Not Installed					
MW-203	9/25/2018	Dry					
MW-203	12/3/2018	Dry					
MW-204	5/15/2018	Not Installed					
MW-204	9/25/2018	**6.3**	**11.9**	**17.3**	**42.7**	138.5	0.099 U
MW-204	12/3/2018	1 U	1 U	1.2	2.1	5.3	0.083 U
MW-205	5/15/2018	Not Installed					
MW-205	9/24/2018	1 U	1.6	1 U	2.3	6	0.1 U
MW-205	12/3/2018	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-206	5/15/2018	Not Installed					
MW-206	9/24/2018	1 U	1 U	1 U	2 U	200 U	0.098 U
MW-206	12/3/2018	1 U [1 U]	1 U [1 U]	1 U [1 U]	2 U [2 U]	200 U [200 U]	0.1 U [0.1 U]
MW-207	5/15/2018	Not Installed					
MW-207	9/24/2018	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-207	12/3/2018	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-208	5/15/2018	Not Installed					
MW-208	9/24/2018	**2**	1.3	**6.7**	**17.8**	202.1	0.099 U
MW-208	12/3/2018	1 U	1 U	4	**11.4**	58.6	0.091 U
MW-209	5/15/2018	Not Installed					
MW-209	9/24/2018	1 U [1 U]	1.1 [1]	1 U [1 U]	2 U [2 U]	1.1 [1]	0.099 U [0.099 U]
MW-209	12/3/2018	1 U	1 U	1 U	2 U	200 U	0.091 U

See Notes on Page 2.

Table 2
2018 Historical Summary of Groundwater Constituents of Concern

ARCADIS Design & Consultancy for natural and built assets

Groundwater Sampling Summary 2018 - Fourth Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID	Date Collected	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	m&p-Xylene (µg/L)	Total VOCs (µg/L)	Total SVOCs (µg/L)
NYSDEC TOGS 1.1.1 (GA Groundwater):		**1**	**5**	**5**	**5**	**---**	**---**
MW-210	5/15/2018	Not Installed					
MW-210	9/26/2018	1 U	1 U	1 U	2 U	200 U	0.13
MW-210	12/5/2018	1 U	1 U	1 U	2 U	200 U	0.098 U
MW-211	5/15/2018	Not Installed					
MW-211	9/25/2018	1 U	1 U	1 U	2 U	200 U	0.29 U
MW-211	12/4/2018	1 U	1 U	1 U	2 U	200 U	0.098 U
PZ106S	5/17/2018	1 U	1 U	1 U	2 U	200 U	0.097 U
PZ106S	9/26/2018	1 U	1 U	1 U	2 U	200 U	0.11 U
PZ106S	12/5/2018	1 U	1 U	1 U	2 U	200 U	0.097 U

Notes:
1. Shaded and bold values indicate a criteria exceedance.
2. Field duplicate sample results are presented in brackets.
3. U = Compound was analyzed for, but not detected.
4. ug/L = Micrograms per liter.
5. Total VOCs represents all VOCs analyzed.

Table 3
Groundwater Analytical Data

ARCADIS Design & Consultancy for natural and built assets

Groundwater Sampling Summary 2018 - Fourth Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID: / Date Collected: / SDG:	NYSDEC TOGS 1 1 1 (GA Groundwater)	Units	BMW2 12/04/18 30273533	BMW3 12/04/18 30273533	BMW8 12/04/18 30273533	BMW9 12/04/18 30273533	BMW13 12/05/18 30273533	BMW14R 12/05/18 30273533	MW-204 12/03/18 30273388	MW-205 12/03/18 30273388
VOCs (EPA 8260C)										
1,2,4-Trimethylbenzene	5	ug/L	1 U	1 U	1 U	1 U	**1,730**	**1,900**	2	1 U
1,3,5-Trimethylbenzene	5	ug/L	1 U	1 U	1 U	1 U	**478**	**545**	1 U	1 U
Benzene	1	ug/L	1 U	1 U	1 U	1 U	**6,220**	**2.5**	1 U	1 U
Ethanol	- -	ug/L	200 UL1CL2c	200 UL1CL2c	200 UL1CL2c	200 UL1CL2c	200 UL1CL2c	200 UL1CL2c	200 UL1CL1c	200 UL1CL1c
Ethylbenzene	5	ug/L	1 U	1 U	1 U	1 U	**1,250**	**149**	1.2	1 U
Isopropylbenzene	5	ug/L	1 U	1 U	1 U	1 U	**64.4**	**76.8**	1 U	1 U
m&p-Xylene	5	ug/L	2 U	2 U	2 U	2 U	**7,130**	**678**	2.1	2 U
Methyl-Tert-Butyl-Ether	10	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Naphthalene	10	ug/L	2 U	2 U	2 U	2 U	**906**	**738**	2 U	2 U
n-Butylbenzene	5	ug/L	1 U	1 U	1 U	1 U	**20.5**	**21.8**	1 U	1 U
n-Propylbenzene	5	ug/L	1 U	1 U	1 U	1 U	**142**	**179**	1 U	1 U
o-Xylene	5	ug/L	1 U	1 U	1 U	1 U	**3,010**	**11.8**	1 U	1 U
p-Isopropyltoluene	5	ug/L	1 U	1 U	1 U	1 U	**12.7**	**12**	1 U	1 U
sec-Butylbenzene	5	ug/L	1 U	1 U	1 U	1 U	**11.7**	**12.5**	1 U	1 U
Tert-Butylbenzene	5	ug/L	1 U	1 U	1 U	1 U	1.6	1.8	1 U	1 U
Toluene	5	ug/L	1 U	1 U	1 U	1 U	**17,300**	**17.6**	1 U	1 U
Total VOCs	- -	ug/L	200 U	200 U	200 U	200 U	38,276.9	4,345.8	5.3	200 U
SVOCs (EPA 8270D by SIM)										
Acenaphthene	20	ug/L	0.098 U1c	0.11 UA51c	0.099 U1c	0.098 U1c	0.83 1c	0.48 1c	0.083 U	0.1 U
Acenaphthylene	- -	ug/L	0.098 U1c	0.11 UA51c	0.099 U1c	0.098 U1c	0.1 U1c	0.1 U1c	0.083 U	0.1 U
Anthracene	50	ug/L	0.098 U1c	0.11 UA51c	0.099 U1c	0.098 U1c	0.1 U1c	0.1 U1c	0.083 U	0.1 U
Benz(a)Anthracene	0.002	ug/L	0.098 U1c	0.11 UA51c	0.099 U1c	0.098 U1c	0.1 U1c	0.1 U1c	0.083 U	0.1 U
Benzo(a)Pyrene	- -	ug/L	0.098 U1c	0.11 UA51c	0.099 U1c	0.098 U1c	0.1 U1c	0.1 U1c	0.083 U	0.1 U
Benzo(b)Fluoranthene	0.002	ug/L	0.098 U1c	0.11 UA51c	0.099 U1c	0.098 U1c	0.1 Uip1c	0.1 Uip1c	0.083 U	0.1 U
Benzo(g,h,i)Perylene	- -	ug/L	0.098 U1c	0.11 UA51c	0.099 U1c	0.098 U1c	0.1 U1c	0.1 U1c	0.083 U	0.1 U
Benzo(k)Fluoranthene	0.002	ug/L	0.098 U1c	0.11 UA51c	0.099 U1c	0.098 U1c	0.1 Uip1c	0.1 Uip1c	0.083 U	0.1 U
Chrysene	0.002	ug/L	0.098 U1c	0.11 UA51c	0.099 U1c	0.098 U1c	0.1 U1c	0.1 U1c	0.083 U	0.1 U
Dibenzo(a,h)Anthracene	- -	ug/L	0.098 U1c	0.11 UA51c	0.099 U1c	0.098 U1c	0.1 U1c	0.1 U1c	0.083 U	0.1 U
Fluoranthene	50	ug/L	0.098 U1c	0.11 UA51c	0.099 U1c	0.098 U1c	0.1 U1c	0.1 U1c	0.083 U	0.1 U
Fluorene	50	ug/L	0.098 U1c	0.11 UA51c	0.099 U1c	0.098 U1c	0.78 1c	0.45 1c	0.083 U	0.1 U
Indeno(1,2,3-cd)Pyrene	0.002	ug/L	0.098 U1c	0.11 UA51c	0.099 U1c	0.098 U1c	0.1 U1c	0.1 U1c	0.083 U	0.1 U
Phenanthrene	50	ug/L	0.098 U1c	0.11 UA51c	0.099 U1c	0.098 U1c	0.44 1c	0.1 U1c	0.083 U	0.1 U
Pyrene	50	ug/L	0.098 U1c	0.11 UA51c	0.099 U1c	0.098 U1c	0.1 U1c	0.1 U1c	0.083 U	0.1 U
Total SVOCs	- -	ug/L	0.098 U	0.11 U	0.099 U	0.098 U	2.05	0.93	0.083 U	0.1 U
Metals										
Manganese	300	ug/L	**332**	**57,400**	**824**	29.5	**1,890**	**950**	**758**	64.9
Dissolved Metals										
Manganese	300	ug/L	109	**1,720**	**770**	5 U	**1,620**	**682**	**671**	30.4
General Chemistry										
Alkalinity, Carbonate (pH4.5)	- -	mg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Alkalinity,Bicarbonate (pH4.5)	- -	mg/L	250	630	450	320	430	510	580	340
Alkalinity,Total (CaCO3 pH4.5)	- -	mg/L	250	630	450	320	430	510	580	340
Iron, Ferrous	- -	mg/L	0.1 UH3H6	0.1 UH3H6	0.52 H3H6	0.1 UH3H6	6.3 H3H6	0.69 H3H6ML	0.26 H3H6	0.51 H3H6
Nitrogen, NO2 plus NO3	- -	mg/L	0.1 U	0.1 U	0.15	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Sulfate	- -	mg/L	39.9	102 ML	91.8	112	10 U	10 U	35.1	394

See Notes on Page 5.

Table 3
Groundwater Analytical Data

Groundwater Sampling Summary 2018 - Fourth Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID: Date Collected: SDG:	NYSDEC TOGS 1 1 1 (GA Groundwater)	Units	BMW2 12/04/18 30273533	BMW3 12/04/18 30273533	BMW8 12/04/18 30273533	BMW9 12/04/18 30273533	BMW13 12/05/18 30273533	BMW14R 12/05/18 30273533	MW-204 12/03/18 30273388	MW-205 12/03/18 30273388
Field Parameters										
pH	- -		7.68	6.98	6.76	7.15	6.77	7.08	6.70	7.15
Temperature	- -	C	5.8	6.2	7.6	6.14	8.0	10.1	8.1	9.2
Conductivity	- -	mS/cm	0.525	1.060	0.999	0.830	0.851	0.930	1.157	1.310
Dissolved Oxygen	- -	mg/L	4.76	2.62	2.73	4.99	2.01	2.68	2.61	3.60
ORP	- -	mV	56.1	27.4	36.5	64.3	-65.8	-90.7	-14.2	9.5
Turbidity	- -	NTU	919.1	549.8	25.2	2.41	53.1	16.1	12.4	48.6

See Notes on Page 5.

Table 3
Groundwater Analytical Data

ARCADIS Design & Consultancy for natural and built assets

Groundwater Sampling Summary 2018 - Fourth Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID: Date Collected: SDG:	NYSDEC TOGS 1 1 1 (GA Groundwater)	Units	MW-206 12/03/18 30273388	MW-207 12/03/18 30273388	MW-208 12/03/18 30273388	MW-209 12/03/18 30273388	MW-210 12/05/18 30273533	MW-211 12/04/18 30273533	PZ106S 12/05/18 30273533
VOCs (EPA 8260C)									
1,2,4-Trimethylbenzene	5	ug/L	1 U [1 U]	1 U	**18.1**	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	5	ug/L	1 U [1 U]	1 U	**12.2**	1 U	1 U	1 U	1 U
Benzene	1	ug/L	1 U [1 U]	1 U	1 U	1 U	1 U	1 U	1 U
Ethanol	- -	ug/L	200 UL1CL1c [200 UL1CL1c]	200 UL1CL1c	200 UL1CL1c	200 UL1CL1c	200 UL1CL2c	200 UL1CL2c	200 UL1CL2c
Ethylbenzene	5	ug/L	1 U [1 U]	1 U	4	1 U	1 U	1 U	1 U
Isopropylbenzene	5	ug/L	1 U [1 U]	1 U	4.9	1 U	1 U	1 U	1 U
m&p-Xylene	5	ug/L	2 U [2 U]	2 U	**11.4**	2 U	2 U	2 U	2 U
Methyl-Tert-Butyl-Ether	10	ug/L	1 U [1 U]	1 U	1 U	1 U	1 U	1 U	1 U
Naphthalene	10	ug/L	2 U [2 U]	2 U	2 U	2 U	2 U	2 U	2 U
n-Butylbenzene	5	ug/L	1 U [1 U]	1 U	1 U	1 U	1 U	1 U	1 U
n-Propylbenzene	5	ug/L	1 U [1 U]	1 U	4.1	1 U	1 U	1 U	1 U
o-Xylene	5	ug/L	1 U [1 U]	1 U	2.7	1 U	1 U	1 U	1 U
p-Isopropyltoluene	5	ug/L	1 U [1 U]	1 U	1.2	1 U	1 U	1 U	1 U
sec-Butylbenzene	5	ug/L	1 U [1 U]	1 U	1 U	1 U	1 U	1 U	1 U
Tert-Butylbenzene	5	ug/L	1 U [1 U]	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	5	ug/L	1 U [1 U]	1 U	1 U	1 U	1 U	1 U	1 U
Total VOCs	- -	ug/L	200 U [200 U]	200 U	58.6	200 U	200 U	200 U	200 U
SVOCs (EPA 8270D by SIM)									
Acenaphthene	20	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 U	0.098 U1c	0.098 U1c	0.097 U1c
Acenaphthylene	- -	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 U	0.098 U1c	0.098 U1c	0.097 U1c
Anthracene	50	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 U	0.098 U1c	0.098 U1c	0.097 U1c
Benz(a)Anthracene	0.002	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 U	0.098 U1c	0.098 U1c	0.097 U1c
Benzo(a)Pyrene	- -	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 U	0.098 U1c	0.098 U1c	0.097 U1c
Benzo(b)Fluoranthene	0.002	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 UR1	0.098 U1c	0.098 U1c	0.097 U1c
Benzo(g,h,i)Perylene	- -	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 U	0.098 U1c	0.098 U1c	0.097 U1c
Benzo(k)Fluoranthene	0.002	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 U	0.098 U1c	0.098 U1c	0.097 U1c
Chrysene	0.002	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 U	0.098 U1c	0.098 U1c	0.097 U1c
Dibenzo(a,h)Anthracene	- -	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 U	0.098 U1c	0.098 U1c	0.097 U1c
Fluoranthene	50	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 U	0.098 U1c	0.098 U1c	0.097 U1c
Fluorene	50	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 U	0.098 U1c	0.098 U1c	0.097 U1c
Indeno(1,2,3-cd)Pyrene	0.002	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 U	0.098 U1c	0.098 U1c	0.097 U1c
Phenanthrene	50	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 U	0.098 U1c	0.098 U1c	0.097 U1c
Pyrene	50	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 UR1	0.098 U1c	0.098 U1c	0.097 U1c
Total SVOCs	- -	ug/L	0.1 U [0.1 U]	0.1 U	0.091 U	0.091 U	0.098 U	0.098 U	0.097 U
Metals									
Manganese	300	ug/L	50 [64.8]	64.1	**1,580**	**2,070 MLR1**	165	**487**	**329**
Dissolved Metals									
Manganese	300	ug/L	5 U [6.7]	5 U	**1,270**	5 U	52.2	221	5.8
General Chemistry									
Alkalinity, Carbonate (pH4.5)	- -	mg/L	10 U [10 U]	10 U	10 U	10 U	10 U	10 U	10 U
Alkalinity,Bicarbonate (pH4.5)	- -	mg/L	260 [270]	270	470	280	410	420	230
Alkalinity,Total (CaCO3 pH4.5)	- -	mg/L	260 [270]	270	470	280	410	420	230
Iron, Ferrous	- -	mg/L	0.1 UH3H6 [0.1 UH3H6]	0.1 UH3H6	0.24 H3H6	0.1 UH3H6	0.1 UH3H6	0.1 UH3H6	0.1 UH3H6
Nitrogen, NO2 plus NO3	- -	mg/L	0.33 [0.33]	0.71	0.1 U	1	1.3	0.1 U	2.3
Sulfate	- -	mg/L	32.7 [32.6]	23.1	22.2	18.9	38.7	154	30.4

See Notes on Page 5.

Table 3
Groundwater Analytical Data

Groundwater Sampling Summary 2018 - Fourth Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID: Date Collected: SDG:	NYSDEC TOGS 1 1 1 (GA Groundwater)	Units	MW-206 12/03/18 30273388	MW-207 12/03/18 30273388	MW-208 12/03/18 30273388	MW-209 12/03/18 30273388	MW-210 12/05/18 30273533	MW-211 12/04/18 30273533	PZ106S 12/05/18 30273533
Field Parameters									
pH	- -		7.41	7.51	6.78	7.28	7.09	7.07	7.71
Temperature	- -	C	9.0	8.7	9.1	8.4	7.7	5.2	7.7
Conductivity	- -	mS/cm	0.526	0.551	0.830	0.560	0.858	1.192	0.562
Dissolved Oxygen	- -	mg/L	4.68	5.71	2.74	5.65	2.85	4.10	4.91
ORP	- -	mV	117	78.7	31.1	172.6	85.5	78.4	112.9
Turbidity	- -	NTU	56.5	26.2	21.6	79.6	69.3	20.0	52.6

See Notes on Page 5.

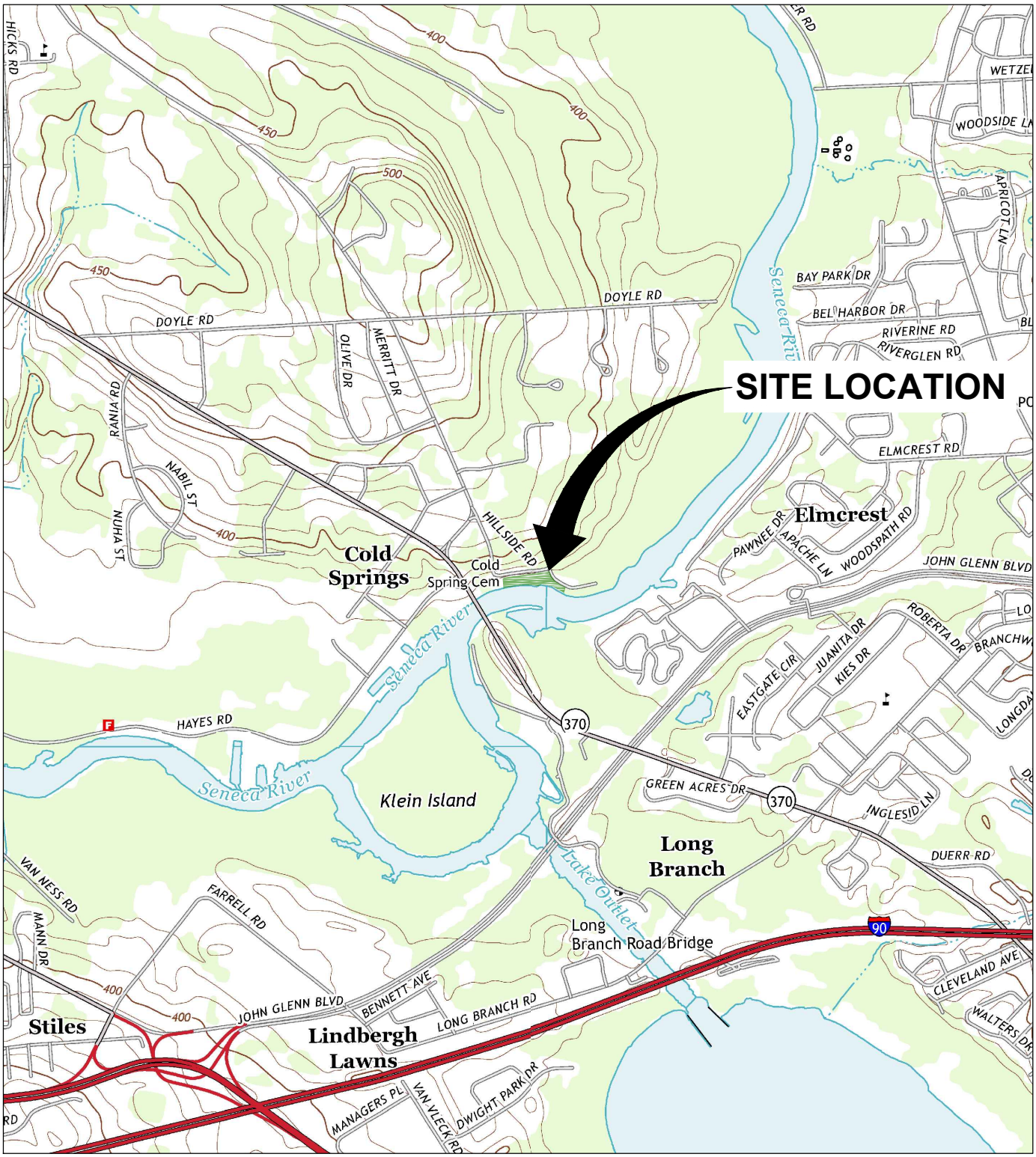
Table 3
Groundwater Analytical Data

Groundwater Sampling Summary 2018 - Fourth Quarter
Northern Cold Springs Terminal
Lysander, New York

Notes:
1. Field parameters measurements were taken prior to sampling.
2. Shaded and bold values indicate a criteria exceedance.
3. Field duplicate sample results are presented in brackets.

Lab Qualifiers	Definition
1c	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
H3H6	Sample was received or analysis requested beyond the recognized method holding time. Analysis initiated outside of the 15 minute EPA required holding time.
H3H6ML	Sample was received or analysis requested beyond the recognized method holding time. Analysis initiated outside of the 15 minute EPA required holding time. Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.
ML	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.
MLR1	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low. RPD value was outside control limits.
U	Indicates the compound was analyzed for, but not detected.
U1c	Indicates the compound was analyzed for, but not detected. A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
UA51c	Indicates the compound was analyzed for, but not detected. Greater than 5% sediment in sample determined by visual observation. Aqueous portion decanted from the sediment and extracted. A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
UH3H6	Indicates the compound was analyzed for, but not detected. Sample was received or analysis requested beyond the recognized method holding time. Analysis initiated outside of the 15 minute EPA required holding time.
Uip1c	Indicates the compound was analyzed for, but not detected. Benzo(b)fluoranthene and benzo(k)fluoranthene were separated in the check standard but did not meet the resolution criteria in SW846 Method 8270D. Whereas sample results included are reported as individual isomers, the lab and the customer must recognize them as an isomeric pair. A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
UL1CL1c	Indicates the compound was analyzed for, but not detected. Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high. The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low. A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
UL1CL2c	Indicates the compound was analyzed for, but not detected. Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low. The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low. The read back of the low concentration calibration standard for this compound is not within 30% of the true value. The results may be biased low and should be considered estimated.
UR1	Indicates the compound was analyzed for, but not detected. RPD value was outside control limits.

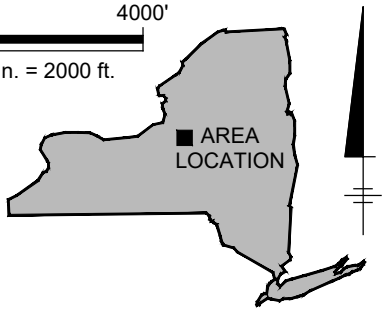
FIGURES



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., BALDWINSVILLE, BREWERTON, CAMILLUS & SYRACUSE WEST, NY, 2013.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.



NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

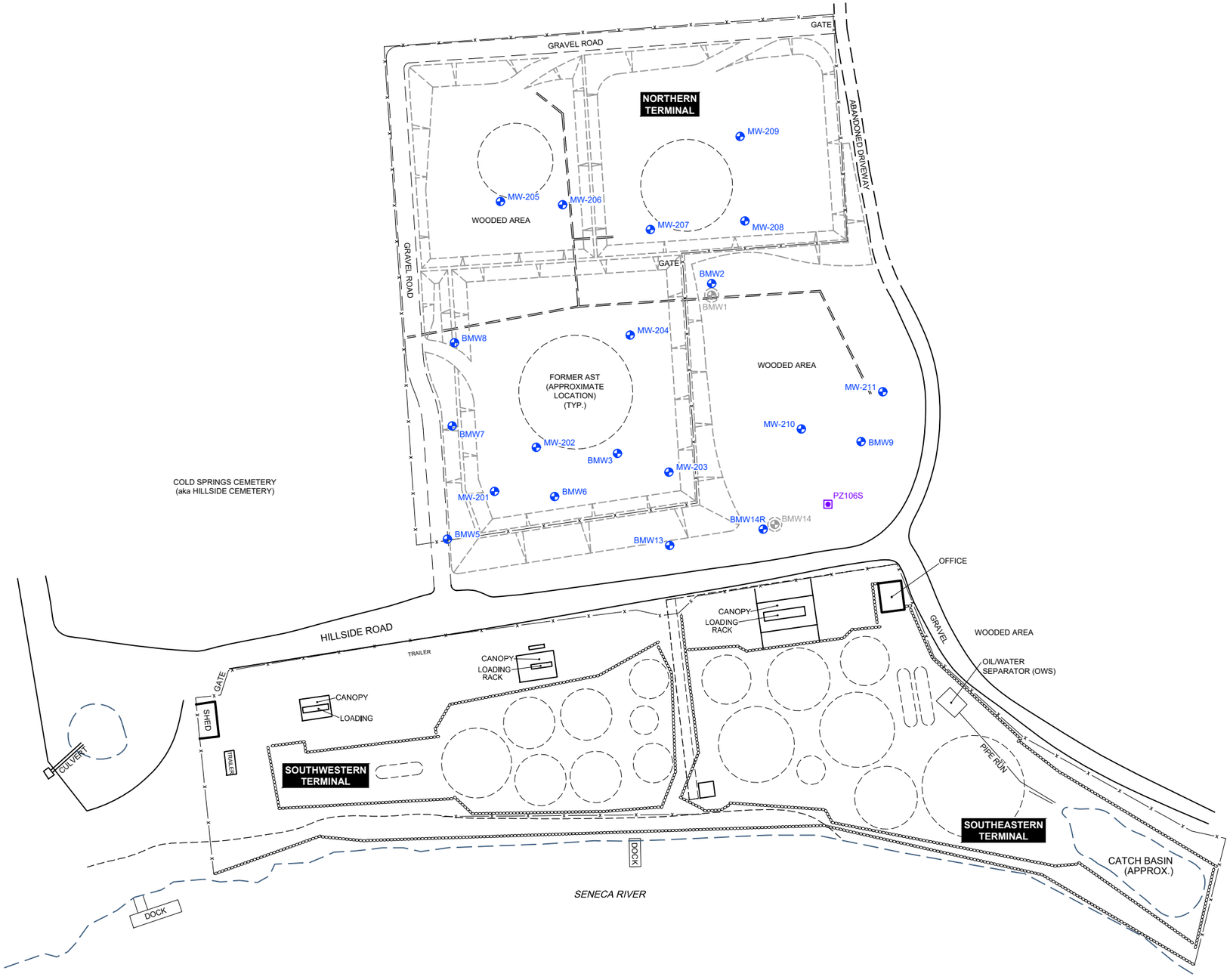
GROUNDWATER SAMPLING SUMMARY
2018 - FOURTH QUARTER

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: N. GRIFFITH LYR:(Opt)ON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2019\B0090004.0006\01-DWG\2018Q4_Fig1_SLM.dwg LAYOUT: 1 SAVED: 1/11/2019 11:18 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 1/11/2019 11:19 AM BY: KRAHMER, ERIC
XREFS: 2018Q4-Title Block
PROJECTNAME: ----



LEGEND:

- MONITORING WELL
- DECOMMISSIONED MONITORING WELL
- PIEZOMETER
- FORMER AST
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED SEPTEMBER 30, 2015.
2. LOCATION OF PIEZOMETER (PZ106S) WAS SURVEYED ON APRIL 26, 2016 BY C.T. MALE. LOCATION OF MONITORING WELLS (MW-201-MW-210) WERE SURVEYED ON JUNE 7, 2018.
3. AST = ABOVE GROUND STORAGE TANK.

0 100' 200'

GRAPHIC SCALE

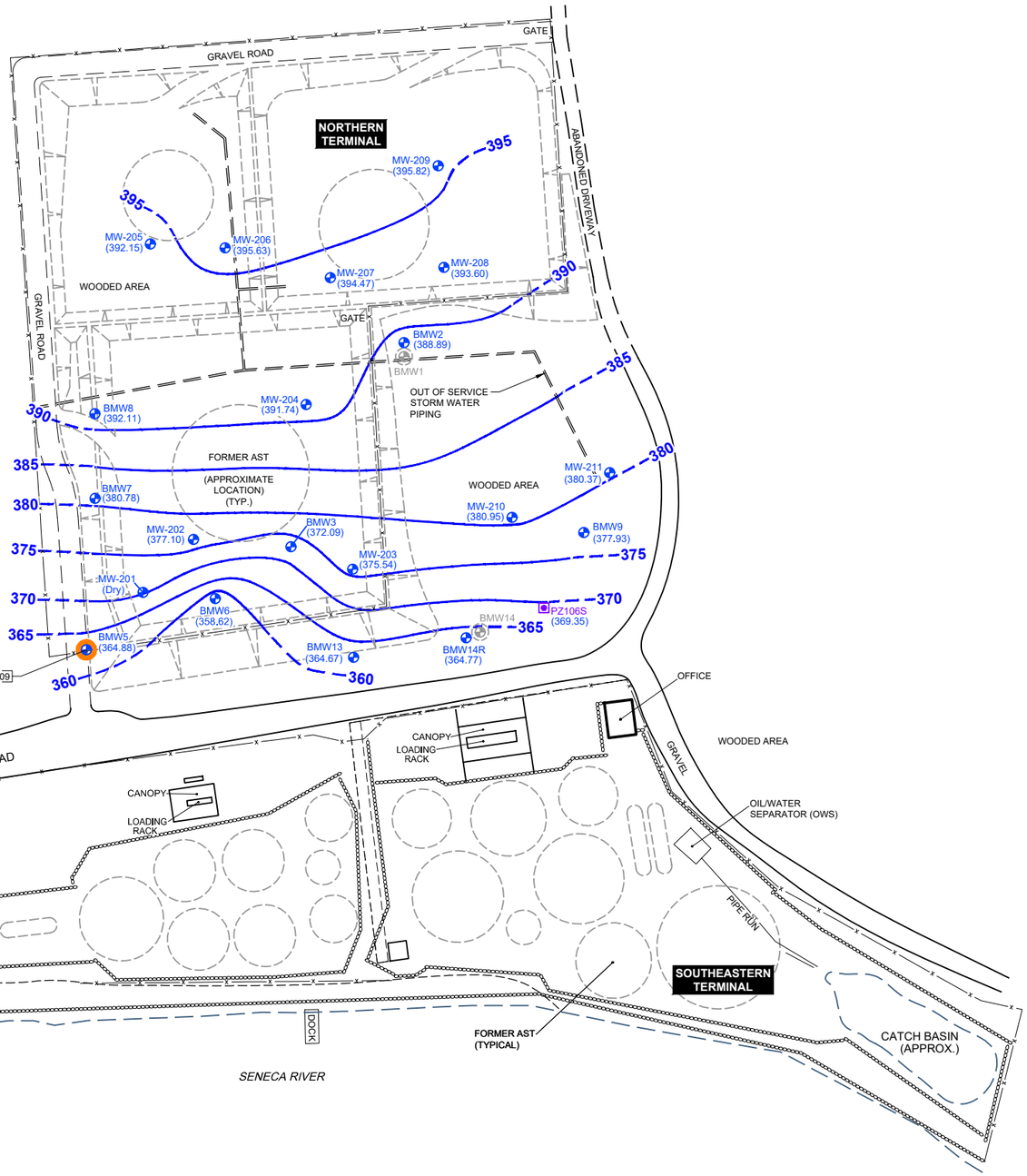
NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK
GROUNDWATER SAMPLING SUMMARY
2018 - FOURTH QUARTER

NORTHERN TERMINAL GROUNDWATER MONITORING WELL NETWORK

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: N. GRIFFITH LYR:(On)ON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2019\B0090004.0008\01-DWG\2018Q4_Fig2_Site Map.dwg LAYOUT: 2 SAVED: 1/11/2019 11:24 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
PLOTTED: 1/24/2019 8:53 AM BY: KRAHMER, ERIC
XREFS: IMAGES: PROJECTNAME: ----
2018Q4-Title Block
X-Base Map



LEGEND:

- MONITORING WELL
- PIEZOMETER
- DECOMMISSIONED MONITORING WELL
- FORMER SITE FEATURE
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK
- 375 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- (367.82) GROUNDWATER ELEVATION (FT AMSL)
- NAPL DETECTED

NOTES:

1. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED SEPTEMBER 30, 2015.
2. LOCATION OF PIEZOMETER PZ106S WAS SURVEYED ON APRIL 16, 2016 BY C.T. MALE. LOCATION OF MONITORING WELLS MW-201 - MW-210 WERE SURVEYED ON JUNE 7, 2018.
3. AST = ABOVE GROUND STORAGE TANK.
4. GROUNDWATER ELEVATION WAS CORRECTED, IF APPROPRIATE, USING THE FOLLOWING CALCULATION: CORRECTED GROUNDWATER ELEVATION = GROUNDWATER ELEVATION + (NAPL SPECIFIC DENSITY (0.79) x PRODUCT THICKNESS).

0 100' 200'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK
GROUNDWATER SAMPLING SUMMARY
2018 - FOURTH QUARTER

GROUNDWATER CONTOUR

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E.KRAHMER PIC: PM: V.MARESCO TM: R. HENSEL TR: K.ROSKOFF LYR:(On)ON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2019\B0090004.0008\01-DWG\2018Q4_Fig3_GW CONT 2018Q4.dwg LAYOUT: 3 SAVED: 1/24/2019 9:16 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
PLOTTED: 1/24/2019 9:15 AM BY: KRAHMER, ERIC
XREFS: IMAGES: PROJECTNAME: ----
2018Q4-Title Block
X-Base Map

MW-206			
Date	5/15/2018	9/24/2018	12/3/2018
Total VOC (ppb)	NI	200 U	200 U [200 U]
Total SVOC (ppb)	NI	0.098 U	0.1 U [0.1 U]

MW-207			
Date	5/15/2018	9/24/2018	12/3/2018
Total VOC (ppb)	NI	200 U	200 U
Total SVOC (ppb)	NI	0.1 U	0.1 U

MW-209			
Date	5/15/2018	9/24/2018	12/3/2018
Total VOC (ppb)	NI	1.1 [1]	200 U
Total SVOC (ppb)	NI	0.099 U [0.099 U]	0.091 U

MW-208			
Date	5/15/2018	9/24/2018	12/3/2018
Total VOC (ppb)	NI	202.1	58.6
Total SVOC (ppb)	NI	0.099 U	0.091 U

MW-205			
Date	5/15/2018	9/24/2018	12/3/2018
Total VOC (ppb)	NI	6.0	200 U
Total SVOC (ppb)	NI	0.1 U	0.1 U

BMW2			
Date	5/17/2018	9/25/2018	12/4/2018
Total VOC (ppb)	200 U	200 U	200 U
Total SVOC (ppb)	0.099 U	0.1 U	0.098 U

BMW8			
Date	5/14/2018	9/25/2018	12/4/2018
Total VOC (ppb)	200 U	200 U	200 U
Total SVOC (ppb)	0.099 U	0.098 U	0.099 U

MW-210			
Date	5/15/2018	9/26/2018	12/4/2018
Total VOC (ppb)	NI	200 U	200 U
Total SVOC (ppb)	NI	0.13	0.098 U

MW-202			
Date	5/15/2018	9/25/2018	12/3/2018
Total VOC (ppb)	NI	Dry	Dry
Total SVOC (ppb)	NI	Dry	Dry

MW-211			
Date	5/15/2018	9/25/2018	12/4/2018
Total VOC (ppb)	NI	200 U	200 U
Total SVOC (ppb)	NI	0.29 U	0.098 U

BMW7			
Date	5/14/2018	9/25/2018	12/3/2018
Total VOC (ppb)	200 U	Dry	Dry
Total SVOC (ppb)	0.099 U	Dry	Dry

BMW9			
Date	5/17/2018	9/25/2018	12/4/2018
Total VOC (ppb)	1.3	Dry	200 U
Total SVOC (ppb)	0.097 U	Dry	0.098 U

MW-201			
Date	5/15/2018	9/25/2018	12/3/2018
Total VOC (ppb)	NI	Dry	Dry
Total SVOC (ppb)	NI	Dry	Dry

PZ106S			
Date	5/17/2018	9/26/2018	12/5/2018
Total VOC (ppb)	200 U	200 U	200 U
Total SVOC (ppb)	0.097 U	0.11 U	0.097 U

BMW5			
Date	5/15/2018	9/25/2018	12/3/2018
Total VOC (ppb)	NP	NP	NP
Total SVOC (ppb)	NP	NP	NP

BMW14R			
Date	8/6/2018	9/25/2018	12/5/2018
Total VOC (ppb)	2,979.7	4,757.60	4,345.80
Total SVOC (ppb)	1.53	6.82	0.93

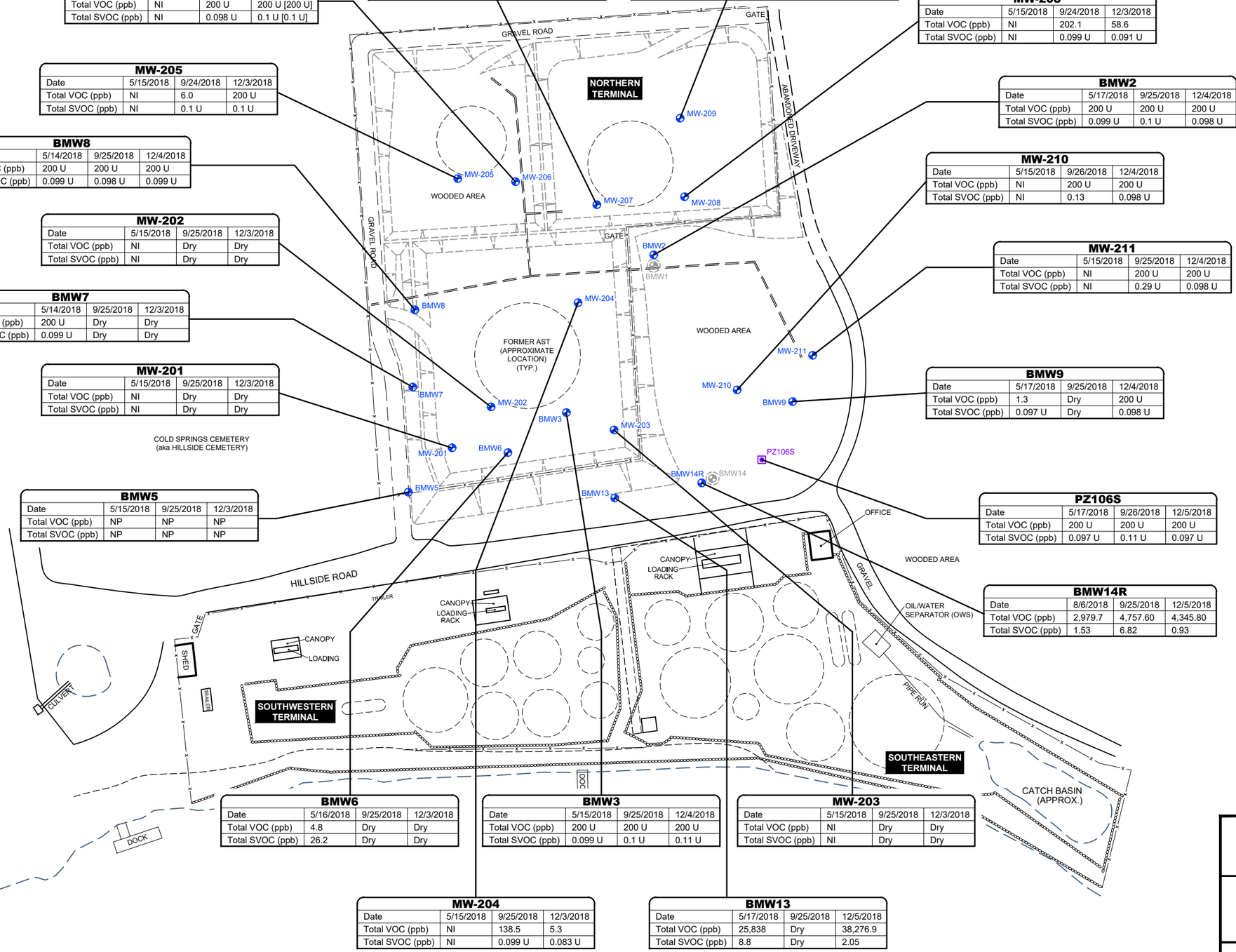
BMW6			
Date	5/16/2018	9/25/2018	12/3/2018
Total VOC (ppb)	4.8	Dry	Dry
Total SVOC (ppb)	26.2	Dry	Dry

BMW3			
Date	5/15/2018	9/25/2018	12/4/2018
Total VOC (ppb)	200 U	200 U	200 U
Total SVOC (ppb)	0.099 U	0.1 U	0.11 U

MW-203			
Date	5/15/2018	9/25/2018	12/3/2018
Total VOC (ppb)	NI	Dry	Dry
Total SVOC (ppb)	NI	Dry	Dry

MW-204			
Date	5/15/2018	9/25/2018	12/3/2018
Total VOC (ppb)	NI	138.5	5.3
Total SVOC (ppb)	NI	0.099 U	0.083 U

BMW13			
Date	5/17/2018	9/25/2018	12/5/2018
Total VOC (ppb)	25,838	Dry	38,276.9
Total SVOC (ppb)	8.8	Dry	2.05



LEGEND:

- MONITORING WELL
- DECOMMISSIONED MONITORING WELL
- PIEZOMETER
- FORMER AST
- FENCE
- RETAINING WALL
- EDGE OF WATER
- EDGE OF BANK

NOTES:

1. ALL CONCENTRATIONS ARE SHOWN IN PARTS PER BILLION (ppb) WHICH IS EQUIVALENT TO MICROGRAMS PER LITER (µg/L).
2. BASE MAP REFERENCE: "SITE MAP MONITORING WELLS" BY GROUNDWATER & ENVIRONMENTAL SERVICES, INC. (GES), DATED SEPTEMBER 30, 2015.
3. LOCATION OF PIEZOMETER (PZ106S) WAS SURVEYED ON APRIL 26, 2016 BY C.T. MALE. LOCATION OF MONITORING WELLS (MW-201-MW-210) WERE SURVEYED ON JUNE 7, 2018.
4. AST = ABOVE GROUND STORAGE TANK.
5. U = INDICATES THE COMPOUND WAS ANALYZED FOR, BUT NOT DETECTED.
6. NI = NOT INSTALLED.
7. NP = NAPL PRESENT.
8. Dry = INSUFFICIENT WATER TO COLLECT A SAMPLE.
9. FIELD DUPLICATE SAMPLE RESULTS ARE PRESENTED IN BRACKETS.

0 100' 200'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

GROUNDWATER SAMPLING SUMMARY 2018 - FOURTH QUARTER

TOTAL VOC AND SVOC CONCENTRATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER PIC: PM: V. MARESCO TM: R. HENSEL TR: N. GRIFFITH LYR:(On)ON=*;OFF=*REF*
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\BP AMOCO CORPORATION\Buckeye Pipeline Company\2019\B0090004.0008\01-DWG\2018Q4_Fig4_Databoxes.dwg LAYOUT: 4 SAVED: 1/11/2019 4:08 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
PLOTTED: 1/24/2019 10:16 AM BY: KRAHMER, ERIC
XREFS: IMAGES: PROJECTNAME: ----
2018Q4-Title Block
X-Base Map

ATTACHMENT A

Laboratory Reports

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

December 18, 2018

Vin Maresco
Arcadis
6723 Towpath Road
Syracuse, NY 13214

RE: Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Dear Vin Maresco:
Enclosed are the analytical results for sample(s) received by the laboratory on December 05, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel Christner
rachel.christner@pacelabs.com
724-850-5611
Project Manager

Enclosures

cc: Mr. P.J. Hart, Arcadis
Mr. Edward Mason, Arcadis
Mr. Mike Teeling, Woodard & Curran

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30273388001	**MW-208**	Water	12/03/18 12:15	12/05/18 11:30
30273388002	**MW-209**	Water	12/03/18 12:30	12/05/18 11:30
30273388003	**MW-209 (MS)**	Water	12/03/18 12:30	12/05/18 11:30
30273388004	**MW-209 (MSD)**	Water	12/03/18 12:30	12/05/18 11:30
30273388005	**DUP 120318**	Water	12/03/18 00:01	12/05/18 11:30
30273388006	**MW-206**	Water	12/03/18 15:15	12/05/18 11:30
30273388007	**MW-205**	Water	12/03/18 17:15	12/05/18 11:30
30273388008	**MW-204**	Water	12/03/18 16:45	12/05/18 11:30
30273388009	**MW-207**	Water	12/03/18 14:30	12/05/18 11:30
30273388010	**Trip Blank**	Water	12/03/18 00:01	12/05/18 11:30

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30273388001	**MW-208**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273388002	**MW-209**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273388003	**MW-209 (MS)**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273388004	**MW-209 (MSD)**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273388005	**DUP 120318**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273388006	**MW-206**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273388007	**MW-205**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273388008	**MW-204**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273388009	**MW-207**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273388010	**Trip Blank**	EPA 8260C	JAS	20	PASI-PA

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Sample: MW-208 **Lab ID: 30273388001** Collected: 12/03/18 12:15 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**1580**	ug/L	5.0	0.77	1	12/07/18 16:55	12/10/18 11:54	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**1270**	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 11:46	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.091	0.026	1	12/10/18 15:25	12/11/18 18:44	83-32-9	
Acenaphthylene	ND	ug/L	0.091	0.031	1	12/10/18 15:25	12/11/18 18:44	208-96-8	
Anthracene	ND	ug/L	0.091	0.025	1	12/10/18 15:25	12/11/18 18:44	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.091	0.035	1	12/10/18 15:25	12/11/18 18:44	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.091	0.011	1	12/10/18 15:25	12/11/18 18:44	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.091	0.024	1	12/10/18 15:25	12/11/18 18:44	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.091	0.032	1	12/10/18 15:25	12/11/18 18:44	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.091	0.021	1	12/10/18 15:25	12/11/18 18:44	207-08-9	
Chrysene	ND	ug/L	0.091	0.036	1	12/10/18 15:25	12/11/18 18:44	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.091	0.025	1	12/10/18 15:25	12/11/18 18:44	53-70-3	
Fluoranthene	ND	ug/L	0.091	0.029	1	12/10/18 15:25	12/11/18 18:44	206-44-0	
Fluorene	ND	ug/L	0.091	0.028	1	12/10/18 15:25	12/11/18 18:44	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.091	0.027	1	12/10/18 15:25	12/11/18 18:44	193-39-5	
Phenanthrene	ND	ug/L	0.091	0.040	1	12/10/18 15:25	12/11/18 18:44	85-01-8	
Pyrene	ND	ug/L	0.091	0.033	1	12/10/18 15:25	12/11/18 18:44	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	59	%.	27-113		1	12/10/18 15:25	12/11/18 18:44	321-60-8	
Terphenyl-d14 (S)	77	%.	56-108		1	12/10/18 15:25	12/11/18 18:44	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 17:00	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 17:00	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 17:00	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 17:00	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 17:00	64-17-5	1c,CL, L1
Ethylbenzene	**4.0**	ug/L	1.0	0.31	1		12/07/18 17:00	100-41-4	
Isopropylbenzene (Cumene)	**4.9**	ug/L	1.0	0.24	1		12/07/18 17:00	98-82-8	
p-Isopropyltoluene	**1.2**	ug/L	1.0	0.36	1		12/07/18 17:00	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 17:00	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 17:00	91-20-3	
n-Propylbenzene	**4.1**	ug/L	1.0	0.29	1		12/07/18 17:00	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 17:00	108-88-3	
1,2,4-Trimethylbenzene	**18.1**	ug/L	1.0	0.25	1		12/07/18 17:00	95-63-6	
1,3,5-Trimethylbenzene	**12.2**	ug/L	1.0	0.21	1		12/07/18 17:00	108-67-8	
m&p-Xylene	**11.4**	ug/L	2.0	0.60	1		12/07/18 17:00	179601-23-1	
o-Xylene	**2.7**	ug/L	1.0	0.18	1		12/07/18 17:00	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	98	%.	79-129		1		12/07/18 17:00	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%.	80-120		1		12/07/18 17:00	17060-07-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Sample: MW-208 **Lab ID: 30273388001** Collected: 12/03/18 12:15 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Toluene-d8 (S)	94	%.	80-120		1		12/07/18 17:00	2037-26-5	
Dibromofluoromethane (S)	93	%.	80-120		1		12/07/18 17:00	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**470**	mg/L	10.0	10.0	1		12/11/18 18:49		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 18:49		
Alkalinity,Total (CaCO3 pH4.5)	**470**	mg/L	10.0	1.0	1		12/11/18 18:49		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	**0.24**	mg/L	0.10	0.020	1		12/05/18 19:05		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		12/11/18 11:41		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**22.2**	mg/L	10.0	4.7	1		12/07/18 15:18	14808-79-8	

Sample: MW-209 **Lab ID: 30273388002** Collected: 12/03/18 12:30 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**2070**	ug/L	5.0	0.77	1	12/07/18 16:55	12/10/18 11:45	7439-96-5	ML,R1
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	ND	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 11:37	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.091	0.026	1	12/10/18 15:25	12/11/18 19:02	83-32-9	
Acenaphthylene	ND	ug/L	0.091	0.031	1	12/10/18 15:25	12/11/18 19:02	208-96-8	
Anthracene	ND	ug/L	0.091	0.025	1	12/10/18 15:25	12/11/18 19:02	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.091	0.035	1	12/10/18 15:25	12/11/18 19:02	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.091	0.011	1	12/10/18 15:25	12/11/18 19:02	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.091	0.024	1	12/10/18 15:25	12/11/18 19:02	205-99-2	R1
Benzo(g,h,i)perylene	ND	ug/L	0.091	0.032	1	12/10/18 15:25	12/11/18 19:02	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.091	0.021	1	12/10/18 15:25	12/11/18 19:02	207-08-9	
Chrysene	ND	ug/L	0.091	0.036	1	12/10/18 15:25	12/11/18 19:02	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.091	0.025	1	12/10/18 15:25	12/11/18 19:02	53-70-3	
Fluoranthene	ND	ug/L	0.091	0.029	1	12/10/18 15:25	12/11/18 19:02	206-44-0	
Fluorene	ND	ug/L	0.091	0.028	1	12/10/18 15:25	12/11/18 19:02	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.091	0.027	1	12/10/18 15:25	12/11/18 19:02	193-39-5	
Phenanthrene	ND	ug/L	0.091	0.040	1	12/10/18 15:25	12/11/18 19:02	85-01-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Sample: MW-209 **Lab ID: 30273388002** Collected: 12/03/18 12:30 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Pyrene	ND	ug/L	0.091	0.033	1	12/10/18 15:25	12/11/18 19:02	129-00-0	R1
Surrogates									
2-Fluorobiphenyl (S)	69	%.	27-113		1	12/10/18 15:25	12/11/18 19:02	321-60-8	
Terphenyl-d14 (S)	62	%.	56-108		1	12/10/18 15:25	12/11/18 19:02	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 17:27	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 17:27	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 17:27	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 17:27	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 17:27	64-17-5	1c,CL, L1
Ethylbenzene	ND	ug/L	1.0	0.31	1		12/07/18 17:27	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		12/07/18 17:27	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		12/07/18 17:27	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 17:27	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 17:27	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		12/07/18 17:27	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 17:27	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 17:27	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		12/07/18 17:27	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		12/07/18 17:27	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		12/07/18 17:27	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	101	%.	79-129		1		12/07/18 17:27	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%.	80-120		1		12/07/18 17:27	17060-07-0	
Toluene-d8 (S)	95	%.	80-120		1		12/07/18 17:27	2037-26-5	
Dibromofluoromethane (S)	99	%.	80-120		1		12/07/18 17:27	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**280**	mg/L	10.0	10.0	1		12/11/18 18:50		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 18:50		
Alkalinity,Total (CaCO3 pH4.5)	**280**	mg/L	10.0	1.0	1		12/11/18 18:50		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		12/05/18 19:07		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	**1.0**	mg/L	0.10	0.028	1		12/11/18 11:42		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**18.9**	mg/L	10.0	4.7	1		12/07/18 15:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Sample: MW-209 (MS) **Lab ID: 30273388003** Collected: 12/03/18 12:30 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**969**	ug/L	5.0	0.77	1	12/07/18 16:55	12/10/18 11:50	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**481**	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 11:42	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	**1.2**	ug/L	0.083	0.024	1	12/10/18 15:25	12/11/18 19:19	83-32-9	
Acenaphthylene	**1.3**	ug/L	0.083	0.028	1	12/10/18 15:25	12/11/18 19:19	208-96-8	
Anthracene	**1.2**	ug/L	0.083	0.023	1	12/10/18 15:25	12/11/18 19:19	120-12-7	
Benzo(a)anthracene	**1.3**	ug/L	0.083	0.032	1	12/10/18 15:25	12/11/18 19:19	56-55-3	
Benzo(a)pyrene	**0.87**	ug/L	0.083	0.010	1	12/10/18 15:25	12/11/18 19:19	50-32-8	
Benzo(b)fluoranthene	**1.0**	ug/L	0.083	0.022	1	12/10/18 15:25	12/11/18 19:19	205-99-2	
Benzo(g,h,i)perylene	**0.63**	ug/L	0.083	0.030	1	12/10/18 15:25	12/11/18 19:19	191-24-2	
Benzo(k)fluoranthene	**0.87**	ug/L	0.083	0.019	1	12/10/18 15:25	12/11/18 19:19	207-08-9	
Chrysene	**1.2**	ug/L	0.083	0.033	1	12/10/18 15:25	12/11/18 19:19	218-01-9	
Dibenz(a,h)anthracene	**0.66**	ug/L	0.083	0.023	1	12/10/18 15:25	12/11/18 19:19	53-70-3	
Fluoranthene	**1.5**	ug/L	0.083	0.027	1	12/10/18 15:25	12/11/18 19:19	206-44-0	
Fluorene	**1.4**	ug/L	0.083	0.026	1	12/10/18 15:25	12/11/18 19:19	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.56**	ug/L	0.083	0.025	1	12/10/18 15:25	12/11/18 19:19	193-39-5	
Phenanthrene	**1.3**	ug/L	0.083	0.036	1	12/10/18 15:25	12/11/18 19:19	85-01-8	
Pyrene	**1.5**	ug/L	0.083	0.030	1	12/10/18 15:25	12/11/18 19:19	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	68	%.	27-113		1	12/10/18 15:25	12/11/18 19:19	321-60-8	
Terphenyl-d14 (S)	71	%.	56-108		1	12/10/18 15:25	12/11/18 19:19	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	**19.3**	ug/L	1.0	0.24	1		12/08/18 00:33	71-43-2	
n-Butylbenzene	**18.2**	ug/L	1.0	0.20	1		12/08/18 00:33	104-51-8	
sec-Butylbenzene	**20.0**	ug/L	1.0	0.25	1		12/08/18 00:33	135-98-8	
tert-Butylbenzene	**20.2**	ug/L	1.0	0.28	1		12/08/18 00:33	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/08/18 00:33	64-17-5	1c,CL, L1
Ethylbenzene	**20.3**	ug/L	1.0	0.31	1		12/08/18 00:33	100-41-4	
Isopropylbenzene (Cumene)	**19.8**	ug/L	1.0	0.24	1		12/08/18 00:33	98-82-8	
p-Isopropyltoluene	**19.8**	ug/L	1.0	0.36	1		12/08/18 00:33	99-87-6	
Methyl-tert-butyl ether	**17.8**	ug/L	1.0	0.23	1		12/08/18 00:33	1634-04-4	
Naphthalene	**24.4**	ug/L	2.0	0.82	1		12/08/18 00:33	91-20-3	
n-Propylbenzene	**19.6**	ug/L	1.0	0.29	1		12/08/18 00:33	103-65-1	
Toluene	**21.7**	ug/L	1.0	0.30	1		12/08/18 00:33	108-88-3	
1,2,4-Trimethylbenzene	**22.2**	ug/L	1.0	0.25	1		12/08/18 00:33	95-63-6	
1,3,5-Trimethylbenzene	**20.0**	ug/L	1.0	0.21	1		12/08/18 00:33	108-67-8	
m&p-Xylene	**41.8**	ug/L	2.0	0.60	1		12/08/18 00:33	179601-23-1	
o-Xylene	**20.4**	ug/L	1.0	0.18	1		12/08/18 00:33	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	100	%.	79-129		1		12/08/18 00:33	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%.	80-120		1		12/08/18 00:33	17060-07-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Sample: MW-209 (MS) **Lab ID: 30273388003** Collected: 12/03/18 12:30 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Toluene-d8 (S)	97	%.	80-120		1		12/08/18 00:33	2037-26-5	
Dibromofluoromethane (S)	100	%.	80-120		1		12/08/18 00:33	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**290**	mg/L	10.0	10.0	1		12/11/18 18:55		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 18:55		
Alkalinity,Total (CaCO3 pH4.5)	**290**	mg/L	10.0	1.0	1		12/11/18 18:55		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	**0.91**	mg/L	0.10	0.020	1		12/05/18 19:10		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	**1.1**	mg/L	0.10	0.028	1		12/11/18 11:46		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**18.5**	mg/L	10.0	4.7	1		12/07/18 15:16	14808-79-8	

Sample: MW-209 (MSD) **Lab ID: 30273388004** Collected: 12/03/18 12:30 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**584**	ug/L	5.0	0.77	1	12/07/18 16:55	12/10/18 11:52	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**490**	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 11:44	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	**1.6**	ug/L	0.11	0.030	1	12/10/18 15:25	12/11/18 19:37	83-32-9	
Acenaphthylene	**1.7**	ug/L	0.11	0.035	1	12/10/18 15:25	12/11/18 19:37	208-96-8	
Anthracene	**1.5**	ug/L	0.11	0.029	1	12/10/18 15:25	12/11/18 19:37	120-12-7	
Benzo(a)anthracene	**1.6**	ug/L	0.11	0.041	1	12/10/18 15:25	12/11/18 19:37	56-55-3	
Benzo(a)pyrene	**1.0**	ug/L	0.11	0.013	1	12/10/18 15:25	12/11/18 19:37	50-32-8	
Benzo(b)fluoranthene	**1.0**	ug/L	0.11	0.028	1	12/10/18 15:25	12/11/18 19:37	205-99-2	
Benzo(g,h,i)perylene	**0.73**	ug/L	0.11	0.037	1	12/10/18 15:25	12/11/18 19:37	191-24-2	
Benzo(k)fluoranthene	**1.1**	ug/L	0.11	0.024	1	12/10/18 15:25	12/11/18 19:37	207-08-9	
Chrysene	**1.6**	ug/L	0.11	0.042	1	12/10/18 15:25	12/11/18 19:37	218-01-9	
Dibenz(a,h)anthracene	**0.78**	ug/L	0.11	0.029	1	12/10/18 15:25	12/11/18 19:37	53-70-3	
Fluoranthene	**1.9**	ug/L	0.11	0.034	1	12/10/18 15:25	12/11/18 19:37	206-44-0	
Fluorene	**1.9**	ug/L	0.11	0.033	1	12/10/18 15:25	12/11/18 19:37	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.68**	ug/L	0.11	0.032	1	12/10/18 15:25	12/11/18 19:37	193-39-5	
Phenanthrene	**1.8**	ug/L	0.11	0.046	1	12/10/18 15:25	12/11/18 19:37	85-01-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Sample: MW-209 (MSD) **Lab ID: 30273388004** Collected: 12/03/18 12:30 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Pyrene	**1.5**	ug/L	0.11	0.038	1	12/10/18 15:25	12/11/18 19:37	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	75	%.	27-113		1	12/10/18 15:25	12/11/18 19:37	321-60-8	
Terphenyl-d14 (S)	55	%.	56-108		1	12/10/18 15:25	12/11/18 19:37	1718-51-0	SR
8260C MSV	Analytical Method: EPA 8260C								
Benzene	**19.4**	ug/L	1.0	0.24	1		12/08/18 01:00	71-43-2	
n-Butylbenzene	**18.7**	ug/L	1.0	0.20	1		12/08/18 01:00	104-51-8	
sec-Butylbenzene	**19.9**	ug/L	1.0	0.25	1		12/08/18 01:00	135-98-8	
tert-Butylbenzene	**20.5**	ug/L	1.0	0.28	1		12/08/18 01:00	98-06-6	
Ethanol	**228**	ug/L	200	79.8	1		12/08/18 01:00	64-17-5	1c,CL, L1
Ethylbenzene	**19.9**	ug/L	1.0	0.31	1		12/08/18 01:00	100-41-4	
Isopropylbenzene (Cumene)	**20.1**	ug/L	1.0	0.24	1		12/08/18 01:00	98-82-8	
p-Isopropyltoluene	**20.0**	ug/L	1.0	0.36	1		12/08/18 01:00	99-87-6	
Methyl-tert-butyl ether	**17.4**	ug/L	1.0	0.23	1		12/08/18 01:00	1634-04-4	
Naphthalene	**21.1**	ug/L	2.0	0.82	1		12/08/18 01:00	91-20-3	
n-Propylbenzene	**19.6**	ug/L	1.0	0.29	1		12/08/18 01:00	103-65-1	
Toluene	**21.1**	ug/L	1.0	0.30	1		12/08/18 01:00	108-88-3	
1,2,4-Trimethylbenzene	**20.5**	ug/L	1.0	0.25	1		12/08/18 01:00	95-63-6	
1,3,5-Trimethylbenzene	**19.7**	ug/L	1.0	0.21	1		12/08/18 01:00	108-67-8	
m&p-Xylene	**41.2**	ug/L	2.0	0.60	1		12/08/18 01:00	179601-23-1	
o-Xylene	**19.9**	ug/L	1.0	0.18	1		12/08/18 01:00	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	99	%.	79-129		1		12/08/18 01:00	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%.	80-120		1		12/08/18 01:00	17060-07-0	
Toluene-d8 (S)	99	%.	80-120		1		12/08/18 01:00	2037-26-5	
Dibromofluoromethane (S)	101	%.	80-120		1		12/08/18 01:00	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**290**	mg/L	10.0	10.0	1		12/11/18 18:56		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 18:56		
Alkalinity,Total (CaCO3 pH4.5)	**290**	mg/L	10.0	1.0	1		12/11/18 18:56		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	**0.90**	mg/L	0.10	0.020	1		12/05/18 19:12		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	**1.1**	mg/L	0.10	0.028	1		12/11/18 11:48		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**19.1**	mg/L	10.0	4.7	1		12/07/18 15:18	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Sample: DUP 120318 **Lab ID: 30273388005** Collected: 12/03/18 00:01 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**64.8**	ug/L	5.0	0.77	1	12/07/18 16:55	12/10/18 11:56	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**6.7**	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 11:48	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.029	1	12/10/18 15:25	12/11/18 19:55	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.034	1	12/10/18 15:25	12/11/18 19:55	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	12/10/18 15:25	12/11/18 19:55	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	12/10/18 15:25	12/11/18 19:55	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	12/10/18 15:25	12/11/18 19:55	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	12/10/18 15:25	12/11/18 19:55	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	12/10/18 15:25	12/11/18 19:55	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	12/10/18 15:25	12/11/18 19:55	207-08-9	
Chrysene	ND	ug/L	0.10	0.041	1	12/10/18 15:25	12/11/18 19:55	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	12/10/18 15:25	12/11/18 19:55	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.033	1	12/10/18 15:25	12/11/18 19:55	206-44-0	
Fluorene	ND	ug/L	0.10	0.032	1	12/10/18 15:25	12/11/18 19:55	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	12/10/18 15:25	12/11/18 19:55	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.045	1	12/10/18 15:25	12/11/18 19:55	85-01-8	
Pyrene	ND	ug/L	0.10	0.037	1	12/10/18 15:25	12/11/18 19:55	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	55	%.	27-113		1	12/10/18 15:25	12/11/18 19:55	321-60-8	
Terphenyl-d14 (S)	66	%.	56-108		1	12/10/18 15:25	12/11/18 19:55	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 17:54	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 17:54	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 17:54	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 17:54	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 17:54	64-17-5	1c,CL, L1
Ethylbenzene	ND	ug/L	1.0	0.31	1		12/07/18 17:54	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		12/07/18 17:54	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		12/07/18 17:54	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 17:54	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 17:54	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		12/07/18 17:54	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 17:54	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 17:54	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		12/07/18 17:54	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		12/07/18 17:54	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		12/07/18 17:54	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	103	%.	79-129		1		12/07/18 17:54	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%.	80-120		1		12/07/18 17:54	17060-07-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Sample: DUP 120318 **Lab ID: 30273388005** Collected: 12/03/18 00:01 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Toluene-d8 (S)	93	%.	80-120		1		12/07/18 17:54	2037-26-5	
Dibromofluoromethane (S)	100	%.	80-120		1		12/07/18 17:54	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**270**	mg/L	10.0	10.0	1		12/11/18 18:58		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 18:58		
Alkalinity,Total (CaCO3 pH4.5)	**270**	mg/L	10.0	1.0	1		12/11/18 18:58		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		12/05/18 19:12		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	**0.33**	mg/L	0.10	0.028	1		12/11/18 12:28		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**32.6**	mg/L	10.0	4.7	1		12/07/18 15:20	14808-79-8	

Sample: MW-206 **Lab ID: 30273388006** Collected: 12/03/18 15:15 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**50.0**	ug/L	5.0	0.77	1	12/07/18 16:55	12/10/18 11:58	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	ND	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 11:50	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.029	1	12/10/18 15:25	12/11/18 20:12	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.034	1	12/10/18 15:25	12/11/18 20:12	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	12/10/18 15:25	12/11/18 20:12	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	12/10/18 15:25	12/11/18 20:12	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.012	1	12/10/18 15:25	12/11/18 20:12	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	12/10/18 15:25	12/11/18 20:12	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	12/10/18 15:25	12/11/18 20:12	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	12/10/18 15:25	12/11/18 20:12	207-08-9	
Chrysene	ND	ug/L	0.10	0.040	1	12/10/18 15:25	12/11/18 20:12	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	12/10/18 15:25	12/11/18 20:12	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.032	1	12/10/18 15:25	12/11/18 20:12	206-44-0	
Fluorene	ND	ug/L	0.10	0.031	1	12/10/18 15:25	12/11/18 20:12	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.030	1	12/10/18 15:25	12/11/18 20:12	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.044	1	12/10/18 15:25	12/11/18 20:12	85-01-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Sample: MW-206 **Lab ID: 30273388006** Collected: 12/03/18 15:15 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Pyrene	ND	ug/L	0.10	0.036	1	12/10/18 15:25	12/11/18 20:12	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	75	%.	27-113		1	12/10/18 15:25	12/11/18 20:12	321-60-8	
Terphenyl-d14 (S)	72	%.	56-108		1	12/10/18 15:25	12/11/18 20:12	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 18:20	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 18:20	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 18:20	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 18:20	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 18:20	64-17-5	1c,CL, L1
Ethylbenzene	ND	ug/L	1.0	0.31	1		12/07/18 18:20	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		12/07/18 18:20	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		12/07/18 18:20	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 18:20	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 18:20	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		12/07/18 18:20	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 18:20	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 18:20	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		12/07/18 18:20	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		12/07/18 18:20	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		12/07/18 18:20	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	101	%.	79-129		1		12/07/18 18:20	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%.	80-120		1		12/07/18 18:20	17060-07-0	
Toluene-d8 (S)	95	%.	80-120		1		12/07/18 18:20	2037-26-5	
Dibromofluoromethane (S)	98	%.	80-120		1		12/07/18 18:20	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**260**	mg/L	10.0	10.0	1		12/11/18 18:59		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 18:59		
Alkalinity,Total (CaCO3 pH4.5)	**260**	mg/L	10.0	1.0	1		12/11/18 18:59		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		12/05/18 19:15		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	**0.33**	mg/L	0.10	0.028	1		12/11/18 12:29		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**32.7**	mg/L	10.0	4.7	1		12/07/18 15:20	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Sample: MW-205 **Lab ID: 30273388007** Collected: 12/03/18 17:15 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**64.9**	ug/L	5.0	0.77	1	12/07/18 16:55	12/10/18 12:00	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**30.4**	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 11:52	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.029	1	12/10/18 15:25	12/11/18 20:30	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.034	1	12/10/18 15:25	12/11/18 20:30	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	12/10/18 15:25	12/11/18 20:30	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	12/10/18 15:25	12/11/18 20:30	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.012	1	12/10/18 15:25	12/11/18 20:30	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	12/10/18 15:25	12/11/18 20:30	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	12/10/18 15:25	12/11/18 20:30	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	12/10/18 15:25	12/11/18 20:30	207-08-9	
Chrysene	ND	ug/L	0.10	0.040	1	12/10/18 15:25	12/11/18 20:30	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	12/10/18 15:25	12/11/18 20:30	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.032	1	12/10/18 15:25	12/11/18 20:30	206-44-0	
Fluorene	ND	ug/L	0.10	0.031	1	12/10/18 15:25	12/11/18 20:30	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.030	1	12/10/18 15:25	12/11/18 20:30	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.044	1	12/10/18 15:25	12/11/18 20:30	85-01-8	
Pyrene	ND	ug/L	0.10	0.036	1	12/10/18 15:25	12/11/18 20:30	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	58	%.	27-113		1	12/10/18 15:25	12/11/18 20:30	321-60-8	
Terphenyl-d14 (S)	77	%.	56-108		1	12/10/18 15:25	12/11/18 20:30	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 18:47	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 18:47	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 18:47	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 18:47	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 18:47	64-17-5	1c,CL, L1
Ethylbenzene	ND	ug/L	1.0	0.31	1		12/07/18 18:47	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		12/07/18 18:47	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		12/07/18 18:47	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 18:47	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 18:47	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		12/07/18 18:47	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 18:47	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 18:47	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		12/07/18 18:47	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		12/07/18 18:47	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		12/07/18 18:47	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	101	%.	79-129		1		12/07/18 18:47	460-00-4	
1,2-Dichloroethane-d4 (S)	110	%.	80-120		1		12/07/18 18:47	17060-07-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Sample: MW-205 **Lab ID: 30273388007** Collected: 12/03/18 17:15 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Toluene-d8 (S)	93	%.	80-120		1		12/07/18 18:47	2037-26-5	
Dibromofluoromethane (S)	100	%.	80-120		1		12/07/18 18:47	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**340**	mg/L	10.0	10.0	1		12/11/18 19:01		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 19:01		
Alkalinity,Total (CaCO3 pH4.5)	**340**	mg/L	10.0	1.0	1		12/11/18 19:01		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	**0.51**	mg/L	0.10	0.020	1		12/05/18 19:19		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		12/11/18 12:31		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**394**	mg/L	250	117	25		12/07/18 16:22	14808-79-8	

Sample: MW-204 **Lab ID: 30273388008** Collected: 12/03/18 16:45 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**758**	ug/L	5.0	0.77	1	12/07/18 16:55	12/10/18 12:07	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**671**	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 12:03	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.083	0.024	1	12/10/18 15:25	12/11/18 20:48	83-32-9	
Acenaphthylene	ND	ug/L	0.083	0.028	1	12/10/18 15:25	12/11/18 20:48	208-96-8	
Anthracene	ND	ug/L	0.083	0.023	1	12/10/18 15:25	12/11/18 20:48	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.083	0.032	1	12/10/18 15:25	12/11/18 20:48	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.083	0.010	1	12/10/18 15:25	12/11/18 20:48	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.083	0.022	1	12/10/18 15:25	12/11/18 20:48	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.083	0.030	1	12/10/18 15:25	12/11/18 20:48	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.083	0.019	1	12/10/18 15:25	12/11/18 20:48	207-08-9	
Chrysene	ND	ug/L	0.083	0.033	1	12/10/18 15:25	12/11/18 20:48	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.083	0.023	1	12/10/18 15:25	12/11/18 20:48	53-70-3	
Fluoranthene	ND	ug/L	0.083	0.027	1	12/10/18 15:25	12/11/18 20:48	206-44-0	
Fluorene	ND	ug/L	0.083	0.026	1	12/10/18 15:25	12/11/18 20:48	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.083	0.025	1	12/10/18 15:25	12/11/18 20:48	193-39-5	
Phenanthrene	ND	ug/L	0.083	0.036	1	12/10/18 15:25	12/11/18 20:48	85-01-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Sample: MW-204 **Lab ID: 30273388008** Collected: 12/03/18 16:45 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Pyrene	ND	ug/L	0.083	0.030	1	12/10/18 15:25	12/11/18 20:48	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	63	%.	27-113		1	12/10/18 15:25	12/11/18 20:48	321-60-8	
Terphenyl-d14 (S)	70	%.	56-108		1	12/10/18 15:25	12/11/18 20:48	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 19:14	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 19:14	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 19:14	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 19:14	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 19:14	64-17-5	1c,CL, L1
Ethylbenzene	**1.2**	ug/L	1.0	0.31	1		12/07/18 19:14	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		12/07/18 19:14	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		12/07/18 19:14	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 19:14	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 19:14	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		12/07/18 19:14	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 19:14	108-88-3	
1,2,4-Trimethylbenzene	**2.0**	ug/L	1.0	0.25	1		12/07/18 19:14	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		12/07/18 19:14	108-67-8	
m&p-Xylene	**2.1**	ug/L	2.0	0.60	1		12/07/18 19:14	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		12/07/18 19:14	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	101	%.	79-129		1		12/07/18 19:14	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%.	80-120		1		12/07/18 19:14	17060-07-0	
Toluene-d8 (S)	92	%.	80-120		1		12/07/18 19:14	2037-26-5	
Dibromofluoromethane (S)	98	%.	80-120		1		12/07/18 19:14	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**580**	mg/L	10.0	10.0	1		12/11/18 19:02		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 19:02		
Alkalinity,Total (CaCO3 pH4.5)	**580**	mg/L	10.0	1.0	1		12/11/18 19:02		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	**0.26**	mg/L	0.10	0.020	1		12/05/18 19:17		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		12/11/18 12:32		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**35.1**	mg/L	10.0	4.7	1		12/07/18 15:22	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Sample: MW-207 **Lab ID: 30273388009** Collected: 12/03/18 14:30 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**64.1**	ug/L	5.0	0.77	1	12/07/18 16:55	12/10/18 12:09	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	ND	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 12:06	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.029	1	12/10/18 15:25	12/11/18 21:06	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.034	1	12/10/18 15:25	12/11/18 21:06	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	12/10/18 15:25	12/11/18 21:06	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	12/10/18 15:25	12/11/18 21:06	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	12/10/18 15:25	12/11/18 21:06	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	12/10/18 15:25	12/11/18 21:06	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	12/10/18 15:25	12/11/18 21:06	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	12/10/18 15:25	12/11/18 21:06	207-08-9	
Chrysene	ND	ug/L	0.10	0.041	1	12/10/18 15:25	12/11/18 21:06	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	12/10/18 15:25	12/11/18 21:06	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.033	1	12/10/18 15:25	12/11/18 21:06	206-44-0	
Fluorene	ND	ug/L	0.10	0.032	1	12/10/18 15:25	12/11/18 21:06	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	12/10/18 15:25	12/11/18 21:06	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.045	1	12/10/18 15:25	12/11/18 21:06	85-01-8	
Pyrene	ND	ug/L	0.10	0.037	1	12/10/18 15:25	12/11/18 21:06	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	56	%.	27-113		1	12/10/18 15:25	12/11/18 21:06	321-60-8	
Terphenyl-d14 (S)	47	%.	56-108		1	12/10/18 15:25	12/11/18 21:06	1718-51-0	2c,SR
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 19:40	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 19:40	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 19:40	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 19:40	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 19:40	64-17-5	1c,CL, L1
Ethylbenzene	ND	ug/L	1.0	0.31	1		12/07/18 19:40	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		12/07/18 19:40	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		12/07/18 19:40	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 19:40	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 19:40	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		12/07/18 19:40	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 19:40	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 19:40	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		12/07/18 19:40	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		12/07/18 19:40	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		12/07/18 19:40	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	103	%.	79-129		1		12/07/18 19:40	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%.	80-120		1		12/07/18 19:40	17060-07-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Sample: MW-207 **Lab ID: 30273388009** Collected: 12/03/18 14:30 Received: 12/05/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Toluene-d8 (S)	93	%.	80-120		1		12/07/18 19:40	2037-26-5	
Dibromofluoromethane (S)	100	%.	80-120		1		12/07/18 19:40	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**270**	mg/L	10.0	10.0	1		12/11/18 19:03		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 19:03		
Alkalinity,Total (CaCO3 pH4.5)	**270**	mg/L	10.0	1.0	1		12/11/18 19:03		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		12/05/18 19:20		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	**0.71**	mg/L	0.10	0.028	1		12/11/18 12:33		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**23.1**	mg/L	10.0	4.7	1		12/07/18 15:23	14808-79-8	

Sample: Trip Blank **Lab ID: 30273388010** Collected: 12/03/18 00:01 Received: 12/05/18 11:30 Matrix: Water

Comments: • Trip Blank was not listed on the chain of custody but was received by laboratory.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 16:07	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 16:07	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 16:07	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 16:07	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 16:07	64-17-5	1c,CL, L1
Ethylbenzene	ND	ug/L	1.0	0.31	1		12/07/18 16:07	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		12/07/18 16:07	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		12/07/18 16:07	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 16:07	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 16:07	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		12/07/18 16:07	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 16:07	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 16:07	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		12/07/18 16:07	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		12/07/18 16:07	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		12/07/18 16:07	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	98	%.	79-129		1		12/07/18 16:07	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%.	80-120		1		12/07/18 16:07	17060-07-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Sample: Trip Blank **Lab ID: 30273388010** Collected: 12/03/18 00:01 Received: 12/05/18 11:30 Matrix: Water

Comments: • Trip Blank was not listed on the chain of custody but was received by laboratory.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Toluene-d8 (S)	93	%.	80-120		1		12/07/18 16:07	2037-26-5	
Dibromofluoromethane (S)	100	%.	80-120		1		12/07/18 16:07	1868-53-7	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

QC Batch: 323255 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009

METHOD BLANK: 1575624 Matrix: Water
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese	ug/L	ND	5.0	1.2	12/10/18 11:41	

LABORATORY CONTROL SAMPLE: 1575625

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	500	512	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1575627 1575628

Parameter	Units	30273388002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese	ug/L	2070	500	500	969	584	-221	-298	75-125	50	20	ML,R1

SAMPLE DUPLICATE: 1575626

Parameter	Units	30273388002 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese	ug/L	2070	2020	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

QC Batch: 323242 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET Dissolved
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009

METHOD BLANK: 1575533 Matrix: Water
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	1.2	12/10/18 11:33	

LABORATORY CONTROL SAMPLE: 1575534

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	500	470	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1575536 1575537

Parameter	Units	30273388002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese, Dissolved	ug/L	ND	500	500	481	490	96	98	75-125	2	20	

MATRIX SPIKE SAMPLE: 1575539

Parameter	Units	30273533005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	ND	500	487	97	75-125	

SAMPLE DUPLICATE: 1575535

Parameter	Units	30273388002 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese, Dissolved	ug/L	ND	ND		20	

SAMPLE DUPLICATE: 1575538

Parameter	Units	30273533005 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese, Dissolved	ug/L	ND	1.6J		20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

QC Batch: 323236 Analysis Method: EPA 8260C
QC Batch Method: EPA 8260C Analysis Description: 8260C MSV
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009, 30273388010

METHOD BLANK: 1575510 Matrix: Water
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009, 30273388010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	1.0	0.25	12/07/18 15:40	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	0.21	12/07/18 15:40	
Benzene	ug/L	ND	1.0	0.24	12/07/18 15:40	
Ethanol	ug/L	ND	200	79.8	12/07/18 15:40	1c,CL
Ethylbenzene	ug/L	ND	1.0	0.31	12/07/18 15:40	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	0.24	12/07/18 15:40	
m&p-Xylene	ug/L	ND	2.0	0.60	12/07/18 15:40	
Methyl-tert-butyl ether	ug/L	ND	1.0	0.23	12/07/18 15:40	
n-Butylbenzene	ug/L	ND	1.0	0.20	12/07/18 15:40	
n-Propylbenzene	ug/L	ND	1.0	0.29	12/07/18 15:40	
Naphthalene	ug/L	ND	2.0	0.82	12/07/18 15:40	
o-Xylene	ug/L	ND	1.0	0.18	12/07/18 15:40	
p-Isopropyltoluene	ug/L	ND	1.0	0.36	12/07/18 15:40	
sec-Butylbenzene	ug/L	ND	1.0	0.25	12/07/18 15:40	
tert-Butylbenzene	ug/L	ND	1.0	0.28	12/07/18 15:40	
Toluene	ug/L	ND	1.0	0.30	12/07/18 15:40	
1,2-Dichloroethane-d4 (S)	%.	107	80-120		12/07/18 15:40	
4-Bromofluorobenzene (S)	%.	102	79-129		12/07/18 15:40	
Dibromofluoromethane (S)	%.	101	80-120		12/07/18 15:40	
Toluene-d8 (S)	%.	93	80-120		12/07/18 15:40	

LABORATORY CONTROL SAMPLE: 1575511

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	19.3	97	70-130	
1,3,5-Trimethylbenzene	ug/L	20	19.4	97	70-130	
Benzene	ug/L	20	18.8	94	70-130	
Ethanol	ug/L	200	380	190	10-175	1c,CL,L1
Ethylbenzene	ug/L	20	19.7	98	70-130	
Isopropylbenzene (Cumene)	ug/L	20	20.2	101	70-130	
m&p-Xylene	ug/L	40	40.4	101	70-130	
Methyl-tert-butyl ether	ug/L	20	18.6	93	70-130	
n-Butylbenzene	ug/L	20	19.7	99	70-130	
n-Propylbenzene	ug/L	20	19.7	99	70-130	
Naphthalene	ug/L	20	20.6	103	70-130	
o-Xylene	ug/L	20	19.9	100	70-130	
p-Isopropyltoluene	ug/L	20	20.3	101	70-130	
sec-Butylbenzene	ug/L	20	20.2	101	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

LABORATORY CONTROL SAMPLE: 1575511

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
tert-Butylbenzene	ug/L	20	20.7	103	70-130	
Toluene	ug/L	20	19.7	98	70-130	
1,2-Dichloroethane-d4 (S)	%.			99	80-120	
4-Bromofluorobenzene (S)	%.			100	79-129	
Dibromofluoromethane (S)	%.			98	80-120	
Toluene-d8 (S)	%.			98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1575512 1575513

Parameter	Units	30273388002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2,4-Trimethylbenzene	ug/L	ND	20	20	22.2	20.5	111	102	75-125	8	30	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	20.0	19.7	100	98	76-121	1	30	
Benzene	ug/L	ND	20	20	19.3	19.4	96	97	67-121	1	30	
Ethanol	ug/L	ND	200	200	142J	228	71	114	10-175		30	1c,CL
Ethylbenzene	ug/L	ND	20	20	20.3	19.9	101	99	70-127	2	30	
Isopropylbenzene (Cumene)	ug/L	ND	20	20	19.8	20.1	99	101	80-122	2	30	
m&p-Xylene	ug/L	ND	40	40	41.8	41.2	104	103	71-128	1	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	17.8	17.4	89	87	79-135	2	30	
n-Butylbenzene	ug/L	ND	20	20	18.2	18.7	91	93	54-128	2	30	
n-Propylbenzene	ug/L	ND	20	20	19.6	19.6	98	98	61-127	0	30	
Naphthalene	ug/L	ND	20	20	24.4	21.1	122	105	62-131	14	30	
o-Xylene	ug/L	ND	20	20	20.4	19.9	102	100	68-125	2	30	
p-Isopropyltoluene	ug/L	ND	20	20	19.8	20.0	99	100	60-125	1	30	
sec-Butylbenzene	ug/L	ND	20	20	20.0	19.9	100	100	61-125	0	30	
tert-Butylbenzene	ug/L	ND	20	20	20.2	20.5	101	103	62-125	2	30	
Toluene	ug/L	ND	20	20	21.7	21.1	109	105	77-125	3	30	
1,2-Dichloroethane-d4 (S)	%.						97	95	80-120			
4-Bromofluorobenzene (S)	%.						100	99	79-129			
Dibromofluoromethane (S)	%.						100	101	80-120			
Toluene-d8 (S)	%.						97	99	80-120			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

QC Batch: 323301 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3510C Analysis Description: 8270D Water PAH by SIM MSSV
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009

METHOD BLANK: 1576296 Matrix: Water
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Acenaphthene	ug/L	ND	0.10	0.029	12/11/18 15:46	
Acenaphthylene	ug/L	ND	0.10	0.034	12/11/18 15:46	
Anthracene	ug/L	ND	0.10	0.028	12/11/18 15:46	
Benzo(a)anthracene	ug/L	ND	0.10	0.039	12/11/18 15:46	
Benzo(a)pyrene	ug/L	ND	0.10	0.012	12/11/18 15:46	
Benzo(b)fluoranthene	ug/L	ND	0.10	0.027	12/11/18 15:46	
Benzo(g,h,i)perylene	ug/L	ND	0.10	0.035	12/11/18 15:46	
Benzo(k)fluoranthene	ug/L	ND	0.10	0.023	12/11/18 15:46	
Chrysene	ug/L	ND	0.10	0.040	12/11/18 15:46	
Dibenz(a,h)anthracene	ug/L	ND	0.10	0.028	12/11/18 15:46	
Fluoranthene	ug/L	ND	0.10	0.032	12/11/18 15:46	
Fluorene	ug/L	ND	0.10	0.031	12/11/18 15:46	
Indeno(1,2,3-cd)pyrene	ug/L	ND	0.10	0.030	12/11/18 15:46	
Phenanthrene	ug/L	ND	0.10	0.044	12/11/18 15:46	
Pyrene	ug/L	ND	0.10	0.036	12/11/18 15:46	
2-Fluorobiphenyl (S)	%.	60	27-113		12/11/18 15:46	
Terphenyl-d14 (S)	%.	75	56-108		12/11/18 15:46	

LABORATORY CONTROL SAMPLE: 1576297

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/L	2	1.6	78	27-105	
Acenaphthylene	ug/L	2	1.6	82	19-120	
Anthracene	ug/L	2	1.6	82	39-111	
Benzo(a)anthracene	ug/L	2	1.8	88	49-120	
Benzo(a)pyrene	ug/L	2	1.9	93	44-121	
Benzo(b)fluoranthene	ug/L	2	1.8	91	51-121	
Benzo(g,h,i)perylene	ug/L	2	1.7	87	43-121	
Benzo(k)fluoranthene	ug/L	2	1.8	92	47-121	
Chrysene	ug/L	2	1.7	83	48-108	
Dibenz(a,h)anthracene	ug/L	2	1.7	87	43-126	
Fluoranthene	ug/L	2	1.8	92	46-120	
Fluorene	ug/L	2	1.8	89	35-110	
Indeno(1,2,3-cd)pyrene	ug/L	2	1.7	86	48-124	
Phenanthrene	ug/L	2	1.7	84	38-107	
Pyrene	ug/L	2	1.8	90	50-117	
2-Fluorobiphenyl (S)	%.			74	27-113	
Terphenyl-d14 (S)	%.			84	56-108	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1576298 1576299

Parameter	Units	30273388002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Acenaphthene	ug/L	ND	2	2	1.5	1.6	73	78	10-115	7	20	
Acenaphthylene	ug/L	ND	2	2	1.5	1.6	76	81	14-108	7	20	
Anthracene	ug/L	ND	2	2	1.4	1.5	70	74	29-107	4	20	
Benzo(a)anthracene	ug/L	ND	2	2	1.5	1.5	76	74	39-114	2	20	
Benzo(a)pyrene	ug/L	ND	2	2	1.0	0.97	52	49	39-108	7	20	
Benzo(b)fluoranthene	ug/L	ND	2	2	1.2	0.97	62	49	26-120	24	20	R1
Benzo(g,h,i)perylene	ug/L	ND	2	2	0.76	0.70	38	35	24-109	8	20	
Benzo(k)fluoranthene	ug/L	ND	2	2	1.0	1.0	52	50	31-112	4	20	
Chrysene	ug/L	ND	2	2	1.5	1.5	73	74	38-111	1	20	
Dibenz(a,h)anthracene	ug/L	ND	2	2	0.79	0.74	39	37	30-109	6	20	
Fluoranthene	ug/L	ND	2	2	1.8	1.8	91	91	35-115	0	20	
Fluorene	ug/L	ND	2	2	1.7	1.8	83	91	17-112	9	20	
Indeno(1,2,3-cd)pyrene	ug/L	ND	2	2	0.67	0.65	34	32	28-109	4	20	
Phenanthrene	ug/L	ND	2	2	1.6	1.7	80	86	25-108	7	20	
Pyrene	ug/L	ND	2	2	1.8	1.4	89	72	33-118	22	20	R1
2-Fluorobiphenyl (S)	%.						68	75	27-113		20	
Terphenyl-d14 (S)	%.						71	55	56-108		20	SR

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

QC Batch: 323135 Analysis Method: SM2320B-2011
QC Batch Method: SM2320B-2011 Analysis Description: 2320B Alkalinity
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009

METHOD BLANK: 1575012 Matrix: Water
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Carbonate (pH4.5)	mg/L	ND	10.0	10.0	12/11/18 18:47	
Alkalinity,Bicarbonate (pH4.5)	mg/L	ND	10.0	10.0	12/11/18 18:47	
Alkalinity,Total (CaCO3 pH4.5)	mg/L	ND	10.0	1.0	12/11/18 18:47	

LABORATORY CONTROL SAMPLE: 1575013

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity,Total (CaCO3 pH4.5)	mg/L	20	20.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1577524 1577525

Parameter	Units	30273388002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity,Total (CaCO3 pH4.5)	mg/L	280	50	50	330	330	100	100	85-115	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

QC Batch: 322970 Analysis Method: SM3500-FeD-00
QC Batch Method: SM3500-FeD-00 Analysis Description: Iron, Ferrous
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009

METHOD BLANK: 1573946 Matrix: Water
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	ND	0.10	0.020	12/05/18 19:03	H6

LABORATORY CONTROL SAMPLE: 1573947

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	1	0.99	99	90-110	H6

MATRIX SPIKE SAMPLE: 1573948

Parameter	Units	30273388002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	ND	1	0.91	90	85-115	H3,H6

MATRIX SPIKE SAMPLE: 1573949

Parameter	Units	30273388002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	ND	1	0.96	95	85-115	H3,H6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

QC Batch: 323487 Analysis Method: SM4500NO3F-00
QC Batch Method: SM4500NO3F-00 Analysis Description: SM4500NO3-F, Nitrate, Preserved
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009

METHOD BLANK: 1576951 Matrix: Water
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.028	12/11/18 11:30	

LABORATORY CONTROL SAMPLE: 1576952

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	4	3.9	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1576953 1576954

Parameter	Units	30273388002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	1.0	5	5	6.4	6.4	106	106	85-115	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

QC Batch: 323193 Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 Analysis Description: ASTM D516-90, 02 Sulfate Water
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009

METHOD BLANK: 1575292 Matrix: Water
Associated Lab Samples: 30273388001, 30273388002, 30273388003, 30273388004, 30273388005, 30273388006, 30273388007, 30273388008, 30273388009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	10.0	4.7	12/07/18 15:11	

LABORATORY CONTROL SAMPLE: 1575293

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	30	29.6	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1575294 1575295

Parameter	Units	30273388002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	18.9	20	20	37.6	37.3	94	92	85-115	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA	Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

1c	The analyte did not meet the method recommended minimum RF.
2c	This sample was re-extracted past the method required holding time. Surrogate recovery in the re-extract was acceptable and the re-extract results were comparable to the original results. The original, in hold, results are reported.
CL	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.
H3	Sample was received or analysis requested beyond the recognized method holding time.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
ML	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.
R1	RPD value was outside control limits.
SR	Surrogate recovery was below laboratory control limits. Results may be biased low.

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30273388001	**MW-208**	EPA 3005A	323255	EPA 6010C	323289
30273388002	**MW-209**	EPA 3005A	323255	EPA 6010C	323289
30273388003	**MW-209 (MS)**	EPA 3005A	323255	EPA 6010C	323289
30273388004	**MW-209 (MSD)**	EPA 3005A	323255	EPA 6010C	323289
30273388005	**DUP 120318**	EPA 3005A	323255	EPA 6010C	323289
30273388006	**MW-206**	EPA 3005A	323255	EPA 6010C	323289
30273388007	**MW-205**	EPA 3005A	323255	EPA 6010C	323289
30273388008	**MW-204**	EPA 3005A	323255	EPA 6010C	323289
30273388009	**MW-207**	EPA 3005A	323255	EPA 6010C	323289
30273388001	**MW-208**	EPA 3005A	323242	EPA 6010C	323284
30273388002	**MW-209**	EPA 3005A	323242	EPA 6010C	323284
30273388003	**MW-209 (MS)**	EPA 3005A	323242	EPA 6010C	323284
30273388004	**MW-209 (MSD)**	EPA 3005A	323242	EPA 6010C	323284
30273388005	**DUP 120318**	EPA 3005A	323242	EPA 6010C	323284
30273388006	**MW-206**	EPA 3005A	323242	EPA 6010C	323284
30273388007	**MW-205**	EPA 3005A	323242	EPA 6010C	323284
30273388008	**MW-204**	EPA 3005A	323242	EPA 6010C	323284
30273388009	**MW-207**	EPA 3005A	323242	EPA 6010C	323284
30273388001	**MW-208**	EPA 3510C	323301	EPA 8270D by SIM	323464
30273388002	**MW-209**	EPA 3510C	323301	EPA 8270D by SIM	323464
30273388003	**MW-209 (MS)**	EPA 3510C	323301	EPA 8270D by SIM	323464
30273388004	**MW-209 (MSD)**	EPA 3510C	323301	EPA 8270D by SIM	323464
30273388005	**DUP 120318**	EPA 3510C	323301	EPA 8270D by SIM	323464
30273388006	**MW-206**	EPA 3510C	323301	EPA 8270D by SIM	323464
30273388007	**MW-205**	EPA 3510C	323301	EPA 8270D by SIM	323464
30273388008	**MW-204**	EPA 3510C	323301	EPA 8270D by SIM	323464
30273388009	**MW-207**	EPA 3510C	323301	EPA 8270D by SIM	323464
30273388001	**MW-208**	EPA 8260C	323236		
30273388002	**MW-209**	EPA 8260C	323236		
30273388003	**MW-209 (MS)**	EPA 8260C	323236		
30273388004	**MW-209 (MSD)**	EPA 8260C	323236		
30273388005	**DUP 120318**	EPA 8260C	323236		
30273388006	**MW-206**	EPA 8260C	323236		
30273388007	**MW-205**	EPA 8260C	323236		
30273388008	**MW-204**	EPA 8260C	323236		
30273388009	**MW-207**	EPA 8260C	323236		
30273388010	**Trip Blank**	EPA 8260C	323236		
30273388001	**MW-208**	SM2320B-2011	323135		
30273388002	**MW-209**	SM2320B-2011	323135		
30273388003	**MW-209 (MS)**	SM2320B-2011	323135		
30273388004	**MW-209 (MSD)**	SM2320B-2011	323135		
30273388005	**DUP 120318**	SM2320B-2011	323135		
30273388006	**MW-206**	SM2320B-2011	323135		
30273388007	**MW-205**	SM2320B-2011	323135		
30273388008	**MW-204**	SM2320B-2011	323135		
30273388009	**MW-207**	SM2320B-2011	323135		

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30273388

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30273388001	**MW-208**	SM3500-FeD-00	322970		
30273388002	**MW-209**	SM3500-FeD-00	322970		
30273388003	**MW-209 (MS)**	SM3500-FeD-00	322970		
30273388004	**MW-209 (MSD)**	SM3500-FeD-00	322970		
30273388005	**DUP 120318**	SM3500-FeD-00	322970		
30273388006	**MW-206**	SM3500-FeD-00	322970		
30273388007	**MW-205**	SM3500-FeD-00	322970		
30273388008	**MW-204**	SM3500-FeD-00	322970		
30273388009	**MW-207**	SM3500-FeD-00	322970		
30273388001	**MW-208**	SM4500NO3F-00	323487		
30273388002	**MW-209**	SM4500NO3F-00	323487		
30273388003	**MW-209 (MS)**	SM4500NO3F-00	323487		
30273388004	**MW-209 (MSD)**	SM4500NO3F-00	323487		
30273388005	**DUP 120318**	SM4500NO3F-00	323487		
30273388006	**MW-206**	SM4500NO3F-00	323487		
30273388007	**MW-205**	SM4500NO3F-00	323487		
30273388008	**MW-204**	SM4500NO3F-00	323487		
30273388009	**MW-207**	SM4500NO3F-00	323487		
30273388001	**MW-208**	ASTM D516-90,02	323193		
30273388002	**MW-209**	ASTM D516-90,02	323193		
30273388003	**MW-209 (MS)**	ASTM D516-90,02	323193		
30273388004	**MW-209 (MSD)**	ASTM D516-90,02	323193		
30273388005	**DUP 120318**	ASTM D516-90,02	323193		
30273388006	**MW-206**	ASTM D516-90,02	323193		
30273388007	**MW-205**	ASTM D516-90,02	323193		
30273388008	**MW-204**	ASTM D516-90,02	323193		
30273388009	**MW-207**	ASTM D516-90,02	323193		

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

WO# : 30273388

30273388

LAB

r Number or

Y

Company: Arcadis	Billing Information:
Address: 110 W. Fayette Street	
Report To: PJ Hart	Email To: Vin.mandio@arcadis.com
Copy To: Vin Mandio	Site Collection Info/Address: Cold Springs Terminal
Customer Project Name/Number: Cold Springs Terminal	State: NY County/City: / Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET
Phone: 315-447-0428 Email:	Site/Facility ID #:
Collected By (print): Nicholle Griffith	Purchase Order #: Quote #:
Collected By (signature):	Turnaround Date Required:
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: [ ] Hold:	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)

Compliance Monitoring? [ ] Yes [ ] No

DW PWS ID #: DW Location Code:

Immediately Packed on Ice: [ ] Yes [ ] No

Field Filtered (if applicable): [ ] Yes [ ] No Analysis: _____

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

Container Preservative Type **

Lab Project Manager:

Analyses

Lab Profile/Line: 8538-L1

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	SVOC 8270	VOC 8260	Fe, Mn, Al, Alkalinity	TOC	Nitrate/Nitrite	Manganese	Manganese - Lab Filtered			Lab Sample # / Comments
MW-208	GW		12/3/18	12:15				11	2	3	1	2	1	1	1			001
MW-209	GW			12:30				11	2	3	1	2	1	1	1			002
MW-209 (MS)	GW			12:30				11	2	3	1	2	1	1	1			003
MW-209 (MSD)	GW			12:30				11	2	3	1	2	1	1	1			004
QAP-120318	GW			—				11	2	3	1	2	1	1	1			005
MW-206	GW			15:15				11	2	3	1	2	1	1	1			006
MW-205	GW			17:15				11	2	3	1	2	1	1	1			007
MW-204	GW			16:45				11	2	3	1	2	1	1	1			008
MW-207	GW			14:30				11	2	3	1	2	1	1	1			009
			12/4/18															TB010

Lab Profile/Line: 8538-L1

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	(Y) N	NA
Custody Signatures Present	(Y) N	NA
Collector Signature Present	(Y) N	NA
Bottles Intact	(Y) N	NA
Correct Bottles	(Y) N	NA
Sufficient Volume	(Y) N	NA
Samples Received on Ice	(Y) N	NA MD 12-5-18
VOA - Headspace Acceptable	(Y) N	NA
USDA Regulated Soils	Y N	(NA)
Samples in Holding Time	(Y) N	NA
Residual Chlorine Present	Y (N)	NA MS 12-5-18
Cl Strips:		
Sample pH Acceptable	(Y) N	NA
pH Strips: 10D29581		
Sulfide Present	Y N	(NA)
Lead Acetate Strips:		

LAB USE ONLY:

JLB|JLB

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: (Wet) Blue Dry None

Packing Material Used: Bubblebag and ICE

Radchem sample(s) screened (<500 cpm): Y N (NA)

SHORT HOLDS PRESENT (<72 hours): (Y) N N/A

Lab Tracking #: 773880689807 2337357

Samples received via: (FEDEX) UPS Client Courier Pace Courier

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#: 10

Cooler 1 Temp Upon Receipt: 2.7 3.5 °C 1.3.6

Cooler 1 Therm Corr. Factor: +0.0 °C

Cooler 1 Corrected Temp: 2.7 3.5 °C 13.6

Comments: MS 10-12-578 MSD 10-12-578

Trip Blank Received: (Y) N NA

(HCL) MeOH TSP Other

Non Conformance(s): (YES) / NO JLB

Page: _____ of _____

12/5/18

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Nicholle Griffith Arcadis	12/4/18 0920	PACE	12/4/18 9:20
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
PACE	12/4/18 17:00		12/5/18 1130
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY

Table #:

Acctnum:

Template:

Prelogin:

PM:

PB:

Pace Analytical
www.pacelabs.com

Sample Receiving Non-Conformance Form (NCF)

Date: 12/5/18	Evaluated by: MD
Client: Buckeye Arcadis	

A **WO#: 30273388**

PM: RDC **Due Date: 12/12/18**

CLIENT: BUCKARCNY

1. If Chain-of-Custody (COC) is not received: contact client and if necessary, fill out a COC and indicate that it was filled out by lab personnel. Note issues on this NCF.

2. If COC is incomplete, check applicable issues below and add details where appropriate:

✓	Collection date/time missing or incorrect		Analyses or analytes: missing or clarification needed		Samples listed on COC do not match samples received (missing, additional, etc.)
	Sample IDs on COC do not match sample labels		Required trip blanks were not received		Required signatures are missing

Comments/Details/Other Issues not listed above:

Sample MW-20 labels time of 1500 on labels

3. Sample integrity issues: check applicable issues below and add details where appropriate:

	Samples: Past holding time		Samples: Condition needs to be brought to lab personnel's attention (details below)		Preservation: Improper
	Samples: Not field filtered		Containers: Broken or compromised		Temperature: not within acceptance criteria (typically 0-6C)
	Samples: Insufficient volume received		Containers: Incorrect		Temperature: Samples arrived frozen
	Samples: Cooler damaged or compromised		Custody Seals: Missing or compromised on samples, trip blanks or coolers	✓	Vials received with improper headspace
	Samples: contain chlorine or sulfides		Packing Material: Insufficient/Improper		Other:

Comments/Details:

MW-204 1 out of 3 vials has headspace

4. If Samples not preserved properly and Sample Receiving adjusts pH, add details below:

Sample ID:	Date/Time:	Amount/type pres added:
Preserved by:	Initial and Final pH:	Lot # of pres added:
Sample ID:	Date/Time:	Amount/type pres added:
Preserved by:	Initial and Final pH:	Lot # of pres added:
Sample ID:	Date/Time:	Amount/type pres added:
Preserved by:	Initial and Final pH:	Lot # of pres added:

5. Client Contact: If client is contacted for any issue listed above, fill in details below:

Client:	Contacted per:	
PM Initials:	Date/Time:	

Client Comments/Instructions:

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

December 18, 2018

Rachel Christner
Pace Analytical Services, Inc.
1638 Roseytown Road
Suites 2,3,4
Greensburg, PA 15601
USA

RE: **30273388**

Pace Workorder: 28913

Dear Rachel Christner:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, December 07, 2018. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ruth Welsh 12/18/2018
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 25

CERTIFICATE OF ANALYSIS

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 28913 30273388

Lab ID	Sample ID	Matrix	Date Collected	Date Received
289130001	30273388 001	Water	12/3/2018 12:15	12/7/2018 09:25
289130002	30273388 002	Water	12/3/2018 12:30	12/7/2018 09:25
289130003	30273388 003 MS	Water	12/3/2018 12:30	12/7/2018 09:25
289130004	30273388 004 MSD	Water	12/3/2018 12:30	12/7/2018 09:25
289130005	30273388 005	Water	12/3/2018 00:01	12/7/2018 09:25
289130006	30273388 006	Water	12/3/2018 15:15	12/7/2018 09:25
289130007	30273388 007	Water	12/3/2018 17:15	12/7/2018 09:25
289130008	30273388 008	Water	12/3/2018 16:45	12/7/2018 09:25
289130009	30273388 009	Water	12/3/2018 14:30	12/7/2018 09:25

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

PROJECT SUMMARY

Workorder: 28913 30273388

Workorder Comments

The samples 28913 (0001-0009) were collected in an alternate container type, than that assigned to PAES method RSK175. The sample container was BAK preserved and only one vial was provided for analysis. In order to assure accurate reporting of all analytes, the equilibrated headspace was transferred to a headspace vial. Results reported at dilution.

Batch Comments

Batch: DISG/7263 - AM20GAX Water QC

The matrix spike and/or spike duplicate, recovery or relative percent difference; accuracy influenced by the concentration of the reference sample 289170006. Analyte Methane. Batch acceptance based on laboratory control sample recovery.

Batch: DISG/7266 - RSK175 QC

The relative percent difference between the sample and sample duplicate exceeded laboratory control limits; reference sample 289020001. Analyte Ethane, Ethene and/or Propane. Results for original and duplicate samples were below reporting limits.

The matrix spike and/or spike duplicate, recovery or relative percent difference, outside laboratory control limits. Analyte Methane, Ethane and Ethene. Batch acceptance based on laboratory control sample recovery. Insufficient sample volume for re-analysis.

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 28913 30273388

Lab ID: **289130001** Date Received: 12/7/2018 09:25 Matrix: Water

Sample ID: **30273388 001** Date Collected: 12/3/2018 12:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**88**	mg/l	5.0	0.12	1	12/12/2018 07:50	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**63**	ug/l	2.5	0.30	5	12/12/2018 09:18	AK	d,M3

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 28913 30273388

Lab ID: **289130002** Date Received: 12/7/2018 09:25 Matrix: Water

Sample ID: **30273388 002** Date Collected: 12/3/2018 12:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**21**	mg/l	5.0	0.12	1	12/12/2018 08:11	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.84J**	ug/l	2.5	0.30	5	12/12/2018 09:28	AK	d,M3

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 28913 30273388

Lab ID: **289130003** Date Received: 12/7/2018 09:25 Matrix: Water

Sample ID: **30273388 003 MS** Date Collected: 12/3/2018 12:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**140**	mg/l	5.0	0.12	1	12/12/2018 08:23	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**61**	ug/l	2.5	0.30	5	12/12/2018 09:39	AK	d,M3

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 28913 30273388

Lab ID: **289130004** Date Received: 12/7/2018 09:25 Matrix: Water

Sample ID: **30273388 004 MSD** Date Collected: 12/3/2018 12:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**130**	mg/l	5.0	0.12	1	12/12/2018 08:33	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**56**	ug/l	2.5	0.30	5	12/12/2018 09:49	AK	d,M3

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 28913 30273388

Lab ID: **289130005** Date Received: 12/7/2018 09:25 Matrix: Water

Sample ID: **30273388 005** Date Collected: 12/3/2018 00:01

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**15**	mg/l	5.0	0.12	1	12/12/2018 08:57	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.81J**	ug/l	2.5	0.30	5	12/12/2018 09:59	AK	d,M3

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 28913 30273388

Lab ID: **289130006** Date Received: 12/7/2018 09:25 Matrix: Water

Sample ID: **30273388 006** Date Collected: 12/3/2018 15:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**15**	mg/l	5.0	0.12	1	12/12/2018 09:12	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.79J**	ug/l	2.5	0.30	5	12/12/2018 10:10	AK	d,M3

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 28913 30273388

Lab ID: **289130007** Date Received: 12/7/2018 09:25 Matrix: Water

Sample ID: **30273388 007** Date Collected: 12/3/2018 17:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**47**	mg/l	5.0	0.12	1	12/12/2018 09:24	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**2.4J**	ug/l	2.5	0.30	5	12/12/2018 10:20	AK	d,M3

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 28913 30273388

Lab ID: **289130008** Date Received: 12/7/2018 09:25 Matrix: Water

Sample ID: **30273388 008** Date Collected: 12/3/2018 16:45

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**190**	mg/l	5.0	0.12	1	12/12/2018 09:36	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**42**	ug/l	2.5	0.30	5	12/12/2018 10:52	AK	d,M3

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 28913 30273388

Lab ID: **289130009** Date Received: 12/7/2018 09:25 Matrix: Water

Sample ID: **30273388 009** Date Collected: 12/3/2018 14:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**17**	mg/l	5.0	0.12	1	12/12/2018 09:47	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.30U**	ug/l	2.5	0.30	5	12/12/2018 11:02	AK	d,M3

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS QUALIFIERS

Workorder: 28913 30273388

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.
d	The analyte concentration was determined from a dilution.
M3	The matrix spike sample recovery was outside laboratory control limits.

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA

Workorder: 28913 30273388

QC Batch: DISG/7263 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 289130001, 289130002, 289130003, 289130004, 289130005, 289130006, 289130007, 289130008, 289130009

METHOD BLANK: 58896

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Carbon Dioxide	mg/l	0.12U	0.12	n

LABORATORY CONTROL SAMPLE & LCSD: 58898 58900

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Carbon Dioxide	mg/l	120	130	130	110	108	80-120	1.3	20	n

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 58923 58924 Original: 289130002

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK											
Carbon Dioxide	mg/l	21	120	140	130	98	93	70-130	3.9	20	n

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA

Workorder: 28913 30273388

QC Batch: DISG/7266 Analysis Method: EPA RSK175

QC Batch Method: EPA RSK175

Associated Lab Samples: 289130001, 289130002, 289130003, 289130004, 289130005, 289130006, 289130007, 289130008, 289130009

METHOD BLANK: 58920

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Methane	ug/l	0.061U	0.061	M3

LABORATORY CONTROL SAMPLE & LCSD: 58921 58922

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Methane	ug/l	44	45	47	102	106	85-115	3.2	20	M3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 58935 58936 Original: 289130002

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK											
Methane	ug/l	0.84	44	61	56	135	124	70-130	8.2	20	d,M3

SAMPLE DUPLICATE: 58934 Original: 289020001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
RISK						
Methane	ug/l	17	15	10	20	M3

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA QUALIFIERS

Workorder: 28913 30273388

QUALITY CONTROL PARAMETER QUALIFIERS

M3	The matrix spike sample recovery was outside laboratory control limits.
d	The analyte concentration was determined from a dilution.
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 28913 30273388

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
289130001	30273388 001			AM20GAX	DISG/7263
289130002	30273388 002			AM20GAX	DISG/7263
289130003	30273388 003 MS			AM20GAX	DISG/7263
289130004	30273388 004 MSD			AM20GAX	DISG/7263
289130005	30273388 005			AM20GAX	DISG/7263
289130006	30273388 006			AM20GAX	DISG/7263
289130007	30273388 007			AM20GAX	DISG/7263
289130008	30273388 008			AM20GAX	DISG/7263
289130009	30273388 009			AM20GAX	DISG/7263
289130001	30273388 001			EPA RSK175	DISG/7266
289130002	30273388 002			EPA RSK175	DISG/7266
289130003	30273388 003 MS			EPA RSK175	DISG/7266
289130004	30273388 004 MSD			EPA RSK175	DISG/7266
289130005	30273388 005			EPA RSK175	DISG/7266
289130006	30273388 006			EPA RSK175	DISG/7266
289130007	30273388 007			EPA RSK175	DISG/7266
289130008	30273388 008			EPA RSK175	DISG/7266
289130009	30273388 009			EPA RSK175	DISG/7266

Chain of Custody

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, Inc.
1638 Roseytown Road
Suites 2,3, & 4
Greensburg, PA 15601
Phone: (724) 850-5600
FAX: (724) 850-5601

Sample Condition upon Receipt: (Please record the following information)		
Temp in C	2	
Received on Ice	Yes	No
Sealed Cooler	Yes	No
Samples Intact	Yes	No

Subcontractor Project No.: 28913
P.O. No: ASR- 30273388

Request Date: 12/6/18 Analysis Due Date: 12/12/2018
Shipped By: Courier

Certification Required: NY

Pace Project No.: 30273388
Report/Invoice to: Rachel Christner

	Pace Sample ID:	Matrix:	Collection Date:	Time:	Analysis Requested:	Analytical Method:	Preservative Type:
1	30273388 001	WT	12/3/18	12:15	Methane	RSK-175	BAK
2	30273388 001	WT	12/3/18	12:15	Carbon Dioxide	AM20GAX	BAK
3	30273388 002	WT	12/3/18	12:30	Methane	RSK-175	BAK
4	30273388 002	WT	12/3/18	12:30	Carbon Dioxide	AM20GAX	BAK
5	30273388 003	WT	12/3/18	12:30	Methane	RSK-175	BAK
6	30273388 003	WT	12/3/18	12:30	Carbon Dioxide	AM20GAX	BAK
7	30273388 004	WT	12/3/18	12:30	Methane	RSK-175	BAK
8	30273388 004	WT	12/3/18	12:30	Carbon Dioxide	AM20GAX	BAK
9	30273388 005	WT	12/3/18	00:01	Methane	RSK-175	BAK
10	30273388 005	WT	12/3/18	00:01	Carbon Dioxide	AM20GAX	BAK
11	30273388 006	WT	12/3/18	15:15	Methane	RSK-175	BAK
12	30273388 006	WT	12/3/18	15:15	Carbon Dioxide	AM20GAX	BAK

Special Requirements: ****Please supply a method blank and LCS QC information on the final report****

Subcontract Lab: Pace Analytical Energy Services PA (Microsee
Address: 220 William Pitt Way
Pittsburgh, PA 15238
Phone: 412-826-5245

Analysis Authorized By: Rachel D Christner (Pace Agent Name) Project Manager (Title)
Acceptance of Terms By: (Subcontract Lab Agent) (Title)

Relinquished By: (Signature & Affiliation) 12-7-18 (Date) 9:22 (Time)
Relinquished By: (Signature & Affiliation) (Date) (Time)

Received By: (Signature & Affiliation) PTS 12.7.18 (Date) 9 25 (Time)
Received By: (Signature & Affiliation) (Date) (Time)

Comments:

In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Chain of Custody

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, Inc.
1638 Roseytown Road
Suites 2,3, & 4
Greensburg, PA 15601
Phone: (724) 850-5600
FAX: (724) 850-5601

Sample Condition upon Receipt: (Please record the following information)		
Temp in C		
Received on Ice	Yes	No
Sealed Cooler	Yes	No
Samples Intact	Yes	No

Subcontractor Project No.: 28913
P.O. No: ASR- 30273388

Request Date: 12/6/18 Analysis Due Date: 12/12/2018
Shipped By: Courier

Certification Required: NY

Pace Project No.: 30273388
Report/Invoice to: Rachel Christner

Page 2 of 2

	Pace Sample ID:	Matrix:	Collection Date:	Time:	Analysis Requested:	Analytical Method:	Preservative Type:
1	30273388 007	WT	12/3/18	17:15	Methane	RSK-175	BAK
2	30273388 007	WT	12/3/18	17:15	Carbon Dioxide	AM20GAX	BAK
3	30273388 008	WT	12/3/18	16:45	Methane	RSK-175	BAK
4	30273388 008	WT	12/3/18	16:45	Carbon Dioxide	AM20GAX	BAK
5	30273388 009	WT	12/3/18	14:30	Methane	RSK-175	BAK
6	30273388 009	WT	12/3/18	14:30	Carbon Dioxide	AM20GAX	BAK
7							
8							
9							
10							
11							
12							

Special Requirements:

****Please supply a method blank and LCS QC information on the final report****
002-OQS, 003-MS, 004-MSD

Subcontract Lab: Pace Analytical Energy Services PA (Microsee
Address: 220 William Pitt Way
Pittsburgh, PA 15238
Phone: 412-826-5245

Analysis Authorized By: _____ (Pace Agent Name) (Title)

Acceptance of Terms By: _____ (Subcontract Lab Agent) (Title)

Relinquished By: RLM Pace 12-7-18 9:22 (Signature & Affiliation) (Date) (Time)

Received By: [illegible] 12.7.18 925 (Signature & Affiliation) (Date) (Time)

Relinquished By: _____ (Signature & Affiliation) (Date) (Time)

Received By: _____ (Signature & Affiliation) (Date) (Time)

Comments:

In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

WO#: 30273388

30273388

28913

Number or: Y

Company: Arcadis

Address: 110 W. Fayette Street +

Billing Information:

Report To: PJ Hart

Email To: vin.marasco@arcadis.com

Copy To: Vin Marasco

Site Collection Info/Address: Cold Springs Terminal

Customer Project Name/Number: Cold Springs Terminal

State: NY / County/City: Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET

Phone: 315-447-0428

Email:

Site/Facility ID #:

Compliance Monitoring? [ ] Yes [ ] No

Collected By (print): Nicholle Griffith

Purchase Order #:

Quote #:

DW PWS ID #:

DW Location Code:

Collected By (signature):

Turnaround Date Required:

Immediately Packed on Ice: [ ] Yes [ ] No

Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: ______ [ ] Hold: ______

Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)

Field Filtered (if applicable): [ ] Yes [ ] No

Analysis: ______

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Container Preservative Type **

Lab Project Manager:

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other ______

Analyses

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Time	Composite End Date	Time	Res Cl	# of Ctns	SVOC 8270	VOC 8260	Fe I, Sulfide, Alkalinity	CO_2	Nitrate/Nitrite	Manganese	Manganese - Lab Filter			Lab Sample # / Comments
MW-208	GW		12/3/18	12:15				11	2	3	1	2	1	1	1			001
MW-209	GW			12:30				11	2	3	1	2	1	1	1			002
MW-209 (MS)	GW			12:30				11	2	3	1	2	1	1	1			003
MW-209 (MSD)	GW			12:30				11	2	3	1	2	1	1	1			004
DUP-120318	GW			—				11	2	3	1	2	1	1	1			005
MW-206	GW			1515				11	2	3	1	2	1	1	1			006
MW-205	GW			1715				11	2	3	1	2	1	1	1			007
MW-204	GW			16:45				11	2	3	1	2	1	1	1			008
MW-207	GW			14:30				11	2	3	1	2	1	1	1			009
			12/4/18															TB010

Lab Profile/Line: 8538-L1

Lab Sample Receipt Checklist:

- Custody Seals Present/Intact (Y) N NA
- Custody Signatures Present (Y) N NA
- Collector Signature Present (Y) N NA
- Bottles Intact (Y) N NA
- Correct Bottles (Y) N NA
- Sufficient Volume (Y) N NA
- Samples Received on Ice (Y) N NA MDS
- VOA - Headspace Acceptable (Y) N NA 12-5-18
- USDA Regulated Soils Y N (NA)
- Samples in Holding Time (Y) N NA
- Residual Chlorine Present Y (N) NA MDS 12-5-18
- Cl Strips: ______
- Sample pH Acceptable (Y) N NA
- pH Strips: 10D2981
- Sulfide Present Y N (NA)
- Lead Acetate Strips: ______

LAB USE ONLY:

Lab Sample # / Comments:

JLB/JLB

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: (Wet) Blue Dry None

SHORT HOLDS PRESENT (<72 hours): (Y) N N/A

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#: 10

Cooler 1 Temp Upon Receipt: 2.7/3.5/1.3 oC

Cooler 1 Therm Corr. Factor: +0.0 oC

Cooler 1 Corrected Temp: 2.7/3.5/1.3 oC

Comments:

MDS 12-5-18

MDS 12-5-18

Packing Material Used: Bubblebag and ICE

Lab Tracking #: 773880689807 2337357

Radchem sample(s) screened (<500 cpm): Y N (NA)

Samples received via: (FEDEX) UPS Client Courier Pace Courier

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	MTJL LAB USE ONLY
Nicholle Griffith Arcadis	12/4/18 0920	PACE	12/4/18 9:20	Table #:
PACE	12/4/18 17:00		12/5/18 1130	Acctnum: / Template: / Prelogin:
				PM: / PB:

Trip Blank Received: (Y) N NA

(HCL) MeOH TSP Other

Non Conformance(s): (YES) / NO

JLB 12/5/18

Page: ______

of ______

25913

Pace Analytical
www.pacelabs.com

Sample Receiving Non-Conformance Form (NCF)

Date: 12/5/18	Evaluated by: MD
Client: Buckeye Arabis	

WO#: 30273388

PM: RDC Due Date: 12/12/18

CLIENT: BUCKARCNY

1. If Chain-of-Custody (COC) is not received: contact client and if necessary, fill out a COC and indicate that it was filled out by lab personnel. Note issues on this NCF.

2. If COC is incomplete, check applicable issues below and add details where appropriate:

✓	Collection date/time missing or incorrect		Analyses or analytes: missing or clarification needed		Samples listed on COC do not match samples received (missing, additional, etc.)
	Sample IDs on COC do not match sample labels		Required trip blanks were not received		Required signatures are missing

Comments/Details/Other Issues not listed above:

Sample MW-204 has time of 1500 on labels

3. Sample integrity issues: check applicable issues below and add details where appropriate:

	Samples: Past holding time		Samples: Condition needs to be brought to lab personnel's attention (details below)		Preservation: Improper
	Samples: Not field filtered		Containers: Broken or compromised		Temperature: not within acceptance criteria (typically 0-6C)
	Samples: Insufficient volume received		Containers: Incorrect		Temperature: Samples arrived frozen
	Samples: Cooler damaged or compromised		Custody Seals: Missing or compromised on samples, trip blanks or coolers	✓	Vials received with improper headspace
	Samples: contain chlorine or sulfides		Packing Material: Insufficient/Improper		Other:

Comments/Details:

MW-204 1 out of 3 vials has headspace

4. If Samples not preserved properly and Sample Receiving adjusts pH, add details below:

Sample ID:	Date/Time:	Amount/type pres added:
Preserved by:	Initial and Final pH:	Lot # of pres added:
Sample ID:	Date/Time:	Amount/type pres added:
Preserved by:	Initial and Final pH:	Lot # of pres added:
Sample ID:	Date/Time:	Amount/type pres added:
Preserved by:	Initial and Final pH:	Lot # of pres added:

5. Client Contact: If client is contacted for any issue listed above, fill in details below:

Client:	Contacted per:	
PM Initials:	Date/Time:	

Client Comments/Instructions:

Cooler Receipt Form

Client Name: Pace **Project:** 30273388 **Lab Work Order:** 28913

A. **Shipping/Container Information** (circle appropriate response)

Courier: FedEx UPS USPS (Client) Other:_____ **Air bill Present:** Yes No

Tracking Number:_____

Custody Seal on Cooler/Box Present: Yes (No) **Seals Intact:** Yes No

Cooler/Box Packing Material: Bubble Wrap Absorbent Foam (Other):_____

Type of Ice: (Wet) Blue None **Ice Intact:** (Yes) Melted

Cooler Temperature: 2°C **Radiation Screened:** Yes (No) **Chain of Custody Present:** (Yes) No

Comments:_____

B. **Laboratory Assignment/Log-in** (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	✓			
Chain of Custody relinquished	✓			
Sampler Name & Signature on COC			✓	
Containers intact	✓			
Were samples in separate bags	✓			
Sample container labels match COC Sample name/date and time collected	✓			
Sufficient volume provided	✓			
PAES containers used	✓			
Are containers properly preserved for the requested testing? (as labeled)	✓			
If an unknown preservation state, were containers checked? Exception: VOA's coliform			✓	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	
Headspace present?	✓			

Comments:_____

_____

Cooler contents examined/received by : CG **Date:** 12.7.18

Project Manager Review : JN **Date:** 12.7.18

NON-CONFORMANCE FORM

PAES Work Order #: 28913

Date: 12.7.18 Time of Receipt: 0925 Receiver: LG

Client: Pace

REASON FOR NON-CONFORMANCE:

1. Headspace in 1 vial @ 303 & both vials @ 004 → 009.
2. ~~Only 1 vial Requested~~ RSK175 on BAK vials
LG 12.7.18

ACTION TAKEN:

Client name: _____ Date: _____ Time: _____

Client emailed

Customer Service Initials: JW Date: 12.7.18

F-PAE-Q-014-rev.00, 20 Nov2014

Joseph Ward - 30273388

From: Joseph Ward
To: Rachel Christner
Subject: 30273388

Upon receiving the samples for the project number referenced above. There was head space in 1 vial for sample 30273388 003 and head space in 2 vials for samples 30273388 004 and 009. Also you have requested RSK-175 on a BAK preserved vials.

Joseph Ward
Customer Service
Pace Analytical Energy Services
220 William Pitt Way
Pittsburgh PA 15238
412-826-5245/412-826-2384(Direct)

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

December 19, 2018

Vin Maresco
Arcadis
6723 Towpath Road
Syracuse, NY 13214

RE: Project: Cold Spring Terminal
Pace Project No.: 30273533

Dear Vin Maresco:
Enclosed are the analytical results for sample(s) received by the laboratory on December 06, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

The samples were subcontracted to Pace Analytical Energy Services, 220 William Pitt Way, Pittsburgh, PA 15238 for RSK-175 Methaneand Carbon Dioxide AM20GAX analysis.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Rachel D Christner

Rachel Christner
rachel.christner@pacelabs.com
724-850-5611
Project Manager

Enclosures

cc: Mr. P.J. Hart, Arcadis
Mr. Edward Mason, Arcadis
Mr. Mike Teeling, Woodard & Curran

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: Cold Spring Terminal
Pace Project No.: 30273533

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30273533001	**BMW3-120418**	Water	12/04/18 10:50	12/06/18 10:00
30273533002	**BMW8-120418**	Water	12/04/18 11:15	12/06/18 10:00
30273533003	**TB-120418**	Water	12/04/18 08:00	12/06/18 10:00
30273533004	**BMW2-120418**	Water	12/04/18 14:30	12/06/18 10:00
30273533005	**BMW9-120418**	Water	12/04/18 15:00	12/06/18 10:00
30273533006	**MW-211-120418**	Water	12/04/18 15:30	12/06/18 10:00
30273533007	**PZ106S-120518**	Water	12/05/18 08:30	12/06/18 10:00
30273533008	**MW-210-120518**	Water	12/05/18 08:50	12/06/18 10:00
30273533009	**BMW13-120518**	Water	12/05/18 09:10	12/06/18 10:00
30273533010	**BMW14R-120518**	Water	12/05/18 09:45	12/06/18 10:00

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: Cold Spring Terminal
Pace Project No.: 30273533

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30273533001	**BMW3-120418**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273533002	**BMW8-120418**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273533003	**TB-120418**	EPA 8260C	JAS	21	PASI-PA
30273533004	**BMW2-120418**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273533005	**BMW9-120418**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273533006	**MW-211-120418**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: Cold Spring Terminal
Pace Project No.: 30273533

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273533007	**PZ106S-120518**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273533008	**MW-210-120518**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273533009	**BMW13-120518**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA
30273533010	**BMW14R-120518**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	JAS	20	PASI-PA
		SM2320B-2011	ZMH	3	PASI-PA
		SM3500-FeD-00	PAS	1	PASI-PA
		SM4500NO3F-00	JWL	1	PASI-PA
		ASTM D516-90,02	LEP	1	PASI-PA

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Sample: BMW3-120418 **Lab ID: 30273533001** Collected: 12/04/18 10:50 Received: 12/06/18 10:00 Matrix: Water

Comments:
- Three 40ml HCl vials received with headspace.
- 12/6/18 14:15 - Added 2.5ml HNO3 to Metals bottle prior to analysis. pH <2.
- 12/6/18 14:15 - Added 2.5ml H2SO4 to nutrient bottle prior to analysis. pH 6, did not preserve.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**57400**	ug/L	25.0	3.8	1	12/10/18 14:56	12/11/18 12:25	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**1720**	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 12:08	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.11	0.031	1	12/11/18 16:03	12/12/18 18:00	83-32-9	1c,A5
Acenaphthylene	ND	ug/L	0.11	0.037	1	12/11/18 16:03	12/12/18 18:00	208-96-8	1c,A5
Anthracene	ND	ug/L	0.11	0.030	1	12/11/18 16:03	12/12/18 18:00	120-12-7	1c,A5
Benzo(a)anthracene	ND	ug/L	0.11	0.042	1	12/11/18 16:03	12/12/18 18:00	56-55-3	1c,A5
Benzo(a)pyrene	ND	ug/L	0.11	0.013	1	12/11/18 16:03	12/12/18 18:00	50-32-8	1c,A5
Benzo(b)fluoranthene	ND	ug/L	0.11	0.029	1	12/11/18 16:03	12/12/18 18:00	205-99-2	1c,A5
Benzo(g,h,i)perylene	ND	ug/L	0.11	0.038	1	12/11/18 16:03	12/12/18 18:00	191-24-2	1c,A5
Benzo(k)fluoranthene	ND	ug/L	0.11	0.025	1	12/11/18 16:03	12/12/18 18:00	207-08-9	1c,A5
Chrysene	ND	ug/L	0.11	0.043	1	12/11/18 16:03	12/12/18 18:00	218-01-9	1c,A5
Dibenz(a,h)anthracene	ND	ug/L	0.11	0.030	1	12/11/18 16:03	12/12/18 18:00	53-70-3	1c,A5
Fluoranthene	ND	ug/L	0.11	0.035	1	12/11/18 16:03	12/12/18 18:00	206-44-0	1c,A5
Fluorene	ND	ug/L	0.11	0.034	1	12/11/18 16:03	12/12/18 18:00	86-73-7	1c,A5
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.11	0.033	1	12/11/18 16:03	12/12/18 18:00	193-39-5	1c,A5
Phenanthrene	ND	ug/L	0.11	0.048	1	12/11/18 16:03	12/12/18 18:00	85-01-8	1c,A5
Pyrene	ND	ug/L	0.11	0.039	1	12/11/18 16:03	12/12/18 18:00	129-00-0	1c,A5
Surrogates									
2-Fluorobiphenyl (S)	76	%.	27-113		1	12/11/18 16:03	12/12/18 18:00	321-60-8	
Terphenyl-d14 (S)	82	%.	56-108		1	12/11/18 16:03	12/12/18 18:00	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 20:07	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 20:07	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 20:07	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 20:07	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 20:07	64-17-5	2c,CL, L1
Ethylbenzene	ND	ug/L	1.0	0.31	1		12/07/18 20:07	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		12/07/18 20:07	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		12/07/18 20:07	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 20:07	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 20:07	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		12/07/18 20:07	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 20:07	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 20:07	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		12/07/18 20:07	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		12/07/18 20:07	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		12/07/18 20:07	95-47-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Sample: BMW3-120418 **Lab ID: 30273533001** Collected: 12/04/18 10:50 Received: 12/06/18 10:00 Matrix: Water

Comments:
- Three 40ml HCl vials received with headspace.
- 12/6/18 14:15 - Added 2.5ml HNO3 to Metals bottle prior to analysis. pH <2.
- 12/6/18 14:15 - Added 2.5ml H2SO4 to nutrient bottle prior to analysis. pH 6, did not preserve.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
4-Bromofluorobenzene (S)	101	%.	79-129		1		12/07/18 20:07	460-00-4	
1,2-Dichloroethane-d4 (S)	109	%.	80-120		1		12/07/18 20:07	17060-07-0	
Toluene-d8 (S)	91	%.	80-120		1		12/07/18 20:07	2037-26-5	
Dibromofluoromethane (S)	105	%.	80-120		1		12/07/18 20:07	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**630**	mg/L	10.0	10.0	1		12/11/18 19:04		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 19:04		
Alkalinity,Total (CaCO3 pH4.5)	**630**	mg/L	10.0	1.0	1		12/11/18 19:04		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		12/06/18 21:27		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		12/12/18 10:30		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**102**	mg/L	50.0	23.4	5		12/07/18 16:23	14808-79-8	ML

Sample: BMW8-120418 **Lab ID: 30273533002** Collected: 12/04/18 11:15 Received: 12/06/18 10:00 Matrix: Water

Comments:
- One 40ml HCl vials received with headspace.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**824**	ug/L	5.0	0.77	1	12/10/18 14:56	12/11/18 12:16	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**770**	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 12:10	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.099	0.028	1	12/11/18 16:03	12/12/18 18:18	83-32-9	1c
Acenaphthylene	ND	ug/L	0.099	0.033	1	12/11/18 16:03	12/12/18 18:18	208-96-8	1c
Anthracene	ND	ug/L	0.099	0.027	1	12/11/18 16:03	12/12/18 18:18	120-12-7	1c
Benzo(a)anthracene	ND	ug/L	0.099	0.038	1	12/11/18 16:03	12/12/18 18:18	56-55-3	1c
Benzo(a)pyrene	ND	ug/L	0.099	0.012	1	12/11/18 16:03	12/12/18 18:18	50-32-8	1c
Benzo(b)fluoranthene	ND	ug/L	0.099	0.027	1	12/11/18 16:03	12/12/18 18:18	205-99-2	1c
Benzo(g,h,i)perylene	ND	ug/L	0.099	0.035	1	12/11/18 16:03	12/12/18 18:18	191-24-2	1c
Benzo(k)fluoranthene	ND	ug/L	0.099	0.023	1	12/11/18 16:03	12/12/18 18:18	207-08-9	1c
Chrysene	ND	ug/L	0.099	0.039	1	12/11/18 16:03	12/12/18 18:18	218-01-9	1c

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Sample: BMW8-120418 **Lab ID: 30273533002** Collected: 12/04/18 11:15 Received: 12/06/18 10:00 Matrix: Water

Comments: • One 40ml HCl vials received with headspace.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Dibenz(a,h)anthracene	ND	ug/L	0.099	0.027	1	12/11/18 16:03	12/12/18 18:18	53-70-3	1c
Fluoranthene	ND	ug/L	0.099	0.032	1	12/11/18 16:03	12/12/18 18:18	206-44-0	1c
Fluorene	ND	ug/L	0.099	0.030	1	12/11/18 16:03	12/12/18 18:18	86-73-7	1c
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.099	0.030	1	12/11/18 16:03	12/12/18 18:18	193-39-5	1c
Phenanthrene	ND	ug/L	0.099	0.043	1	12/11/18 16:03	12/12/18 18:18	85-01-8	1c
Pyrene	ND	ug/L	0.099	0.035	1	12/11/18 16:03	12/12/18 18:18	129-00-0	1c
Surrogates									
2-Fluorobiphenyl (S)	54	%.	27-113		1	12/11/18 16:03	12/12/18 18:18	321-60-8	
Terphenyl-d14 (S)	87	%.	56-108		1	12/11/18 16:03	12/12/18 18:18	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 20:34	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 20:34	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 20:34	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 20:34	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 20:34	64-17-5	2c,CL, L1
Ethylbenzene	ND	ug/L	1.0	0.31	1		12/07/18 20:34	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		12/07/18 20:34	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		12/07/18 20:34	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 20:34	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 20:34	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		12/07/18 20:34	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 20:34	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 20:34	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		12/07/18 20:34	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		12/07/18 20:34	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		12/07/18 20:34	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	100	%.	79-129		1		12/07/18 20:34	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%.	80-120		1		12/07/18 20:34	17060-07-0	
Toluene-d8 (S)	92	%.	80-120		1		12/07/18 20:34	2037-26-5	
Dibromofluoromethane (S)	98	%.	80-120		1		12/07/18 20:34	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**450**	mg/L	10.0	10.0	1		12/11/18 19:07		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 19:07		
Alkalinity,Total (CaCO3 pH4.5)	**450**	mg/L	10.0	1.0	1		12/11/18 19:07		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	**0.52**	mg/L	0.10	0.020	1		12/06/18 21:29		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	**0.15**	mg/L	0.10	0.028	1		12/12/18 10:31		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Sample: BMW8-120418 **Lab ID: 30273533002** Collected: 12/04/18 11:15 Received: 12/06/18 10:00 Matrix: Water

Comments: • One 40ml HCl vials received with headspace.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**91.8**	mg/L	50.0	23.4	5		12/07/18 15:41	14808-79-8	

Sample: TB-120418 **Lab ID: 30273533003** Collected: 12/04/18 08:00 Received: 12/06/18 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 16:34	71-43-2	
tert-Butyl Alcohol	ND	ug/L	5.0	3.7	1		12/07/18 16:34	75-65-0	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 16:34	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 16:34	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 16:34	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 16:34	64-17-5	2c,CL, L1
Ethylbenzene	ND	ug/L	1.0	0.31	1		12/07/18 16:34	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		12/07/18 16:34	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		12/07/18 16:34	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 16:34	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 16:34	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		12/07/18 16:34	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 16:34	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 16:34	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		12/07/18 16:34	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		12/07/18 16:34	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		12/07/18 16:34	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	101	%.	79-129		1		12/07/18 16:34	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%.	80-120		1		12/07/18 16:34	17060-07-0	
Toluene-d8 (S)	93	%.	80-120		1		12/07/18 16:34	2037-26-5	
Dibromofluoromethane (S)	101	%.	80-120		1		12/07/18 16:34	1868-53-7	

Sample: BMW2-120418 **Lab ID: 30273533004** Collected: 12/04/18 14:30 Received: 12/06/18 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**332**	ug/L	5.0	0.77	1	12/10/18 14:56	12/11/18 12:27	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**109**	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 12:12	7439-96-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Sample: BMW2-120418 **Lab ID: 30273533004** Collected: 12/04/18 14:30 Received: 12/06/18 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.098	0.028	1	12/11/18 16:03	12/12/18 18:35	83-32-9	1c
Acenaphthylene	ND	ug/L	0.098	0.033	1	12/11/18 16:03	12/12/18 18:35	208-96-8	1c
Anthracene	ND	ug/L	0.098	0.027	1	12/11/18 16:03	12/12/18 18:35	120-12-7	1c
Benzo(a)anthracene	ND	ug/L	0.098	0.038	1	12/11/18 16:03	12/12/18 18:35	56-55-3	1c
Benzo(a)pyrene	ND	ug/L	0.098	0.012	1	12/11/18 16:03	12/12/18 18:35	50-32-8	1c
Benzo(b)fluoranthene	ND	ug/L	0.098	0.026	1	12/11/18 16:03	12/12/18 18:35	205-99-2	1c
Benzo(g,h,i)perylene	ND	ug/L	0.098	0.035	1	12/11/18 16:03	12/12/18 18:35	191-24-2	1c
Benzo(k)fluoranthene	ND	ug/L	0.098	0.023	1	12/11/18 16:03	12/12/18 18:35	207-08-9	1c
Chrysene	ND	ug/L	0.098	0.039	1	12/11/18 16:03	12/12/18 18:35	218-01-9	1c
Dibenz(a,h)anthracene	ND	ug/L	0.098	0.027	1	12/11/18 16:03	12/12/18 18:35	53-70-3	1c
Fluoranthene	ND	ug/L	0.098	0.031	1	12/11/18 16:03	12/12/18 18:35	206-44-0	1c
Fluorene	ND	ug/L	0.098	0.030	1	12/11/18 16:03	12/12/18 18:35	86-73-7	1c
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.098	0.029	1	12/11/18 16:03	12/12/18 18:35	193-39-5	1c
Phenanthrene	ND	ug/L	0.098	0.043	1	12/11/18 16:03	12/12/18 18:35	85-01-8	1c
Pyrene	ND	ug/L	0.098	0.035	1	12/11/18 16:03	12/12/18 18:35	129-00-0	1c
Surrogates									
2-Fluorobiphenyl (S)	60	%.	27-113		1	12/11/18 16:03	12/12/18 18:35	321-60-8	
Terphenyl-d14 (S)	72	%.	56-108		1	12/11/18 16:03	12/12/18 18:35	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 21:00	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 21:00	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 21:00	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 21:00	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 21:00	64-17-5	2c,CL, L1
Ethylbenzene	ND	ug/L	1.0	0.31	1		12/07/18 21:00	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		12/07/18 21:00	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		12/07/18 21:00	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 21:00	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 21:00	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		12/07/18 21:00	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 21:00	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 21:00	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		12/07/18 21:00	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		12/07/18 21:00	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		12/07/18 21:00	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	103	%.	79-129		1		12/07/18 21:00	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%.	80-120		1		12/07/18 21:00	17060-07-0	
Toluene-d8 (S)	94	%.	80-120		1		12/07/18 21:00	2037-26-5	
Dibromofluoromethane (S)	101	%.	80-120		1		12/07/18 21:00	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**250**	mg/L	10.0	10.0	1		12/11/18 19:08		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 19:08		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Sample: BMW2-120418 **Lab ID: 30273533004** Collected: 12/04/18 14:30 Received: 12/06/18 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Total (CaCO3 pH4.5)	**250**	mg/L	10.0	1.0	1		12/11/18 19:08		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		12/06/18 21:29		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		12/12/18 10:33		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**39.9**	mg/L	10.0	4.7	1		12/07/18 15:43	14808-79-8	

Sample: BMW9-120418 **Lab ID: 30273533005** Collected: 12/04/18 15:00 Received: 12/06/18 10:00 Matrix: Water

Comments: • 500ml plastic unpreserved container received open with no sample at the laboratory; analysis completed from 1L glass amber unpreserved.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**29.5**	ug/L	5.0	0.77	1	12/10/18 14:56	12/11/18 12:29	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	ND	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 12:14	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.098	0.028	1	12/11/18 16:03	12/12/18 18:53	83-32-9	1c
Acenaphthylene	ND	ug/L	0.098	0.033	1	12/11/18 16:03	12/12/18 18:53	208-96-8	1c
Anthracene	ND	ug/L	0.098	0.027	1	12/11/18 16:03	12/12/18 18:53	120-12-7	1c
Benzo(a)anthracene	ND	ug/L	0.098	0.038	1	12/11/18 16:03	12/12/18 18:53	56-55-3	1c
Benzo(a)pyrene	ND	ug/L	0.098	0.012	1	12/11/18 16:03	12/12/18 18:53	50-32-8	1c
Benzo(b)fluoranthene	ND	ug/L	0.098	0.026	1	12/11/18 16:03	12/12/18 18:53	205-99-2	1c
Benzo(g,h,i)perylene	ND	ug/L	0.098	0.035	1	12/11/18 16:03	12/12/18 18:53	191-24-2	1c
Benzo(k)fluoranthene	ND	ug/L	0.098	0.023	1	12/11/18 16:03	12/12/18 18:53	207-08-9	1c
Chrysene	ND	ug/L	0.098	0.039	1	12/11/18 16:03	12/12/18 18:53	218-01-9	1c
Dibenz(a,h)anthracene	ND	ug/L	0.098	0.027	1	12/11/18 16:03	12/12/18 18:53	53-70-3	1c
Fluoranthene	ND	ug/L	0.098	0.031	1	12/11/18 16:03	12/12/18 18:53	206-44-0	1c
Fluorene	ND	ug/L	0.098	0.030	1	12/11/18 16:03	12/12/18 18:53	86-73-7	1c
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.098	0.029	1	12/11/18 16:03	12/12/18 18:53	193-39-5	1c
Phenanthrene	ND	ug/L	0.098	0.043	1	12/11/18 16:03	12/12/18 18:53	85-01-8	1c
Pyrene	ND	ug/L	0.098	0.035	1	12/11/18 16:03	12/12/18 18:53	129-00-0	1c
Surrogates									
2-Fluorobiphenyl (S)	64	%.	27-113		1	12/11/18 16:03	12/12/18 18:53	321-60-8	
Terphenyl-d14 (S)	60	%.	56-108		1	12/11/18 16:03	12/12/18 18:53	1718-51-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Sample: BMW9-120418 **Lab ID: 30273533005** Collected: 12/04/18 15:00 Received: 12/06/18 10:00 Matrix: Water

Comments: • 500ml plastic unpreserved container received open with no sample at the laboratory; analysis completed from 1L glass amber unpreserved.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 21:27	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 21:27	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 21:27	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 21:27	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 21:27	64-17-5	2c,CL, L1
Ethylbenzene	ND	ug/L	1.0	0.31	1		12/07/18 21:27	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		12/07/18 21:27	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		12/07/18 21:27	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 21:27	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 21:27	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		12/07/18 21:27	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 21:27	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 21:27	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		12/07/18 21:27	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		12/07/18 21:27	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		12/07/18 21:27	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	98	%.	79-129		1		12/07/18 21:27	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%.	80-120		1		12/07/18 21:27	17060-07-0	
Toluene-d8 (S)	95	%.	80-120		1		12/07/18 21:27	2037-26-5	
Dibromofluoromethane (S)	97	%.	80-120		1		12/07/18 21:27	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**320**	mg/L	10.0	10.0	1		12/11/18 19:09		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 19:09		
Alkalinity,Total (CaCO3 pH4.5)	**320**	mg/L	10.0	1.0	1		12/11/18 19:09		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		12/06/18 21:31		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		12/12/18 10:37		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**112**	mg/L	50.0	23.4	5		12/07/18 15:43	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Sample: MW-211-120418 **Lab ID: 30273533006** Collected: 12/04/18 15:30 Received: 12/06/18 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**487**	ug/L	5.0	0.77	1	12/10/18 14:56	12/11/18 12:32	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**221**	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 12:21	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.098	0.028	1	12/11/18 16:03	12/12/18 19:11	83-32-9	1c
Acenaphthylene	ND	ug/L	0.098	0.033	1	12/11/18 16:03	12/12/18 19:11	208-96-8	1c
Anthracene	ND	ug/L	0.098	0.027	1	12/11/18 16:03	12/12/18 19:11	120-12-7	1c
Benzo(a)anthracene	ND	ug/L	0.098	0.038	1	12/11/18 16:03	12/12/18 19:11	56-55-3	1c
Benzo(a)pyrene	ND	ug/L	0.098	0.012	1	12/11/18 16:03	12/12/18 19:11	50-32-8	1c
Benzo(b)fluoranthene	ND	ug/L	0.098	0.026	1	12/11/18 16:03	12/12/18 19:11	205-99-2	1c
Benzo(g,h,i)perylene	ND	ug/L	0.098	0.035	1	12/11/18 16:03	12/12/18 19:11	191-24-2	1c
Benzo(k)fluoranthene	ND	ug/L	0.098	0.023	1	12/11/18 16:03	12/12/18 19:11	207-08-9	1c
Chrysene	ND	ug/L	0.098	0.039	1	12/11/18 16:03	12/12/18 19:11	218-01-9	1c
Dibenz(a,h)anthracene	ND	ug/L	0.098	0.027	1	12/11/18 16:03	12/12/18 19:11	53-70-3	1c
Fluoranthene	ND	ug/L	0.098	0.031	1	12/11/18 16:03	12/12/18 19:11	206-44-0	1c
Fluorene	ND	ug/L	0.098	0.030	1	12/11/18 16:03	12/12/18 19:11	86-73-7	1c
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.098	0.029	1	12/11/18 16:03	12/12/18 19:11	193-39-5	1c
Phenanthrene	ND	ug/L	0.098	0.043	1	12/11/18 16:03	12/12/18 19:11	85-01-8	1c
Pyrene	ND	ug/L	0.098	0.035	1	12/11/18 16:03	12/12/18 19:11	129-00-0	1c
Surrogates									
2-Fluorobiphenyl (S)	70	%.	27-113		1	12/11/18 16:03	12/12/18 19:11	321-60-8	
Terphenyl-d14 (S)	74	%.	56-108		1	12/11/18 16:03	12/12/18 19:11	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 21:54	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 21:54	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 21:54	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 21:54	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 21:54	64-17-5	2c,CL, L1
Ethylbenzene	ND	ug/L	1.0	0.31	1		12/07/18 21:54	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		12/07/18 21:54	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		12/07/18 21:54	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 21:54	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 21:54	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		12/07/18 21:54	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 21:54	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 21:54	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		12/07/18 21:54	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		12/07/18 21:54	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		12/07/18 21:54	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	100	%.	79-129		1		12/07/18 21:54	460-00-4	
1,2-Dichloroethane-d4 (S)	110	%.	80-120		1		12/07/18 21:54	17060-07-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Sample: MW-211-120418 **Lab ID: 30273533006** Collected: 12/04/18 15:30 Received: 12/06/18 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Toluene-d8 (S)	93	%.	80-120		1		12/07/18 21:54	2037-26-5	
Dibromofluoromethane (S)	100	%.	80-120		1		12/07/18 21:54	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**420**	mg/L	10.0	10.0	1		12/11/18 19:10		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 19:10		
Alkalinity,Total (CaCO3 pH4.5)	**420**	mg/L	10.0	1.0	1		12/11/18 19:10		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		12/06/18 21:31		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		12/12/18 10:38		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**154**	mg/L	50.0	23.4	5		12/07/18 16:31	14808-79-8	

Sample: PZ106S-120518 **Lab ID: 30273533007** Collected: 12/05/18 08:30 Received: 12/06/18 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**329**	ug/L	5.0	0.77	1	12/10/18 14:56	12/11/18 12:38	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**5.8**	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 12:23	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.097	0.028	1	12/11/18 16:03	12/12/18 19:29	83-32-9	1c
Acenaphthylene	ND	ug/L	0.097	0.033	1	12/11/18 16:03	12/12/18 19:29	208-96-8	1c
Anthracene	ND	ug/L	0.097	0.027	1	12/11/18 16:03	12/12/18 19:29	120-12-7	1c
Benzo(a)anthracene	ND	ug/L	0.097	0.038	1	12/11/18 16:03	12/12/18 19:29	56-55-3	1c
Benzo(a)pyrene	ND	ug/L	0.097	0.012	1	12/11/18 16:03	12/12/18 19:29	50-32-8	1c
Benzo(b)fluoranthene	ND	ug/L	0.097	0.026	1	12/11/18 16:03	12/12/18 19:29	205-99-2	1c
Benzo(g,h,i)perylene	ND	ug/L	0.097	0.034	1	12/11/18 16:03	12/12/18 19:29	191-24-2	1c
Benzo(k)fluoranthene	ND	ug/L	0.097	0.022	1	12/11/18 16:03	12/12/18 19:29	207-08-9	1c
Chrysene	ND	ug/L	0.097	0.039	1	12/11/18 16:03	12/12/18 19:29	218-01-9	1c
Dibenz(a,h)anthracene	ND	ug/L	0.097	0.027	1	12/11/18 16:03	12/12/18 19:29	53-70-3	1c
Fluoranthene	ND	ug/L	0.097	0.031	1	12/11/18 16:03	12/12/18 19:29	206-44-0	1c
Fluorene	ND	ug/L	0.097	0.030	1	12/11/18 16:03	12/12/18 19:29	86-73-7	1c
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.097	0.029	1	12/11/18 16:03	12/12/18 19:29	193-39-5	1c
Phenanthrene	ND	ug/L	0.097	0.043	1	12/11/18 16:03	12/12/18 19:29	85-01-8	1c

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Sample: PZ106S-120518 **Lab ID: 30273533007** Collected: 12/05/18 08:30 Received: 12/06/18 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Pyrene	ND	ug/L	0.097	0.035	1	12/11/18 16:03	12/12/18 19:29	129-00-0	1c
Surrogates									
2-Fluorobiphenyl (S)	51	%.	27-113		1	12/11/18 16:03	12/12/18 19:29	321-60-8	
Terphenyl-d14 (S)	79	%.	56-108		1	12/11/18 16:03	12/12/18 19:29	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 22:20	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 22:20	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 22:20	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 22:20	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 22:20	64-17-5	2c,CL, L1
Ethylbenzene	ND	ug/L	1.0	0.31	1		12/07/18 22:20	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		12/07/18 22:20	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		12/07/18 22:20	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 22:20	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 22:20	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		12/07/18 22:20	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 22:20	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 22:20	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		12/07/18 22:20	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		12/07/18 22:20	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		12/07/18 22:20	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	99	%.	79-129		1		12/07/18 22:20	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%.	80-120		1		12/07/18 22:20	17060-07-0	
Toluene-d8 (S)	96	%.	80-120		1		12/07/18 22:20	2037-26-5	
Dibromofluoromethane (S)	100	%.	80-120		1		12/07/18 22:20	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**230**	mg/L	10.0	10.0	1		12/11/18 19:12		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 19:12		
Alkalinity,Total (CaCO3 pH4.5)	**230**	mg/L	10.0	1.0	1		12/11/18 19:12		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		12/06/18 21:34		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	**2.3**	mg/L	0.10	0.028	1		12/12/18 10:39		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**30.4**	mg/L	10.0	4.7	1		12/07/18 15:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Sample: MW-210-120518 **Lab ID: 30273533008** Collected: 12/05/18 08:50 Received: 12/06/18 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**165**	ug/L	5.0	0.77	1	12/10/18 14:56	12/11/18 12:40	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**52.2**	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 12:33	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.098	0.028	1	12/11/18 16:03	12/12/18 19:46	83-32-9	1c
Acenaphthylene	ND	ug/L	0.098	0.033	1	12/11/18 16:03	12/12/18 19:46	208-96-8	1c
Anthracene	ND	ug/L	0.098	0.027	1	12/11/18 16:03	12/12/18 19:46	120-12-7	1c
Benzo(a)anthracene	ND	ug/L	0.098	0.038	1	12/11/18 16:03	12/12/18 19:46	56-55-3	1c
Benzo(a)pyrene	ND	ug/L	0.098	0.012	1	12/11/18 16:03	12/12/18 19:46	50-32-8	1c
Benzo(b)fluoranthene	ND	ug/L	0.098	0.026	1	12/11/18 16:03	12/12/18 19:46	205-99-2	1c
Benzo(g,h,i)perylene	ND	ug/L	0.098	0.035	1	12/11/18 16:03	12/12/18 19:46	191-24-2	1c
Benzo(k)fluoranthene	ND	ug/L	0.098	0.022	1	12/11/18 16:03	12/12/18 19:46	207-08-9	1c
Chrysene	ND	ug/L	0.098	0.039	1	12/11/18 16:03	12/12/18 19:46	218-01-9	1c
Dibenz(a,h)anthracene	ND	ug/L	0.098	0.027	1	12/11/18 16:03	12/12/18 19:46	53-70-3	1c
Fluoranthene	ND	ug/L	0.098	0.031	1	12/11/18 16:03	12/12/18 19:46	206-44-0	1c
Fluorene	ND	ug/L	0.098	0.030	1	12/11/18 16:03	12/12/18 19:46	86-73-7	1c
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.098	0.029	1	12/11/18 16:03	12/12/18 19:46	193-39-5	1c
Phenanthrene	ND	ug/L	0.098	0.043	1	12/11/18 16:03	12/12/18 19:46	85-01-8	1c
Pyrene	ND	ug/L	0.098	0.035	1	12/11/18 16:03	12/12/18 19:46	129-00-0	1c
Surrogates									
2-Fluorobiphenyl (S)	59	%.	27-113		1	12/11/18 16:03	12/12/18 19:46	321-60-8	
Terphenyl-d14 (S)	86	%.	56-108		1	12/11/18 16:03	12/12/18 19:46	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		12/07/18 22:47	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		12/07/18 22:47	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 22:47	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		12/07/18 22:47	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 22:47	64-17-5	2c,CL, L1
Ethylbenzene	ND	ug/L	1.0	0.31	1		12/07/18 22:47	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		12/07/18 22:47	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		12/07/18 22:47	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 22:47	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		12/07/18 22:47	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		12/07/18 22:47	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		12/07/18 22:47	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		12/07/18 22:47	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		12/07/18 22:47	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		12/07/18 22:47	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		12/07/18 22:47	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	102	%.	79-129		1		12/07/18 22:47	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%.	80-120		1		12/07/18 22:47	17060-07-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Sample: MW-210-120518 **Lab ID: 30273533008** Collected: 12/05/18 08:50 Received: 12/06/18 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Toluene-d8 (S)	92	%.	80-120		1		12/07/18 22:47	2037-26-5	
Dibromofluoromethane (S)	99	%.	80-120		1		12/07/18 22:47	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**410**	mg/L	10.0	10.0	1		12/11/18 19:13		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 19:13		
Alkalinity,Total (CaCO3 pH4.5)	**410**	mg/L	10.0	1.0	1		12/11/18 19:13		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		12/06/18 21:34		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	**1.3**	mg/L	0.10	0.028	1		12/12/18 10:41		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**38.7**	mg/L	10.0	4.7	1		12/07/18 15:48	14808-79-8	

Sample: BMW13-120518 **Lab ID: 30273533009** Collected: 12/05/18 09:10 Received: 12/06/18 10:00 Matrix: Water

Comments: • 500ml plastic unpreserved container received with lid slightly loose at the laboratory; sample was intact and inside a sealed plastic bag alone. Possible sources of contamination were ruled out by visual inspection upon receipt, and the bottle did not appear to have leaked into the bag. Client gave permission to report results of alkalinity, ferrous iron, and sulfate from this container.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**1890**	ug/L	5.0	0.77	1	12/10/18 14:56	12/11/18 12:43	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**1620**	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 12:36	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	**0.83**	ug/L	0.10	0.029	1	12/11/18 16:03	12/12/18 20:04	83-32-9	1c
Acenaphthylene	ND	ug/L	0.10	0.034	1	12/11/18 16:03	12/12/18 20:04	208-96-8	1c
Anthracene	ND	ug/L	0.10	0.028	1	12/11/18 16:03	12/12/18 20:04	120-12-7	1c
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	12/11/18 16:03	12/12/18 20:04	56-55-3	1c
Benzo(a)pyrene	ND	ug/L	0.10	0.012	1	12/11/18 16:03	12/12/18 20:04	50-32-8	1c
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	12/11/18 16:03	12/12/18 20:04	205-99-2	1c,ip
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	12/11/18 16:03	12/12/18 20:04	191-24-2	1c
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	12/11/18 16:03	12/12/18 20:04	207-08-9	1c,ip
Chrysene	ND	ug/L	0.10	0.040	1	12/11/18 16:03	12/12/18 20:04	218-01-9	1c
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	12/11/18 16:03	12/12/18 20:04	53-70-3	1c
Fluoranthene	ND	ug/L	0.10	0.032	1	12/11/18 16:03	12/12/18 20:04	206-44-0	1c
Fluorene	**0.78**	ug/L	0.10	0.031	1	12/11/18 16:03	12/12/18 20:04	86-73-7	1c

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Sample: BMW13-120518 **Lab ID: 30273533009** Collected: 12/05/18 09:10 Received: 12/06/18 10:00 Matrix: Water

Comments: • 500ml plastic unpreserved container received with lid slightly loose at the laboratory; sample was intact and inside a sealed plastic bag alone. Possible sources of contamination were ruled out by visual inspection upon receipt, and the bottle did not appear to have leaked into the bag. Client gave permission to report results of alkalinity, ferrous iron, and sulfate from this container.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.030	1	12/11/18 16:03	12/12/18 20:04	193-39-5	1c
Phenanthrene	**0.44**	ug/L	0.10	0.044	1	12/11/18 16:03	12/12/18 20:04	85-01-8	1c
Pyrene	ND	ug/L	0.10	0.036	1	12/11/18 16:03	12/12/18 20:04	129-00-0	1c
Surrogates									
2-Fluorobiphenyl (S)	74	%.	27-113		1	12/11/18 16:03	12/12/18 20:04	321-60-8	
Terphenyl-d14 (S)	72	%.	56-108		1	12/11/18 16:03	12/12/18 20:04	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	**6220**	ug/L	100	24.0	100		12/10/18 22:29	71-43-2	
n-Butylbenzene	**20.5**	ug/L	1.0	0.20	1		12/07/18 23:13	104-51-8	
sec-Butylbenzene	**11.7**	ug/L	1.0	0.25	1		12/07/18 23:13	135-98-8	
tert-Butylbenzene	**1.6**	ug/L	1.0	0.28	1		12/07/18 23:13	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 23:13	64-17-5	2c,CL, L1
Ethylbenzene	**1250**	ug/L	100	31.0	100		12/10/18 22:29	100-41-4	
Isopropylbenzene (Cumene)	**64.4**	ug/L	1.0	0.24	1		12/07/18 23:13	98-82-8	
p-Isopropyltoluene	**12.7**	ug/L	1.0	0.36	1		12/07/18 23:13	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 23:13	1634-04-4	
Naphthalene	**906**	ug/L	200	82.0	100		12/10/18 22:29	91-20-3	
n-Propylbenzene	**142**	ug/L	1.0	0.29	1		12/07/18 23:13	103-65-1	
Toluene	**17300**	ug/L	100	30.0	100		12/10/18 22:29	108-88-3	
1,2,4-Trimethylbenzene	**1730**	ug/L	100	25.0	100		12/10/18 22:29	95-63-6	
1,3,5-Trimethylbenzene	**478**	ug/L	100	21.0	100		12/10/18 22:29	108-67-8	
m&p-Xylene	**7130**	ug/L	200	60.0	100		12/10/18 22:29	179601-23-1	
o-Xylene	**3010**	ug/L	100	18.0	100		12/10/18 22:29	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	100	%.	79-129		1		12/07/18 23:13	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%.	80-120		1		12/07/18 23:13	17060-07-0	
Toluene-d8 (S)	94	%.	80-120		1		12/07/18 23:13	2037-26-5	
Dibromofluoromethane (S)	76	%.	80-120		1		12/07/18 23:13	1868-53-7	S0
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**430**	mg/L	10.0	10.0	1		12/11/18 19:14		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 19:14		
Alkalinity,Total (CaCO3 pH4.5)	**430**	mg/L	10.0	1.0	1		12/11/18 19:14		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	**6.3**	mg/L	1.0	0.20	10		12/06/18 21:52		H3,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		12/12/18 10:42		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Sample: BMW13-120518 **Lab ID: 30273533009** Collected: 12/05/18 09:10 Received: 12/06/18 10:00 Matrix: Water

Comments: • 500ml plastic unpreserved container received with lid slightly loose at the laboratory; sample was intact and inside a sealed plastic bag alone. Possible sources of contamination were ruled out by visual inspection upon receipt, and the bottle did not appear to have leaked into the bag. Client gave permission to report results of alkalinity, ferrous iron, and sulfate from this container.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	ND	mg/L	10.0	4.7	1		12/07/18 15:49	14808-79-8	

Sample: BMW14R-120518 **Lab ID: 30273533010** Collected: 12/05/18 09:45 Received: 12/06/18 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**950**	ug/L	5.0	0.77	1	12/10/18 14:56	12/11/18 12:45	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**682**	ug/L	5.0	0.77	1	12/07/18 15:47	12/10/18 12:38	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	**0.48**	ug/L	0.10	0.029	1	12/11/18 16:03	12/12/18 20:22	83-32-9	1c
Acenaphthylene	ND	ug/L	0.10	0.034	1	12/11/18 16:03	12/12/18 20:22	208-96-8	1c
Anthracene	ND	ug/L	0.10	0.028	1	12/11/18 16:03	12/12/18 20:22	120-12-7	1c
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	12/11/18 16:03	12/12/18 20:22	56-55-3	1c
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	12/11/18 16:03	12/12/18 20:22	50-32-8	1c
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	12/11/18 16:03	12/12/18 20:22	205-99-2	1c,ip
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	12/11/18 16:03	12/12/18 20:22	191-24-2	1c
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	12/11/18 16:03	12/12/18 20:22	207-08-9	1c,ip
Chrysene	ND	ug/L	0.10	0.041	1	12/11/18 16:03	12/12/18 20:22	218-01-9	1c
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	12/11/18 16:03	12/12/18 20:22	53-70-3	1c
Fluoranthene	ND	ug/L	0.10	0.033	1	12/11/18 16:03	12/12/18 20:22	206-44-0	1c
Fluorene	**0.45**	ug/L	0.10	0.032	1	12/11/18 16:03	12/12/18 20:22	86-73-7	1c
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	12/11/18 16:03	12/12/18 20:22	193-39-5	1c
Phenanthrene	ND	ug/L	0.10	0.045	1	12/11/18 16:03	12/12/18 20:22	85-01-8	1c
Pyrene	ND	ug/L	0.10	0.037	1	12/11/18 16:03	12/12/18 20:22	129-00-0	1c
Surrogates									
2-Fluorobiphenyl (S)	62	%.	27-113		1	12/11/18 16:03	12/12/18 20:22	321-60-8	
Terphenyl-d14 (S)	65	%.	56-108		1	12/11/18 16:03	12/12/18 20:22	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	**2.5**	ug/L	1.0	0.24	1		12/07/18 23:40	71-43-2	
n-Butylbenzene	**21.8**	ug/L	1.0	0.20	1		12/07/18 23:40	104-51-8	
sec-Butylbenzene	**12.5**	ug/L	1.0	0.25	1		12/07/18 23:40	135-98-8	
tert-Butylbenzene	**1.8**	ug/L	1.0	0.28	1		12/07/18 23:40	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		12/07/18 23:40	64-17-5	2c,CL, L1
Ethylbenzene	**149**	ug/L	1.0	0.31	1		12/07/18 23:40	100-41-4	
Isopropylbenzene (Cumene)	**76.8**	ug/L	1.0	0.24	1		12/07/18 23:40	98-82-8	
p-Isopropyltoluene	**12.0**	ug/L	1.0	0.36	1		12/07/18 23:40	99-87-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS

Project: Cold Spring Terminal
Pace Project No.: 30273533

Sample: BMW14R-120518 **Lab ID: 30273533010** Collected: 12/05/18 09:45 Received: 12/06/18 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		12/07/18 23:40	1634-04-4	
Naphthalene	**738**	ug/L	20.0	8.2	10		12/08/18 00:06	91-20-3	
n-Propylbenzene	**179**	ug/L	1.0	0.29	1		12/07/18 23:40	103-65-1	
Toluene	**17.6**	ug/L	1.0	0.30	1		12/07/18 23:40	108-88-3	
1,2,4-Trimethylbenzene	**1900**	ug/L	10.0	2.5	10		12/08/18 00:06	95-63-6	
1,3,5-Trimethylbenzene	**545**	ug/L	10.0	2.1	10		12/08/18 00:06	108-67-8	
m&p-Xylene	**678**	ug/L	2.0	0.60	1		12/07/18 23:40	179601-23-1	
o-Xylene	**11.8**	ug/L	1.0	0.18	1		12/07/18 23:40	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	100	%.	79-129		1		12/07/18 23:40	460-00-4	
1,2-Dichloroethane-d4 (S)	87	%.	80-120		1		12/07/18 23:40	17060-07-0	
Toluene-d8 (S)	98	%.	80-120		1		12/07/18 23:40	2037-26-5	
Dibromofluoromethane (S)	84	%.	80-120		1		12/07/18 23:40	1868-53-7	
2320B Alkalinity	Analytical Method: SM2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**510**	mg/L	10.0	10.0	1		12/11/18 19:15		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		12/11/18 19:15		
Alkalinity,Total (CaCO3 pH4.5)	**510**	mg/L	10.0	1.0	1		12/11/18 19:15		
Iron, Ferrous	Analytical Method: SM3500-FeD-00								
Iron, Ferrous	**0.69**	mg/L	0.10	0.020	1		12/06/18 21:39		H3,H6, ML
SM4500NO3-F, NO3-NO2	Analytical Method: SM4500NO3F-00								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		12/12/18 10:44		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	ND	mg/L	10.0	4.7	1		12/07/18 15:50	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Cold Spring Terminal
Pace Project No.: 30273533

QC Batch: 323417 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET
Associated Lab Samples: 30273533001, 30273533002, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

METHOD BLANK: 1576638 Matrix: Water
Associated Lab Samples: 30273533001, 30273533002, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese	ug/L	ND	5.0	1.2	12/11/18 12:12	

LABORATORY CONTROL SAMPLE: 1576639

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	500	491	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1576641 1576642

Parameter	Units	30273533002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese	ug/L	824	500	500	1300	1320	94	100	75-125	2	20	

SAMPLE DUPLICATE: 1576640

Parameter	Units	30273533002 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese	ug/L	824	820	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Cold Spring Terminal
Pace Project No.: 30273533

QC Batch: 323242 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET Dissolved
Associated Lab Samples: 30273533001, 30273533002, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

METHOD BLANK: 1575533 Matrix: Water
Associated Lab Samples: 30273533001, 30273533002, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	1.2	12/10/18 11:33	

LABORATORY CONTROL SAMPLE: 1575534

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	500	470	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1575536 1575537

Parameter	Units	30273388002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese, Dissolved	ug/L	ND	500	500	481	490	96	98	75-125	2	20	

MATRIX SPIKE SAMPLE: 1575539

Parameter	Units	30273533005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	ND	500	487	97	75-125	

SAMPLE DUPLICATE: 1575535

Parameter	Units	30273388002 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese, Dissolved	ug/L	ND	ND		20	

SAMPLE DUPLICATE: 1575538

Parameter	Units	30273533005 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese, Dissolved	ug/L	ND	1.6J		20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Cold Spring Terminal
Pace Project No.: 30273533

QC Batch: 323236 Analysis Method: EPA 8260C
QC Batch Method: EPA 8260C Analysis Description: 8260C MSV
Associated Lab Samples: 30273533001, 30273533002, 30273533003, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

METHOD BLANK: 1575510 Matrix: Water
Associated Lab Samples: 30273533001, 30273533002, 30273533003, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	1.0	0.25	12/07/18 15:40	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	0.21	12/07/18 15:40	
Benzene	ug/L	ND	1.0	0.24	12/07/18 15:40	
Ethanol	ug/L	ND	200	79.8	12/07/18 15:40	2c,CL
Ethylbenzene	ug/L	ND	1.0	0.31	12/07/18 15:40	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	0.24	12/07/18 15:40	
m&p-Xylene	ug/L	ND	2.0	0.60	12/07/18 15:40	
Methyl-tert-butyl ether	ug/L	ND	1.0	0.23	12/07/18 15:40	
n-Butylbenzene	ug/L	ND	1.0	0.20	12/07/18 15:40	
n-Propylbenzene	ug/L	ND	1.0	0.29	12/07/18 15:40	
Naphthalene	ug/L	ND	2.0	0.82	12/07/18 15:40	
o-Xylene	ug/L	ND	1.0	0.18	12/07/18 15:40	
p-Isopropyltoluene	ug/L	ND	1.0	0.36	12/07/18 15:40	
sec-Butylbenzene	ug/L	ND	1.0	0.25	12/07/18 15:40	
tert-Butyl Alcohol	ug/L	ND	5.0	3.7	12/07/18 15:40	
tert-Butylbenzene	ug/L	ND	1.0	0.28	12/07/18 15:40	
Toluene	ug/L	ND	1.0	0.30	12/07/18 15:40	
1,2-Dichloroethane-d4 (S)	%.	107	80-120		12/07/18 15:40	
4-Bromofluorobenzene (S)	%.	102	79-129		12/07/18 15:40	
Dibromofluoromethane (S)	%.	101	80-120		12/07/18 15:40	
Toluene-d8 (S)	%.	93	80-120		12/07/18 15:40	

LABORATORY CONTROL SAMPLE: 1575511

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	19.3	97	70-130	
1,3,5-Trimethylbenzene	ug/L	20	19.4	97	70-130	
Benzene	ug/L	20	18.8	94	70-130	
Ethanol	ug/L	200	380	190	10-175	2c,CL,L1
Ethylbenzene	ug/L	20	19.7	98	70-130	
Isopropylbenzene (Cumene)	ug/L	20	20.2	101	70-130	
m&p-Xylene	ug/L	40	40.4	101	70-130	
Methyl-tert-butyl ether	ug/L	20	18.6	93	70-130	
n-Butylbenzene	ug/L	20	19.7	99	70-130	
n-Propylbenzene	ug/L	20	19.7	99	70-130	
Naphthalene	ug/L	20	20.6	103	70-130	
o-Xylene	ug/L	20	19.9	100	70-130	
p-Isopropyltoluene	ug/L	20	20.3	101	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Cold Spring Terminal
Pace Project No.: 30273533

LABORATORY CONTROL SAMPLE: 1575511

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
sec-Butylbenzene	ug/L	20	20.2	101	70-130	
tert-Butyl Alcohol	ug/L	100	102	102	76-159	
tert-Butylbenzene	ug/L	20	20.7	103	70-130	
Toluene	ug/L	20	19.7	98	70-130	
1,2-Dichloroethane-d4 (S)	%.			99	80-120	
4-Bromofluorobenzene (S)	%.			100	79-129	
Dibromofluoromethane (S)	%.			98	80-120	
Toluene-d8 (S)	%.			98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1575512 1575513

Parameter	Units	30273388002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2,4-Trimethylbenzene	ug/L	ND	20	20	22.2	20.5	111	102	75-125	8	30	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	20.0	19.7	100	98	76-121	1	30	
Benzene	ug/L	ND	20	20	19.3	19.4	96	97	67-121	1	30	
Ethanol	ug/L	ND	200	200	142J	228	71	114	10-175		30	2c,CL
Ethylbenzene	ug/L	ND	20	20	20.3	19.9	101	99	70-127	2	30	
Isopropylbenzene (Cumene)	ug/L	ND	20	20	19.8	20.1	99	101	80-122	2	30	
m&p-Xylene	ug/L	ND	40	40	41.8	41.2	104	103	71-128	1	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	17.8	17.4	89	87	79-135	2	30	
n-Butylbenzene	ug/L	ND	20	20	18.2	18.7	91	93	54-128	2	30	
n-Propylbenzene	ug/L	ND	20	20	19.6	19.6	98	98	61-127	0	30	
Naphthalene	ug/L	ND	20	20	24.4	21.1	122	105	62-131	14	30	
o-Xylene	ug/L	ND	20	20	20.4	19.9	102	100	68-125	2	30	
p-Isopropyltoluene	ug/L	ND	20	20	19.8	20.0	99	100	60-125	1	30	
sec-Butylbenzene	ug/L	ND	20	20	20.0	19.9	100	100	61-125	0	30	
tert-Butyl Alcohol	ug/L	ND	100	100	79.3	88.2	79	88	65-152	11	30	
tert-Butylbenzene	ug/L	ND	20	20	20.2	20.5	101	103	62-125	2	30	
Toluene	ug/L	ND	20	20	21.7	21.1	109	105	77-125	3	30	
1,2-Dichloroethane-d4 (S)	%.						97	95	80-120			
4-Bromofluorobenzene (S)	%.						100	99	79-129			
Dibromofluoromethane (S)	%.						100	101	80-120			
Toluene-d8 (S)	%.						97	99	80-120			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Cold Spring Terminal
Pace Project No.: 30273533

QC Batch: 323459 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3510C Analysis Description: 8270D Water PAH by SIM MSSV
Associated Lab Samples: 30273533001, 30273533002, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

METHOD BLANK: 1576799 Matrix: Water
Associated Lab Samples: 30273533001, 30273533002, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Acenaphthene	ug/L	ND	0.10	0.029	12/12/18 17:25	
Acenaphthylene	ug/L	ND	0.10	0.034	12/12/18 17:25	
Anthracene	ug/L	ND	0.10	0.028	12/12/18 17:25	
Benzo(a)anthracene	ug/L	ND	0.10	0.039	12/12/18 17:25	
Benzo(a)pyrene	ug/L	ND	0.10	0.012	12/12/18 17:25	
Benzo(b)fluoranthene	ug/L	ND	0.10	0.027	12/12/18 17:25	
Benzo(g,h,i)perylene	ug/L	ND	0.10	0.035	12/12/18 17:25	
Benzo(k)fluoranthene	ug/L	ND	0.10	0.023	12/12/18 17:25	
Chrysene	ug/L	ND	0.10	0.040	12/12/18 17:25	
Dibenz(a,h)anthracene	ug/L	ND	0.10	0.028	12/12/18 17:25	
Fluoranthene	ug/L	ND	0.10	0.032	12/12/18 17:25	
Fluorene	ug/L	ND	0.10	0.031	12/12/18 17:25	
Indeno(1,2,3-cd)pyrene	ug/L	ND	0.10	0.030	12/12/18 17:25	
Phenanthrene	ug/L	ND	0.10	0.044	12/12/18 17:25	
Pyrene	ug/L	ND	0.10	0.036	12/12/18 17:25	
2-Fluorobiphenyl (S)	%.	67	27-113		12/12/18 17:25	
Terphenyl-d14 (S)	%.	72	56-108		12/12/18 17:25	

LABORATORY CONTROL SAMPLE: 1576800

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/L	2	1.3	63	27-105	
Acenaphthylene	ug/L	2	1.3	67	19-120	
Anthracene	ug/L	2	1.4	68	39-111	
Benzo(a)anthracene	ug/L	2	1.5	75	49-120	
Benzo(a)pyrene	ug/L	2	1.7	83	44-121	
Benzo(b)fluoranthene	ug/L	2	1.6	79	51-121	
Benzo(g,h,i)perylene	ug/L	2	1.6	81	43-121	
Benzo(k)fluoranthene	ug/L	2	1.6	79	47-121	
Chrysene	ug/L	2	1.4	71	48-108	
Dibenz(a,h)anthracene	ug/L	2	1.6	80	43-126	
Fluoranthene	ug/L	2	1.4	70	46-120	
Fluorene	ug/L	2	1.5	75	35-110	
Indeno(1,2,3-cd)pyrene	ug/L	2	1.6	78	48-124	
Phenanthrene	ug/L	2	1.4	68	38-107	
Pyrene	ug/L	2	1.4	69	50-117	
2-Fluorobiphenyl (S)	%.			63	27-113	
Terphenyl-d14 (S)	%.			73	56-108	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Cold Spring Terminal
Pace Project No.: 30273533

QC Batch: 323135 Analysis Method: SM2320B-2011
QC Batch Method: SM2320B-2011 Analysis Description: 2320B Alkalinity
Associated Lab Samples: 30273533001, 30273533002, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

METHOD BLANK: 1575012 Matrix: Water
Associated Lab Samples: 30273533001, 30273533002, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Carbonate (pH4.5)	mg/L	ND	10.0	10.0	12/11/18 18:47	
Alkalinity,Bicarbonate (pH4.5)	mg/L	ND	10.0	10.0	12/11/18 18:47	
Alkalinity,Total (CaCO3 pH4.5)	mg/L	ND	10.0	1.0	12/11/18 18:47	

LABORATORY CONTROL SAMPLE: 1575013

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity,Total (CaCO3 pH4.5)	mg/L	20	20.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1577524 1577525

Parameter	Units	30273388002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity,Total (CaCO3 pH4.5)	mg/L	280	50	50	330	330	100	100	85-115	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Cold Spring Terminal
Pace Project No.: 30273533

QC Batch: 323137 Analysis Method: SM3500-FeD-00
QC Batch Method: SM3500-FeD-00 Analysis Description: Iron, Ferrous
Associated Lab Samples: 30273533001, 30273533002, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

METHOD BLANK: 1575060 Matrix: Water
Associated Lab Samples: 30273533001, 30273533002, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	ND	0.10	0.020	12/06/18 21:24	H6

LABORATORY CONTROL SAMPLE: 1575061

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	1	1.0	100	90-110	H6

MATRIX SPIKE SAMPLE: 1575063

Parameter	Units	30273533010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	0.69	1	1.5	79	85-115	H3,H6,ML

SAMPLE DUPLICATE: 1575062

Parameter	Units	30273533010 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	0.69	0.67	3	20	H3,H6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Cold Spring Terminal
Pace Project No.: 30273533

QC Batch: 323488 Analysis Method: SM4500NO3F-00
QC Batch Method: SM4500NO3F-00 Analysis Description: SM4500NO3-F, Nitrate, Preserved
Associated Lab Samples: 30273533001, 30273533002, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

METHOD BLANK: 1576955 Matrix: Water
Associated Lab Samples: 30273533001, 30273533002, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.028	12/12/18 10:14	

LABORATORY CONTROL SAMPLE: 1576956

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	4	3.9	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1576957 1576958

Parameter	Units	30273466005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	5	5	5.2	5.2	103	103	85-115	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: Cold Spring Terminal
Pace Project No.: 30273533

QC Batch: 323194 Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 Analysis Description: ASTM D516-90, 02 Sulfate Water
Associated Lab Samples: 30273533001, 30273533002, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

METHOD BLANK: 1575297 Matrix: Water
Associated Lab Samples: 30273533001, 30273533002, 30273533004, 30273533005, 30273533006, 30273533007, 30273533008, 30273533009, 30273533010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	10.0	4.7	12/07/18 15:38	

LABORATORY CONTROL SAMPLE: 1575298

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	30	28.5	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1575299 1575300

Parameter	Units	30273533001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	102	20	20	123	109	104	37	85-115	12	20	ML

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: Cold Spring Terminal
Pace Project No.: 30273533

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA	Pace Analytical Services - Greensburg

BATCH QUALIFIERS

Batch: 323459

[M5]	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1c	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
2c	The analyte did not meet the method recommended minimum RF.
A5	Greater than 5% sediment in sample determined by visual observation. Aqueous portion decanted from the sediment and extracted.
CL	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.
H3	Sample was received or analysis requested beyond the recognized method holding time.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
ML	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.
S0	Surrogate recovery outside laboratory control limits.

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: Cold Spring Terminal
Pace Project No.: 30273533

ANALYTE QUALIFIERS

ip	Benzo(b)fluoranthene and benzo(k)fluoranthene were separated in the check standard but did not meet the resolution criteria in SW846 Method 8270D. Whereas sample results included are reported as individual isomers, the lab and the customer must recognize them as an isomeric pair.

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Cold Spring Terminal
Pace Project No.: 30273533

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30273533001	**BMW3-120418**	EPA 3005A	323417	EPA 6010C	323475
30273533002	**BMW8-120418**	EPA 3005A	323417	EPA 6010C	323475
30273533004	**BMW2-120418**	EPA 3005A	323417	EPA 6010C	323475
30273533005	**BMW9-120418**	EPA 3005A	323417	EPA 6010C	323475
30273533006	**MW-211-120418**	EPA 3005A	323417	EPA 6010C	323475
30273533007	**PZ106S-120518**	EPA 3005A	323417	EPA 6010C	323475
30273533008	**MW-210-120518**	EPA 3005A	323417	EPA 6010C	323475
30273533009	**BMW13-120518**	EPA 3005A	323417	EPA 6010C	323475
30273533010	**BMW14R-120518**	EPA 3005A	323417	EPA 6010C	323475
30273533001	**BMW3-120418**	EPA 3005A	323242	EPA 6010C	323284
30273533002	**BMW8-120418**	EPA 3005A	323242	EPA 6010C	323284
30273533004	**BMW2-120418**	EPA 3005A	323242	EPA 6010C	323284
30273533005	**BMW9-120418**	EPA 3005A	323242	EPA 6010C	323284
30273533006	**MW-211-120418**	EPA 3005A	323242	EPA 6010C	323284
30273533007	**PZ106S-120518**	EPA 3005A	323242	EPA 6010C	323284
30273533008	**MW-210-120518**	EPA 3005A	323242	EPA 6010C	323284
30273533009	**BMW13-120518**	EPA 3005A	323242	EPA 6010C	323284
30273533010	**BMW14R-120518**	EPA 3005A	323242	EPA 6010C	323284
30273533001	**BMW3-120418**	EPA 3510C	323459	EPA 8270D by SIM	323621
30273533002	**BMW8-120418**	EPA 3510C	323459	EPA 8270D by SIM	323621
30273533004	**BMW2-120418**	EPA 3510C	323459	EPA 8270D by SIM	323621
30273533005	**BMW9-120418**	EPA 3510C	323459	EPA 8270D by SIM	323621
30273533006	**MW-211-120418**	EPA 3510C	323459	EPA 8270D by SIM	323621
30273533007	**PZ106S-120518**	EPA 3510C	323459	EPA 8270D by SIM	323621
30273533008	**MW-210-120518**	EPA 3510C	323459	EPA 8270D by SIM	323621
30273533009	**BMW13-120518**	EPA 3510C	323459	EPA 8270D by SIM	323621
30273533010	**BMW14R-120518**	EPA 3510C	323459	EPA 8270D by SIM	323621
30273533001	**BMW3-120418**	EPA 8260C	323236		
30273533002	**BMW8-120418**	EPA 8260C	323236		
30273533003	**TB-120418**	EPA 8260C	323236		
30273533004	**BMW2-120418**	EPA 8260C	323236		
30273533005	**BMW9-120418**	EPA 8260C	323236		
30273533006	**MW-211-120418**	EPA 8260C	323236		
30273533007	**PZ106S-120518**	EPA 8260C	323236		
30273533008	**MW-210-120518**	EPA 8260C	323236		
30273533009	**BMW13-120518**	EPA 8260C	323236		
30273533010	**BMW14R-120518**	EPA 8260C	323236		
30273533001	**BMW3-120418**	SM2320B-2011	323135		
30273533002	**BMW8-120418**	SM2320B-2011	323135		
30273533004	**BMW2-120418**	SM2320B-2011	323135		
30273533005	**BMW9-120418**	SM2320B-2011	323135		
30273533006	**MW-211-120418**	SM2320B-2011	323135		
30273533007	**PZ106S-120518**	SM2320B-2011	323135		
30273533008	**MW-210-120518**	SM2320B-2011	323135		
30273533009	**BMW13-120518**	SM2320B-2011	323135		
30273533010	**BMW14R-120518**	SM2320B-2011	323135		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Cold Spring Terminal
Pace Project No.: 30273533

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30273533001	**BMW3-120418**	SM3500-FeD-00	323137		
30273533002	**BMW8-120418**	SM3500-FeD-00	323137		
30273533004	**BMW2-120418**	SM3500-FeD-00	323137		
30273533005	**BMW9-120418**	SM3500-FeD-00	323137		
30273533006	**MW-211-120418**	SM3500-FeD-00	323137		
30273533007	**PZ106S-120518**	SM3500-FeD-00	323137		
30273533008	**MW-210-120518**	SM3500-FeD-00	323137		
30273533009	**BMW13-120518**	SM3500-FeD-00	323137		
30273533010	**BMW14R-120518**	SM3500-FeD-00	323137		
30273533001	**BMW3-120418**	SM4500NO3F-00	323488		
30273533002	**BMW8-120418**	SM4500NO3F-00	323488		
30273533004	**BMW2-120418**	SM4500NO3F-00	323488		
30273533005	**BMW9-120418**	SM4500NO3F-00	323488		
30273533006	**MW-211-120418**	SM4500NO3F-00	323488		
30273533007	**PZ106S-120518**	SM4500NO3F-00	323488		
30273533008	**MW-210-120518**	SM4500NO3F-00	323488		
30273533009	**BMW13-120518**	SM4500NO3F-00	323488		
30273533010	**BMW14R-120518**	SM4500NO3F-00	323488		
30273533001	**BMW3-120418**	ASTM D516-90,02	323194		
30273533002	**BMW8-120418**	ASTM D516-90,02	323194		
30273533004	**BMW2-120418**	ASTM D516-90,02	323194		
30273533005	**BMW9-120418**	ASTM D516-90,02	323194		
30273533006	**MW-211-120418**	ASTM D516-90,02	323194		
30273533007	**PZ106S-120518**	ASTM D516-90,02	323194		
30273533008	**MW-210-120518**	ASTM D516-90,02	323194		
30273533009	**BMW13-120518**	ASTM D516-90,02	323194		
30273533010	**BMW14R-120518**	ASTM D516-90,02	323194		

Pace Analytical®

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorder

WO#: 30273533

30273533

ALL SHADED

Company: Arcadis

Address: 110 W Fayette Syracuse, NY

Billing Information:

Report To: Vin Mavesco

Email To: vin.mavesco@arcadis.com

Copy To: PJ Hart

Site Collection Info/Address: Lysander, NY

Customer Project Name/Number: Buckeye/Cold Spring Terminal

State: NY County/City: Onondaga Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET

Phone: 315-447-0428
Email:

Site/Facility ID #:

Compliance Monitoring? [ ] Yes [ ] No

Collected By (print): Nichole Griffith

Purchase Order #:
Quote #:

DW PWS ID #:
DW Location Code:

Collected By (signature):

Turnaround Date Required:

Immediately Packed on Ice: [ ] Yes [ ] No

Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: ______ [ ] Hold: ______

Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)

Field Filtered (if applicable): [ ] Yes [ ] No
Analysis: ______

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Container Preservative Type **

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other ______

Customer Sample ID	Matrix *	Comp / Grab	Collected Date	Collected Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	SVOC 8270	VOC 8260	FeI, alkalinity, Sulfate	CO2 Methane	nitrate / nitrite	manganese	manganese, lab filter	Lab Sample #
BMW3-120418	GW	G	12/4/18	1050				11	X	X	X	X	X	X	X	001
BMW8-120418	GW	G	12/4/18	1115				11	X	X	X	X	X	X	X	002
TB-120418	TB	G	12/4/18	0800				#2		X						003
BMW2-120418	GW	G	12/4/18	14:30				11	X	X	X	X	X	X	X	004
BMW9-120418	GW	G	12/4/18	15:00				11	X	X	X	X	X	X	X	005
MW-211-120418	GW	G	12/4/18	15:30				11	X	X	X	X	X	X	X	006
PZ106S-120518	GW	G	12/5/18	0830				11	X	X	X	X	X	X	X	007
MW-210-120518	GW	G	12/5/18	0850				11	X	X	X	X	X	X	X	008
BMW13-120518	GW	G	12/5/18	0910				11	X	X	X	X	X	X	X	009
BMW14R-120518	GW	G	12/5/18	0945				11	X	X	X	X	X	X	X	010

Lab Profile/Line:

Lab Sample Receipt Checklist:
- Custody Seals Present/Intact (Y) N NA
- Custody Signatures Present (Y) N NA
- Collector Signature Present (Y) N NA
- Bottles Intact (Y) N NA MDS 12-6-18
- Correct Bottles (Y) N NA
- Sufficient Volume (Y) N NA
- Samples Received on Ice (Y) N NA
- VOA - Headspace Acceptable (Y) N NA
- USDA Regulated Soils Y N (NA)
- Samples in Holding Time (Y) N NA
- Residual Chlorine Present (Y) N NA
- Cl Strips:
- Sample pH Acceptable (N) NA MDS 12-6-18
- pH Strips: COD2951
- Sulfide Present Y N (NA)
- Lead Acetate Strips: ______

LAB USE ONLY:
Lab Sample # / Comments: MDS

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: (Wet) Blue Dry None

Packing Material Used: Bubble Bag and ICE

Radchem sample(s) screened (<500 cpm): Y N (NA)

SHORT HOLDS PRESENT (<72 hours): (Y) N N/A

Lab Tracking #: 773892655692337358

Samples received via: (FEDEX) UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N (NA)
Therm ID#: 10
Cooler 1 Temp Upon Receipt: 5.9, 5.1, 4.9 °C
Cooler 1 Therm Corr. Factor: +0.0 °C
Cooler 1 Corrected Temp: 5.9, 5.1, 4.9 °C
Comments: MDS 12-6-18

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Nichole Griffith / Arcadis	12/5/18 11:45	[signature] PACE	12/5/18 12:00
[signature] PACE	12/5/18 17:00	[signature]	12/6/18 1000

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: (Y) N NA
(HCL) MeOH TSP Other

Non Conformance(s): (YES) / NO

Page: 1 of: 2

Pace Analytical
www.pacelabs.com

Sample Receiving Non-Conforma (NCF)

Date: 12-6-18	Evaluated by: MJS
Client: Buckeye - Arcadis	

Affix Work

WO# : 30273533

PM: RDC Due Date: 12/13/18

CLIENT: BUCKARCNY

1. If Chain-of-Custody (COC) is not received: contact client and if necessary, fill out a COC and indicate that it was filled out by lab personnel. Note issues on this NCF.

2. If COC is incomplete, check applicable issues below and add details where appropriate:

Collection date/time missing or incorrect	Analyses or analytes: missing or clarification needed	Samples listed on COC do not match samples received (missing, additional, etc.)
Sample IDs on COC do not match sample labels	Required trip blanks were not received	Required signatures are missing

Comments/Details/Other Issues not listed above:

3. Sample integrity issues: check applicable issues below and add details where appropriate:

Samples: Past holding time	Samples: Condition needs to be brought to lab personnel's attention (details below)	Preservation: Improper
Samples: Not field filtered	Containers: Broken or compromised	Temperature: not within acceptance criteria (typically 0-6C)
Samples: Insufficient volume received	Containers: Incorrect	Temperature: Samples arrived frozen
Samples: Cooler damaged or compromised	Custody Seals: Missing or compromised on samples, trip blanks or coolers	Vials received with improper headspace
Samples: contain chlorine or sulfides	Packing Material: Insufficient/Improper	Other:

Comments/Details: All vials of sample 001, 1 vial in sample 002
Sample 005 BP2U received open no sample left
Sample 009 BP2U received open sample still intact

4. If Samples not preserved properly and Sample Receiving adjusts pH, add details below:

Sample ID: BMW3-120418	Date/Time: 12-6-18 1415	Amount/type pres added: 2.5mL of HNO3
Preserved by: MJS	Initial and Final pH: 7; <2	Lot # of pres added: D618-BC4
Sample ID: BMW3-120418	Date/Time: 12-6-18 1415	Amount/type pres added: 1mL of H2SO4
Preserved by: MJS	Initial and Final pH: 7; ~~<2~~ 6 MJS 12-6-18	Lot # of pres added: 101518-4CFX
Sample ID:	Date/Time: MJS 12-6-18	Amount/type pres added:
Preserved by:	Initial and Final pH:	Lot # of pres added:

Still not preserved

5. Client Contact: If client is contacted for any issue listed above, fill in details below:

Client:	Contacted per:	
PM Initials:	Date/Time:	

Client Comments/Instructions: