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:
July 2, 2019

Arcadis Project No.:
B0090004.0008

Subject:
Second Quarter 2019 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 second quarter 2019 groundwater sampling event. The site location is shown on **Figure 1**.

The groundwater monitoring field event was completed by Arcadis personnel May 20 through 22, 2019. 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 (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 May 2019 event.

FIELD ACTIVITIES

During the May 2019 event, Arcadis completed groundwater monitoring and gauging. A liquid level meter, which 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 18 monitoring wells were sampled. The following three monitoring wells were not sampled because there was NAPL present: BMW5, BMW13 and BMW14R. At BMW14R there was a trace detection, which was the first detection of NAPL since the quarterly monitoring began in May 2018. The remaining 18 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 (Formerly 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 was 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 second quarter 2019 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 May 2019 sampling event, samples collected from 2 of the 18 monitoring wells sampled (MW-204 and MW-208) exhibited one or more VOC 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, BMW6, BMW8, MW-201, MW-202, MW-204, MW-207, MW-208, MW-210, MW-211, and PZ106S exhibited concentrations of manganese greater than NYSDEC ambient water quality standards and guidance values presented in NYSDEC's TOGS 1.1.1.

The dissolved phase analytical results from the 2018 sampling events (second, third, and fourth quarters) and the 2019 sampling events (first and second quarter) were generally consistent.

SUMMARY AND FUTURE PLANNED ACTIVITES

Groundwater samples were collected from a total of 18 monitoring wells during the second quarter monitoring event to provide a representation of current dissolved constituent concentrations at the subject site and to monitor NAPL thicknesses and locations across the site. One or more individual dissolved phase BTEX concentrations above TOGS 1.1.1 were detected at 2 of the 18 monitoring wells. During the pre-sampling groundwater gauging event, NAPL was detected at monitoring wells BMW5, BMW13 and BMW14R. No other monitoring wells gauged during this event indicated NAPL. BMW14R was a trace detection and the first detection since the quarterly monitoring began in May 2018.

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)
Wendy Marsh, Hancock Estabrook, LLP (electronic copy)
Stephen Gonzalski, BP (electronic copy)
Michael Teeling, PG, Woodard & Curran (electronic copy)
David Devaprasad, Devaprasad PLLC (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., Sidley Austin 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 – 2019 Groundwater Measurements
Table 2 – 2019 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 – 2019 – Second Quarter
Figure 4 – Total VOC and SVOC Concentrations

Attachments

Attachment A – Laboratory Reports

TABLES

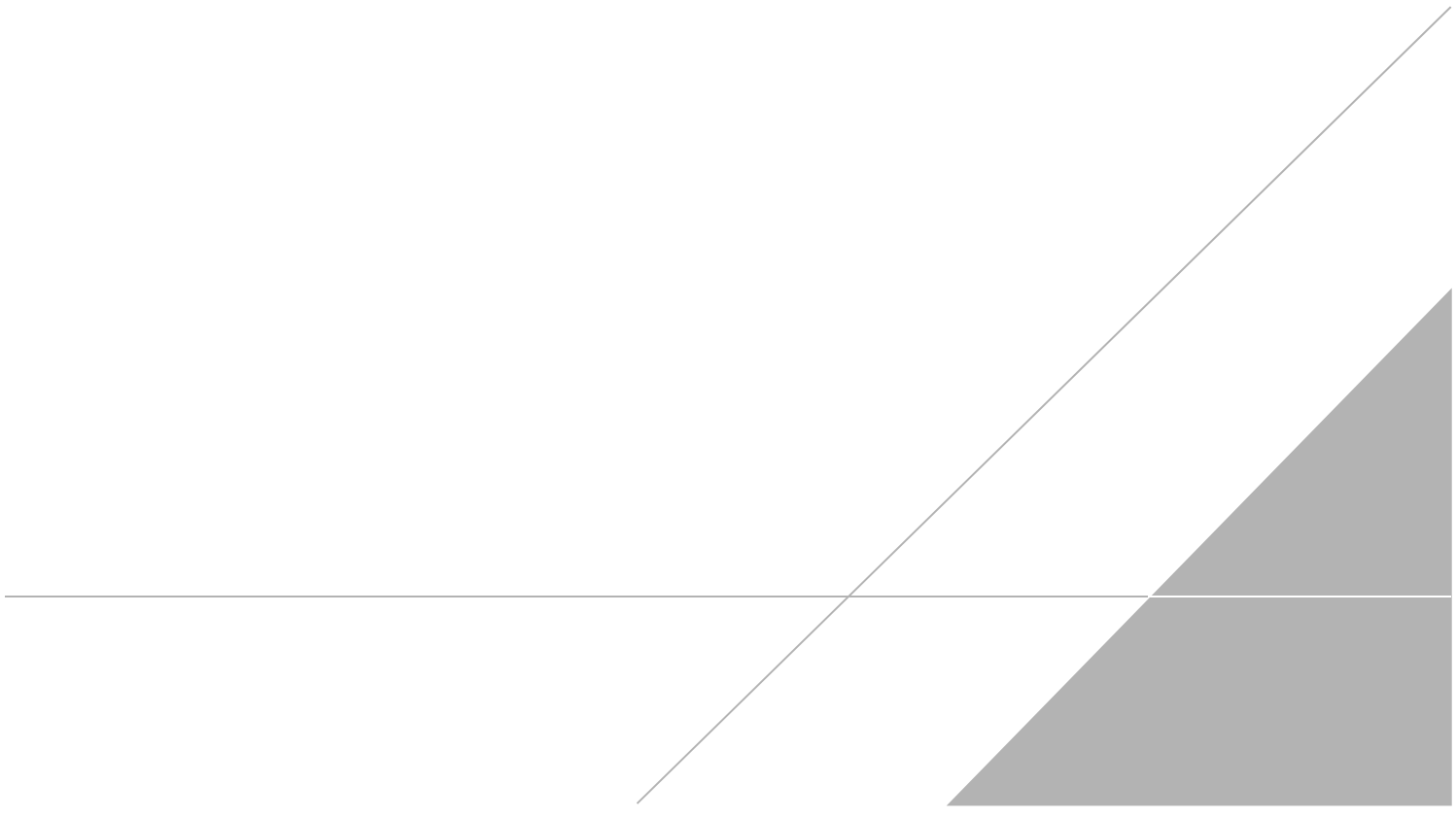


Table 1
2019 Groundwater Measurements

Groundwater Sampling Summary 2019 - Second 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	6.70	ND	389.95	389.95	
BMW3	1141323.86	908969.02	395.30	2	3.5-29.0	ND	5.33	ND	389.97	389.97	
BMW5	1141248.92	908820.46	389.50	2	10.0-30.0	22.16	23.62	1.46	365.88	367.03	No sample collected due to the presence of NAPL.
BMW6	1141286.17	908914.24	394.88	2	10.0-30.0	ND	21.23	ND	373.65	373.65	
BMW7	1141347.84	908824.60	397.61	2	5.0-15.0	ND	4.78	ND	392.83	392.83	
BMW8	1141420.52	908826.55	399.86	2	5.0-20.0	ND	5.70	ND	394.16	394.16	
BMW9	1141334.24	909181.88	380.15	2	5.0-15.0	ND	2.05	ND	378.10	378.10	
BMW13	1141243.20	909014.31	382.60	4	UK	16.05	16.60	0.55	366.00	366.44	No sample collected due to the presence of NAPL.
BMW14R	1141257.52	909096.329	379.82	2	5.0-20.0	12.72	12.72	Trace	367.10	367.10	No sample collected due to the presence of NAPL.
MW-201	1141290.74	908861.62	395.24	2	14.0-24.0	ND	20.15	ND	375.09	375.09	
MW-202	1141329.17	908898.17	395.25	2	6.0-16.5	ND	4.11	ND	391.14	391.14	
MW-203	1141307.55	909013.86	394.31	2	5.0-20.0	ND	3.32	ND	390.99	390.99	
MW-204	1141427.24	908980.08	394.95	2	5.0-20.0	ND	2.01	ND	392.94	392.94	
MW-205	1141543.83	908866.84	397.79	2	10.0-20.0	ND	3.58	ND	394.21	394.21	
MW-206	1141541.04	908921.18	397.68	2	5.0-20.0	ND	0**	ND	397.68**	397.68**	
MW-207	1141519.38	908997.73	398.50	2	5.0-20.0	ND	2.62	ND	395.88	395.88	
MW-208	1141526.88	909080.26	397.09	2	5.0-20.0	ND	3.03	ND	394.06	394.06	
MW-209	1141600.72	909076.11	399.62	2	5.0-20.0	ND	0**	ND	399.62**	399.62**	
MW-210	1141345.09	909129.64	386.60	2	8.0-18.0	ND	4.92	ND	381.68	381.68	
MW-211	1141377.65	909200.72	387.45	2	5.0-15.0	ND	6.21	ND	381.24	381.24	
PZ106S	1141279.48	909152.97	374.02	2	5.5-15.5	ND	2.54	ND	371.48	371.48	

Notes:

* DTW was above the screened interval for the following wells: BMW2, BMW3, BMW7, BMW8, BMW9, MW-202, MW-203, MW-204, MW-205, MW-206, MW-207, MW-208, MW-209, MW-210, MW-211, and PZ106S.

** Water was artesian and above the riser pipe. DTW is unknown and GWE is estimated.

Corrected GWE = GWE + (NAPL Specific density (0.79) x Product thickness)
bmp = Below measuring point
DTP = Depth to product
DTW = Depth to water
ft bgs = Feet below ground surface
GWE = Groundwater elevation
ID= Identification
NAPL = Nonaqueous phase liquid
ND = No detection
UK = Unknown

Table 2
2019 Historical Summary of Groundwater Constituents of Concern

ARCADIS Design & Consultancy for natural and built assets

Groundwater Sampling Summary 2019 - Second 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
BMW2	2/20/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW2	5/22/2019	1 U	1 U	1 U	2 U	200 U	0.14 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
BMW3	2/19/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW3	5/22/2019	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	12/3/2018	NAPL Present					
BMW5	2/18/2019	NAPL Present					
BMW5	5/20/2019	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					
BMW6	2/18/2019	Dry					
BMW6	5/20/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
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					
BMW7	2/19/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW7	5/20/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
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
BMW8	2/19/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW8	5/20/2019	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
BMW9	2/18/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
BMW9	5/21/2019	1 U	1 U	1 U	2 U	200 U	0.1 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
BMW13	2/18/2019	NAPL Present					
BMW13	5/20/2019	NAPL Present					
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
BMW14R	2/20/2019	1 U	1 U	**202**	**762**	4,156.0	1.92
BMW14R	5/20/2019	NAPL Present					
MW-201	5/15/2018	Not Installed					
MW-201	9/25/2018	Dry					
MW-201	12/3/2018	Dry					
MW-201	2/18/2019	Dry					
MW-201	5/20/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-202	5/15/2018	Not Installed					
MW-202	9/25/2018	Dry					
MW-202	12/3/2018	Dry					
MW-202	2/19/2019	1 U	1 U	1 U	2 U	200 U	0.11 U
MW-202	5/20/2019	1 U	1 U	1 U	2 U	200 U	0.098 U
MW-203	5/15/2018	Not Installed					
MW-203	9/25/2018	Dry					
MW-203	12/3/2018	Dry					
MW-203	2/19/2019	1 U	1 U	1 U	2 U	200 U	0.11 U
MW-203	5/20/2019	1 U	1 U	1 U	2 U	200 U	0.1 U

See Notes on Page 2.

Table 2
2019 Historical Summary of Groundwater Constituents of Concern

ARCADIS Design & Consultancy for natural and built assets

Groundwater Sampling Summary 2019 - Second 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-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-204	2/18/2019	**4.6**	2.4	4.2	**8.2**	36.1	0.1 U
MW-204	5/22/2019	**1.3**	1 U	1 U	2.4	10.6	0.098 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-205	2/18/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-205	5/21/2019	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-206	2/18/2019	Frozen					
MW-206	5/21/2019	1 U	1 U	1 U	2 U	200 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-207	2/18/2019	1 U [1 U]	1 U [1 U]	1 U [1 U]	2 U [2 U]	200 U [200 U]	0.1 U [0.12 U]
MW-207	5/21/2019	1 U [1 U]	1 U [1 U]	1 U [1 U]	2 U [2 U]	200 U [200 U]	0.1 U [0.099 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-208	2/18/2019	1 U	1 U	4.7	**15.6**	94.6	0.1 U
MW-208	5/21/2019	1 U	1 U	3.9	**10.7**	86.8	0.1 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
MW-209	2/18/2019	Frozen					
MW-209	5/22/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
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-210	2/20/2019	1 U	1 U	1 U	3.7	20.3	0.1 U
MW-210	5/21/2019	1 U	1 U	1 U	2 U	200 U	0.1 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
MW-211	2/18/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
MW-211	5/21/2019	1 U	1 U	1 U	2 U	200 U	0.1 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
PZ106S	2/20/2019	1 U	1 U	1 U	2 U	200 U	0.1 U
PZ106S	5/21/2019	1 U	1 U	1 U	2 U	200 U	0.1 U

Notes:
1. Shaded and bold values indicate a criteria exceedance.
2. Field duplicate sample results are presented in brackets.
3. Total VOCs represents all VOCs analyzed.

NAPL = Non-aqueous phase liquid
SVOC = Semivolatile organic compound
VOC = Volatile organic compound
U = Compound was analyzed for, but not detected.
ug/L = Micrograms per liter

Table 3
Groundwater Analytical Data

Groundwater Sampling Summary 2019 - Second Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID:	NYSDEC		BMW2	BMW3	BMW6	BMW7	BMW8	BMW9	MW-201	MW-202	MW-203	MW-204
Date Collected:	TOGS 1 1 1		5/22/2019	5/22/2019	5/20/2019	5/20/2019	5/20/2019	5/21/2019	5/20/2019	5/20/2019	5/20/2019	5/22/2019
SDG:	(GA Groundwater)	Units	30295911	30295911	30295374	30295374	30295374	30295649	30295374	30295374	30295374	30295911
VOCs (EPA 8260C)												
1,2,4-Trimethylbenzene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2.9
1,3,5-Trimethylbenzene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	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	1 U	**1.3**
Ethanol	- -	ug/L	200 U4c	200 U4c	200 UCH3c	200 UCH3c	200 UCH3c	200 UCH3c	200 UCH3c	200 UCH3c	200 UCH3c	200 U4c
Ethylbenzene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Isopropylbenzene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.2
m&p-Xylene	5	ug/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2.4
Methyl-Tert-Butyl-Ether	10	ug/L	1 U	1 U	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	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	1 U	1 U
n-Propylbenzene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2.8
o-Xylene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
p-Isopropyltoluene	5	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	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	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	1 U	1 U
Toluene	5	ug/L	1 U	1 U	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	200 U	200 U	200 U	200 U	200 U	200 U	10.6
SVOCs (EPA 8270D by SIM)												
Acenaphthene	20	ug/L	0.14 UA51c	0.11 UA51c	0.1 U1c	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U1c
Acenaphthylene	- -	ug/L	0.14 UA51c	0.11 UA51c	0.1 U1c	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U1c
Anthracene	50	ug/L	0.14 UA51c	0.11 UA51c	0.1 U1c	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U1c
Benz(a)Anthracene	0.002	ug/L	0.14 UA51c	0.11 UA51c	0.1 U1c	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U1c
Benzo(a)Pyrene	- -	ug/L	0.14 UA51c	0.11 UA51c	0.1 U1c	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U1c
Benzo(b)Fluoranthene	0.002	ug/L	0.14 UA51c	0.11 UA51c	0.1 U1c	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U1c
Benzo(g,h,i)Perylene	- -	ug/L	0.14 UA51c	0.11 UA51c	0.1 U1c	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U1c
Benzo(k)Fluoranthene	0.002	ug/L	0.14 UA51c	0.11 UA51c	0.1 U1c	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U1c
Chrysene	0.002	ug/L	0.14 UA51c	0.11 UA51c	0.1 U1c	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U1c
Dibenzo(a,h)Anthracene	- -	ug/L	0.14 UA51c	0.11 UA51c	0.1 U1c	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U1c
Fluoranthene	50	ug/L	0.14 UA51c	0.11 UA51c	0.1 U1c	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U1c
Fluorene	50	ug/L	0.14 UA51c	0.11 UA51c	0.1 U1c	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U1c
Indeno(1,2,3-cd)Pyrene	0.002	ug/L	0.14 UA51c	0.11 UA51c	0.1 U1c	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U1c
Phenanthrene	50	ug/L	0.14 UA51c	0.11 UA51c	0.1 U1c	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U1c
Pyrene	50	ug/L	0.14 UA51c	0.11 UA51c	0.1 U1c	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U1c
Total SVOCs	- -	ug/L	0.14 U	0.11 U	0.1 U	0.1 U	0.099 U	0.1 U	0.1 U	0.098 U	0.1 U	0.098 U
Metals (EPA 6010B)												
Manganese	300	ug/L	**1,400**	**10,900**	**2,850**	230	**842**	152	**726**	**392**	148	**1,520**
Dissolved Metals												
Manganese	300	ug/L	22	5 U	5.7	5 U	**861**	129	**688**	**590**	5 U	**1,190**
General Chemistry												
Alkalinity, Carbonate (pH4.5)	- -	mg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Alkalinity,Bicarbonate (pH4.5)	- -	mg/L	280	490	390	480	490	350	650	480	270	560
Alkalinity,Total (CaCO3 pH4.5)	- -	mg/L	280	490	390	480	490	350	650	480	270	560
Iron, Ferrous	- -	mg/L	0.1 UH63c	0.1 UH63c	0.1 UH6H12c	0.1 UH6H12c	0.53 H6H12c	0.15 H6H12c	0.1 UH6H12c	0.1 UH6H12c	0.1 UH6H12c	2.8 H63c
Nitrogen, NO2 plus NO3	- -	mg/L	0.1 U	0.1 U	1.4	0.1 U	0.15	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Sulfate	- -	mg/L	37	10 U	65.2	20.3	58.8	38.6	745	10.9	17.1	12.1

See Notes on Page 5.

Table 3
Groundwater Analytical Data

Groundwater Sampling Summary 2019 - Second Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID: Date Collected: SDG:	NYSDEC TOGS 1 1 1 (GA Groundwater)	Units	BMW2 5/22/2019 30295911	BMW3 5/22/2019 30295911	BMW6 5/20/2019 30295374	BMW7 5/20/2019 30295374	BMW8 5/20/2019 30295374	BMW9 5/21/2019 30295649	MW-201 5/20/2019 30295374	MW-202 5/20/2019 30295374	MW-203 5/20/2019 30295374	MW-204 5/22/2019 30295911
Field Parameters												
pH	- -		7.53	6.77	6.77	6.73	6.58	6.92	6.80	6.63	7.07	6.72
Temperature	- -	C	11.7	8.7	8.8	8.8	8.6	9.7	9.1	9.4	12.7	9.0
Conductivity	- -	mS/cm	0.401	.204	0.547	0.544	0.605	0.511	1.245	0.551	0.366	0.729
Dissolved Oxygen	- -	mg/L	0.64	5.28	3.35	4.65	0.67	0.00	3.74	5.01	0.07	0.07
ORP	- -	mV	36.6	118.7	78.3	113.2	26.0	-1.7	71.5	102.8	79.2	-98.5
Turbidity	- -	NTU	124	NM	33.2	12.9	4.26	1.15	7.95	3.88	36.3	13.6

See Notes on Page 5.

Table 3
Groundwater Analytical Data

Groundwater Sampling Summary 2019 - Second Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID:	NYSDEC		MW-205	MW-206	MW-207	MW-208	MW-209	MW-210	MW-211	PZ106S
Date Collected:	TOGS 1 1 1		5/21/2019	5/21/2019	5/21/2019	5/21/2019	5/22/2019	5/21/2019	5/21/2019	5/21/2019
SDG:	(GA Groundwater)	Units	30295649	30295649	30295649	30295649	30295911	30295649	30295649	30295649
VOCs (EPA 8260C)										
1,2,4-Trimethylbenzene	5	ug/L	1 U	1 U	1 U [1 U]	**30.9**	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	5	ug/L	1 U	1 U	1 U [1 U]	**20.7**	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	1 U
Ethanol	- -	ug/L	200 UCH3c	200 UCH3c	200 UCH3c [200 UCH3c]	200 UCH3c	200 U4c	200 UCH3c	200 UCH3c	200 UCH3c
Ethylbenzene	5	ug/L	1 U	1 U	1 U [1 U]	3.9	1 U	1 U	1 U	1 U
Isopropylbenzene	5	ug/L	1 U	1 U	1 U [1 U]	**5.7**	1 U	1 U	1 U	1 U
m&p-Xylene	5	ug/L	2 U	2 U	2 U [2 U]	**10.7**	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	1 U
Naphthalene	10	ug/L	2 U	2 U	2 U [2 U]	3.1	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	1 U
n-Propylbenzene	5	ug/L	1 U	1 U	1 U [1 U]	**7.3**	1 U	1 U	1 U	1 U
o-Xylene	5	ug/L	1 U	1 U	1 U [1 U]	2.2	1 U	1 U	1 U	1 U
p-Isopropyltoluene	5	ug/L	1 U	1 U	1 U [1 U]	2.3	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	1 U
Tert-Butylbenzene	5	ug/L	1 U	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	1 U
Total VOCs	- -	ug/L	200 U	200 U	200 U [200 U]	86.8	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 [0.099 U]	0.1 U	0.1 U1c	0.1 U	0.1 U1c	0.1 U
Acenaphthylene	- -	ug/L	0.1 U	0.1 U	0.1 U [0.099 U]	0.1 U	0.1 U1c	0.1 U	0.1 U1c	0.1 U
Anthracene	50	ug/L	0.1 U	0.1 U	0.1 U [0.099 U]	0.1 U	0.1 U1c	0.1 U	0.1 U1c	0.1 U
Benz(a)Anthracene	0.002	ug/L	0.1 U	0.1 U	0.1 U [0.099 U]	0.1 U	0.1 U1c	0.1 U	0.1 U1c	0.1 U
Benzo(a)Pyrene	- -	ug/L	0.1 U	0.1 U	0.1 U [0.099 U]	0.1 U	0.1 U1c	0.1 U	0.1 U1c	0.1 U
Benzo(b)Fluoranthene	0.002	ug/L	0.1 U	0.1 U	0.1 U [0.099 U]	0.1 U	0.1 U1c	0.1 U	0.1 U1c	0.1 U
Benzo(g,h,i)Perylene	- -	ug/L	0.1 U	0.1 U	0.1 U [0.099 U]	0.1 U	0.1 U1c	0.1 U	0.1 U1c	0.1 U
Benzo(k)Fluoranthene	0.002	ug/L	0.1 U	0.1 U	0.1 U [0.099 U]	0.1 U	0.1 U1c	0.1 U	0.1 U1c	0.1 U
Chrysene	0.002	ug/L	0.1 U	0.1 U	0.1 U [0.099 U]	0.1 U	0.1 U1c	0.1 U	0.1 U1c	0.1 U
Dibenzo(a,h)Anthracene	- -	ug/L	0.1 U	0.1 U	0.1 U [0.099 U]	0.1 U	0.1 U1c	0.1 U	0.1 U1c	0.1 U
Fluoranthene	50	ug/L	0.1 U	0.1 U	0.1 U [0.099 U]	0.1 U	0.1 U1c	0.1 U	0.1 U1c	0.1 U
Fluorene	50	ug/L	0.1 U	0.1 U	0.1 U [0.099 U]	0.1 U	0.1 U1c	0.1 U	0.1 U1c	0.1 U
Indeno(1,2,3-cd)Pyrene	0.002	ug/L	0.1 U	0.1 U	0.1 U [0.099 U]	0.1 U	0.1 U1c	0.1 U	0.1 U1c	0.1 U
Phenanthrene	50	ug/L	0.1 U	0.1 U	0.1 U [0.099 U]	0.1 U	0.1 U1c	0.1 U	0.1 U1c	0.1 U
Pyrene	50	ug/L	0.1 U	0.1 U	0.1 U [0.099 U]	0.1 U	0.1 U1c	0.1 U	0.1 U1c	0.1 U
Total SVOCs	- -	ug/L	0.1 U	0.1 U	0.1 U [0.099 U]	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Metals (EPA 6010B)										
Manganese	300	ug/L	44.4	28.5	**626 [628]**	**846**	117	**376**	**2,870**	**1,760**
Dissolved Metals										
Manganese	300	ug/L	29.9	6	5 U [5 U]	**966**	5 U	5.5	41.9	21.9
General Chemistry										
Alkalinity, Carbonate (pH4.5)	- -	mg/L	10 U	10 U	10 U [10 U]	10 U	10 U	10 U	10 U	10 U
Alkalinity,Bicarbonate (pH4.5)	- -	mg/L	380	270	290 [290]	540	320	330	450	400
Alkalinity,Total (CaCO3 pH4.5)	- -	mg/L	380	270	290 [290]	540	320	330	450	400
Iron, Ferrous	- -	mg/L	0.52 H6H12c	0.1 UH6H12c	0.1 UH6H12c [0.1 UH3H62c]	1.1 H6H12c	0.1 UH3H63c	0.1 UH6H12c	0.1 UH6H12c	0.1 UH6H12c
Nitrogen, NO2 plus NO3	- -	mg/L	0.1 U	0.56	0.96 [0.95]	0.1 U	1	0.12	0.1 U	0.26
Sulfate	- -	mg/L	200 U	27.8	21.5 [20.9 ML]	21.5	16.3	33.3	53.9	44.6

See Notes on Page 5.

Table 3
Groundwater Analytical Data

Groundwater Sampling Summary 2019 - Second Quarter
Northern Cold Springs Terminal
Lysander, New York

Location ID: Date Collected: SDG:	NYSDEC TOGS 1 1 1 (GA Groundwater)	Units	MW-205 5/21/2019 30295649	MW-206 5/21/2019 30295649	MW-207 5/21/2019 30295649	MW-208 5/21/2019 30295649	MW-209 5/22/2019 30295911	MW-210 5/21/2019 30295649	MW-211 5/21/2019 30295649	PZ106S 5/21/2019 30295649
Field Parameters										
pH	- -		7.01	7.35	7.33	6.80	7.32	7.15	6.98	6.86
Temperature	- -	C	9.1	9.5	9.7	9.4	8.6	10.9	8.6	10.2
Conductivity	- -	mS/cm	0.934	0.368	0.373	0.663	0.395	0.462	0.753	0.563
Dissolved Oxygen	- -	mg/L	0.21	5.32	4.82	0.12	5.04	0.01	1.84	0.55
ORP	- -	mV	-12.8	92.3	124.2	-11.7	81.0	130.1	110.8	95.2
Turbidity	- -	NTU	7.39	6.34	27.0	25.4	36.1	1.03	66.0	57.3

See Notes on Page 5.

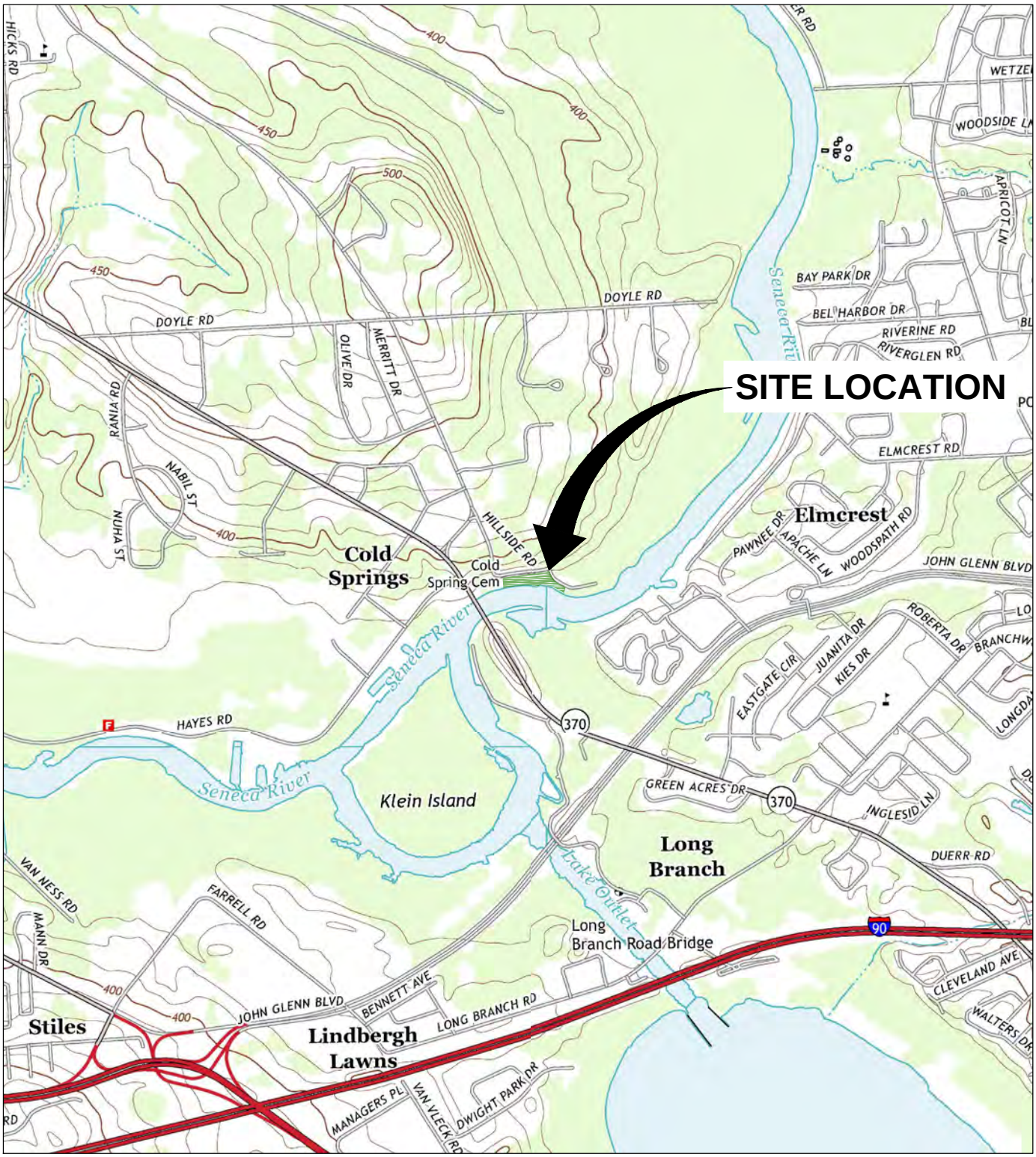
Table 3
Groundwater Analytical Data

Groundwater Sampling Summary 2019 - Second 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.
C = Celsius
mS/cm = MilliSiemens per centimeter
mg/L = Milligrams per liter
mV = Millivolt
NM= Not measured
NTU = Nephelometric turbidity unit
SVOC = Semivolatile organic compound
VOC = Volatile organic compound
ug/L = Micrograms per liter

Lab Qualifiers	Definition
A5	Greater than 5% sediment in sample determined by visual observation. Aqueous portion decanted from the sediment and extracted.
1c	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
2c	Sample pH adjusted to <2 in the lab.
3c	RF below method recommended limit.
4c	The analyte did not meet the method recommended minimum RF.
CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
H1	Analysis conducted outside the EPA method holding time.
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.
ML	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.
U	Indicates the compound was analyzed for, but not detected.

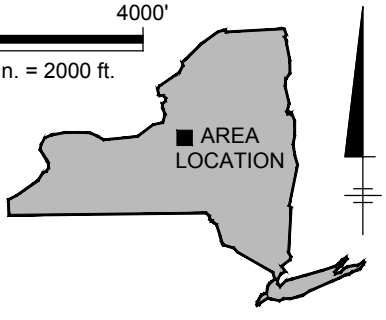
FIGURES



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.



NEW YORK

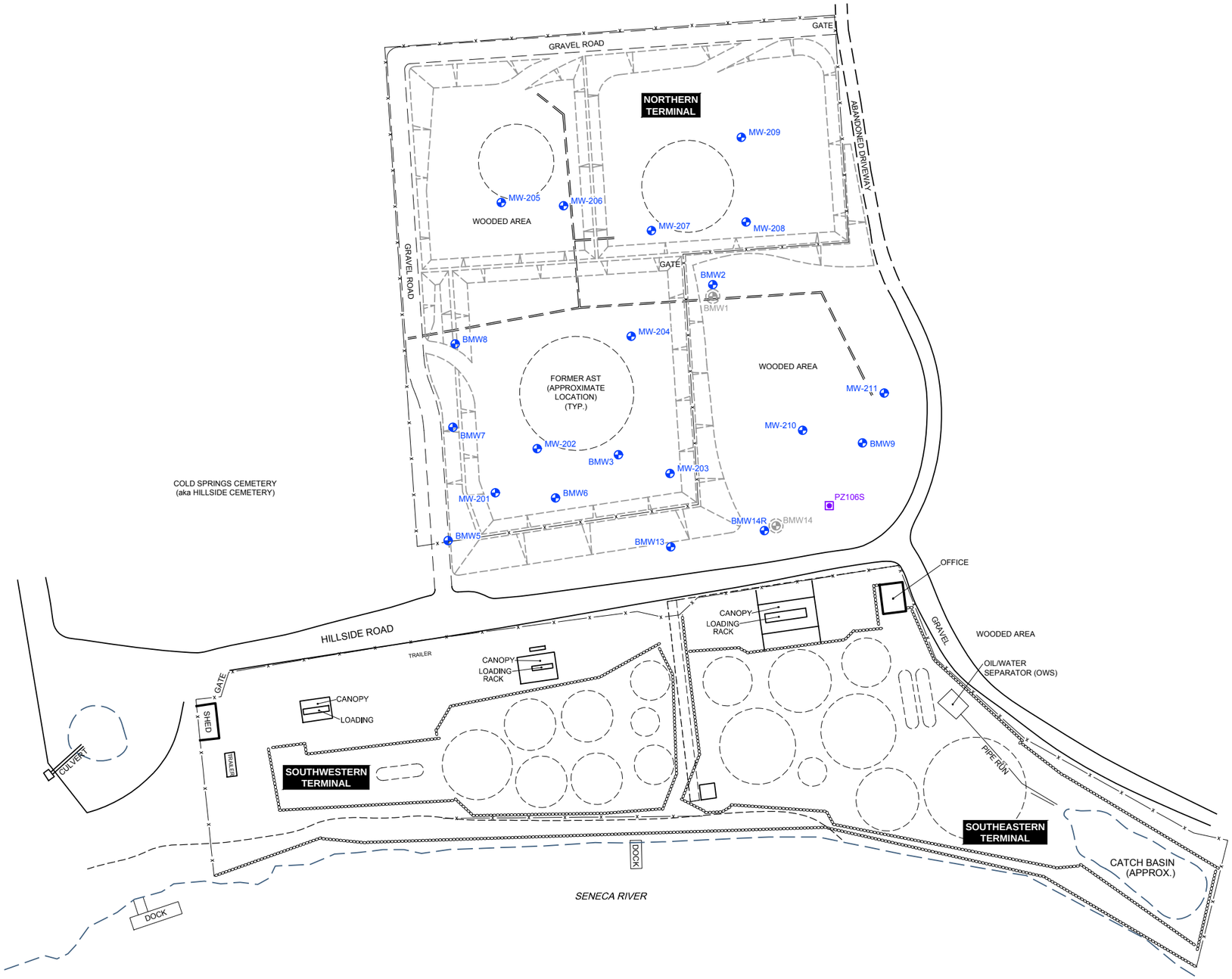
NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

GROUNDWATER SAMPLING SUMMARY
2019 - SECOND QUARTER

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1



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

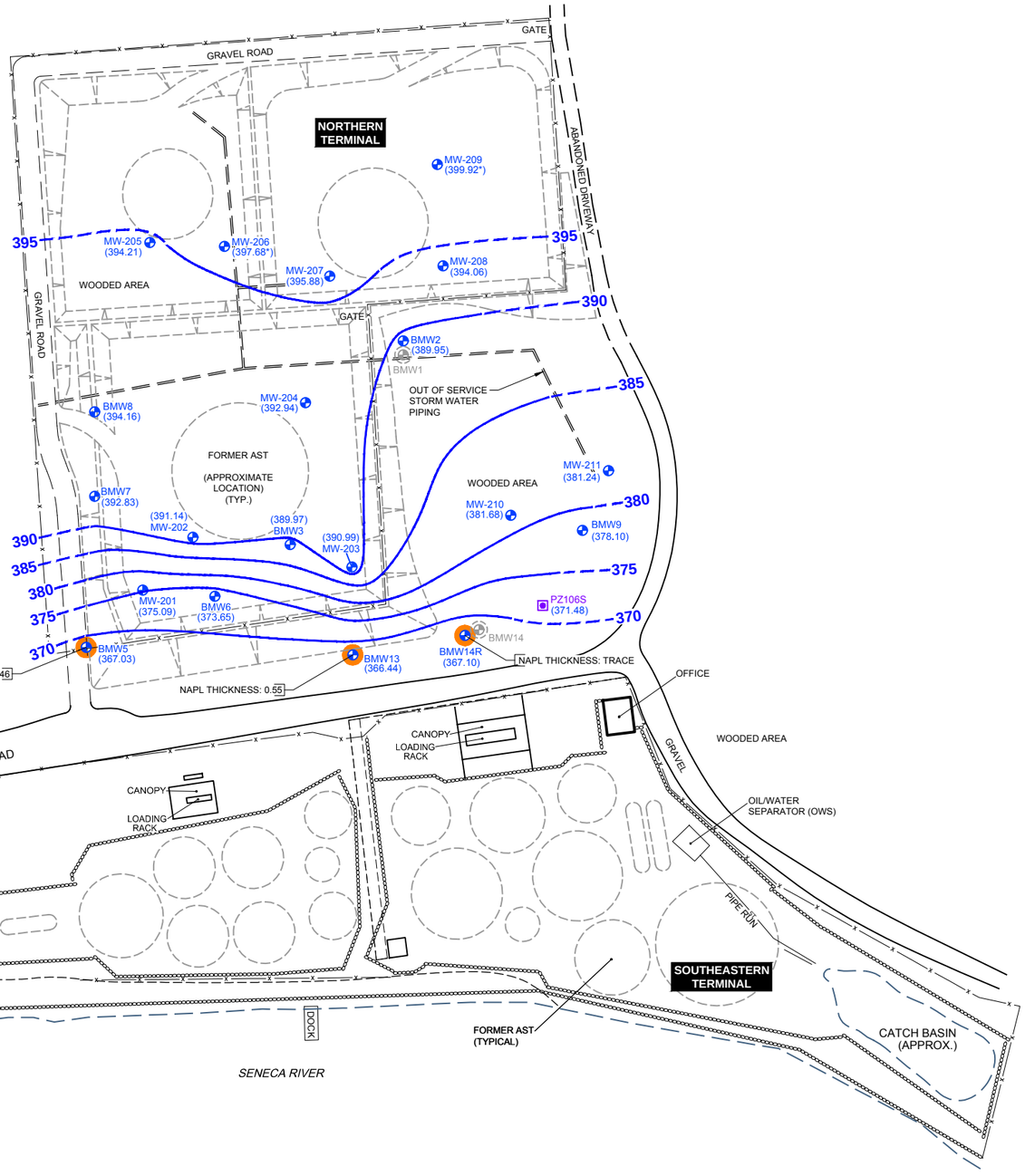
GROUNDWATER SAMPLING SUMMARY
2019 - SECOND QUARTER

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:\BIM\OneDrive - ARCADIS\BIM 360 Docs\ANA - BP AMOCO CORPORATION\Buckeye Pipeline Company\2019\B0090004.0011\01-DWG\2019Q2_Fig2_Site Map.dwg LAYOUT: 2 SAVED: 6/19/2019 9:35 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 6/19/2019 9:35 AM BY: KRAHMER, ERIC
XREFS: IMAGES: PROJECTNAME: ----
2019Q2-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)
- (378.10) 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).
5. * = WATER WAS ARTESIAN AND ABOVE WATER PIPE. DEPTH TO WATER IS UNKNOWN AND GROUNDWATER ELEVATION IS ESTIMATED.

0 100' 200'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

GROUNDWATER SAMPLING SUMMARY 2019 - SECOND 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:(Opt)ON=*;OFF=*REF*
C:\IBM\OneDrive - ARCADIS\IBM 360 Docs\ANA - BP AMOCO CORPORATION\Buckeye Pipeline Company\2019\B0090004.0011\01-DWG\2019Q2_Fig3_GW CONT.dwg LAYOUT: 3 SAVED: 6/20/2019 11:37 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 6/20/2019 11:39 AM BY: KRAHMER, ERIC
XREFS: IMAGES: PROJECTNAME: ----
2019Q2_Title Block
X-Base Map

MW-206				
Date	9/24/2018	12/3/2018	2/18/219	5/21/2019
Total VOC (ppb)	200 U	200 U [200 U]	Frozen	200 U
Total SVOC (ppb)	0.098 U	0.1 U [0.1 U]	Frozen	0.1 U

MW-207				
Date	9/24/2018	12/3/2018	2/18/2019	5/21/2019
Total VOC (ppb)	200 U	200 U	200 U [200 U]	200 U [200 U]
Total SVOC (ppb)	0.1 U	0.1 U	0.1 U [0.12 U]	0.1 U [0.099 U]

MW-209				
Date	9/24/2018	12/3/2018	2/18/2019	5/22/2019
Total VOC (ppb)	1.1 [1]	200 U	Frozen	200 U
Total SVOC (ppb)	0.099 U [0.099 U]	0.091 U	Frozen	0.1 U

MW-208				
Date	9/24/2018	12/3/2018	2/18/2019	5/21/2019
Total VOC (ppb)	202.1	58.6	94.6	86.8
Total SVOC (ppb)	0.099 U	0.091 U	0.1 U	0.1 U

MW-205				
Date	9/24/2018	12/3/2018	2/18/2019	5/21/2019
Total VOC (ppb)	6	200 U	200 U	200 U
Total SVOC (ppb)	0.1 U	0.1 U	0.1 U	0.1 U

BMW2				
Date	9/25/2018	12/4/2018	2/20/2019	5/22/2019
Total VOC (ppb)	200 U	200 U	200 U	200 U
Total SVOC (ppb)	0.1 U	0.098 U	0.1 U	0.14 U

BMW8				
Date	9/25/2018	12/4/2018	2/19/2019	5/20/2019
Total VOC (ppb)	200 U	200 U	200 U	200 U
Total SVOC (ppb)	0.098 U	0.099 U	0.1 U	0.099 U

MW-210				
Date	9/26/2018	12/4/2018	2/20/2019	5/21/2019
Total VOC (ppb)	200 U	200 U	20.3	200 U
Total SVOC (ppb)	0.13	0.098 U	0.1 U	0.1 U

MW-202				
Date	9/25/2018	12/3/2018	2/19/2019	5/20/2019
Total VOC (ppb)	Dry	Dry	200 U	200 U
Total SVOC (ppb)	Dry	Dry	0.11 U	0.098 U

MW-211				
Date	9/25/2018	12/4/2018	2/18/2019	5/21/2019
Total VOC (ppb)	200 U	200 U	200 U	200 U
Total SVOC (ppb)	0.29 U	0.098 U	0.1 U	0.1 U

BMW7				
Date	9/25/2018	12/3/2018	2/19/2019	5/20/2019
Total VOC (ppb)	Dry	Dry	200 U	200 U
Total SVOC (ppb)	Dry	Dry	0.1 U	0.1 U

BMW9				
Date	9/25/2018	12/4/2018	2/18/2019	5/21/2019
Total VOC (ppb)	Dry	200 U	200 U	200 U
Total SVOC (ppb)	Dry	0.098 U	0.1 U	0.1 U

MW-201				
Date	9/25/2018	12/3/2018	2/18/2019	5/20/2019
Total VOC (ppb)	Dry	Dry	Dry	200 U
Total SVOC (ppb)	Dry	Dry	Dry	0.1 U

PZ106S				
Date	9/25/2018	12/5/2018	2/20/2019	5/21/2019
Total VOC (ppb)	200 U	200 U	200 U	200 U
Total SVOC (ppb)	0.11 U	0.097 U	0.1 U	0.1 U

BMW5				
Date	9/25/2018	12/3/2018	2/18/2019	5/20/2019
Total VOC (ppb)	NP	NP	NP	NP
Total SVOC (ppb)	NP	NP	NP	NP

BMW14R				
Date	9/25/2018	12/5/2018	2/20/2019	5/20/2019
Total VOC (ppb)	4,757.6	4,345.8	4,156.0	NP
Total SVOC (ppb)	6.82	0.93	1.92	NP

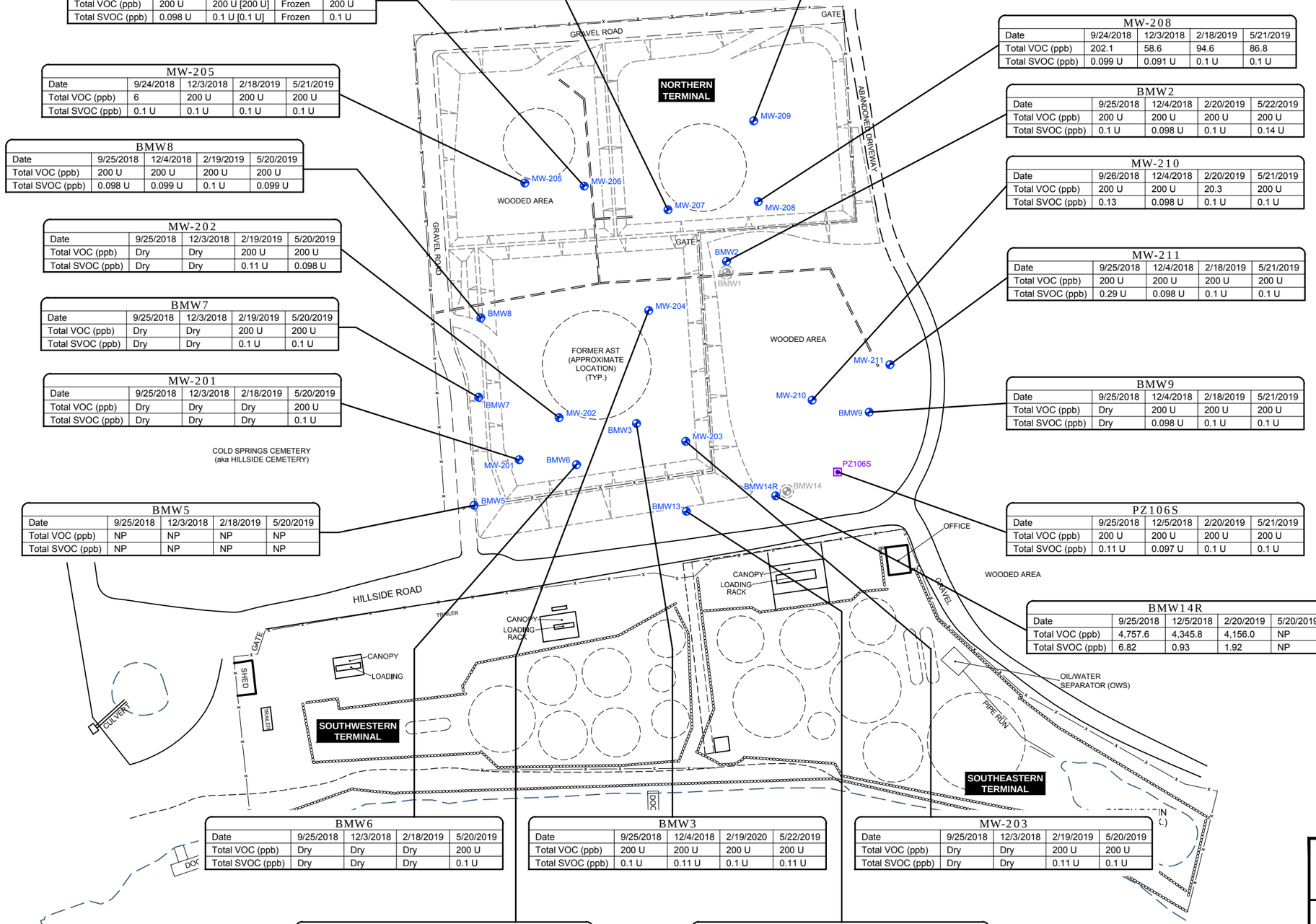
BMW6				
Date	9/25/2018	12/3/2018	2/18/2019	5/20/2019
Total VOC (ppb)	Dry	Dry	Dry	200 U
Total SVOC (ppb)	Dry	Dry	Dry	0.1 U

BMW3				
Date	9/25/2018	12/4/2018	2/19/2020	5/22/2019
Total VOC (ppb)	200 U	200 U	200 U	200 U
Total SVOC (ppb)	0.1 U	0.11 U	0.1 U	0.11 U

MW-203				
Date	9/25/2018	12/3/2018	2/19/2019	5/20/2019
Total VOC (ppb)	Dry	Dry	200 U	200 U
Total SVOC (ppb)	Dry	Dry	0.11 U	0.1 U

MW-204				
Date	9/25/2018	12/3/2018	2/18/2019	5/22/2019
Total VOC (ppb)	138.5	5.3	36.1	10.6
Total SVOC (ppb)	0.099 U	0.083 U	0.1 U	0.098 U

BMW13				
Date	9/25/2018	12/5/2018	2/18/2019	5/20/2019
Total VOC (ppb)	NP	38,276.9	NP	NP
Total SVOC (ppb)	NP	2.05	NP	NP



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. NP = NAPL PRESENT.
7. Dry/Frozen = INSUFFICIENT WATER TO COLLECT A SAMPLE.
8. FIELD DUPLICATE SAMPLE RESULTS ARE PRESENTED IN BRACKETS.

0 100' 200'

GRAPHIC SCALE

NORTHERN COLD SPRINGS TERMINAL
LYSANDER, NEW YORK

GROUNDWATER SAMPLING SUMMARY 2019 - SECOND 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:(Opt)ON="OFF=*REF*
C:\BIM\OneDrive - ARCADIS\BIM 360 Docs\ANA - BP AMOCO CORPORATION\Buckeye Pipeline Company\2019\B0090004.0011\01-DWG\2019Q2_Fig4_Databoxes.dwg LAYOUT: 4 SAVED: 6/19/2019 10:06 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED:
6/20/2019 11:49 AM BY: KRAHMER, ERIC
XREFS: IMAGES: PROJECTNAME: ---
2019Q2-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

June 04, 2019

Vin Maresco
Arcadis
6723 Towpath Road
Syracuse, NY 13214

RE: Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295374

Dear Vin Maresco:
Enclosed are the analytical results for sample(s) received by the laboratory on May 21, 2019. 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 Dissolved Gases analysis. The results of this analysis are reported on the Pace Analytical Energy Services data tables 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

REPORT OF LABORATORY ANALYSIS

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

cc: 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.: 30295374

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
Florida: Cert E871149 SEKS WET
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.: 30295374

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30295374001	**MW-201**	Water	05/20/19 10:45	05/21/19 09:30
30295374002	**MW-202**	Water	05/20/19 13:40	05/21/19 09:30
30295374003	**BMW6**	Water	05/20/19 13:45	05/21/19 09:30
30295374004	**BMW7**	Water	05/20/19 14:40	05/21/19 09:30
30295374005	**MW-203**	Water	05/20/19 15:40	05/21/19 09:30
30295374006	**BMW-8**	Water	05/20/19 16:15	05/21/19 09:30
30295374007	**Trip Blank**	Water	05/20/19 00:00	05/21/19 09:30

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.: 30295374

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30295374001	**MW-201**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295374002	**MW-202**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295374003	**BMW6**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295374004	**BMW7**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295374005	**MW-203**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-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.: 30295374

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295374006	**BMW-8**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295374007	**Trip Blank**	EPA 8260C	LEL	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.: 30295374

Sample: MW-201 **Lab ID: 30295374001** Collected: 05/20/19 10:45 Received: 05/21/19 09:30 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	**726**	ug/L	5.0	1.2	1	05/21/19 16:27	05/22/19 08:54	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**688**	ug/L	5.0	1.2	1	05/23/19 08:12	05/24/19 08:43	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	05/24/19 08:51	05/28/19 19:26	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.034	1	05/24/19 08:51	05/28/19 19:26	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 19:26	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	05/24/19 08:51	05/28/19 19:26	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	05/24/19 08:51	05/28/19 19:26	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	05/24/19 08:51	05/28/19 19:26	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	05/24/19 08:51	05/28/19 19:26	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	05/24/19 08:51	05/28/19 19:26	207-08-9	
Chrysene	ND	ug/L	0.10	0.041	1	05/24/19 08:51	05/28/19 19:26	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 19:26	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.033	1	05/24/19 08:51	05/28/19 19:26	206-44-0	
Fluorene	ND	ug/L	0.10	0.032	1	05/24/19 08:51	05/28/19 19:26	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	05/24/19 08:51	05/28/19 19:26	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.045	1	05/24/19 08:51	05/28/19 19:26	85-01-8	
Pyrene	ND	ug/L	0.10	0.037	1	05/24/19 08:51	05/28/19 19:26	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	41	%.	19-97		1	05/24/19 08:51	05/28/19 19:26	321-60-8	
Terphenyl-d14 (S)	62	%.	47-105		1	05/24/19 08:51	05/28/19 19:26	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/28/19 22:18	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 22:18	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 22:18	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 22:18	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 22:18	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 22:18	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 22:18	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 22:18	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 22:18	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 22:18	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 22:18	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 22:18	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 22:18	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 22:18	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 22:18	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 22:18	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	102	%.	78-122		1		05/28/19 22:18	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%.	80-120		1		05/28/19 22:18	17060-07-0	
Toluene-d8 (S)	99	%.	80-120		1		05/28/19 22:18	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295374

Sample: MW-201 **Lab ID: 30295374001** Collected: 05/20/19 10:45 Received: 05/21/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	99	%.	80-120		1		05/28/19 22:18	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**650**	mg/L	10.0	10.0	1		05/28/19 17:22		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:22		
Alkalinity,Total (CaCO3 pH4.5)	**650**	mg/L	10.0	1.0	1		05/28/19 17:22		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		05/21/19 18:22		2c,H1, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		05/29/19 14:22		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**745**	mg/L	100	46.7	10		05/23/19 16:56	14808-79-8	

Sample: MW-202 **Lab ID: 30295374002** Collected: 05/20/19 13:40 Received: 05/21/19 09:30 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	**392**	ug/L	5.0	1.2	1	05/21/19 16:27	05/22/19 08:46	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**590**	ug/L	5.0	1.2	1	05/23/19 08:12	05/24/19 08:46	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	05/24/19 08:51	05/28/19 19:45	83-32-9	
Acenaphthylene	ND	ug/L	0.098	0.033	1	05/24/19 08:51	05/28/19 19:45	208-96-8	
Anthracene	ND	ug/L	0.098	0.027	1	05/24/19 08:51	05/28/19 19:45	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.098	0.038	1	05/24/19 08:51	05/28/19 19:45	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.098	0.012	1	05/24/19 08:51	05/28/19 19:45	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.098	0.026	1	05/24/19 08:51	05/28/19 19:45	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.098	0.035	1	05/24/19 08:51	05/28/19 19:45	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.098	0.023	1	05/24/19 08:51	05/28/19 19:45	207-08-9	
Chrysene	ND	ug/L	0.098	0.039	1	05/24/19 08:51	05/28/19 19:45	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.098	0.027	1	05/24/19 08:51	05/28/19 19:45	53-70-3	
Fluoranthene	ND	ug/L	0.098	0.031	1	05/24/19 08:51	05/28/19 19:45	206-44-0	
Fluorene	ND	ug/L	0.098	0.030	1	05/24/19 08:51	05/28/19 19:45	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.098	0.029	1	05/24/19 08:51	05/28/19 19:45	193-39-5	
Phenanthrene	ND	ug/L	0.098	0.043	1	05/24/19 08:51	05/28/19 19:45	85-01-8	
Pyrene	ND	ug/L	0.098	0.035	1	05/24/19 08:51	05/28/19 19:45	129-00-0	

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.: 30295374

Sample: MW-202 **Lab ID: 30295374002** Collected: 05/20/19 13:40 Received: 05/21/19 09:30 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								
Surrogates									
2-Fluorobiphenyl (S)	50	%.	19-97		1	05/24/19 08:51	05/28/19 19:45	321-60-8	
Terphenyl-d14 (S)	66	%.	47-105		1	05/24/19 08:51	05/28/19 19:45	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/28/19 22:43	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 22:43	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 22:43	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 22:43	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 22:43	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 22:43	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 22:43	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 22:43	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 22:43	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 22:43	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 22:43	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 22:43	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 22:43	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 22:43	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 22:43	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 22:43	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	103	%.	78-122		1		05/28/19 22:43	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%.	80-120		1		05/28/19 22:43	17060-07-0	
Toluene-d8 (S)	98	%.	80-120		1		05/28/19 22:43	2037-26-5	
Dibromofluoromethane (S)	100	%.	80-120		1		05/28/19 22:43	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**480**	mg/L	10.0	10.0	1		05/28/19 17:24		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:24		
Alkalinity,Total (CaCO3 pH4.5)	**480**	mg/L	10.0	1.0	1		05/28/19 17:24		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		05/21/19 18:24		2c,H1, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		05/29/19 14:24		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**10.9**	mg/L	10.0	4.7	1		05/22/19 18:22	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.: 30295374

Sample: BMW6 **Lab ID: 30295374003** Collected: 05/20/19 13:45 Received: 05/21/19 09:30 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	**2850**	ug/L	25.0	5.9	1	05/21/19 16:27	05/22/19 08:56	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**5.7**	ug/L	5.0	1.2	1	05/23/19 08:12	05/24/19 08:52	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.030	1	05/24/19 08:51	05/28/19 20:05	83-32-9	1c
Acenaphthylene	ND	ug/L	0.10	0.035	1	05/24/19 08:51	05/28/19 20:05	208-96-8	1c
Anthracene	ND	ug/L	0.10	0.029	1	05/24/19 08:51	05/28/19 20:05	120-12-7	1c
Benzo(a)anthracene	ND	ug/L	0.10	0.040	1	05/24/19 08:51	05/28/19 20:05	56-55-3	1c
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	05/24/19 08:51	05/28/19 20:05	50-32-8	1c
Benzo(b)fluoranthene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 20:05	205-99-2	1c
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.037	1	05/24/19 08:51	05/28/19 20:05	191-24-2	1c
Benzo(k)fluoranthene	ND	ug/L	0.10	0.024	1	05/24/19 08:51	05/28/19 20:05	207-08-9	1c
Chrysene	ND	ug/L	0.10	0.042	1	05/24/19 08:51	05/28/19 20:05	218-01-9	1c
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.029	1	05/24/19 08:51	05/28/19 20:05	53-70-3	1c
Fluoranthene	ND	ug/L	0.10	0.033	1	05/24/19 08:51	05/28/19 20:05	206-44-0	1c
Fluorene	ND	ug/L	0.10	0.032	1	05/24/19 08:51	05/28/19 20:05	86-73-7	1c
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	05/24/19 08:51	05/28/19 20:05	193-39-5	1c
Phenanthrene	ND	ug/L	0.10	0.046	1	05/24/19 08:51	05/28/19 20:05	85-01-8	1c
Pyrene	ND	ug/L	0.10	0.038	1	05/24/19 08:51	05/28/19 20:05	129-00-0	1c
Surrogates									
2-Fluorobiphenyl (S)	67	%.	19-97		1	05/24/19 08:51	05/28/19 20:05	321-60-8	
Terphenyl-d14 (S)	56	%.	47-105		1	05/24/19 08:51	05/28/19 20:05	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/28/19 23:09	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 23:09	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 23:09	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 23:09	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 23:09	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 23:09	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 23:09	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 23:09	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 23:09	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 23:09	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 23:09	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 23:09	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 23:09	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 23:09	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 23:09	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 23:09	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	102	%.	78-122		1		05/28/19 23:09	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%.	80-120		1		05/28/19 23:09	17060-07-0	
Toluene-d8 (S)	97	%.	80-120		1		05/28/19 23:09	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295374

Sample: BMW6 **Lab ID: 30295374003** Collected: 05/20/19 13:45 Received: 05/21/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	101	%.	80-120		1		05/28/19 23:09	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**390**	mg/L	10.0	10.0	1		05/28/19 17:25		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:25		
Alkalinity,Total (CaCO3 pH4.5)	**390**	mg/L	10.0	1.0	1		05/28/19 17:25		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		05/21/19 18:25		2c,H1, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	**1.4**	mg/L	0.10	0.028	1		05/29/19 14:25		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**65.2**	mg/L	10.0	4.7	1		05/22/19 17:35	14808-79-8	

Sample: BMW7 **Lab ID: 30295374004** Collected: 05/20/19 14:40 Received: 05/21/19 09:30 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	**230**	ug/L	5.0	1.2	1	05/21/19 16:27	05/22/19 08:59	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	ND	ug/L	5.0	1.2	1	05/23/19 08:12	05/24/19 08:54	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	05/24/19 08:51	05/28/19 20:25	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.034	1	05/24/19 08:51	05/28/19 20:25	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 20:25	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	05/24/19 08:51	05/28/19 20:25	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	05/24/19 08:51	05/28/19 20:25	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	05/24/19 08:51	05/28/19 20:25	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	05/24/19 08:51	05/28/19 20:25	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	05/24/19 08:51	05/28/19 20:25	207-08-9	
Chrysene	ND	ug/L	0.10	0.041	1	05/24/19 08:51	05/28/19 20:25	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 20:25	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.033	1	05/24/19 08:51	05/28/19 20:25	206-44-0	
Fluorene	ND	ug/L	0.10	0.032	1	05/24/19 08:51	05/28/19 20:25	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	05/24/19 08:51	05/28/19 20:25	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.045	1	05/24/19 08:51	05/28/19 20:25	85-01-8	
Pyrene	ND	ug/L	0.10	0.037	1	05/24/19 08:51	05/28/19 20:25	129-00-0	

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.: 30295374

Sample: BMW7 **Lab ID: 30295374004** Collected: 05/20/19 14:40 Received: 05/21/19 09:30 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								
Surrogates									
2-Fluorobiphenyl (S)	53	%.	19-97		1	05/24/19 08:51	05/28/19 20:25	321-60-8	
Terphenyl-d14 (S)	66	%.	47-105		1	05/24/19 08:51	05/28/19 20:25	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/28/19 23:34	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 23:34	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 23:34	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 23:34	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 23:34	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 23:34	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 23:34	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 23:34	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 23:34	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 23:34	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 23:34	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 23:34	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 23:34	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 23:34	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 23:34	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 23:34	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	103	%.	78-122		1		05/28/19 23:34	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%.	80-120		1		05/28/19 23:34	17060-07-0	
Toluene-d8 (S)	98	%.	80-120		1		05/28/19 23:34	2037-26-5	
Dibromofluoromethane (S)	100	%.	80-120		1		05/28/19 23:34	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**480**	mg/L	10.0	10.0	1		05/28/19 17:26		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:26		
Alkalinity,Total (CaCO3 pH4.5)	**480**	mg/L	10.0	1.0	1		05/28/19 17:26		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		05/21/19 18:27		2c,H1, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		05/29/19 14:26		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**20.3**	mg/L	10.0	4.7	1		05/22/19 17:35	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.: 30295374

Sample: MW-203 **Lab ID: 30295374005** Collected: 05/20/19 15:40 Received: 05/21/19 09:30 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	**148**	ug/L	5.0	1.2	1	05/21/19 16:27	05/22/19 09:01	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	ND	ug/L	5.0	1.2	1	05/23/19 08:12	05/24/19 09:01	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	05/24/19 08:51	05/28/19 20:45	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.034	1	05/24/19 08:51	05/28/19 20:45	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 20:45	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	05/24/19 08:51	05/28/19 20:45	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.012	1	05/24/19 08:51	05/28/19 20:45	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	05/24/19 08:51	05/28/19 20:45	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	05/24/19 08:51	05/28/19 20:45	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	05/24/19 08:51	05/28/19 20:45	207-08-9	
Chrysene	ND	ug/L	0.10	0.040	1	05/24/19 08:51	05/28/19 20:45	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 20:45	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.032	1	05/24/19 08:51	05/28/19 20:45	206-44-0	
Fluorene	ND	ug/L	0.10	0.031	1	05/24/19 08:51	05/28/19 20:45	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.030	1	05/24/19 08:51	05/28/19 20:45	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.044	1	05/24/19 08:51	05/28/19 20:45	85-01-8	
Pyrene	ND	ug/L	0.10	0.036	1	05/24/19 08:51	05/28/19 20:45	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	73	%.	19-97		1	05/24/19 08:51	05/28/19 20:45	321-60-8	
Terphenyl-d14 (S)	75	%.	47-105		1	05/24/19 08:51	05/28/19 20:45	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/28/19 23:59	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 23:59	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 23:59	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 23:59	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 23:59	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 23:59	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 23:59	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 23:59	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 23:59	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 23:59	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 23:59	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 23:59	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 23:59	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 23:59	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 23:59	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 23:59	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	99	%.	78-122		1		05/28/19 23:59	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%.	80-120		1		05/28/19 23:59	17060-07-0	
Toluene-d8 (S)	97	%.	80-120		1		05/28/19 23:59	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295374

Sample: MW-203 **Lab ID: 30295374005** Collected: 05/20/19 15:40 Received: 05/21/19 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	102	%.	80-120		1		05/28/19 23:59	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**270**	mg/L	10.0	10.0	1		05/28/19 17:27		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:27		
Alkalinity,Total (CaCO3 pH4.5)	**270**	mg/L	10.0	1.0	1		05/28/19 17:27		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		05/21/19 18:27		2c,H1, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		05/29/19 14:28		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**17.1**	mg/L	10.0	4.7	1		05/22/19 17:37	14808-79-8	

Sample: BMW-8 **Lab ID: 30295374006** Collected: 05/20/19 16:15 Received: 05/21/19 09:30 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	**842**	ug/L	5.0	1.2	1	05/21/19 16:27	05/22/19 09:07	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**861**	ug/L	5.0	1.2	1	05/23/19 08:12	05/24/19 09:03	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	05/24/19 08:51	05/28/19 21:05	83-32-9	
Acenaphthylene	ND	ug/L	0.099	0.033	1	05/24/19 08:51	05/28/19 21:05	208-96-8	
Anthracene	ND	ug/L	0.099	0.027	1	05/24/19 08:51	05/28/19 21:05	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.099	0.038	1	05/24/19 08:51	05/28/19 21:05	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.099	0.012	1	05/24/19 08:51	05/28/19 21:05	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.099	0.027	1	05/24/19 08:51	05/28/19 21:05	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.099	0.035	1	05/24/19 08:51	05/28/19 21:05	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.099	0.023	1	05/24/19 08:51	05/28/19 21:05	207-08-9	
Chrysene	ND	ug/L	0.099	0.039	1	05/24/19 08:51	05/28/19 21:05	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.099	0.027	1	05/24/19 08:51	05/28/19 21:05	53-70-3	
Fluoranthene	ND	ug/L	0.099	0.032	1	05/24/19 08:51	05/28/19 21:05	206-44-0	
Fluorene	ND	ug/L	0.099	0.030	1	05/24/19 08:51	05/28/19 21:05	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.099	0.030	1	05/24/19 08:51	05/28/19 21:05	193-39-5	
Phenanthrene	ND	ug/L	0.099	0.043	1	05/24/19 08:51	05/28/19 21:05	85-01-8	
Pyrene	ND	ug/L	0.099	0.035	1	05/24/19 08:51	05/28/19 21:05	129-00-0	

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.: 30295374

Sample: BMW-8 **Lab ID: 30295374006** Collected: 05/20/19 16:15 Received: 05/21/19 09:30 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								
Surrogates									
2-Fluorobiphenyl (S)	65	%.	19-97		1	05/24/19 08:51	05/28/19 21:05	321-60-8	
Terphenyl-d14 (S)	77	%.	47-105		1	05/24/19 08:51	05/28/19 21:05	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/29/19 00:24	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/29/19 00:24	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/29/19 00:24	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/29/19 00:24	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/29/19 00:24	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/29/19 00:24	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/29/19 00:24	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/29/19 00:24	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/29/19 00:24	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/29/19 00:24	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/29/19 00:24	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/29/19 00:24	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/29/19 00:24	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/29/19 00:24	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/29/19 00:24	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/29/19 00:24	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	103	%.	78-122		1		05/29/19 00:24	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%.	80-120		1		05/29/19 00:24	17060-07-0	
Toluene-d8 (S)	98	%.	80-120		1		05/29/19 00:24	2037-26-5	
Dibromofluoromethane (S)	103	%.	80-120		1		05/29/19 00:24	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**490**	mg/L	10.0	10.0	1		05/28/19 17:28		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:28		
Alkalinity,Total (CaCO3 pH4.5)	**490**	mg/L	10.0	1.0	1		05/28/19 17:28		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	**0.53**	mg/L	0.10	0.020	1		05/21/19 18:29		2c,H1, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	**0.15**	mg/L	0.10	0.028	1		05/29/19 14:29		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**58.8**	mg/L	10.0	4.7	1		05/22/19 17:37	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.: 30295374

Sample: Trip Blank **Lab ID: 30295374007** Collected: 05/20/19 00:00 Received: 05/21/19 09:30 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		05/28/19 17:41	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 17:41	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 17:41	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 17:41	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 17:41	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 17:41	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 17:41	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 17:41	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 17:41	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 17:41	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 17:41	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 17:41	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 17:41	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 17:41	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 17:41	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 17:41	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	102	%.	78-122		1		05/28/19 17:41	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%.	80-120		1		05/28/19 17:41	17060-07-0	
Toluene-d8 (S)	96	%.	80-120		1		05/28/19 17:41	2037-26-5	
Dibromofluoromethane (S)	98	%.	80-120		1		05/28/19 17:41	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.: 30295374

QC Batch: 343606 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET
Associated Lab Samples: 30295374001, 30295374002, 30295374003, 30295374004, 30295374005, 30295374006

METHOD BLANK: 1671968 Matrix: Water
Associated Lab Samples: 30295374001, 30295374002, 30295374003, 30295374004, 30295374005, 30295374006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese	ug/L	ND	5.0	1.2	05/22/19 08:41	

LABORATORY CONTROL SAMPLE: 1671969

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	500	492	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1671971 1671972

Parameter	Units	30295374002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese	ug/L	392	500	500	892	874	100	97	75-125	2	20	

SAMPLE DUPLICATE: 1671970

Parameter	Units	30295374002 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese	ug/L	392	391	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.: 30295374

QC Batch: 343902 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET Dissolved
Associated Lab Samples: 30295374001, 30295374002, 30295374003, 30295374004, 30295374005, 30295374006

METHOD BLANK: 1673505 Matrix: Water
Associated Lab Samples: 30295374001, 30295374002, 30295374003, 30295374004, 30295374005, 30295374006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	1.2	05/24/19 08:09	

LABORATORY CONTROL SAMPLE: 1673506

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	500	438	88	80-120	

MATRIX SPIKE SAMPLE: 1673508

Parameter	Units	30295374002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	590	500	1060	94	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1673510 1673511

Parameter	Units	30295649005 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	5.5	500	500	513	510	101	101	75-125	1	20	

SAMPLE DUPLICATE: 1673507

Parameter	Units	30295374002 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese, Dissolved	ug/L	590	569	4	20	

SAMPLE DUPLICATE: 1673509

Parameter	Units	30295649005 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese, Dissolved	ug/L	5.5	5.8	5	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.: 30295374

QC Batch: 344479 Analysis Method: EPA 8260C
QC Batch Method: EPA 8260C Analysis Description: 8260C MSV
Associated Lab Samples: 30295374001, 30295374002, 30295374003, 30295374004, 30295374005, 30295374006, 30295374007

METHOD BLANK: 1676237 Matrix: Water
Associated Lab Samples: 30295374001, 30295374002, 30295374003, 30295374004, 30295374005, 30295374006, 30295374007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	1.0	0.25	05/28/19 17:15	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	0.21	05/28/19 17:15	
Benzene	ug/L	ND	1.0	0.24	05/28/19 17:15	
Ethanol	ug/L	ND	200	79.8	05/28/19 17:15	3c,CH
Ethylbenzene	ug/L	ND	1.0	0.31	05/28/19 17:15	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	0.24	05/28/19 17:15	
m&p-Xylene	ug/L	ND	2.0	0.60	05/28/19 17:15	
Methyl-tert-butyl ether	ug/L	ND	1.0	0.23	05/28/19 17:15	
n-Butylbenzene	ug/L	ND	1.0	0.20	05/28/19 17:15	
n-Propylbenzene	ug/L	ND	1.0	0.29	05/28/19 17:15	
Naphthalene	ug/L	ND	2.0	0.82	05/28/19 17:15	
o-Xylene	ug/L	ND	1.0	0.18	05/28/19 17:15	
p-Isopropyltoluene	ug/L	ND	1.0	0.36	05/28/19 17:15	
sec-Butylbenzene	ug/L	ND	1.0	0.25	05/28/19 17:15	
tert-Butylbenzene	ug/L	ND	1.0	0.28	05/28/19 17:15	
Toluene	ug/L	ND	1.0	0.30	05/28/19 17:15	
1,2-Dichloroethane-d4 (S)	%.	100	80-120		05/28/19 17:15	
4-Bromofluorobenzene (S)	%.	104	78-122		05/28/19 17:15	
Dibromofluoromethane (S)	%.	101	80-120		05/28/19 17:15	
Toluene-d8 (S)	%.	98	80-120		05/28/19 17:15	

LABORATORY CONTROL SAMPLE: 1676238

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	22.6	113	70-130	
1,3,5-Trimethylbenzene	ug/L	20	22.1	110	70-130	
Benzene	ug/L	20	19.5	98	70-130	
Ethanol	ug/L	200	159J	79	10-175	3c,CH
Ethylbenzene	ug/L	20	21.1	105	70-130	
Isopropylbenzene (Cumene)	ug/L	20	23.4	117	70-130	
m&p-Xylene	ug/L	40	43.0	107	70-130	
Methyl-tert-butyl ether	ug/L	20	21.3	106	70-130	
n-Butylbenzene	ug/L	20	22.0	110	71-138	
n-Propylbenzene	ug/L	20	22.3	112	70-130	
Naphthalene	ug/L	20	23.9	119	69-135	
o-Xylene	ug/L	20	20.7	103	70-130	
p-Isopropyltoluene	ug/L	20	23.4	117	70-130	
sec-Butylbenzene	ug/L	20	23.0	115	70-130	
tert-Butylbenzene	ug/L	20	23.2	116	70-130	
Toluene	ug/L	20	20.0	100	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.: 30295374

LABORATORY CONTROL SAMPLE: 1676238

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethane-d4 (S)	%.			98	80-120	
4-Bromofluorobenzene (S)	%.			102	78-122	
Dibromofluoromethane (S)	%.			102	80-120	
Toluene-d8 (S)	%.			98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1676239 1676240

Parameter	Units	30295649005 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	20.4	22.8	102	114	70-130	11	30	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	20.7	22.9	104	115	70-130	10	30	
Benzene	ug/L	ND	20	20	18.4	19.9	92	100	67-119	8	30	
Ethanol	ug/L	ND	200	200	135J	223	68	111	10-175		30	3c,CH
Ethylbenzene	ug/L	ND	20	20	19.8	21.5	99	107	69-127	8	30	
Isopropylbenzene (Cumene)	ug/L	ND	20	20	21.7	24.1	109	121	70-130	10	30	
m&p-Xylene	ug/L	ND	40	40	39.8	43.2	99	108	70-129	8	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	19.3	23.3	97	116	70-130	19	30	
n-Butylbenzene	ug/L	ND	20	20	20.3	22.5	102	113	54-128	10	30	
n-Propylbenzene	ug/L	ND	20	20	20.9	23.1	104	116	62-127	10	30	
Naphthalene	ug/L	ND	20	20	20.3	23.6	101	118	60-136	15	30	
o-Xylene	ug/L	ND	20	20	19.5	20.9	98	104	68-126	7	30	
p-Isopropyltoluene	ug/L	ND	20	20	21.7	23.9	108	120	60-125	10	30	
sec-Butylbenzene	ug/L	ND	20	20	21.7	24.0	109	120	63-125	10	30	
tert-Butylbenzene	ug/L	ND	20	20	22.2	23.9	111	120	64-124	8	30	
Toluene	ug/L	ND	20	20	18.7	20.3	93	102	70-130	8	30	
1,2-Dichloroethane-d4 (S)	%.						101	98	80-120			
4-Bromofluorobenzene (S)	%.						102	102	78-122			
Dibromofluoromethane (S)	%.						99	100	80-120			
Toluene-d8 (S)	%.						99	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.: 30295374

QC Batch: 344043 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3510C Analysis Description: 8270D Water PAH by SIM MSSV
Associated Lab Samples: 30295374001, 30295374002, 30295374003, 30295374004, 30295374005, 30295374006

METHOD BLANK: 1673979 Matrix: Water
Associated Lab Samples: 30295374001, 30295374002, 30295374003, 30295374004, 30295374005, 30295374006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Acenaphthene	ug/L	ND	0.10	0.029	05/28/19 18:46	
Acenaphthylene	ug/L	ND	0.10	0.034	05/28/19 18:46	
Anthracene	ug/L	ND	0.10	0.028	05/28/19 18:46	
Benzo(a)anthracene	ug/L	ND	0.10	0.039	05/28/19 18:46	
Benzo(a)pyrene	ug/L	ND	0.10	0.012	05/28/19 18:46	
Benzo(b)fluoranthene	ug/L	ND	0.10	0.027	05/28/19 18:46	
Benzo(g,h,i)perylene	ug/L	ND	0.10	0.035	05/28/19 18:46	
Benzo(k)fluoranthene	ug/L	ND	0.10	0.023	05/28/19 18:46	
Chrysene	ug/L	ND	0.10	0.040	05/28/19 18:46	
Dibenz(a,h)anthracene	ug/L	ND	0.10	0.028	05/28/19 18:46	
Fluoranthene	ug/L	ND	0.10	0.032	05/28/19 18:46	
Fluorene	ug/L	ND	0.10	0.031	05/28/19 18:46	
Indeno(1,2,3-cd)pyrene	ug/L	ND	0.10	0.030	05/28/19 18:46	
Phenanthrene	ug/L	ND	0.10	0.044	05/28/19 18:46	
Pyrene	ug/L	ND	0.10	0.036	05/28/19 18:46	
2-Fluorobiphenyl (S)	%.	91	19-97		05/28/19 18:46	
Terphenyl-d14 (S)	%.	94	47-105		05/28/19 18:46	

LABORATORY CONTROL SAMPLE: 1673980

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/L	2	1.5	74	34-105	
Acenaphthylene	ug/L	2	1.6	78	30-121	
Anthracene	ug/L	2	1.5	75	39-113	
Benzo(a)anthracene	ug/L	2	1.7	85	51-115	
Benzo(a)pyrene	ug/L	2	1.6	82	46-117	
Benzo(b)fluoranthene	ug/L	2	1.7	86	50-126	
Benzo(g,h,i)perylene	ug/L	2	1.7	83	48-117	
Benzo(k)fluoranthene	ug/L	2	1.7	86	52-118	
Chrysene	ug/L	2	1.7	83	55-107	
Dibenz(a,h)anthracene	ug/L	2	1.7	83	53-118	
Fluoranthene	ug/L	2	1.6	81	45-122	
Fluorene	ug/L	2	1.6	79	36-113	
Indeno(1,2,3-cd)pyrene	ug/L	2	1.7	83	52-117	
Phenanthrene	ug/L	2	1.5	77	40-109	
Pyrene	ug/L	2	1.7	83	45-122	
2-Fluorobiphenyl (S)	%.			79	19-97	
Terphenyl-d14 (S)	%.			82	47-105	

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.: 30295374

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1673981 1673982

Parameter	Units	30295649005 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	2.1	2.1	1.5	1.5	74	71	10-111	5	20	
Acenaphthylene	ug/L	ND	2.1	2.1	1.6	1.6	78	76	14-121	3	20	
Anthracene	ug/L	ND	2.1	2.1	1.6	1.6	78	78	23-108	0	20	
Benzo(a)anthracene	ug/L	ND	2.1	2.1	1.8	1.8	88	89	30-118	0	20	
Benzo(a)pyrene	ug/L	ND	2.1	2.1	1.4	1.3	67	64	10-126	4	20	
Benzo(b)fluoranthene	ug/L	ND	2.1	2.1	1.5	1.5	73	71	17-127	3	20	
Benzo(g,h,i)perylene	ug/L	ND	2.1	2.1	1.2	1.1	56	52	10-122	8	20	
Benzo(k)fluoranthene	ug/L	ND	2.1	2.1	1.4	1.3	67	63	22-118	7	20	
Chrysene	ug/L	ND	2.1	2.1	1.7	1.7	84	84	29-110	0	20	
Dibenz(a,h)anthracene	ug/L	ND	2.1	2.1	1.2	1.2	59	56	10-124	5	20	
Fluoranthene	ug/L	ND	2.1	2.1	1.8	1.8	88	87	15-134	1	20	
Fluorene	ug/L	ND	2.1	2.1	1.7	1.6	80	79	16-113	1	20	
Indeno(1,2,3-cd)pyrene	ug/L	ND	2.1	2.1	1.1	1.0	53	50	10-125	7	20	
Phenanthrene	ug/L	ND	2.1	2.1	1.6	1.6	80	80	20-112	0	20	
Pyrene	ug/L	ND	2.1	2.1	1.8	1.9	90	91	25-125	1	20	
2-Fluorobiphenyl (S)	%.						75	72	19-97		20	
Terphenyl-d14 (S)	%.						81	82	47-105		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.: 30295374

QC Batch: 344285 Analysis Method: SM 2320B-2011
QC Batch Method: SM 2320B-2011 Analysis Description: 2320B Alkalinity
Associated Lab Samples: 30295374001, 30295374002, 30295374003, 30295374004, 30295374005, 30295374006

METHOD BLANK: 1675512 Matrix: Water
Associated Lab Samples: 30295374001, 30295374002, 30295374003, 30295374004, 30295374005, 30295374006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Carbonate (pH4.5)	mg/L	ND	10.0	10.0	05/28/19 17:20	
Alkalinity,Bicarbonate (pH4.5)	mg/L	ND	10.0	10.0	05/28/19 17:20	
Alkalinity,Total (CaCO3 pH4.5)	mg/L	ND	10.0	1.0	05/28/19 17:20	

LABORATORY CONTROL SAMPLE: 1675513

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: 1676201 1676202

Parameter	Units	30295649005 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	330	50	50	380	380	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.: 30295374

QC Batch: 343608 Analysis Method: SM 3500-FeB-2011
QC Batch Method: SM 3500-FeB-2011 Analysis Description: Iron, Ferrous
Associated Lab Samples: 30295374001, 30295374002, 30295374003, 30295374004, 30295374005, 30295374006

METHOD BLANK: 1671977 Matrix: Water
Associated Lab Samples: 30295374001, 30295374002, 30295374003, 30295374004, 30295374005, 30295374006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	ND	0.10	0.020	05/21/19 18:20	H6

LABORATORY CONTROL SAMPLE: 1671978

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	1	1.0	103	90-110	H6

MATRIX SPIKE SAMPLE: 1671980

Parameter	Units	30295374006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	0.53	1	1.5	95	85-115	H1,H6

SAMPLE DUPLICATE: 1671979

Parameter	Units	30295374006 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	0.53	0.57	7	20	H1,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.: 30295374

QC Batch: 344603 Analysis Method: SM 4500NO3F-2011
QC Batch Method: SM 4500NO3F-2011 Analysis Description: SM4500NO3-F, Nitrate, Preserved
Associated Lab Samples: 30295374001, 30295374002, 30295374003, 30295374004, 30295374005, 30295374006

METHOD BLANK: 1676756 Matrix: Water
Associated Lab Samples: 30295374001, 30295374002, 30295374003, 30295374004, 30295374005, 30295374006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.028	05/29/19 13:58	

METHOD BLANK: 1676758 Matrix: Water
Associated Lab Samples: 30295374001, 30295374002, 30295374003, 30295374004, 30295374005, 30295374006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.028	05/29/19 14:00	

LABORATORY CONTROL SAMPLE: 1676757

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	4	3.9	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1676759 1676760

Parameter	Units	30294855002 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	6.4	5	5	11.6	11.6	103	102	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.: 30295374

QC Batch: 343805 Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 Analysis Description: ASTM D516-90, 02 Sulfate Water
Associated Lab Samples: 30295374001, 30295374002

METHOD BLANK: 1672956 Matrix: Water
Associated Lab Samples: 30295374001, 30295374002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	10.0	4.7	05/22/19 17:56	

METHOD BLANK: 1673138 Matrix: Water
Associated Lab Samples: 30295374001, 30295374002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	10.0	4.7	05/22/19 18:05	

LABORATORY CONTROL SAMPLE: 1672957

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	30	29.2	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1672959 1672960

Parameter	Units	30294314001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	ND	20	20	25.2	24.6	98	95	85-115	3	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.: 30295374

QC Batch: 343808 Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 Analysis Description: ASTM D516-90, 02 Sulfate Water
Associated Lab Samples: 30295374003, 30295374004, 30295374005, 30295374006

METHOD BLANK: 1672968 Matrix: Water
Associated Lab Samples: 30295374003, 30295374004, 30295374005, 30295374006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	10.0	4.7	05/22/19 17:30	

LABORATORY CONTROL SAMPLE: 1672969

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	30	29.1	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1672970 1672971

Parameter	Units	30294558001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	457	20	20	449	467	-36	50	85-115	4	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.: 30295374

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	De-Chlorinated
2c	Sample pH adjusted to <2 in the lab.
3c	The analyte did not meet the method recommended minimum RF.
CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
H1	Analysis conducted outside the EPA method holding time.
H6	Analysis initiated outside of the 15 minute EPA required holding time.

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.: 30295374

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30295374001	**MW-201**	EPA 3005A	343606	EPA 6010C	343643
30295374002	**MW-202**	EPA 3005A	343606	EPA 6010C	343643
30295374003	**BMW6**	EPA 3005A	343606	EPA 6010C	343643
30295374004	**BMW7**	EPA 3005A	343606	EPA 6010C	343643
30295374005	**MW-203**	EPA 3005A	343606	EPA 6010C	343643
30295374006	**BMW-8**	EPA 3005A	343606	EPA 6010C	343643
30295374001	**MW-201**	EPA 3005A	343902	EPA 6010C	343991
30295374002	**MW-202**	EPA 3005A	343902	EPA 6010C	343991
30295374003	**BMW6**	EPA 3005A	343902	EPA 6010C	343991
30295374004	**BMW7**	EPA 3005A	343902	EPA 6010C	343991
30295374005	**MW-203**	EPA 3005A	343902	EPA 6010C	343991
30295374006	**BMW-8**	EPA 3005A	343902	EPA 6010C	343991
30295374001	**MW-201**	EPA 3510C	344043	EPA 8270D by SIM	344200
30295374002	**MW-202**	EPA 3510C	344043	EPA 8270D by SIM	344200
30295374003	**BMW6**	EPA 3510C	344043	EPA 8270D by SIM	344200
30295374004	**BMW7**	EPA 3510C	344043	EPA 8270D by SIM	344200
30295374005	**MW-203**	EPA 3510C	344043	EPA 8270D by SIM	344200
30295374006	**BMW-8**	EPA 3510C	344043	EPA 8270D by SIM	344200
30295374001	**MW-201**	EPA 8260C	344479		
30295374002	**MW-202**	EPA 8260C	344479		
30295374003	**BMW6**	EPA 8260C	344479		
30295374004	**BMW7**	EPA 8260C	344479		
30295374005	**MW-203**	EPA 8260C	344479		
30295374006	**BMW-8**	EPA 8260C	344479		
30295374007	**Trip Blank**	EPA 8260C	344479		
30295374001	**MW-201**	SM 2320B-2011	344285		
30295374002	**MW-202**	SM 2320B-2011	344285		
30295374003	**BMW6**	SM 2320B-2011	344285		
30295374004	**BMW7**	SM 2320B-2011	344285		
30295374005	**MW-203**	SM 2320B-2011	344285		
30295374006	**BMW-8**	SM 2320B-2011	344285		
30295374001	**MW-201**	SM 3500-FeB-2011	343608		
30295374002	**MW-202**	SM 3500-FeB-2011	343608		
30295374003	**BMW6**	SM 3500-FeB-2011	343608		
30295374004	**BMW7**	SM 3500-FeB-2011	343608		
30295374005	**MW-203**	SM 3500-FeB-2011	343608		
30295374006	**BMW-8**	SM 3500-FeB-2011	343608		
30295374001	**MW-201**	SM 4500NO3F-2011	344603		
30295374002	**MW-202**	SM 4500NO3F-2011	344603		
30295374003	**BMW6**	SM 4500NO3F-2011	344603		
30295374004	**BMW7**	SM 4500NO3F-2011	344603		
30295374005	**MW-203**	SM 4500NO3F-2011	344603		
30295374006	**BMW-8**	SM 4500NO3F-2011	344603		
30295374001	**MW-201**	ASTM D516-90,02	343805		
30295374002	**MW-202**	ASTM D516-90,02	343805		

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.: 30295374

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30295374003	**BMW6**	ASTM D516-90,02	343808		
30295374004	**BMW7**	ASTM D516-90,02	343808		
30295374005	**MW-203**	ASTM D516-90,02	343808		
30295374006	**BMW-8**	ASTM D516-90,02	343808		

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

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

WO# : 30295374

30295374

Company: Arcadis	Billing Information:
Address: 110 W Fayette St Syracuse NY 13202	
Report To: Jeff Spradlin	Email To: Vin.Maresco@arcadis.com
Copy To: Vin Maresco	Site Collection Info/Address: Cold Springs Terminal Hillside Rd, Lysander
Customer Project Name/Number: Cold Springs Terminal	State: NY / County/City: Lysander Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET
Phone: / Email:	Site/Facility ID #:
Collected By (print): Austin George	Purchase Order #: B009004.0008 / 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: [X] Yes [ ] No

Field Filtered (if applicable): [ ] Yes [X] 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)

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	VOCs 8260	SVOCs 8270	Nitrate/Nitrite	Sulfate & Alkalinity, Fe Ion	Manganese, Unfiltered	Methane, CO2	Manganese, Lab Filtered			Lab Sample # / Comments
MW-201	GW	G	5/20/19	1045				11	3	2	1	1	1	2	1			001
MW-202	GW	G	5/20/19	1340				11	3	2	1	1	1	2	1			002
BMW6	GW	G	5/20/19	1345				11	3	2	1	1	1	2	1			003
BMW7	GW	G	5/20/19	1440				11	3	2	1	1	1	2	1			004
MW-203	GW	G	5/20/19	1540				11	3	2	1	1	1	2	1			005
BMW8	GW	G	5/20/19	1615				11	3	2	1	1	1	2	1			006
Trip blank	W	G	5/14/19	/				2	2									007

Analyses

Lab Profile/Line:

Lab Sample Receipt Checklist: ET 5-21-19

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
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	Y	N	NA
pH Strips: 10035581			
Sulfide Present	Y	N	NA
Lead Acetate Strips:			

LAB USE ONLY:
Lab Sample # / Comments:

BRA/ET

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: (Wet) Blue Dry None

Packing Material Used: Plastic bag bubble wrap

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

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

Lab Tracking #: 7752 6006 4784 0050

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

Lab Sample Temperature Info:
Temp Blank Received: Y N (NA)
Therm ID#: 11
Cooler 1 Temp Upon Receipt: 3.4 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 3.4 oC
Comments:

ET 5-21-19

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

Non Conformance(s): (YES) / NO

Page: _____ of: _____

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Austin George (HDe) Arcadis	5/20/19 1620	PACE	5/20/19 16:20
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
PACE	5/20/19 17:00		5-21-19 0930
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY

Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Page 53 of 54

30295374

Pace Analytical™
www.pacelabs.com

Sample Receiving Non-Conformance Form (NCF)

Date: 5-21-19	Evaluated by: ET
Client: Arcadis	

Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here

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: Sample BMW6 has Res Cl. Detected in both AG1Us
Sample BMW-7 one VOA vial 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

June 4, 2019

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

RE: **30295374**

Pace Workorder: 30439

Dear Rachel Christner:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, May 24, 2019. 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 06/04/2019
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 22

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: 30439 30295374

Lab ID	Sample ID	Matrix	Date Collected	Date Received
304390001	30295374001	Water	5/20/2019 10:45	5/24/2019 11:28
304390002	30295374002	Water	5/20/2019 13:40	5/24/2019 11:28
304390003	30295374003	Water	5/20/2019 14:40	5/24/2019 11:28
304390004	30295374004	Water	5/20/2019 15:40	5/24/2019 11:28
304390005	30295374005	Water	5/20/2019 16:15	5/24/2019 11:28
304390006	30295374006	Water	5/20/2019 16:15	5/24/2019 11:28

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

PROJECT SUMMARY

Workorder: 30439 30295374

Workorder Comments

The samples 30439 (0001-0006) were collected in an alternate container type, than that assigned to PAES method RSK175. The sample container was BAK preserved and capped with butyl septa.

Sample 30295374002 could not be analyzed for Carbon Dioxide, method AM20GAx. The volume provided for this sample was exhausted in performance of the RSK175 analysis.

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

ANALYTICAL RESULTS

Workorder: 30439 30295374

Lab ID: **304390001** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295374001** Date Collected: 5/20/2019 10:45

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**150**	mg/l	5.0	0.45	1	5/31/2019 07:17	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.13J**	ug/l	0.50	0.067	1	5/29/2019 10:27	AK	

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

ANALYTICAL RESULTS

Workorder: 30439 30295374

Lab ID: **304390002** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295374002** Date Collected: 5/20/2019 13:40

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.13J**	ug/l	0.50	0.067	1	5/29/2019 10:37	AK	

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

ANALYTICAL RESULTS

Workorder: 30439 30295374

Lab ID: **304390003** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295374003** Date Collected: 5/20/2019 14:40

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**89**	mg/l	5.0	0.45	1	5/31/2019 07:30	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.068J**	ug/l	0.50	0.067	1	5/29/2019 11:21	AK	

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

ANALYTICAL RESULTS

Workorder: 30439 30295374

Lab ID: **304390004** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295374004** Date Collected: 5/20/2019 15:40

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**100**	mg/l	5.0	0.45	1	5/31/2019 07:39	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.55**	ug/l	0.50	0.067	1	5/29/2019 11:35	AK	

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

ANALYTICAL RESULTS

Workorder: 30439 30295374

Lab ID: **304390005** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295374005** Date Collected: 5/20/2019 16:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**30**	mg/l	5.0	0.45	1	5/31/2019 07:49	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.65**	ug/l	0.50	0.067	1	5/30/2019 09:39	AK	

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

ANALYTICAL RESULTS

Workorder: 30439 30295374

Lab ID: **304390006** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295374006** Date Collected: 5/20/2019 16:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**150**	mg/l	5.0	0.45	1	5/31/2019 08:09	BW	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**1.4**	ug/l	0.50	0.067	1	5/30/2019 09:50	AK	

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

ANALYTICAL RESULTS QUALIFIERS

Workorder: 30439 30295374

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.

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

QUALITY CONTROL DATA

Workorder: 30439 30295374

QC Batch: DISG/7562 Analysis Method: EPA RSK175

QC Batch Method: EPA RSK175

Associated Lab Samples: 304390001, 304390002, 304390003, 304390004

METHOD BLANK: 61387

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Methane	ug/l	0.067U	0.067	

LABORATORY CONTROL SAMPLE & LCSD: 61388 61389

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Methane	ug/l	44	43	43	97	97	85-115	0.097	20	

SAMPLE DUPLICATE: 61390 Original: 304300002

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
RISK						
Methane	ug/l	130	130	0.28	20	

SAMPLE DUPLICATE: 61391 Original: 304390002

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
RISK						
Methane	ug/l	.13	.13	2.7	20	

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

QUALITY CONTROL DATA

Workorder: 30439 30295374

QC Batch: DISG/7564 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 304390001, 304390003, 304390004, 304390005, 304390006

METHOD BLANK: 61403

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Carbon Dioxide	mg/l	0.45U	0.45	n

LABORATORY CONTROL SAMPLE & LCSD: 61405 61407

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Carbon Dioxide	mg/l	120	110	110	92	92	80-120	0.71	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: 30439 30295374

QC Batch: DISG/7565 Analysis Method: EPA RSK175

QC Batch Method: EPA RSK175

Associated Lab Samples: 304390005, 304390006

METHOD BLANK: 61408

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Methane	ug/l	0.067U	0.067	

LABORATORY CONTROL SAMPLE & LCSD: 61409 61410

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Methane	ug/l	44	42	42	94	96	85-115	1.5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 61411 61412 Original: 304400005

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK											
Methane	ug/l	2.2	44	57	49	120	100	70-130	15	20	d

SAMPLE DUPLICATE: 61416 Original: 304500001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
RISK						
Methane	ug/l	5.7	6.1	6.2	20	

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: 30439 30295374

QUALITY CONTROL PARAMETER QUALIFIERS

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: 30439 30295374

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
304390001	30295374001			EPA RSK175	DISG/7562
304390002	30295374002			EPA RSK175	DISG/7562
304390003	30295374003			EPA RSK175	DISG/7562
304390004	30295374004			EPA RSK175	DISG/7562
304390001	30295374001			AM20GAX	DISG/7564
304390003	30295374003			AM20GAX	DISG/7564
304390004	30295374004			AM20GAX	DISG/7564
304390005	30295374005			AM20GAX	DISG/7564
304390006	30295374006			AM20GAX	DISG/7564
304390005	30295374005			EPA RSK175	DISG/7565
304390006	30295374006			EPA RSK175	DISG/7565

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.:
P.O. No: ASR- 30295374

Request Date: 5/21/19 Analysis Due Date: 5/29/2019
Shipped By: Courier

Certification Required: NY

Pace Project No.: 30295374
Report/Invoice to: Rachel Christner

Page 1 of 1

	Pace Sample ID:	Matrix:	Collection Date:	Time:	Analysis Requested:	Analytical Method:	Preservative Type:
1	30295374001	WT	5/20/19	10:45	Methane	RSK-175	BAK
2	30295374001	WT	5/20/19	10:45	Carbon Dioxide	AM20GAX	BAK
3	30295374002	WT	5/20/19	13:40	Methane	RSK-175	BAK
4	30295374002	WT	5/20/19	13:40	Carbon Dioxide	AM20GAX	BAK
5	30295374003	WT	5/20/19	14:40	Methane	RSK-175	BAK
6	30295374003	WT	5/20/19	14:40	Carbon Dioxide	AM20GAX	BAK
7	30295374004	WT	5/20/19	15:40	Methane	RSK-175	BAK
8	30295374004	WT	5/20/19	15:40	Carbon Dioxide	AM20GAX	BAK
9	30295374005	WT	5/20/19	16:15	Methane	RSK-175	BAK
10	30295374005	WT	5/20/19	16:15	Carbon Dioxide	AM20GAX	BAK
11	30295374006	WT	5/20/19		Methane	RSK-175	BAK
12	30295374006	WT	5/20/19		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 (Microseep
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: _____ PACE 5-24-19 _____ (Signature & Affiliation) (Date) (Time)
Received By: _____ (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.

Cooler Receipt Form

Client Name: _____ Project: _____ Lab Work Order: _____

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: _____ 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: _____ Date: _____

Project Manager Review: _____ Date: 5/24/19

NON-CONFORMANCE FORM

PAES Work Order #: 30137

Date: [illegible] Time of Receipt: 14:10 Receiver: [illegible]

Client: Pace

REASON FOR NON-CONFORMANCE:

Sample 003 vials time is 13:45 while COC states 14:40

Sample 004 vials time is 14:40 while COC states 15:40

Sample 005 vials time is 15:40 while COC states 16:15

Sample 006 No time & collection on COC vials time is 16:15

Only 1 vial per analysis no backup.

Headspace in samples 003, 004, 005 & 006.

ACTION TAKEN:

Client name: ______ Date: ______ Time: ______

Client emailed

Customer Service Initials: JW Date: 8-24-19

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

Joseph Ward - 30295374

From: Joseph Ward
To: Rachel Christner
Subject: 30295374

Upon receiving your samples for the project referenced above, Sample 003 vials time is 13:45 but 14:40 on the COC. Sample 004 vials time is 14:40 but 15:40 on the COC. Sample 005 Vials time is 15:40 but 16:15 on the COC. Sample 006 no time of collection on the COC but 16:15 on the vials. We also only received 1 vial per analysis, and there is headspace in samples 003, 004, 005, and 006.

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

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical™

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

WO# : 30295374

30295374

Company: Arcadis	Billing Information:
Address: 110 W Fayette St Syracuse NY 13202	
Report To: Jeff Spradlin	Email To: Vin.Maresco@arcadis.com
Copy To: Vin Maresco	Site Collection Info/Address: Hillside Rd, Lysander Cold Springs Terminal
Customer Project Name/Number: Cold Springs Terminal	State: NY / County/City: Lysander Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET
Phone: Email:	Site/Facility ID #: Compliance Monitoring? [ ] Yes [ ] No
Collected By (print): Austin George	Purchase Order #: 80090034.0008 Quote #: DW PWS ID #: DW Location Code:
Collected By (signature):	Turnaround Date Required: Immediately Packed on Ice: [X] 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 [X] 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)

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	VOCs 8260	SVOCs 8270	Nitrate / Nitrite	Sulfide & Alkalinity, Fe Ion	Manganese, Unfiltered	Methane, CO2	Manganese, Lab Filtered			Lab Profile/Line:
MW-201	GW	G	5/20/19	1045				11	3	2	1	1	1	2	1			001
MW-202	GW	G	5/20/19	1340				11	3	2	1	1	1	2	1			002
BMW6	GW	G	5/20/19	1345				11	3	2	1	1	1	2	1			003
BMW7	GW	G	5/20/19	1440				11	3	2	1	1	1	2	1			004
MW-203	GW	G	5/20/19	1540				11	3	2	1	1	1	2	1			005
BMW8	GW	G	5/20/19	1615				11	3	2	1	1	1	2	1			006
Trip blank	W	G	5/14/19	/				2	2									007

Analyses

Lab Sample Receipt Checklist: ET 5-21-19

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
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	Y	N	NA
pH Strips: 10035581			
Sulfide Present	Y	N	NA
Lead Acetate Strips:			

LAB USE ONLY:
Lab Sample # / Comments:

BRL/ET

** 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 Benzalkonium chloride

Cooler: 3 | 2 | | 1 | 0

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: (Wet) Blue Dry None

Packing Material Used: Plastic bag bubble wrap

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

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

Lab Tracking #: 7752 6660 2384 050

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

Lab Sample Temperature Info:
Temp Blank Received: Y N (NA)
Therm ID#: 11
Cooler 1 Temp Upon Receipt: 3.4 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 3.4 oC
Comments:
ET 5-21-19

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

Non Conformance(s): (YES) / NO
Page: ____ of: ____

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Austin George Arcadis	5/20/19 1620	PACE	5/20/19 16:20
PACE	5/20/19 17:00		5-21-19 0930

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

30295374

Pace Analytical™
www.pacelabs.com

Sample Receiving Non-Conformance Form (NCF)

Date: 5-21-19	Evaluated by: ET
Client: Arcadis	

Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here

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: Sample BMW4 has Res Cl. Detected in both AGIUs
Sample BMW-7 one VOA vial 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 Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 06, 2019

Vin Maresco
Arcadis
6723 Towpath Road
Syracuse, NY 13214

RE: Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295649

Dear Vin Maresco:
Enclosed are the analytical results for sample(s) received by the laboratory on May 22, 2019. 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 Methane, Carbon Dioxide analysis.

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

REPORT OF LABORATORY ANALYSIS

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.: 30295649

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
Florida: Cert E871149 SEKS WET
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.: 30295649

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30295649001	**MW-205**	Water	05/21/19 11:50	05/22/19 09:20
30295649002	**MW-206**	Water	05/21/19 13:30	05/22/19 09:20
30295649003	**MW-207**	Water	05/21/19 10:05	05/22/19 09:20
30295649004	**MW-208**	Water	05/21/19 15:00	05/22/19 09:20
30295649005	**MW-210**	Water	05/21/19 10:00	05/22/19 09:20
30295649006	**MW-211**	Water	05/21/19 11:55	05/22/19 09:20
30295649007	**BMW-9**	Water	05/21/19 15:11	05/22/19 09:20
30295649008	**PZ106S**	Water	05/21/19 13:20	05/22/19 09:20
30295649009	**DUP-052119**	Water	05/21/19 00:00	05/22/19 09:20
30295649010	**Trip Blank**	Water	05/21/19 00:00	05/22/19 09:20

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.: 30295649

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30295649001	**MW-205**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295649002	**MW-206**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295649003	**MW-207**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295649004	**MW-208**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295649005	**MW-210**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-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.: 30295649

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295649006	**MW-211**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295649007	**BMW-9**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295649008	**PZ106S**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295649009	**DUP-052119**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295649010	**Trip Blank**	EPA 8260C	LEL	20	PASI-PA

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.: 30295649

Sample: MW-205 **Lab ID: 30295649001** Collected: 05/21/19 11:50 Received: 05/22/19 09:20 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	**44.4**	ug/L	5.0	1.2	1	05/23/19 08:16	05/24/19 09:23	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**29.9**	ug/L	5.0	1.2	1	05/23/19 08:12	05/24/19 08:21	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.030	1	05/24/19 08:51	05/28/19 21:24	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.035	1	05/24/19 08:51	05/28/19 21:24	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 21:24	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.040	1	05/24/19 08:51	05/28/19 21:24	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	05/24/19 08:51	05/28/19 21:24	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 21:24	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	05/24/19 08:51	05/28/19 21:24	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.024	1	05/24/19 08:51	05/28/19 21:24	207-08-9	
Chrysene	ND	ug/L	0.10	0.041	1	05/24/19 08:51	05/28/19 21:24	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 21:24	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.033	1	05/24/19 08:51	05/28/19 21:24	206-44-0	
Fluorene	ND	ug/L	0.10	0.032	1	05/24/19 08:51	05/28/19 21:24	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	05/24/19 08:51	05/28/19 21:24	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.045	1	05/24/19 08:51	05/28/19 21:24	85-01-8	
Pyrene	ND	ug/L	0.10	0.037	1	05/24/19 08:51	05/28/19 21:24	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	60	%.	19-97		1	05/24/19 08:51	05/28/19 21:24	321-60-8	
Terphenyl-d14 (S)	74	%.	47-105		1	05/24/19 08:51	05/28/19 21:24	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/28/19 18:31	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 18:31	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 18:31	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 18:31	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 18:31	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 18:31	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 18:31	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 18:31	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 18:31	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 18:31	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 18:31	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 18:31	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 18:31	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 18:31	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 18:31	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 18:31	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	104	%.	78-122		1		05/28/19 18:31	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%.	80-120		1		05/28/19 18:31	17060-07-0	
Toluene-d8 (S)	99	%.	80-120		1		05/28/19 18:31	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295649

Sample: MW-205 **Lab ID: 30295649001** Collected: 05/21/19 11:50 Received: 05/22/19 09:20 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	102	%.	80-120		1		05/28/19 18:31	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**380**	mg/L	10.0	10.0	1		05/28/19 17:29		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:29		
Alkalinity,Total (CaCO3 pH4.5)	**380**	mg/L	10.0	1.0	1		05/28/19 17:29		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	**0.52**	mg/L	0.10	0.020	1		05/22/19 22:27		2c,H1, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		05/31/19 14:00		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	ND	mg/L	200	93.4	20		05/24/19 21:19	14808-79-8	

Sample: MW-206 **Lab ID: 30295649002** Collected: 05/21/19 13:30 Received: 05/22/19 09:20 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	**28.5**	ug/L	5.0	1.2	1	05/23/19 08:16	05/24/19 09:25	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**6.0**	ug/L	5.0	1.2	1	05/23/19 08:12	05/24/19 08:24	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.030	1	05/24/19 08:51	05/28/19 21:44	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.035	1	05/24/19 08:51	05/28/19 21:44	208-96-8	
Anthracene	ND	ug/L	0.10	0.029	1	05/24/19 08:51	05/28/19 21:44	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.040	1	05/24/19 08:51	05/28/19 21:44	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	05/24/19 08:51	05/28/19 21:44	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 21:44	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.037	1	05/24/19 08:51	05/28/19 21:44	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.024	1	05/24/19 08:51	05/28/19 21:44	207-08-9	
Chrysene	ND	ug/L	0.10	0.042	1	05/24/19 08:51	05/28/19 21:44	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.029	1	05/24/19 08:51	05/28/19 21:44	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.033	1	05/24/19 08:51	05/28/19 21:44	206-44-0	
Fluorene	ND	ug/L	0.10	0.032	1	05/24/19 08:51	05/28/19 21:44	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	05/24/19 08:51	05/28/19 21:44	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.046	1	05/24/19 08:51	05/28/19 21:44	85-01-8	
Pyrene	ND	ug/L	0.10	0.038	1	05/24/19 08:51	05/28/19 21:44	129-00-0	

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.: 30295649

Sample: MW-206 **Lab ID: 30295649002** Collected: 05/21/19 13:30 Received: 05/22/19 09:20 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								
Surrogates									
2-Fluorobiphenyl (S)	68	%.	19-97		1	05/24/19 08:51	05/28/19 21:44	321-60-8	
Terphenyl-d14 (S)	82	%.	47-105		1	05/24/19 08:51	05/28/19 21:44	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/28/19 18:57	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 18:57	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 18:57	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 18:57	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 18:57	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 18:57	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 18:57	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 18:57	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 18:57	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 18:57	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 18:57	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 18:57	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 18:57	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 18:57	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 18:57	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 18:57	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	101	%.	78-122		1		05/28/19 18:57	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%.	80-120		1		05/28/19 18:57	17060-07-0	
Toluene-d8 (S)	98	%.	80-120		1		05/28/19 18:57	2037-26-5	
Dibromofluoromethane (S)	102	%.	80-120		1		05/28/19 18:57	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**270**	mg/L	10.0	10.0	1		05/28/19 17:30		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:30		
Alkalinity,Total (CaCO3 pH4.5)	**270**	mg/L	10.0	1.0	1		05/28/19 17:30		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		05/22/19 22:29		2c,H1, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	**0.56**	mg/L	0.10	0.028	1		05/31/19 14:02		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**27.8**	mg/L	10.0	4.7	1		05/23/19 17:11	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.: 30295649

Sample: MW-207 **Lab ID: 30295649003** Collected: 05/21/19 10:05 Received: 05/22/19 09:20 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	**626**	ug/L	5.0	1.2	1	05/23/19 08:16	05/24/19 09:27	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	ND	ug/L	5.0	1.2	1	05/23/19 08:12	05/24/19 08:26	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.030	1	05/24/19 08:51	05/28/19 22:04	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.035	1	05/24/19 08:51	05/28/19 22:04	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 22:04	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.040	1	05/24/19 08:51	05/28/19 22:04	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	05/24/19 08:51	05/28/19 22:04	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 22:04	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	05/24/19 08:51	05/28/19 22:04	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.024	1	05/24/19 08:51	05/28/19 22:04	207-08-9	
Chrysene	ND	ug/L	0.10	0.041	1	05/24/19 08:51	05/28/19 22:04	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 22:04	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.033	1	05/24/19 08:51	05/28/19 22:04	206-44-0	
Fluorene	ND	ug/L	0.10	0.032	1	05/24/19 08:51	05/28/19 22:04	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	05/24/19 08:51	05/28/19 22:04	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.045	1	05/24/19 08:51	05/28/19 22:04	85-01-8	
Pyrene	ND	ug/L	0.10	0.037	1	05/24/19 08:51	05/28/19 22:04	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	53	%.	19-97		1	05/24/19 08:51	05/28/19 22:04	321-60-8	
Terphenyl-d14 (S)	61	%.	47-105		1	05/24/19 08:51	05/28/19 22:04	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/28/19 19:22	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 19:22	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 19:22	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 19:22	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 19:22	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 19:22	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 19:22	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 19:22	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 19:22	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 19:22	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 19:22	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 19:22	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 19:22	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 19:22	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 19:22	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 19:22	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	102	%.	78-122		1		05/28/19 19:22	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%.	80-120		1		05/28/19 19:22	17060-07-0	
Toluene-d8 (S)	99	%.	80-120		1		05/28/19 19:22	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295649

Sample: MW-207 **Lab ID: 30295649003** Collected: 05/21/19 10:05 Received: 05/22/19 09:20 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	100	%.	80-120		1		05/28/19 19:22	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**290**	mg/L	10.0	10.0	1		05/28/19 17:33		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:33		
Alkalinity,Total (CaCO3 pH4.5)	**290**	mg/L	10.0	1.0	1		05/28/19 17:33		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		05/22/19 22:29		2c,H1, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	**0.96**	mg/L	0.10	0.028	1		05/31/19 14:03		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**21.5**	mg/L	10.0	4.7	1		05/23/19 17:12	14808-79-8	

Sample: MW-208 **Lab ID: 30295649004** Collected: 05/21/19 15:00 Received: 05/22/19 09:20 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	**846**	ug/L	5.0	1.2	1	05/23/19 08:16	05/24/19 09:29	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**966**	ug/L	5.0	1.2	1	05/23/19 08:12	05/24/19 08:28	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.10	0.030	1	05/24/19 08:51	05/28/19 22:24	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.035	1	05/24/19 08:51	05/28/19 22:24	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 22:24	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.040	1	05/24/19 08:51	05/28/19 22:24	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	05/24/19 08:51	05/28/19 22:24	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 22:24	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	05/24/19 08:51	05/28/19 22:24	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.024	1	05/24/19 08:51	05/28/19 22:24	207-08-9	
Chrysene	ND	ug/L	0.10	0.041	1	05/24/19 08:51	05/28/19 22:24	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 22:24	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.033	1	05/24/19 08:51	05/28/19 22:24	206-44-0	
Fluorene	ND	ug/L	0.10	0.032	1	05/24/19 08:51	05/28/19 22:24	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	05/24/19 08:51	05/28/19 22:24	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.045	1	05/24/19 08:51	05/28/19 22:24	85-01-8	
Pyrene	ND	ug/L	0.10	0.037	1	05/24/19 08:51	05/28/19 22:24	129-00-0	

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.: 30295649

Sample: MW-208 **Lab ID: 30295649004** Collected: 05/21/19 15:00 Received: 05/22/19 09:20 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								
Surrogates									
2-Fluorobiphenyl (S)	58	%.	19-97		1	05/24/19 08:51	05/28/19 22:24	321-60-8	
Terphenyl-d14 (S)	68	%.	47-105		1	05/24/19 08:51	05/28/19 22:24	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/28/19 19:47	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 19:47	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 19:47	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 19:47	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 19:47	64-17-5	3c,CH
Ethylbenzene	**3.9**	ug/L	1.0	0.31	1		05/28/19 19:47	100-41-4	
Isopropylbenzene (Cumene)	**5.7**	ug/L	1.0	0.24	1		05/28/19 19:47	98-82-8	
p-Isopropyltoluene	**2.3**	ug/L	1.0	0.36	1		05/28/19 19:47	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 19:47	1634-04-4	
Naphthalene	**3.1**	ug/L	2.0	0.82	1		05/28/19 19:47	91-20-3	
n-Propylbenzene	**7.3**	ug/L	1.0	0.29	1		05/28/19 19:47	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 19:47	108-88-3	
1,2,4-Trimethylbenzene	**30.9**	ug/L	1.0	0.25	1		05/28/19 19:47	95-63-6	
1,3,5-Trimethylbenzene	**20.7**	ug/L	1.0	0.21	1		05/28/19 19:47	108-67-8	
m&p-Xylene	**10.7**	ug/L	2.0	0.60	1		05/28/19 19:47	179601-23-1	
o-Xylene	**2.2**	ug/L	1.0	0.18	1		05/28/19 19:47	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	100	%.	78-122		1		05/28/19 19:47	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%.	80-120		1		05/28/19 19:47	17060-07-0	
Toluene-d8 (S)	100	%.	80-120		1		05/28/19 19:47	2037-26-5	
Dibromofluoromethane (S)	99	%.	80-120		1		05/28/19 19:47	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**540**	mg/L	10.0	10.0	1		05/28/19 17:34		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:34		
Alkalinity,Total (CaCO3 pH4.5)	**540**	mg/L	10.0	1.0	1		05/28/19 17:34		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	**1.1**	mg/L	0.10	0.020	1		05/22/19 22:31		2c,H1, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		05/31/19 14:04		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**21.5**	mg/L	10.0	4.7	1		05/23/19 17:13	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.: 30295649

Sample: MW-210 **Lab ID: 30295649005** Collected: 05/21/19 10:00 Received: 05/22/19 09:20 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	**376**	ug/L	5.0	1.2	1	05/23/19 08:16	05/24/19 09:14	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**5.5**	ug/L	5.0	1.2	1	05/23/19 08:12	05/24/19 08:13	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	05/24/19 08:51	05/28/19 22:43	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.034	1	05/24/19 08:51	05/28/19 22:43	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 22:43	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	05/24/19 08:51	05/28/19 22:43	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	05/24/19 08:51	05/28/19 22:43	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	05/24/19 08:51	05/28/19 22:43	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	05/24/19 08:51	05/28/19 22:43	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	05/24/19 08:51	05/28/19 22:43	207-08-9	
Chrysene	ND	ug/L	0.10	0.041	1	05/24/19 08:51	05/28/19 22:43	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/28/19 22:43	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.033	1	05/24/19 08:51	05/28/19 22:43	206-44-0	
Fluorene	ND	ug/L	0.10	0.032	1	05/24/19 08:51	05/28/19 22:43	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	05/24/19 08:51	05/28/19 22:43	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.045	1	05/24/19 08:51	05/28/19 22:43	85-01-8	
Pyrene	ND	ug/L	0.10	0.037	1	05/24/19 08:51	05/28/19 22:43	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	52	%.	19-97		1	05/24/19 08:51	05/28/19 22:43	321-60-8	
Terphenyl-d14 (S)	57	%.	47-105		1	05/24/19 08:51	05/28/19 22:43	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/28/19 20:12	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 20:12	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 20:12	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 20:12	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 20:12	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 20:12	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 20:12	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 20:12	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 20:12	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 20:12	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 20:12	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 20:12	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 20:12	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 20:12	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 20:12	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 20:12	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	100	%.	78-122		1		05/28/19 20:12	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%.	80-120		1		05/28/19 20:12	17060-07-0	
Toluene-d8 (S)	97	%.	80-120		1		05/28/19 20:12	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295649

Sample: MW-210 **Lab ID: 30295649005** Collected: 05/21/19 10:00 Received: 05/22/19 09:20 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	99	%.	80-120		1		05/28/19 20:12	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**330**	mg/L	10.0	10.0	1		05/28/19 17:35		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:35		
Alkalinity,Total (CaCO3 pH4.5)	**330**	mg/L	10.0	1.0	1		05/28/19 17:35		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		05/22/19 22:32		2c,H1, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	**0.12**	mg/L	0.10	0.028	1		05/31/19 14:06		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**33.3**	mg/L	10.0	4.7	1		05/23/19 17:14	14808-79-8	

Sample: MW-211 **Lab ID: 30295649006** Collected: 05/21/19 11:55 Received: 05/22/19 09:20 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	**2870**	ug/L	5.0	1.2	1	05/23/19 08:16	05/24/19 09:36	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**41.9**	ug/L	5.0	1.2	1	05/23/19 08:12	05/24/19 08:35	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	05/24/19 08:51	05/29/19 01:21	83-32-9	1c
Acenaphthylene	ND	ug/L	0.10	0.034	1	05/24/19 08:51	05/29/19 01:21	208-96-8	1c
Anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/29/19 01:21	120-12-7	1c
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	05/24/19 08:51	05/29/19 01:21	56-55-3	1c
Benzo(a)pyrene	ND	ug/L	0.10	0.012	1	05/24/19 08:51	05/29/19 01:21	50-32-8	1c
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	05/24/19 08:51	05/29/19 01:21	205-99-2	1c
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	05/24/19 08:51	05/29/19 01:21	191-24-2	1c
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	05/24/19 08:51	05/29/19 01:21	207-08-9	1c
Chrysene	ND	ug/L	0.10	0.041	1	05/24/19 08:51	05/29/19 01:21	218-01-9	1c
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/29/19 01:21	53-70-3	1c
Fluoranthene	ND	ug/L	0.10	0.032	1	05/24/19 08:51	05/29/19 01:21	206-44-0	1c
Fluorene	ND	ug/L	0.10	0.031	1	05/24/19 08:51	05/29/19 01:21	86-73-7	1c
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.030	1	05/24/19 08:51	05/29/19 01:21	193-39-5	1c
Phenanthrene	ND	ug/L	0.10	0.044	1	05/24/19 08:51	05/29/19 01:21	85-01-8	1c
Pyrene	ND	ug/L	0.10	0.037	1	05/24/19 08:51	05/29/19 01:21	129-00-0	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: Liverpool Terminal-Cold Spring
Pace Project No.: 30295649

Sample: MW-211 **Lab ID: 30295649006** Collected: 05/21/19 11:55 Received: 05/22/19 09:20 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								
Surrogates									
2-Fluorobiphenyl (S)	59	%.	19-97		1	05/24/19 08:51	05/29/19 01:21	321-60-8	
Terphenyl-d14 (S)	65	%.	47-105		1	05/24/19 08:51	05/29/19 01:21	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/28/19 20:38	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 20:38	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 20:38	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 20:38	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 20:38	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 20:38	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 20:38	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 20:38	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 20:38	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 20:38	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 20:38	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 20:38	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 20:38	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 20:38	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 20:38	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 20:38	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	100	%.	78-122		1		05/28/19 20:38	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%.	80-120		1		05/28/19 20:38	17060-07-0	
Toluene-d8 (S)	99	%.	80-120		1		05/28/19 20:38	2037-26-5	
Dibromofluoromethane (S)	103	%.	80-120		1		05/28/19 20:38	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**450**	mg/L	10.0	10.0	1		05/28/19 17:38		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:38		
Alkalinity,Total (CaCO3 pH4.5)	**450**	mg/L	10.0	1.0	1		05/28/19 17:38		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		05/22/19 22:36		2c,H1, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		05/31/19 14:10		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**53.9**	mg/L	10.0	4.7	1		05/24/19 21:19	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.: 30295649

Sample: BMW-9 **Lab ID: 30295649007** Collected: 05/21/19 15:11 Received: 05/22/19 09:20 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	**152**	ug/L	5.0	1.2	1	05/23/19 08:16	05/24/19 09:38	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**129**	ug/L	5.0	1.2	1	05/23/19 08:12	05/24/19 08:37	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	05/24/19 08:51	05/29/19 01:41	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.034	1	05/24/19 08:51	05/29/19 01:41	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/29/19 01:41	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	05/24/19 08:51	05/29/19 01:41	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.012	1	05/24/19 08:51	05/29/19 01:41	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	05/24/19 08:51	05/29/19 01:41	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	05/24/19 08:51	05/29/19 01:41	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	05/24/19 08:51	05/29/19 01:41	207-08-9	
Chrysene	ND	ug/L	0.10	0.040	1	05/24/19 08:51	05/29/19 01:41	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/29/19 01:41	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.032	1	05/24/19 08:51	05/29/19 01:41	206-44-0	
Fluorene	ND	ug/L	0.10	0.031	1	05/24/19 08:51	05/29/19 01:41	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.030	1	05/24/19 08:51	05/29/19 01:41	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.044	1	05/24/19 08:51	05/29/19 01:41	85-01-8	
Pyrene	ND	ug/L	0.10	0.036	1	05/24/19 08:51	05/29/19 01:41	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	47	%.	19-97		1	05/24/19 08:51	05/29/19 01:41	321-60-8	
Terphenyl-d14 (S)	65	%.	47-105		1	05/24/19 08:51	05/29/19 01:41	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/28/19 21:03	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 21:03	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 21:03	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 21:03	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 21:03	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 21:03	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 21:03	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 21:03	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 21:03	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 21:03	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 21:03	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 21:03	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 21:03	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 21:03	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 21:03	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 21:03	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	100	%.	78-122		1		05/28/19 21:03	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%.	80-120		1		05/28/19 21:03	17060-07-0	
Toluene-d8 (S)	98	%.	80-120		1		05/28/19 21:03	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295649

Sample: BMW-9 **Lab ID: 30295649007** Collected: 05/21/19 15:11 Received: 05/22/19 09:20 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	101	%.	80-120		1		05/28/19 21:03	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**350**	mg/L	10.0	10.0	1		05/28/19 17:39		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:39		
Alkalinity,Total (CaCO3 pH4.5)	**350**	mg/L	10.0	1.0	1		05/28/19 17:39		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	**0.15**	mg/L	0.10	0.020	1		05/22/19 22:39		2c,H1, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		05/31/19 14:11		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**38.6**	mg/L	10.0	4.7	1		05/24/19 21:20	14808-79-8	

Sample: PZ106S **Lab ID: 30295649008** Collected: 05/21/19 13:20 Received: 05/22/19 09:20 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	**1760**	ug/L	5.0	1.2	1	05/23/19 08:16	05/24/19 09:40	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**21.9**	ug/L	5.0	1.2	1	05/23/19 08:12	05/24/19 08:39	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	05/24/19 08:51	05/29/19 02:01	83-32-9	
Acenaphthylene	ND	ug/L	0.10	0.034	1	05/24/19 08:51	05/29/19 02:01	208-96-8	
Anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/29/19 02:01	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	05/24/19 08:51	05/29/19 02:01	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	0.012	1	05/24/19 08:51	05/29/19 02:01	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	05/24/19 08:51	05/29/19 02:01	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.035	1	05/24/19 08:51	05/29/19 02:01	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	05/24/19 08:51	05/29/19 02:01	207-08-9	
Chrysene	ND	ug/L	0.10	0.040	1	05/24/19 08:51	05/29/19 02:01	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	05/24/19 08:51	05/29/19 02:01	53-70-3	
Fluoranthene	ND	ug/L	0.10	0.032	1	05/24/19 08:51	05/29/19 02:01	206-44-0	
Fluorene	ND	ug/L	0.10	0.031	1	05/24/19 08:51	05/29/19 02:01	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.030	1	05/24/19 08:51	05/29/19 02:01	193-39-5	
Phenanthrene	ND	ug/L	0.10	0.044	1	05/24/19 08:51	05/29/19 02:01	85-01-8	
Pyrene	ND	ug/L	0.10	0.036	1	05/24/19 08:51	05/29/19 02:01	129-00-0	

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.: 30295649

Sample: PZ106S **Lab ID: 30295649008** Collected: 05/21/19 13:20 Received: 05/22/19 09:20 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								
Surrogates									
2-Fluorobiphenyl (S)	48	%.	19-97		1	05/24/19 08:51	05/29/19 02:01	321-60-8	
Terphenyl-d14 (S)	57	%.	47-105		1	05/24/19 08:51	05/29/19 02:01	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/28/19 21:28	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 21:28	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 21:28	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 21:28	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 21:28	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 21:28	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 21:28	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 21:28	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 21:28	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 21:28	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 21:28	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 21:28	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 21:28	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 21:28	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 21:28	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 21:28	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	102	%.	78-122		1		05/28/19 21:28	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%.	80-120		1		05/28/19 21:28	17060-07-0	
Toluene-d8 (S)	98	%.	80-120		1		05/28/19 21:28	2037-26-5	
Dibromofluoromethane (S)	93	%.	80-120		1		05/28/19 21:28	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**400**	mg/L	10.0	10.0	1		05/28/19 17:40		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:40		
Alkalinity,Total (CaCO3 pH4.5)	**400**	mg/L	10.0	1.0	1		05/28/19 17:40		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		05/22/19 22:41		2c,H1, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	**0.26**	mg/L	0.10	0.028	1		05/31/19 14:13		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**44.6**	mg/L	10.0	4.7	1		05/24/19 21:21	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.: 30295649

Sample: DUP-052119 **Lab ID: 30295649009** Collected: 05/21/19 00:00 Received: 05/22/19 09:20 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	**628**	ug/L	5.0	1.2	1	05/23/19 08:16	05/24/19 09:43	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	ND	ug/L	5.0	1.2	1	05/23/19 08:12	05/24/19 08:41	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.099	0.029	1	05/24/19 08:51	05/29/19 02:20	83-32-9	
Acenaphthylene	ND	ug/L	0.099	0.033	1	05/24/19 08:51	05/29/19 02:20	208-96-8	
Anthracene	ND	ug/L	0.099	0.027	1	05/24/19 08:51	05/29/19 02:20	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.099	0.038	1	05/24/19 08:51	05/29/19 02:20	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.099	0.012	1	05/24/19 08:51	05/29/19 02:20	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.099	0.027	1	05/24/19 08:51	05/29/19 02:20	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.099	0.035	1	05/24/19 08:51	05/29/19 02:20	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.099	0.023	1	05/24/19 08:51	05/29/19 02:20	207-08-9	
Chrysene	ND	ug/L	0.099	0.040	1	05/24/19 08:51	05/29/19 02:20	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.099	0.027	1	05/24/19 08:51	05/29/19 02:20	53-70-3	
Fluoranthene	ND	ug/L	0.099	0.032	1	05/24/19 08:51	05/29/19 02:20	206-44-0	
Fluorene	ND	ug/L	0.099	0.031	1	05/24/19 08:51	05/29/19 02:20	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.099	0.030	1	05/24/19 08:51	05/29/19 02:20	193-39-5	
Phenanthrene	ND	ug/L	0.099	0.043	1	05/24/19 08:51	05/29/19 02:20	85-01-8	
Pyrene	ND	ug/L	0.099	0.036	1	05/24/19 08:51	05/29/19 02:20	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	74	%.	19-97		1	05/24/19 08:51	05/29/19 02:20	321-60-8	
Terphenyl-d14 (S)	80	%.	47-105		1	05/24/19 08:51	05/29/19 02:20	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/28/19 21:53	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 21:53	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 21:53	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 21:53	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 21:53	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 21:53	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 21:53	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 21:53	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 21:53	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 21:53	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 21:53	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 21:53	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 21:53	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 21:53	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 21:53	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 21:53	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	101	%.	78-122		1		05/28/19 21:53	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%.	80-120		1		05/28/19 21:53	17060-07-0	
Toluene-d8 (S)	96	%.	80-120		1		05/28/19 21:53	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295649

Sample: DUP-052119 **Lab ID: 30295649009** Collected: 05/21/19 00:00 Received: 05/22/19 09:20 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	98	%.	80-120		1		05/28/19 21:53	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**290**	mg/L	10.0	10.0	1		05/28/19 17:41		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:41		
Alkalinity,Total (CaCO3 pH4.5)	**290**	mg/L	10.0	1.0	1		05/28/19 17:41		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		05/22/19 22:41		2c,H3, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	**0.95**	mg/L	0.10	0.028	1		05/31/19 14:14		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**20.9**	mg/L	10.0	4.7	1		05/24/19 21:22	14808-79-8	ML

Sample: Trip Blank **Lab ID: 30295649010** Collected: 05/21/19 00:00 Received: 05/22/19 09:20 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		05/28/19 18:06	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 18:06	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 18:06	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 18:06	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/28/19 18:06	64-17-5	3c,CH
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 18:06	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 18:06	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 18:06	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 18:06	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 18:06	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 18:06	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 18:06	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 18:06	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 18:06	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 18:06	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 18:06	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	102	%.	78-122		1		05/28/19 18:06	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%.	80-120		1		05/28/19 18:06	17060-07-0	
Toluene-d8 (S)	97	%.	80-120		1		05/28/19 18:06	2037-26-5	
Dibromofluoromethane (S)	101	%.	80-120		1		05/28/19 18:06	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.: 30295649

QC Batch: 343903 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET
Associated Lab Samples: 30295649001, 30295649002, 30295649003, 30295649004, 30295649005, 30295649006, 30295649007, 30295649008, 30295649009

METHOD BLANK: 1673513 Matrix: Water
Associated Lab Samples: 30295649001, 30295649002, 30295649003, 30295649004, 30295649005, 30295649006, 30295649007, 30295649008, 30295649009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese	ug/L	ND	5.0	1.2	05/24/19 09:10	

LABORATORY CONTROL SAMPLE: 1673514

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	500	531	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1673516 1673517

Parameter	Units	30295649005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese	ug/L	376	500	500	908	855	106	96	75-125	6	20	

SAMPLE DUPLICATE: 1673515

Parameter	Units	30295649005 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese	ug/L	376	372	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

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295649

QC Batch: 343902 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET Dissolved
Associated Lab Samples: 30295649001, 30295649002, 30295649003, 30295649004, 30295649005, 30295649006, 30295649007, 30295649008, 30295649009

METHOD BLANK: 1673505 Matrix: Water
Associated Lab Samples: 30295649001, 30295649002, 30295649003, 30295649004, 30295649005, 30295649006, 30295649007, 30295649008, 30295649009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	1.2	05/24/19 08:09	

LABORATORY CONTROL SAMPLE: 1673506

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	500	438	88	80-120	

MATRIX SPIKE SAMPLE: 1673508

Parameter	Units	30295374002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	590	500	1060	94	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1673510 1673511

Parameter	Units	30295649005 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	5.5	500	500	513	510	101	101	75-125	1	20	

SAMPLE DUPLICATE: 1673507

Parameter	Units	30295374002 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese, Dissolved	ug/L	590	569	4	20	

SAMPLE DUPLICATE: 1673509

Parameter	Units	30295649005 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese, Dissolved	ug/L	5.5	5.8	5	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.: 30295649

QC Batch: 344479 Analysis Method: EPA 8260C
QC Batch Method: EPA 8260C Analysis Description: 8260C MSV
Associated Lab Samples: 30295649001, 30295649002, 30295649003, 30295649004, 30295649005, 30295649006, 30295649007, 30295649008, 30295649009, 30295649010

METHOD BLANK: 1676237 Matrix: Water
Associated Lab Samples: 30295649001, 30295649002, 30295649003, 30295649004, 30295649005, 30295649006, 30295649007, 30295649008, 30295649009, 30295649010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	1.0	0.25	05/28/19 17:15	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	0.21	05/28/19 17:15	
Benzene	ug/L	ND	1.0	0.24	05/28/19 17:15	
Ethanol	ug/L	ND	200	79.8	05/28/19 17:15	3c,CH
Ethylbenzene	ug/L	ND	1.0	0.31	05/28/19 17:15	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	0.24	05/28/19 17:15	
m&p-Xylene	ug/L	ND	2.0	0.60	05/28/19 17:15	
Methyl-tert-butyl ether	ug/L	ND	1.0	0.23	05/28/19 17:15	
n-Butylbenzene	ug/L	ND	1.0	0.20	05/28/19 17:15	
n-Propylbenzene	ug/L	ND	1.0	0.29	05/28/19 17:15	
Naphthalene	ug/L	ND	2.0	0.82	05/28/19 17:15	
o-Xylene	ug/L	ND	1.0	0.18	05/28/19 17:15	
p-Isopropyltoluene	ug/L	ND	1.0	0.36	05/28/19 17:15	
sec-Butylbenzene	ug/L	ND	1.0	0.25	05/28/19 17:15	
tert-Butylbenzene	ug/L	ND	1.0	0.28	05/28/19 17:15	
Toluene	ug/L	ND	1.0	0.30	05/28/19 17:15	
1,2-Dichloroethane-d4 (S)	%.	100	80-120		05/28/19 17:15	
4-Bromofluorobenzene (S)	%.	104	78-122		05/28/19 17:15	
Dibromofluoromethane (S)	%.	101	80-120		05/28/19 17:15	
Toluene-d8 (S)	%.	98	80-120		05/28/19 17:15	

LABORATORY CONTROL SAMPLE: 1676238

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	22.6	113	70-130	
1,3,5-Trimethylbenzene	ug/L	20	22.1	110	70-130	
Benzene	ug/L	20	19.5	98	70-130	
Ethanol	ug/L	200	159J	79	10-175	3c,CH
Ethylbenzene	ug/L	20	21.1	105	70-130	
Isopropylbenzene (Cumene)	ug/L	20	23.4	117	70-130	
m&p-Xylene	ug/L	40	43.0	107	70-130	
Methyl-tert-butyl ether	ug/L	20	21.3	106	70-130	
n-Butylbenzene	ug/L	20	22.0	110	71-138	
n-Propylbenzene	ug/L	20	22.3	112	70-130	
Naphthalene	ug/L	20	23.9	119	69-135	
o-Xylene	ug/L	20	20.7	103	70-130	
p-Isopropyltoluene	ug/L	20	23.4	117	70-130	
sec-Butylbenzene	ug/L	20	23.0	115	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.: 30295649

LABORATORY CONTROL SAMPLE: 1676238

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
tert-Butylbenzene	ug/L	20	23.2	116	70-130	
Toluene	ug/L	20	20.0	100	70-130	
1,2-Dichloroethane-d4 (S)	%.			98	80-120	
4-Bromofluorobenzene (S)	%.			102	78-122	
Dibromofluoromethane (S)	%.			102	80-120	
Toluene-d8 (S)	%.			98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1676239 1676240

Parameter	Units	30295649005 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	20.4	22.8	102	114	70-130	11	30	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	20.7	22.9	104	115	70-130	10	30	
Benzene	ug/L	ND	20	20	18.4	19.9	92	100	67-119	8	30	
Ethanol	ug/L	ND	200	200	135J	223	68	111	10-175		30	3c,CH
Ethylbenzene	ug/L	ND	20	20	19.8	21.5	99	107	69-127	8	30	
Isopropylbenzene (Cumene)	ug/L	ND	20	20	21.7	24.1	109	121	70-130	10	30	
m&p-Xylene	ug/L	ND	40	40	39.8	43.2	99	108	70-129	8	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	19.3	23.3	97	116	70-130	19	30	
n-Butylbenzene	ug/L	ND	20	20	20.3	22.5	102	113	54-128	10	30	
n-Propylbenzene	ug/L	ND	20	20	20.9	23.1	104	116	62-127	10	30	
Naphthalene	ug/L	ND	20	20	20.3	23.6	101	118	60-136	15	30	
o-Xylene	ug/L	ND	20	20	19.5	20.9	98	104	68-126	7	30	
p-Isopropyltoluene	ug/L	ND	20	20	21.7	23.9	108	120	60-125	10	30	
sec-Butylbenzene	ug/L	ND	20	20	21.7	24.0	109	120	63-125	10	30	
tert-Butylbenzene	ug/L	ND	20	20	22.2	23.9	111	120	64-124	8	30	
Toluene	ug/L	ND	20	20	18.7	20.3	93	102	70-130	8	30	
1,2-Dichloroethane-d4 (S)	%.						101	98	80-120			
4-Bromofluorobenzene (S)	%.						102	102	78-122			
Dibromofluoromethane (S)	%.						99	100	80-120			
Toluene-d8 (S)	%.						99	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.: 30295649

QC Batch: 344043 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3510C Analysis Description: 8270D Water PAH by SIM MSSV
Associated Lab Samples: 30295649001, 30295649002, 30295649003, 30295649004, 30295649005, 30295649006, 30295649007, 30295649008, 30295649009

METHOD BLANK: 1673979 Matrix: Water
Associated Lab Samples: 30295649001, 30295649002, 30295649003, 30295649004, 30295649005, 30295649006, 30295649007, 30295649008, 30295649009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Acenaphthene	ug/L	ND	0.10	0.029	05/28/19 18:46	
Acenaphthylene	ug/L	ND	0.10	0.034	05/28/19 18:46	
Anthracene	ug/L	ND	0.10	0.028	05/28/19 18:46	
Benzo(a)anthracene	ug/L	ND	0.10	0.039	05/28/19 18:46	
Benzo(a)pyrene	ug/L	ND	0.10	0.012	05/28/19 18:46	
Benzo(b)fluoranthene	ug/L	ND	0.10	0.027	05/28/19 18:46	
Benzo(g,h,i)perylene	ug/L	ND	0.10	0.035	05/28/19 18:46	
Benzo(k)fluoranthene	ug/L	ND	0.10	0.023	05/28/19 18:46	
Chrysene	ug/L	ND	0.10	0.040	05/28/19 18:46	
Dibenz(a,h)anthracene	ug/L	ND	0.10	0.028	05/28/19 18:46	
Fluoranthene	ug/L	ND	0.10	0.032	05/28/19 18:46	
Fluorene	ug/L	ND	0.10	0.031	05/28/19 18:46	
Indeno(1,2,3-cd)pyrene	ug/L	ND	0.10	0.030	05/28/19 18:46	
Phenanthrene	ug/L	ND	0.10	0.044	05/28/19 18:46	
Pyrene	ug/L	ND	0.10	0.036	05/28/19 18:46	
2-Fluorobiphenyl (S)	%.	91	19-97		05/28/19 18:46	
Terphenyl-d14 (S)	%.	94	47-105		05/28/19 18:46	

LABORATORY CONTROL SAMPLE: 1673980

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/L	2	1.5	74	34-105	
Acenaphthylene	ug/L	2	1.6	78	30-121	
Anthracene	ug/L	2	1.5	75	39-113	
Benzo(a)anthracene	ug/L	2	1.7	85	51-115	
Benzo(a)pyrene	ug/L	2	1.6	82	46-117	
Benzo(b)fluoranthene	ug/L	2	1.7	86	50-126	
Benzo(g,h,i)perylene	ug/L	2	1.7	83	48-117	
Benzo(k)fluoranthene	ug/L	2	1.7	86	52-118	
Chrysene	ug/L	2	1.7	83	55-107	
Dibenz(a,h)anthracene	ug/L	2	1.7	83	53-118	
Fluoranthene	ug/L	2	1.6	81	45-122	
Fluorene	ug/L	2	1.6	79	36-113	
Indeno(1,2,3-cd)pyrene	ug/L	2	1.7	83	52-117	
Phenanthrene	ug/L	2	1.5	77	40-109	
Pyrene	ug/L	2	1.7	83	45-122	
2-Fluorobiphenyl (S)	%.			79	19-97	
Terphenyl-d14 (S)	%.			82	47-105	

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.: 30295649

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1673981 1673982

Parameter	Units	30295649005 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	2.1	2.1	1.5	1.5	74	71	10-111	5	20	
Acenaphthylene	ug/L	ND	2.1	2.1	1.6	1.6	78	76	14-121	3	20	
Anthracene	ug/L	ND	2.1	2.1	1.6	1.6	78	78	23-108	0	20	
Benzo(a)anthracene	ug/L	ND	2.1	2.1	1.8	1.8	88	89	30-118	0	20	
Benzo(a)pyrene	ug/L	ND	2.1	2.1	1.4	1.3	67	64	10-126	4	20	
Benzo(b)fluoranthene	ug/L	ND	2.1	2.1	1.5	1.5	73	71	17-127	3	20	
Benzo(g,h,i)perylene	ug/L	ND	2.1	2.1	1.2	1.1	56	52	10-122	8	20	
Benzo(k)fluoranthene	ug/L	ND	2.1	2.1	1.4	1.3	67	63	22-118	7	20	
Chrysene	ug/L	ND	2.1	2.1	1.7	1.7	84	84	29-110	0	20	
Dibenz(a,h)anthracene	ug/L	ND	2.1	2.1	1.2	1.2	59	56	10-124	5	20	
Fluoranthene	ug/L	ND	2.1	2.1	1.8	1.8	88	87	15-134	1	20	
Fluorene	ug/L	ND	2.1	2.1	1.7	1.6	80	79	16-113	1	20	
Indeno(1,2,3-cd)pyrene	ug/L	ND	2.1	2.1	1.1	1.0	53	50	10-125	7	20	
Phenanthrene	ug/L	ND	2.1	2.1	1.6	1.6	80	80	20-112	0	20	
Pyrene	ug/L	ND	2.1	2.1	1.8	1.9	90	91	25-125	1	20	
2-Fluorobiphenyl (S)	%.						75	72	19-97		20	
Terphenyl-d14 (S)	%.						81	82	47-105		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.: 30295649

QC Batch: 344285 Analysis Method: SM 2320B-2011
QC Batch Method: SM 2320B-2011 Analysis Description: 2320B Alkalinity
Associated Lab Samples: 30295649001, 30295649002, 30295649003, 30295649004, 30295649005, 30295649006, 30295649007, 30295649008, 30295649009

METHOD BLANK: 1675512 Matrix: Water
Associated Lab Samples: 30295649001, 30295649002, 30295649003, 30295649004, 30295649005, 30295649006, 30295649007, 30295649008, 30295649009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Carbonate (pH4.5)	mg/L	ND	10.0	10.0	05/28/19 17:20	
Alkalinity,Bicarbonate (pH4.5)	mg/L	ND	10.0	10.0	05/28/19 17:20	
Alkalinity,Total (CaCO3 pH4.5)	mg/L	ND	10.0	1.0	05/28/19 17:20	

LABORATORY CONTROL SAMPLE: 1675513

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: 1676201 1676202

Parameter	Units	30295649005 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	330	50	50	380	380	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.: 30295649

QC Batch: 343879 Analysis Method: SM 3500-FeB-2011
QC Batch Method: SM 3500-FeB-2011 Analysis Description: Iron, Ferrous
Associated Lab Samples: 30295649001, 30295649002, 30295649003, 30295649004, 30295649005, 30295649006, 30295649007, 30295649008, 30295649009

METHOD BLANK: 1673367 Matrix: Water
Associated Lab Samples: 30295649001, 30295649002, 30295649003, 30295649004, 30295649005, 30295649006, 30295649007, 30295649008, 30295649009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	ND	0.10	0.020	05/22/19 22:25	H6

LABORATORY CONTROL SAMPLE: 1673368

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	1	0.98	98	90-110	H6

MATRIX SPIKE SAMPLE: 1673369

Parameter	Units	30295649005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	ND	1	0.98	98	85-115	H1,H6

MATRIX SPIKE SAMPLE: 1673370

Parameter	Units	30295649005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	ND	1	0.99	99	85-115	H1,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.: 30295649

QC Batch: 345007 Analysis Method: SM 4500NO3F-2011
QC Batch Method: SM 4500NO3F-2011 Analysis Description: SM4500NO3-F, Nitrate, Preserved
Associated Lab Samples: 30295649001, 30295649002, 30295649003, 30295649004, 30295649005, 30295649006, 30295649007, 30295649008, 30295649009

METHOD BLANK: 1678631 Matrix: Water
Associated Lab Samples: 30295649001, 30295649002, 30295649003, 30295649004, 30295649005, 30295649006, 30295649007, 30295649008, 30295649009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.028	05/31/19 13:58	

LABORATORY CONTROL SAMPLE: 1678632

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	4	4.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1678633 1678634

Parameter	Units	30295649005 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	0.12	5	5	5.3	5.4	104	105	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

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295649

QC Batch: 344024 Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 Analysis Description: ASTM D516-90, 02 Sulfate Water
Associated Lab Samples: 30295649002, 30295649003, 30295649004, 30295649005

METHOD BLANK: 1673920 Matrix: Water
Associated Lab Samples: 30295649002, 30295649003, 30295649004, 30295649005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	10.0	4.7	05/23/19 17:02	

LABORATORY CONTROL SAMPLE: 1673921

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	30	28.9	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1673922 1673923

Parameter	Units	30295649005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	33.3	20	20	52.0	51.3	94	90	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

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295649

QC Batch: 344026 Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 Analysis Description: ASTM D516-90, 02 Sulfate Water
Associated Lab Samples: 30295649001, 30295649006, 30295649007, 30295649008, 30295649009

METHOD BLANK: 1673930 Matrix: Water
Associated Lab Samples: 30295649001, 30295649006, 30295649007, 30295649008, 30295649009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	10.0	4.7	05/24/19 21:17	

LABORATORY CONTROL SAMPLE: 1673931

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	30	30.2	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1674417 1674418

Parameter	Units	30295649009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	20.9	20	20	35.2	38.0	72	86	85-115	7	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: Liverpool Terminal-Cold Spring
Pace Project No.: 30295649

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	De-Chlorinated
2c	Sample pH adjusted to <2 in the lab.
3c	The analyte did not meet the method recommended minimum RF.
CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
H1	Analysis conducted outside the EPA method holding time.
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.
ML	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result 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.: 30295649

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30295649001	**MW-205**	EPA 3005A	343903	EPA 6010C	343992
30295649002	**MW-206**	EPA 3005A	343903	EPA 6010C	343992
30295649003	**MW-207**	EPA 3005A	343903	EPA 6010C	343992
30295649004	**MW-208**	EPA 3005A	343903	EPA 6010C	343992
30295649005	**MW-210**	EPA 3005A	343903	EPA 6010C	343992
30295649006	**MW-211**	EPA 3005A	343903	EPA 6010C	343992
30295649007	**BMW-9**	EPA 3005A	343903	EPA 6010C	343992
30295649008	**PZ106S**	EPA 3005A	343903	EPA 6010C	343992
30295649009	**DUP-052119**	EPA 3005A	343903	EPA 6010C	343992
30295649001	**MW-205**	EPA 3005A	343902	EPA 6010C	343991
30295649002	**MW-206**	EPA 3005A	343902	EPA 6010C	343991
30295649003	**MW-207**	EPA 3005A	343902	EPA 6010C	343991
30295649004	**MW-208**	EPA 3005A	343902	EPA 6010C	343991
30295649005	**MW-210**	EPA 3005A	343902	EPA 6010C	343991
30295649006	**MW-211**	EPA 3005A	343902	EPA 6010C	343991
30295649007	**BMW-9**	EPA 3005A	343902	EPA 6010C	343991
30295649008	**PZ106S**	EPA 3005A	343902	EPA 6010C	343991
30295649009	**DUP-052119**	EPA 3005A	343902	EPA 6010C	343991
30295649001	**MW-205**	EPA 3510C	344043	EPA 8270D by SIM	344200
30295649002	**MW-206**	EPA 3510C	344043	EPA 8270D by SIM	344200
30295649003	**MW-207**	EPA 3510C	344043	EPA 8270D by SIM	344200
30295649004	**MW-208**	EPA 3510C	344043	EPA 8270D by SIM	344200
30295649005	**MW-210**	EPA 3510C	344043	EPA 8270D by SIM	344200
30295649006	**MW-211**	EPA 3510C	344043	EPA 8270D by SIM	344200
30295649007	**BMW-9**	EPA 3510C	344043	EPA 8270D by SIM	344200
30295649008	**PZ106S**	EPA 3510C	344043	EPA 8270D by SIM	344200
30295649009	**DUP-052119**	EPA 3510C	344043	EPA 8270D by SIM	344200
30295649001	**MW-205**	EPA 8260C	344479		
30295649002	**MW-206**	EPA 8260C	344479		
30295649003	**MW-207**	EPA 8260C	344479		
30295649004	**MW-208**	EPA 8260C	344479		
30295649005	**MW-210**	EPA 8260C	344479		
30295649006	**MW-211**	EPA 8260C	344479		
30295649007	**BMW-9**	EPA 8260C	344479		
30295649008	**PZ106S**	EPA 8260C	344479		
30295649009	**DUP-052119**	EPA 8260C	344479		
30295649010	**Trip Blank**	EPA 8260C	344479		
30295649001	**MW-205**	SM 2320B-2011	344285		
30295649002	**MW-206**	SM 2320B-2011	344285		
30295649003	**MW-207**	SM 2320B-2011	344285		
30295649004	**MW-208**	SM 2320B-2011	344285		
30295649005	**MW-210**	SM 2320B-2011	344285		
30295649006	**MW-211**	SM 2320B-2011	344285		
30295649007	**BMW-9**	SM 2320B-2011	344285		
30295649008	**PZ106S**	SM 2320B-2011	344285		
30295649009	**DUP-052119**	SM 2320B-2011	344285		

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.: 30295649

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30295649001	**MW-205**	SM 3500-FeB-2011	343879		
30295649002	**MW-206**	SM 3500-FeB-2011	343879		
30295649003	**MW-207**	SM 3500-FeB-2011	343879		
30295649004	**MW-208**	SM 3500-FeB-2011	343879		
30295649005	**MW-210**	SM 3500-FeB-2011	343879		
30295649006	**MW-211**	SM 3500-FeB-2011	343879		
30295649007	**BMW-9**	SM 3500-FeB-2011	343879		
30295649008	**PZ106S**	SM 3500-FeB-2011	343879		
30295649009	**DUP-052119**	SM 3500-FeB-2011	343879		
30295649001	**MW-205**	SM 4500NO3F-2011	345007		
30295649002	**MW-206**	SM 4500NO3F-2011	345007		
30295649003	**MW-207**	SM 4500NO3F-2011	345007		
30295649004	**MW-208**	SM 4500NO3F-2011	345007		
30295649005	**MW-210**	SM 4500NO3F-2011	345007		
30295649006	**MW-211**	SM 4500NO3F-2011	345007		
30295649007	**BMW-9**	SM 4500NO3F-2011	345007		
30295649008	**PZ106S**	SM 4500NO3F-2011	345007		
30295649009	**DUP-052119**	SM 4500NO3F-2011	345007		
30295649001	**MW-205**	ASTM D516-90,02	344026		
30295649002	**MW-206**	ASTM D516-90,02	344024		
30295649003	**MW-207**	ASTM D516-90,02	344024		
30295649004	**MW-208**	ASTM D516-90,02	344024		
30295649005	**MW-210**	ASTM D516-90,02	344024		
30295649006	**MW-211**	ASTM D516-90,02	344026		
30295649007	**BMW-9**	ASTM D516-90,02	344026		
30295649008	**PZ106S**	ASTM D516-90,02	344026		
30295649009	**DUP-052119**	ASTM D516-90,02	344026		

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical

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

LAB USE ONLY- Aff

WO# : 30295649

30295649

ALL S

Company: Arcadis	Billing Information:
Address: 110 W Fayette St Syracuse NY 13202	
Report To: PJ Hart	Email To: vin.maresco@arcadis.com
Copy To: Vin Maresco	Site Collection Info/Address: Cold Springs Terminal / Lysander NY
Customer Project Name/Number: Cold Springs Terminal	State: NY / County/City: Onondaga / Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: / Email:	Site/Facility ID #:
Collected By (print): Austin George	Purchase Order #: 30090041.0008 / 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 [X] No / Analysis:

Container Preservative Type **: 3 | 2 | | 1 | | 0 | | | | | 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 Benzalkonium Chloride

* 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)

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	VOCs 8260D	SVOCs 8270D	Nitrate Nitrite	Sulfide + Alkalinity, Ferrous Iron	Manganese, Unfiltered	Manganese, Lab Filtered	Methane, CO2			Lab Profile/Line:
MW-205	GW	G	5/21/19	1150				11	3	2	1	1	1	1	2			001
MW-206	GW	G	5/21/19	1330				11	3	2	1	1	1	1	2			002
MW-207	GW	G	5/21/19	1005				11	3	2	1	1	1	1	2			003
MW-208	GW	G	5/21/19	1500				11	3	2	1	1	1	1	2			004
MW-210	GW	G	5/21/19	1000				11	3	2	1	1	1	1	2			005
MW-210 MS/MSD	GW	G	5/21/19	1060				22	6	4	2	2	2	2	4			1
MW-211	GW	G	5/21/19	1155				11	3	2	1	1	1	1	2			006
BMW-9	GW	G	5/21/19	1511				11	3	2	1	1	1	1	2			007
PZ1065	GW	G	5/21/19	1320				11	3	2	1	1	1	1	2			008
DUP-052119	GW	G	5/21/19					11	3	2	1	1	1	1	2			009

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
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	(Y) N NA
pH Strips: 100181	
Sulfide Present	Y N (NA)
Lead Acetate Strips:	

LAB USE ONLY:
Lab Sample # / Comments:

BAM / ET

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: (Wet) Blue Dry None

Packing Material Used: Bubble wrap, Plastic bag, + ice

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

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

Lab Tracking #: 782771414852384052

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

Lab Sample Temperature Info:
Temp Blank Received: Y N (NA)
Therm ID#: 11
Cooler 1 Temp Upon Receipt: 9.1 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 9.1 oC
Comments:
ET 5-22-19

Relinquished by/Company: (Signature) Arcadis	Date/Time: 5/21/19 1630	Received by/Company: (Signature) PACE	Date/Time: 5/21/19 16:30
Relinquished by/Company: (Signature) PACE	Date/Time: 5/21/19 17:00	Received by/Company: (Signature)	Date/Time: 5-22-19 0820
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

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: of:

Page 63

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

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

LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here

ALL SHADED AREAS are for LAB USE ONLY

Company: Arcadis	Billing Information:
Address: 110 W Fayette St Syracuse NY 13202	
Report To: PJ Hart	Email To: Vin.Maresco@arcadis.com
Copy To: Vin Maresco	Site Collection Info/Address: Cold Springs Terminal / Lysander NY
Customer Project Name/Number: Cold Springs Terminal	State: NY County/City: Onondaga Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET
Phone: Email:	Site/Facility ID #: Compliance Monitoring? [ ] Yes [ ] No
Collected By (print): Austin George	Purchase Order #: B009004 0008 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 [X] No Analysis:

Container Preservative Type **: 3 | 2 | 1 | 0

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 Benzalkonium Chloride

* 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)

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	VOCs 8260	SVOCs 8270	Nitrate Nitrite	Sulfide, Alkalinity, Ferrous Iron	Manganese, unfiltered	Manganese, lab filtered	Methane, CO_2				Lab Sample # / Comments
Trip blank	W	/		/				2	2										See Page 1
Trip blank	W	/		/				2	2										010
																			#
																			30269

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
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	Y N NA
pH Strips:	
Sulfide Present	Y N NA
Lead Acetate Strips:	

LAB USE ONLY:

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

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

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

Lab Tracking #: 2384051

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#:

Cooler 1 Temp Upon Receipt: oC

Cooler 1 Therm Corr. Factor: oC

Cooler 1 Corrected Temp: oC

Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
	5/20/19 1630	PACE	5/21/19 16:20
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
	5/21/19 17:00		5-21-19 0920
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

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: of:

Pace Analytical™
www.pacelabs.com

Sample Receiving Non-Conformance Form (NCF)

Date: 5-22-19	Evaluated by: ET
Client: Arcadis	

Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here

30295649

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:
Sample MW-211 has Res Cl. detected in both AGIUs.

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

June 5, 2019

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

RE: **30295649**

Pace Workorder: 30440

Dear Rachel Christner:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, May 24, 2019. 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 06/05/2019
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 27

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: 30440 30295649

Lab ID	Sample ID	Matrix	Date Collected	Date Received
304400001	30295649 001	Water	5/21/2019 11:50	5/24/2019 11:28
304400002	30295649 002	Water	5/21/2019 13:30	5/24/2019 11:28
304400003	30295649 003	Water	5/21/2019 10:05	5/24/2019 11:28
304400004	30295649 004	Water	5/21/2019 15:00	5/24/2019 11:28
304400005	30295649 005	Water	5/21/2019 10:00	5/24/2019 11:28
304400006	30295649 005 MS	Water	5/21/2019 10:00	5/24/2019 11:28
304400007	30295649 005 MSD	Water	5/21/2019 10:00	5/24/2019 11:28
304400008	30295649 006	Water	5/21/2019 11:55	5/24/2019 11:28
304400009	30295649 007	Water	5/21/2019 15:11	5/24/2019 11:28
304400010	30295649 008	Water	5/21/2019 13:20	5/24/2019 11:28
304400011	30295649 009	Water	5/21/2019 00:00	5/24/2019 11:28

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

PROJECT SUMMARY

Workorder: 30440 30295649

Workorder Comments

The samples 30440 (0001-0011) were collected in an alternate container type, than that assigned to PAES method RSK175. The sample container was BAK preserved and capped with butyl septa.

Only one vial was provided for analysis of method RSK175. In order to assure accurate reporting of all analytes, the equilibrated headspace was transferred to a headspace vial. Results reported at dilution. Samples 30440 (0001-0011).

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

ANALYTICAL RESULTS

Workorder: 30440 30295649

Lab ID: **304400001** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295649 001** Date Collected: 5/21/2019 11:50

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**220**	mg/l	5.0	0.47	1	6/1/2019 13:39	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**2.8**	ug/l	2.5	0.34	5	5/30/2019 10:11	AK	d

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

ANALYTICAL RESULTS

Workorder: 30440 30295649

Lab ID: **304400002** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295649 002** Date Collected: 5/21/2019 13:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**24**	mg/l	5.0	0.47	1	6/1/2019 13:52	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.34U**	ug/l	2.5	0.34	5	5/30/2019 10:21	AK	d

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

ANALYTICAL RESULTS

Workorder: 30440 30295649

Lab ID: **304400003** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295649 003** Date Collected: 5/21/2019 10:05

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**14**	mg/l	5.0	0.47	1	6/1/2019 14:04	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.34U**	ug/l	2.5	0.34	5	5/30/2019 10:31	AK	d

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

ANALYTICAL RESULTS

Workorder: 30440 30295649

Lab ID: **304400004** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295649 004** Date Collected: 5/21/2019 15:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**100**	mg/l	5.0	0.47	1	6/1/2019 14:17	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**110**	ug/l	2.5	0.34	5	5/30/2019 11:34	AK	d

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

ANALYTICAL RESULTS

Workorder: 30440 30295649

Lab ID: **304400005** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295649 005** Date Collected: 5/21/2019 10:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**26**	mg/l	5.0	0.47	1	6/1/2019 14:29	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**2.2J**	ug/l	2.5	0.34	5	5/30/2019 10:42	AK	d

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

ANALYTICAL RESULTS

Workorder: 30440 30295649

Lab ID: **304400006** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295649 005 MS** Date Collected: 5/21/2019 10:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**160**	mg/l	5.0	0.47	1	6/1/2019 14:55	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**57**	ug/l	2.5	0.34	5	5/30/2019 10:52	AK	d

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

ANALYTICAL RESULTS

Workorder: 30440 30295649

Lab ID: **304400007** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295649 005 MSD** Date Collected: 5/21/2019 10:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**170**	mg/l	5.0	0.47	1	6/1/2019 15:07	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**49**	ug/l	2.5	0.34	5	5/30/2019 11:02	AK	d

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

ANALYTICAL RESULTS

Workorder: 30440 30295649

Lab ID: **304400008** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295649 006** Date Collected: 5/21/2019 11:55

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**76**	mg/l	5.0	0.47	1	6/1/2019 14:42	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.34U**	ug/l	2.5	0.34	5	5/30/2019 11:45	AK	d

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

ANALYTICAL RESULTS

Workorder: 30440 30295649

Lab ID: **304400009** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295649 007** Date Collected: 5/21/2019 15:11

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**42**	mg/l	5.0	0.47	1	6/3/2019 06:08	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**1.0J**	ug/l	2.5	0.34	5	5/30/2019 11:55	AK	d

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

ANALYTICAL RESULTS

Workorder: 30440 30295649

Lab ID: **304400010** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295649 008** Date Collected: 5/21/2019 13:20

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**64**	mg/l	5.0	0.47	1	6/3/2019 06:22	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.38J**	ug/l	2.5	0.34	5	5/30/2019 12:06	AK	d

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

ANALYTICAL RESULTS

Workorder: 30440 30295649

Lab ID: **304400011** Date Received: 5/24/2019 11:28 Matrix: Water

Sample ID: **30295649 009** Date Collected: 5/21/2019 00:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**13**	mg/l	5.0	0.47	1	6/3/2019 06:34	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**0.34U**	ug/l	2.5	0.34	5	5/30/2019 12:50	AK	d

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

ANALYTICAL RESULTS QUALIFIERS

Workorder: 30440 30295649

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.

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

QUALITY CONTROL DATA

Workorder: 30440 30295649

QC Batch: DISG/7565 Analysis Method: EPA RSK175

QC Batch Method: EPA RSK175

Associated Lab Samples: 304400001, 304400002, 304400003, 304400004, 304400005, 304400006, 304400007, 304400008, 304400009, 304400010, 304400011

METHOD BLANK: 61408

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Methane	ug/l	0.067U	0.067	

LABORATORY CONTROL SAMPLE & LCSD: 61409 61410

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Methane	ug/l	44	42	42	94	96	85-115	1.5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 61411 61412 Original: 304400005

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK											
Methane	ug/l	2.2	44	57	49	120	100	70-130	15	20	d

SAMPLE DUPLICATE: 61416 Original: 304500001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
RISK						
Methane	ug/l	5.7	6.1	6.2	20	

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

QUALITY CONTROL DATA

Workorder: 30440 30295649

QC Batch: DISG/7570 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 304400001, 304400002, 304400003, 304400004, 304400005, 304400006, 304400007, 304400008

METHOD BLANK: 61457

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Carbon Dioxide	mg/l	0.47U	0.47	n

LABORATORY CONTROL SAMPLE & LCSD: 61459 61461

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Carbon Dioxide	mg/l	120	140	140	116	118	80-120	1.6	20	n

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 61462 61463 Original: 304400005

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	26	120	160	170	118	127	70-130	6.3	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: 30440 30295649

QC Batch: DISG/7571 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 304400009, 304400010, 304400011

METHOD BLANK: 61465

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Carbon Dioxide	mg/l	0.47U	0.47	n

LABORATORY CONTROL SAMPLE & LCSD: 61467 61469

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Carbon Dioxide	mg/l	120	130	130	112	112	80-120	0.18	20	n

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 61485 61486 Original: 304480012

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	26	120	170	170	122	122	70-130	0.37	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 QUALIFIERS

Workorder: 30440 30295649

QUALITY CONTROL PARAMETER QUALIFIERS

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: 30440 30295649

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
304400001	30295649 001			EPA RSK175	DISG/7565
304400002	30295649 002			EPA RSK175	DISG/7565
304400003	30295649 003			EPA RSK175	DISG/7565
304400004	30295649 004			EPA RSK175	DISG/7565
304400005	30295649 005			EPA RSK175	DISG/7565
304400006	30295649 005 MS			EPA RSK175	DISG/7565
304400007	30295649 005 MSD			EPA RSK175	DISG/7565
304400008	30295649 006			EPA RSK175	DISG/7565
304400009	30295649 007			EPA RSK175	DISG/7565
304400010	30295649 008			EPA RSK175	DISG/7565
304400011	30295649 009			EPA RSK175	DISG/7565
304400001	30295649 001			AM20GAX	DISG/7570
304400002	30295649 002			AM20GAX	DISG/7570
304400003	30295649 003			AM20GAX	DISG/7570
304400004	30295649 004			AM20GAX	DISG/7570
304400005	30295649 005			AM20GAX	DISG/7570
304400006	30295649 005 MS			AM20GAX	DISG/7570
304400007	30295649 005 MSD			AM20GAX	DISG/7570
304400008	30295649 006			AM20GAX	DISG/7570
304400009	30295649 007			AM20GAX	DISG/7571
304400010	30295649 008			AM20GAX	DISG/7571
304400011	30295649 009			AM20GAX	DISG/7571

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.:
P.O. No: ASR- 30295649

Request Date: 5/22/19
Shipped By: FedEx

Analysis Due Date: 5/30/2019

Certification Required: NY

Pace Project No.: 30295649
Report/Invoice to: Rachel Christner

Page 1 of 2

	Pace Sample ID:	Matrix:	Collection Date:	Time:	Analysis Requested:	Analytical Method:	Preservative Type:
1	30295649 001	WT	5/21/19	11:50	Methane	RSK-175	BAK
2					Carbon Dioxide	AM20GAX	BAK
3	30295649 002	WT	5/21/19	13:30	Methane	RSK-175	BAK
4					Carbon Dioxide	AM20GAX	BAK
5	30295649 003	WT	5/21/19	10:05	Methane	RSK-175	BAK
6					Carbon Dioxide	AM20GAX	BAK
7	30295649 004	WT	5/21/19	15:00	Methane	RSK-175	BAK
8					Carbon Dioxide	AM20GAX	BAK
9	30295649 005	WT	5/21/19	10:00	Methane	RSK-175	BAK
10					Carbon Dioxide	AM20GAX	BAK
11	3029649 006	WT	5/21/19	11:55	Methane	RSK-175	BAK
12					Carbon Dioxide	AM20GAX	BAK

Special Requirements:

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

Sample 005 = RGS/ME/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: PACE 5.24-19 1015
(Signature & Affiliation) (Date) (Time)

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

Received By: 5.24-19 1015
(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

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.: 30295649
P.O. No: ASR- 30295649

Request Date: 5/22/19 Analysis Due Date: 5/30/2019
Shipped By: FedEx

Certification Required: NY

Pace Project No.: 30295649
Report/Invoice to: Rachel Christner

Page 2 of 2

	Pace Sample ID:	Matrix:	Collection Date:	Time:	Analysis Requested:	Analytical Method:	Preservative Type:
1	30295649 007	WT	5/21/19	15:11	Methane	RSK-175	BAK
2					Carbon Dioxide	AM20GAX	BAK
3	30295649 008	WT	5/21/19	13:20	Methane	RSK-175	BAK
4					Carbon Dioxide	AM20GAX	BAK
5	30295649 009	WT	5/21/19	00:00	Methane	RSK-175	BAK
6					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****
Sample 005 RQS/MS/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: _____ PAE 5-24-19 1000
(Signature & Affiliation) (Date) (Time)

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

Received By: _____ 5-24-19 1000
(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.

Cooler Receipt Form

Client Name: _____ Project: _____ Lab Work Order: _____

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: 1.6 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: _____ Date: _____

Project Manager Review: _____ Date: 5-24-19

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical

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

LAB USE ONLY- Aff

WO# : 30295649

30295649

ALL S

Page 61 of 63

Company: Arcadis	Billing Information:
Address: 110 W Fayette St Syracuse NY 13202	
Report To: PJ Hart	Email To: Vin.Maresco@arcadis.com
Copy To: Vin Maresco	Site Collection Info/Address: Cold Springs Terminal / Lysander NY
Customer Project Name/Number: Cold Springs Terminal	State: NY / County/City: Onondaga / Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: / Email:	Site/Facility ID#:
Collected By (print): Austin George	Purchase Order #: / Quote #: 8009004.0008
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 [X] No

Analysis: ____

Container Preservative Type **: 3 | 2 | 1 | 0

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 Barium Chloride

* 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)

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	VOCs 8260	SVOCs 8270	Nitrate + Nitrite	Sulfate + Alkalinity, Ferrous Iron	Manganese, Unfiltered	Manganese, Lab Filtered	Methane, CO2			Lab Profile/Line:
MW-205	GW	G	5/21/19	1150				11	3	2	1	1	1	1	2			001
MW-206	GW	G	5/21/19	1330				11	3	2	1	1	1	1	2			002
MW-207	GW	G	5/21/19	1005				11	3	2	1	1	1	1	2			003
MW-208	GW	G	5/21/19	1500				11	3	2	1	1	1	1	2			004
MW-210	GW	G	5/21/19	1000				11	3	2	1	1	1	1	2			005
MW-210 MS/MSD	GW	G	5/21/19	1060				22	6	4	2	2	2	2	4			1
MW-211	GW	G	5/21/19	1155				11	3	2	1	1	1	1	2			006
BMW-9	GW	G	5/21/19	1511				11	3	2	1	1	1	1	2			007
PZ106S	GW	G	5/21/19	1320				11	3	2	1	1	1	1	2			008
DUP-052119	GW	G	5/21/19					11	3	2	1	1	1	1	2			009

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
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	Y	N NA
pH Strips: LOT#181		
Sulfide Present	Y	N NA
Lead Acetate Strips:		

LAB USE ONLY:
Lab Sample # / Comments:

BMM / ET

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: (Wet) Blue Dry None

Packing Material Used: Bubble wrap, Plastic bag, + ice

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

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

Lab Tracking #: 7527714852384052

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

Lab Sample Temperature Info:
Temp Blank Received: Y N (NA)
Therm ID#: 11
Cooler 1 Temp Upon Receipt: 4.1 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 4.1 oC
Comments: ET 5-22-19

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

Non Conformance(s): (YES) / NO

Page: ____ of: ____

	Date/Time:		Date/Time:
Relinquished by/Company: (Signature) Arcadis	5/21/19 1630	Received by/Company: (Signature) PACE	5/21/19 16:30
Relinquished by/Company: (Signature) PACE	5/21/19 17:00	Received by/Company: (Signature)	5-22-19 0920
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY

Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

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

LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here

ALL SHADED AREAS are for LAB USE ONLY

Company: Arcadis	Billing Information:
Address: 110 W Fayette St Syracuse NY 13202	
Report To: PJ Hart	Email To: Vin.Maresco@arcadis.com
Copy To: Vin Maresco	Site Collection Info/Address: Cold Springs Terminal / Lysander NY
Customer Project Name/Number: Cold Springs Terminal	State: NY County/City: Onondaga Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET
Phone: Email:	Site/Facility ID #:
Collected By (print): Austin George	Purchase Order #: Quote #: B090070008
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 [X] No
	Analysis:

Container Preservative Type **: 3 | 2 | 1 | 0

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 Benzalkonium Chloride

* 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)

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	VOCs 8260	SVOCs 8270	Nitrate, Nitrite	Sulfide, Alkalinity	Ferrous Iron	Manganese, unfiltered	Manganese, lab filtered	Methane, CO2			Analyses	Lab Profile/Line:
Trip blank	W	/		/				2	2											010
Trip blank	W	/		/				2	2											

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
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	Y N NA
pH Strips:	
Sulfide Present	Y N NA
Lead Acetate Strips:	

LAB USE ONLY:
Lab Sample # / Comments:
See Page 1

#30265955

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

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

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

Lab Tracking #: 2384051

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#:
Cooler 1 Temp Upon Receipt: oC
Cooler 1 Therm Corr. Factor: oC
Cooler 1 Corrected Temp: oC
Comments:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: of:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Arcadis	5/21/19 1630	PACE	5/21/19 16:30
PACE	5/21/19 17:00		5-21-19 0920

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

Pace Analytical™
www.pacelabs.com

Sample Receiving Non-Conformance Form (NCF)

Date: 5-22-19	Evaluated by: ET
Client: Arcadis	

Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here

 # 30295649

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:
Sample MW-211 has Res Cl. detected in both AGUs.

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

June 05, 2019

Vin Maresco
Arcadis
6723 Towpath Road
Syracuse, NY 13214

RE: Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295911

Dear Vin Maresco:
Enclosed are the analytical results for sample(s) received by the laboratory on May 23, 2019. 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 Methane and Carbon Dioxide 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

REPORT OF LABORATORY ANALYSIS

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.: 30295911

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
Florida: Cert E871149 SEKS WET
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.: 30295911

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30295911001	**MW-204**	Water	05/22/19 11:15	05/23/19 09:40
30295911002	**MW-209**	Water	05/22/19 09:15	05/23/19 09:40
30295911003	**BMW2**	Water	05/22/19 11:45	05/23/19 09:40
30295911004	**BMW3**	Water	05/22/19 09:45	05/23/19 09:40
30295911005	**Trip Blank**	Water	05/14/19 00:01	05/23/19 09:40

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.: 30295911

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30295911001	**MW-204**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295911002	**MW-209**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295911003	**BMW2**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295911004	**BMW3**	EPA 6010C	CTS	1	PASI-PA
		EPA 6010C	CTS	1	PASI-PA
		EPA 8270D by SIM	AJC	17	PASI-PA
		EPA 8260C	LEL	20	PASI-PA
		SM 2320B-2011	ZMH	3	PASI-PA
		SM 3500-FeB-2011	PAS	1	PASI-PA
		SM 4500NO3F-2011	JLM	1	PASI-PA
		ASTM D516-90,02	RTB	1	PASI-PA
30295911005	**Trip Blank**	EPA 8260C	JAS	21	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.: 30295911

Sample: MW-204 **Lab ID: 30295911001** Collected: 05/22/19 11:15 Received: 05/23/19 09:40 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	**1520**	ug/L	5.0	1.2	1	05/24/19 12:11	05/28/19 08:44	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**1190**	ug/L	5.0	1.2	1	05/28/19 18:40	05/30/19 11:45	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	05/29/19 08:04	05/30/19 17:29	83-32-9	1c
Acenaphthylene	ND	ug/L	0.098	0.033	1	05/29/19 08:04	05/30/19 17:29	208-96-8	1c
Anthracene	ND	ug/L	0.098	0.027	1	05/29/19 08:04	05/30/19 17:29	120-12-7	1c
Benzo(a)anthracene	ND	ug/L	0.098	0.038	1	05/29/19 08:04	05/30/19 17:29	56-55-3	1c
Benzo(a)pyrene	ND	ug/L	0.098	0.012	1	05/29/19 08:04	05/30/19 17:29	50-32-8	1c
Benzo(b)fluoranthene	ND	ug/L	0.098	0.026	1	05/29/19 08:04	05/30/19 17:29	205-99-2	1c
Benzo(g,h,i)perylene	ND	ug/L	0.098	0.035	1	05/29/19 08:04	05/30/19 17:29	191-24-2	1c
Benzo(k)fluoranthene	ND	ug/L	0.098	0.022	1	05/29/19 08:04	05/30/19 17:29	207-08-9	1c
Chrysene	ND	ug/L	0.098	0.039	1	05/29/19 08:04	05/30/19 17:29	218-01-9	1c
Dibenz(a,h)anthracene	ND	ug/L	0.098	0.027	1	05/29/19 08:04	05/30/19 17:29	53-70-3	1c
Fluoranthene	ND	ug/L	0.098	0.031	1	05/29/19 08:04	05/30/19 17:29	206-44-0	1c
Fluorene	ND	ug/L	0.098	0.030	1	05/29/19 08:04	05/30/19 17:29	86-73-7	1c
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.098	0.029	1	05/29/19 08:04	05/30/19 17:29	193-39-5	1c
Phenanthrene	ND	ug/L	0.098	0.043	1	05/29/19 08:04	05/30/19 17:29	85-01-8	1c
Pyrene	ND	ug/L	0.098	0.035	1	05/29/19 08:04	05/30/19 17:29	129-00-0	1c
Surrogates									
2-Fluorobiphenyl (S)	51	%.	19-97		1	05/29/19 08:04	05/30/19 17:29	321-60-8	
Terphenyl-d14 (S)	65	%.	47-105		1	05/29/19 08:04	05/30/19 17:29	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	**1.3**	ug/L	1.0	0.24	1		05/29/19 20:08	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/29/19 20:08	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/29/19 20:08	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/29/19 20:08	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/29/19 20:08	64-17-5	4c
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/29/19 20:08	100-41-4	
Isopropylbenzene (Cumene)	**1.2**	ug/L	1.0	0.24	1		05/29/19 20:08	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/29/19 20:08	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/29/19 20:08	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/29/19 20:08	91-20-3	
n-Propylbenzene	**2.8**	ug/L	1.0	0.29	1		05/29/19 20:08	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/29/19 20:08	108-88-3	
1,2,4-Trimethylbenzene	**2.9**	ug/L	1.0	0.25	1		05/29/19 20:08	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/29/19 20:08	108-67-8	
m&p-Xylene	**2.4**	ug/L	2.0	0.60	1		05/29/19 20:08	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/29/19 20:08	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	98	%.	78-122		1		05/29/19 20:08	460-00-4	
1,2-Dichloroethane-d4 (S)	90	%.	80-120		1		05/29/19 20:08	17060-07-0	
Toluene-d8 (S)	100	%.	80-120		1		05/29/19 20:08	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295911

Sample: MW-204 **Lab ID: 30295911001** Collected: 05/22/19 11:15 Received: 05/23/19 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	97	%.	80-120		1		05/29/19 20:08	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**560**	mg/L	10.0	10.0	1		05/28/19 17:43		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:43		
Alkalinity,Total (CaCO3 pH4.5)	**560**	mg/L	10.0	1.0	1		05/28/19 17:43		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	**2.8**	mg/L	0.10	0.020	1		05/23/19 00:41		3c,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		05/31/19 16:15		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**12.1**	mg/L	10.0	4.7	1		05/24/19 23:38	14808-79-8	

Sample: MW-209 **Lab ID: 30295911002** Collected: 05/22/19 09:15 Received: 05/23/19 09:40 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	**117**	ug/L	5.0	1.2	1	05/24/19 12:11	05/28/19 08:46	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	ND	ug/L	5.0	1.2	1	05/28/19 18:40	05/30/19 11:47	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	05/29/19 08:04	05/30/19 17:49	83-32-9	1c
Acenaphthylene	ND	ug/L	0.10	0.034	1	05/29/19 08:04	05/30/19 17:49	208-96-8	1c
Anthracene	ND	ug/L	0.10	0.028	1	05/29/19 08:04	05/30/19 17:49	120-12-7	1c
Benzo(a)anthracene	ND	ug/L	0.10	0.039	1	05/29/19 08:04	05/30/19 17:49	56-55-3	1c
Benzo(a)pyrene	ND	ug/L	0.10	0.013	1	05/29/19 08:04	05/30/19 17:49	50-32-8	1c
Benzo(b)fluoranthene	ND	ug/L	0.10	0.027	1	05/29/19 08:04	05/30/19 17:49	205-99-2	1c
Benzo(g,h,i)perylene	ND	ug/L	0.10	0.036	1	05/29/19 08:04	05/30/19 17:49	191-24-2	1c
Benzo(k)fluoranthene	ND	ug/L	0.10	0.023	1	05/29/19 08:04	05/30/19 17:49	207-08-9	1c
Chrysene	ND	ug/L	0.10	0.041	1	05/29/19 08:04	05/30/19 17:49	218-01-9	1c
Dibenz(a,h)anthracene	ND	ug/L	0.10	0.028	1	05/29/19 08:04	05/30/19 17:49	53-70-3	1c
Fluoranthene	ND	ug/L	0.10	0.033	1	05/29/19 08:04	05/30/19 17:49	206-44-0	1c
Fluorene	ND	ug/L	0.10	0.032	1	05/29/19 08:04	05/30/19 17:49	86-73-7	1c
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	0.031	1	05/29/19 08:04	05/30/19 17:49	193-39-5	1c
Phenanthrene	ND	ug/L	0.10	0.045	1	05/29/19 08:04	05/30/19 17:49	85-01-8	1c
Pyrene	ND	ug/L	0.10	0.037	1	05/29/19 08:04	05/30/19 17:49	129-00-0	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: Liverpool Terminal-Cold Spring
Pace Project No.: 30295911

Sample: MW-209 **Lab ID: 30295911002** Collected: 05/22/19 09:15 Received: 05/23/19 09:40 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								
Surrogates									
2-Fluorobiphenyl (S)	71	%.	19-97		1	05/29/19 08:04	05/30/19 17:49	321-60-8	
Terphenyl-d14 (S)	83	%.	47-105		1	05/29/19 08:04	05/30/19 17:49	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/29/19 20:33	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/29/19 20:33	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/29/19 20:33	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/29/19 20:33	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/29/19 20:33	64-17-5	4c
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/29/19 20:33	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/29/19 20:33	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/29/19 20:33	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/29/19 20:33	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/29/19 20:33	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/29/19 20:33	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/29/19 20:33	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/29/19 20:33	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/29/19 20:33	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/29/19 20:33	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/29/19 20:33	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	101	%.	78-122		1		05/29/19 20:33	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%.	80-120		1		05/29/19 20:33	17060-07-0	
Toluene-d8 (S)	95	%.	80-120		1		05/29/19 20:33	2037-26-5	
Dibromofluoromethane (S)	102	%.	80-120		1		05/29/19 20:33	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**320**	mg/L	10.0	10.0	1		05/28/19 17:44		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:44		
Alkalinity,Total (CaCO3 pH4.5)	**320**	mg/L	10.0	1.0	1		05/28/19 17:44		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		05/23/19 00:43		3c,H3, H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	**1.0**	mg/L	0.10	0.028	1		05/31/19 16:19		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**16.3**	mg/L	10.0	4.7	1		05/24/19 23:39	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.: 30295911

Sample: BMW2 **Lab ID: 30295911003** Collected: 05/22/19 11:45 Received: 05/23/19 09:40 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	**1400**	ug/L	5.0	1.2	1	05/24/19 12:11	05/28/19 08:53	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	**22.0**	ug/L	5.0	1.2	1	05/28/19 18:40	05/30/19 11:49	7439-96-5	
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3510C								
Acenaphthene	ND	ug/L	0.14	0.040	1	05/29/19 08:04	05/30/19 18:08	83-32-9	1c,A5
Acenaphthylene	ND	ug/L	0.14	0.047	1	05/29/19 08:04	05/30/19 18:08	208-96-8	1c,A5
Anthracene	ND	ug/L	0.14	0.038	1	05/29/19 08:04	05/30/19 18:08	120-12-7	1c,A5
Benzo(a)anthracene	ND	ug/L	0.14	0.054	1	05/29/19 08:04	05/30/19 18:08	56-55-3	1c,A5
Benzo(a)pyrene	ND	ug/L	0.14	0.017	1	05/29/19 08:04	05/30/19 18:08	50-32-8	1c,A5
Benzo(b)fluoranthene	ND	ug/L	0.14	0.037	1	05/29/19 08:04	05/30/19 18:08	205-99-2	1c,A5
Benzo(g,h,i)perylene	ND	ug/L	0.14	0.049	1	05/29/19 08:04	05/30/19 18:08	191-24-2	1c,A5
Benzo(k)fluoranthene	ND	ug/L	0.14	0.032	1	05/29/19 08:04	05/30/19 18:08	207-08-9	1c,A5
Chrysene	ND	ug/L	0.14	0.055	1	05/29/19 08:04	05/30/19 18:08	218-01-9	1c,A5
Dibenz(a,h)anthracene	ND	ug/L	0.14	0.038	1	05/29/19 08:04	05/30/19 18:08	53-70-3	1c,A5
Fluoranthene	ND	ug/L	0.14	0.044	1	05/29/19 08:04	05/30/19 18:08	206-44-0	1c,A5
Fluorene	ND	ug/L	0.14	0.043	1	05/29/19 08:04	05/30/19 18:08	86-73-7	1c,A5
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.14	0.042	1	05/29/19 08:04	05/30/19 18:08	193-39-5	1c,A5
Phenanthrene	ND	ug/L	0.14	0.061	1	05/29/19 08:04	05/30/19 18:08	85-01-8	1c,A5
Pyrene	ND	ug/L	0.14	0.050	1	05/29/19 08:04	05/30/19 18:08	129-00-0	1c,A5
Surrogates									
2-Fluorobiphenyl (S)	62	%.	19-97		1	05/29/19 08:04	05/30/19 18:08	321-60-8	
Terphenyl-d14 (S)	84	%.	47-105		1	05/29/19 08:04	05/30/19 18:08	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/29/19 20:58	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/29/19 20:58	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/29/19 20:58	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/29/19 20:58	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/29/19 20:58	64-17-5	4c
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/29/19 20:58	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/29/19 20:58	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/29/19 20:58	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/29/19 20:58	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/29/19 20:58	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/29/19 20:58	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/29/19 20:58	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/29/19 20:58	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/29/19 20:58	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/29/19 20:58	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/29/19 20:58	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	98	%.	78-122		1		05/29/19 20:58	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%.	80-120		1		05/29/19 20:58	17060-07-0	
Toluene-d8 (S)	97	%.	80-120		1		05/29/19 20:58	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295911

Sample: BMW2 **Lab ID: 30295911003** Collected: 05/22/19 11:45 Received: 05/23/19 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260C MSV	Analytical Method: EPA 8260C								
Surrogates									
Dibromofluoromethane (S)	99	%.	80-120		1		05/29/19 20:58	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**280**	mg/L	10.0	10.0	1		05/28/19 17:45		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:45		
Alkalinity,Total (CaCO3 pH4.5)	**280**	mg/L	10.0	1.0	1		05/28/19 17:45		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		05/23/19 00:43		3c,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		05/31/19 16:20		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	**37.0**	mg/L	10.0	4.7	1		05/24/19 23:40	14808-79-8	

Sample: BMW3 **Lab ID: 30295911004** Collected: 05/22/19 09:45 Received: 05/23/19 09:40 Matrix: Water

Comments: • 8260: Post-analysis pH measurement indicates pH > 2.
• 8260 pH = 6

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese	**10900**	ug/L	25.0	5.9	1	05/24/19 12:11	05/28/19 08:56	7439-96-5	
6010C MET ICP, Lab Filtered	Analytical Method: EPA 6010C Preparation Method: EPA 3005A								
Manganese, Dissolved	ND	ug/L	5.0	1.2	1	05/28/19 18:40	05/30/19 11:51	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	05/29/19 08:04	05/30/19 18:28	83-32-9	1c,A5
Acenaphthylene	ND	ug/L	0.11	0.036	1	05/29/19 08:04	05/30/19 18:28	208-96-8	1c,A5
Anthracene	ND	ug/L	0.11	0.029	1	05/29/19 08:04	05/30/19 18:28	120-12-7	1c,A5
Benzo(a)anthracene	ND	ug/L	0.11	0.041	1	05/29/19 08:04	05/30/19 18:28	56-55-3	1c,A5
Benzo(a)pyrene	ND	ug/L	0.11	0.013	1	05/29/19 08:04	05/30/19 18:28	50-32-8	1c,A5
Benzo(b)fluoranthene	ND	ug/L	0.11	0.029	1	05/29/19 08:04	05/30/19 18:28	205-99-2	1c,A5
Benzo(g,h,i)perylene	ND	ug/L	0.11	0.038	1	05/29/19 08:04	05/30/19 18:28	191-24-2	1c,A5
Benzo(k)fluoranthene	ND	ug/L	0.11	0.024	1	05/29/19 08:04	05/30/19 18:28	207-08-9	1c,A5
Chrysene	ND	ug/L	0.11	0.042	1	05/29/19 08:04	05/30/19 18:28	218-01-9	1c,A5
Dibenz(a,h)anthracene	ND	ug/L	0.11	0.029	1	05/29/19 08:04	05/30/19 18:28	53-70-3	1c,A5
Fluoranthene	ND	ug/L	0.11	0.034	1	05/29/19 08:04	05/30/19 18:28	206-44-0	1c,A5
Fluorene	ND	ug/L	0.11	0.033	1	05/29/19 08:04	05/30/19 18:28	86-73-7	1c,A5
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.11	0.032	1	05/29/19 08:04	05/30/19 18:28	193-39-5	1c,A5
Phenanthrene	ND	ug/L	0.11	0.047	1	05/29/19 08:04	05/30/19 18:28	85-01-8	1c,A5

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.: 30295911

Sample: BMW3 **Lab ID: 30295911004** Collected: 05/22/19 09:45 Received: 05/23/19 09:40 Matrix: Water

Comments: • 8260: Post-analysis pH measurement indicates pH > 2.
• 8260 pH = 6

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	0.11	0.038	1	05/29/19 08:04	05/30/19 18:28	129-00-0	1c,A5
Surrogates									
2-Fluorobiphenyl (S)	43	%.	19-97		1	05/29/19 08:04	05/30/19 18:28	321-60-8	
Terphenyl-d14 (S)	89	%.	47-105		1	05/29/19 08:04	05/30/19 18:28	1718-51-0	
8260C MSV	Analytical Method: EPA 8260C								
Benzene	ND	ug/L	1.0	0.24	1		05/29/19 21:22	71-43-2	
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/29/19 21:22	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/29/19 21:22	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/29/19 21:22	98-06-6	
Ethanol	ND	ug/L	200	79.8	1		05/29/19 21:22	64-17-5	4c
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/29/19 21:22	100-41-4	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/29/19 21:22	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/29/19 21:22	99-87-6	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/29/19 21:22	1634-04-4	
Naphthalene	ND	ug/L	2.0	0.82	1		05/29/19 21:22	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/29/19 21:22	103-65-1	
Toluene	ND	ug/L	1.0	0.30	1		05/29/19 21:22	108-88-3	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/29/19 21:22	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/29/19 21:22	108-67-8	
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/29/19 21:22	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.18	1		05/29/19 21:22	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	110	%.	78-122		1		05/29/19 21:22	460-00-4	
1,2-Dichloroethane-d4 (S)	87	%.	80-120		1		05/29/19 21:22	17060-07-0	
Toluene-d8 (S)	99	%.	80-120		1		05/29/19 21:22	2037-26-5	
Dibromofluoromethane (S)	95	%.	80-120		1		05/29/19 21:22	1868-53-7	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity,Bicarbonate (pH4.5)	**490**	mg/L	10.0	10.0	1		05/28/19 17:46		
Alkalinity, Carbonate (pH4.5)	ND	mg/L	10.0	10.0	1		05/28/19 17:46		
Alkalinity,Total (CaCO3 pH4.5)	**490**	mg/L	10.0	1.0	1		05/28/19 17:46		
Iron, Ferrous	Analytical Method: SM 3500-FeB-2011								
Iron, Ferrous	ND	mg/L	0.10	0.020	1		05/23/19 00:45		3c,H6
SM4500NO3-F, NO3-NO2	Analytical Method: SM 4500NO3F-2011								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.028	1		05/31/19 16:21		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516-90,02								
Sulfate	ND	mg/L	10.0	4.7	1		05/24/19 23:41	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.: 30295911

Sample: Trip Blank **Lab ID: 30295911005** Collected: 05/14/19 00:01 Received: 05/23/19 09:40 Matrix: Water

Comments: • The internal standard recoveries in the continuing calibration verification (CCV) associated with sample exceed the upper control limit. The reported results should be considered estimated values.

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		05/28/19 13:00	71-43-2	M5
tert-Butyl Alcohol	ND	ug/L	5.0	3.7	1		05/28/19 13:00	75-65-0	M5
n-Butylbenzene	ND	ug/L	1.0	0.20	1		05/28/19 13:00	104-51-8	M5
sec-Butylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 13:00	135-98-8	M5
tert-Butylbenzene	ND	ug/L	1.0	0.28	1		05/28/19 13:00	98-06-6	M5
Ethanol	ND	ug/L	200	79.8	1		05/28/19 13:00	64-17-5	2c,CH, M5
Ethylbenzene	ND	ug/L	1.0	0.31	1		05/28/19 13:00	100-41-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.24	1		05/28/19 13:00	98-82-8	M5
p-Isopropyltoluene	ND	ug/L	1.0	0.36	1		05/28/19 13:00	99-87-6	M5
Methyl-tert-butyl ether	ND	ug/L	1.0	0.23	1		05/28/19 13:00	1634-04-4	M5
Naphthalene	ND	ug/L	2.0	0.82	1		05/28/19 13:00	91-20-3	M5
n-Propylbenzene	ND	ug/L	1.0	0.29	1		05/28/19 13:00	103-65-1	M5
Toluene	ND	ug/L	1.0	0.30	1		05/28/19 13:00	108-88-3	M5
1,2,4-Trimethylbenzene	ND	ug/L	1.0	0.25	1		05/28/19 13:00	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.21	1		05/28/19 13:00	108-67-8	M5
m&p-Xylene	ND	ug/L	2.0	0.60	1		05/28/19 13:00	179601-23-1	M5
o-Xylene	ND	ug/L	1.0	0.18	1		05/28/19 13:00	95-47-6	M5
Surrogates									
4-Bromofluorobenzene (S)	101	%.	78-122		1		05/28/19 13:00	460-00-4	M5
1,2-Dichloroethane-d4 (S)	101	%.	80-120		1		05/28/19 13:00	17060-07-0	M5
Toluene-d8 (S)	91	%.	80-120		1		05/28/19 13:00	2037-26-5	M5
Dibromofluoromethane (S)	100	%.	80-120		1		05/28/19 13:00	1868-53-7	M5

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.: 30295911

QC Batch: 344191 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

METHOD BLANK: 1674884 Matrix: Water
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese	ug/L	ND	5.0	1.2	05/28/19 08:27	

LABORATORY CONTROL SAMPLE: 1674885

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese	ug/L	500	520	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1674887 1674888

Parameter	Units	30295922001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese	ug/L	696	500	500	1200	1210	101	102	75-125	0	20	

SAMPLE DUPLICATE: 1674886

Parameter	Units	30295922001 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese	ug/L	696	690	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

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295911

QC Batch: 344502 Analysis Method: EPA 6010C
QC Batch Method: EPA 3005A Analysis Description: 6010C MET Dissolved
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

METHOD BLANK: 1676336 Matrix: Water
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	1.2	05/30/19 11:20	

LABORATORY CONTROL SAMPLE: 1676337

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	500	483	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1676339 1676340

Parameter	Units	30295461001 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	568	500	500	1060	1080	99	103	75-125	2	20	

SAMPLE DUPLICATE: 1676338

Parameter	Units	30295461001 Result	Dup Result	RPD	Max RPD	Qualifiers
Manganese, Dissolved	ug/L	568	563	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

QUALITY CONTROL DATA

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295911

QC Batch: 344377 Analysis Method: EPA 8260C
QC Batch Method: EPA 8260C Analysis Description: 8260C MSV
Associated Lab Samples: 30295911005

METHOD BLANK: 1675939 Matrix: Water
Associated Lab Samples: 30295911005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	1.0	0.25	05/28/19 12:32	M5
1,3,5-Trimethylbenzene	ug/L	ND	1.0	0.21	05/28/19 12:32	M5
Benzene	ug/L	ND	1.0	0.24	05/28/19 12:32	M5
Ethanol	ug/L	ND	200	79.8	05/28/19 12:32	2c,CH,M5
Ethylbenzene	ug/L	ND	1.0	0.31	05/28/19 12:32	M5
Isopropylbenzene (Cumene)	ug/L	ND	1.0	0.24	05/28/19 12:32	M5
m&p-Xylene	ug/L	ND	2.0	0.60	05/28/19 12:32	M5
Methyl-tert-butyl ether	ug/L	ND	1.0	0.23	05/28/19 12:32	M5
n-Butylbenzene	ug/L	ND	1.0	0.20	05/28/19 12:32	M5
n-Propylbenzene	ug/L	ND	1.0	0.29	05/28/19 12:32	M5
Naphthalene	ug/L	ND	2.0	0.82	05/28/19 12:32	M5
o-Xylene	ug/L	ND	1.0	0.18	05/28/19 12:32	M5
p-Isopropyltoluene	ug/L	ND	1.0	0.36	05/28/19 12:32	M5
sec-Butylbenzene	ug/L	ND	1.0	0.25	05/28/19 12:32	M5
tert-Butyl Alcohol	ug/L	ND	5.0	3.7	05/28/19 12:32	M5
tert-Butylbenzene	ug/L	ND	1.0	0.28	05/28/19 12:32	M5
Toluene	ug/L	ND	1.0	0.30	05/28/19 12:32	M5
1,2-Dichloroethane-d4 (S)	%.	105	80-120		05/28/19 12:32	M5
4-Bromofluorobenzene (S)	%.	105	78-122		05/28/19 12:32	M5
Dibromofluoromethane (S)	%.	100	80-120		05/28/19 12:32	M5
Toluene-d8 (S)	%.	96	80-120		05/28/19 12:32	M5

LABORATORY CONTROL SAMPLE: 1675940

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	23.1	115	70-130	M5
1,3,5-Trimethylbenzene	ug/L	20	22.3	112	70-130	M5
Benzene	ug/L	20	19.5	98	70-130	M5
Ethanol	ug/L	200	288	144	10-175	2c,CH,M5
Ethylbenzene	ug/L	20	21.6	108	70-130	M5
Isopropylbenzene (Cumene)	ug/L	20	23.4	117	70-130	M5
m&p-Xylene	ug/L	40	44.0	110	70-130	M5
Methyl-tert-butyl ether	ug/L	20	19.3	97	70-130	M5
n-Butylbenzene	ug/L	20	22.5	113	71-138	M5
n-Propylbenzene	ug/L	20	22.9	115	70-130	M5
Naphthalene	ug/L	20	24.0	120	69-135	M5
o-Xylene	ug/L	20	21.8	109	70-130	M5
p-Isopropyltoluene	ug/L	20	24.3	121	70-130	M5
sec-Butylbenzene	ug/L	20	23.6	118	70-130	M5
tert-Butyl Alcohol	ug/L	100	116	116	63-147	M5

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.: 30295911

LABORATORY CONTROL SAMPLE: 1675940

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
tert-Butylbenzene	ug/L	20	24.5	123	70-130	M5
Toluene	ug/L	20	21.0	105	70-130	M5
1,2-Dichloroethane-d4 (S)	%.			107	80-120	M5
4-Bromofluorobenzene (S)	%.			105	78-122	M5
Dibromofluoromethane (S)	%.			98	80-120	M5
Toluene-d8 (S)	%.			94	80-120	M5

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.: 30295911

QC Batch: 344654 Analysis Method: EPA 8260C
QC Batch Method: EPA 8260C Analysis Description: 8260C MSV
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

METHOD BLANK: 1676942 Matrix: Water
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	ug/L	ND	1.0	0.25	05/29/19 16:02	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	0.21	05/29/19 16:02	
Benzene	ug/L	ND	1.0	0.24	05/29/19 16:02	
Ethanol	ug/L	ND	200	79.8	05/29/19 16:02	4c
Ethylbenzene	ug/L	ND	1.0	0.31	05/29/19 16:02	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	0.24	05/29/19 16:02	
m&p-Xylene	ug/L	ND	2.0	0.60	05/29/19 16:02	
Methyl-tert-butyl ether	ug/L	ND	1.0	0.23	05/29/19 16:02	
n-Butylbenzene	ug/L	ND	1.0	0.20	05/29/19 16:02	
n-Propylbenzene	ug/L	ND	1.0	0.29	05/29/19 16:02	
Naphthalene	ug/L	ND	2.0	0.82	05/29/19 16:02	
o-Xylene	ug/L	ND	1.0	0.18	05/29/19 16:02	
p-Isopropyltoluene	ug/L	ND	1.0	0.36	05/29/19 16:02	
sec-Butylbenzene	ug/L	ND	1.0	0.25	05/29/19 16:02	
tert-Butylbenzene	ug/L	ND	1.0	0.28	05/29/19 16:02	
Toluene	ug/L	ND	1.0	0.30	05/29/19 16:02	
1,2-Dichloroethane-d4 (S)	%.	94	80-120		05/29/19 16:02	
4-Bromofluorobenzene (S)	%.	98	78-122		05/29/19 16:02	
Dibromofluoromethane (S)	%.	102	80-120		05/29/19 16:02	
Toluene-d8 (S)	%.	95	80-120		05/29/19 16:02	

LABORATORY CONTROL SAMPLE: 1676943

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	20	21.3	107	70-130	
1,3,5-Trimethylbenzene	ug/L	20	21.7	109	70-130	
Benzene	ug/L	20	20.9	104	70-130	
Ethanol	ug/L	200	260	130	10-175	4c
Ethylbenzene	ug/L	20	22.1	111	70-130	
Isopropylbenzene (Cumene)	ug/L	20	22.0	110	70-130	
m&p-Xylene	ug/L	40	45.8	114	70-130	
Methyl-tert-butyl ether	ug/L	20	18.9	95	70-130	
n-Butylbenzene	ug/L	20	22.6	113	71-138	
n-Propylbenzene	ug/L	20	22.4	112	70-130	
Naphthalene	ug/L	20	22.2	111	69-135	
o-Xylene	ug/L	20	22.3	112	70-130	
p-Isopropyltoluene	ug/L	20	21.8	109	70-130	
sec-Butylbenzene	ug/L	20	22.2	111	70-130	
tert-Butylbenzene	ug/L	20	21.9	110	70-130	
Toluene	ug/L	20	21.3	106	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.: 30295911

LABORATORY CONTROL SAMPLE: 1676943

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethane-d4 (S)	%.			91	80-120	
4-Bromofluorobenzene (S)	%.			100	78-122	
Dibromofluoromethane (S)	%.			101	80-120	
Toluene-d8 (S)	%.			99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1676977 1676978

Parameter	Units	40187838003 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	<1.0	20	20	17.4	18.0	87	90	70-130	3	30	
1,3,5-Trimethylbenzene	ug/L	<1.0	20	20	18.1	18.7	90	94	70-130	4	30	
Benzene	ug/L	<1.0	20	20	17.3	18.1	86	90	67-119	4	30	
Ethanol	ug/L	<200	200	200	146J	224	73	112	10-175		30	4c
Ethylbenzene	ug/L	<1.0	20	20	18.1	19.6	91	98	69-127	8	30	
Isopropylbenzene (Cumene)	ug/L	<1.0	20	20	18.7	19.1	93	95	70-130	2	30	
m&p-Xylene	ug/L	<2.0	40	40	37.6	39.8	94	100	70-129	6	30	
Methyl-tert-butyl ether	ug/L	<1.0	20	20	16.1	19.2	80	96	70-130	18	30	
n-Butylbenzene	ug/L	<1.0	20	20	18.0	18.9	90	94	54-128	5	30	
n-Propylbenzene	ug/L	<1.0	20	20	18.3	19.0	91	95	62-127	4	30	
Naphthalene	ug/L	<2.0	20	20	17.4	18.9	87	95	60-136	9	30	
o-Xylene	ug/L	<1.0	20	20	18.5	19.4	92	97	68-126	5	30	
p-Isopropyltoluene	ug/L	<1.0	20	20	17.7	18.8	88	94	60-125	6	30	
sec-Butylbenzene	ug/L	<1.0	20	20	18.4	19.1	92	96	63-125	4	30	
tert-Butylbenzene	ug/L	<1.0	20	20	18.5	19.2	92	96	64-124	4	30	
Toluene	ug/L	<1.0	20	20	17.8	19.4	89	97	70-130	8	30	
1,2-Dichloroethane-d4 (S)	%.						87	87	80-120			
4-Bromofluorobenzene (S)	%.						100	99	78-122			
Dibromofluoromethane (S)	%.						98	99	80-120			
Toluene-d8 (S)	%.						99	100	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.: 30295911

QC Batch: 344455 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3510C Analysis Description: 8270D Water PAH by SIM MSSV
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

METHOD BLANK: 1676190 Matrix: Water
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Acenaphthene	ug/L	ND	0.10	0.029	05/30/19 16:49	
Acenaphthylene	ug/L	ND	0.10	0.034	05/30/19 16:49	
Anthracene	ug/L	ND	0.10	0.028	05/30/19 16:49	
Benzo(a)anthracene	ug/L	ND	0.10	0.039	05/30/19 16:49	
Benzo(a)pyrene	ug/L	ND	0.10	0.012	05/30/19 16:49	
Benzo(b)fluoranthene	ug/L	ND	0.10	0.027	05/30/19 16:49	
Benzo(g,h,i)perylene	ug/L	ND	0.10	0.035	05/30/19 16:49	
Benzo(k)fluoranthene	ug/L	ND	0.10	0.023	05/30/19 16:49	
Chrysene	ug/L	ND	0.10	0.040	05/30/19 16:49	
Dibenz(a,h)anthracene	ug/L	ND	0.10	0.028	05/30/19 16:49	
Fluoranthene	ug/L	ND	0.10	0.032	05/30/19 16:49	
Fluorene	ug/L	ND	0.10	0.031	05/30/19 16:49	
Indeno(1,2,3-cd)pyrene	ug/L	ND	0.10	0.030	05/30/19 16:49	
Phenanthrene	ug/L	ND	0.10	0.044	05/30/19 16:49	
Pyrene	ug/L	ND	0.10	0.036	05/30/19 16:49	
2-Fluorobiphenyl (S)	%.	85	19-97		05/30/19 16:49	
Terphenyl-d14 (S)	%.	86	47-105		05/30/19 16:49	

LABORATORY CONTROL SAMPLE: 1676191

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/L	2	1.4	69	34-105	
Acenaphthylene	ug/L	2	1.4	72	30-121	
Anthracene	ug/L	2	1.5	74	39-113	
Benzo(a)anthracene	ug/L	2	1.9	96	51-115	
Benzo(a)pyrene	ug/L	2	1.9	94	46-117	
Benzo(b)fluoranthene	ug/L	2	2.0	99	50-126	
Benzo(g,h,i)perylene	ug/L	2	2.1	106	48-117	
Benzo(k)fluoranthene	ug/L	2	1.8	91	52-118	
Chrysene	ug/L	2	1.8	91	55-107	
Dibenz(a,h)anthracene	ug/L	2	2.1	106	53-118	
Fluoranthene	ug/L	2	1.8	89	45-122	
Fluorene	ug/L	2	1.5	73	36-113	
Indeno(1,2,3-cd)pyrene	ug/L	2	2.1	105	52-117	
Phenanthrene	ug/L	2	1.5	74	40-109	
Pyrene	ug/L	2	1.8	91	45-122	
2-Fluorobiphenyl (S)	%.			69	19-97	
Terphenyl-d14 (S)	%.			90	47-105	

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.: 30295911

QC Batch: 344285 Analysis Method: SM 2320B-2011
QC Batch Method: SM 2320B-2011 Analysis Description: 2320B Alkalinity
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

METHOD BLANK: 1675512 Matrix: Water
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Carbonate (pH4.5)	mg/L	ND	10.0	10.0	05/28/19 17:20	
Alkalinity,Bicarbonate (pH4.5)	mg/L	ND	10.0	10.0	05/28/19 17:20	
Alkalinity,Total (CaCO3 pH4.5)	mg/L	ND	10.0	1.0	05/28/19 17:20	

LABORATORY CONTROL SAMPLE: 1675513

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: 1676201 1676202

Parameter	Units	30295649005 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	330	50	50	380	380	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.: 30295911

QC Batch: 344109 Analysis Method: SM 3500-FeB-2011
QC Batch Method: SM 3500-FeB-2011 Analysis Description: Iron, Ferrous
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

METHOD BLANK: 1674437 Matrix: Water
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	ND	0.10	0.020	05/23/19 00:38	H6

LABORATORY CONTROL SAMPLE: 1674438

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	1	1.0	101	90-110	H6

MATRIX SPIKE SAMPLE: 1674440

Parameter	Units	30295923010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	0.20	1	0.97	77	85-115	3c,H6,ML

SAMPLE DUPLICATE: 1674439

Parameter	Units	30295923010 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	0.20	0.18	7	20	3c,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.: 30295911

QC Batch: 345037 Analysis Method: SM 4500NO3F-2011
QC Batch Method: SM 4500NO3F-2011 Analysis Description: SM4500NO3-F, Nitrate, Preserved
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

METHOD BLANK: 1678714 Matrix: Water
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.028	05/31/19 15:57	

LABORATORY CONTROL SAMPLE: 1678715

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: 1678716 1678717

Parameter	Units	30295902013 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	0.37	5	5	5.6	5.6	104	104	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.: 30295911

QC Batch: 344108 Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 Analysis Description: ASTM D516-90, 02 Sulfate Water
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

METHOD BLANK: 1674433 Matrix: Water
Associated Lab Samples: 30295911001, 30295911002, 30295911003, 30295911004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	10.0	4.7	05/24/19 23:24	

LABORATORY CONTROL SAMPLE: 1674434

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	30	33.2	111	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1674435 1674436

Parameter	Units	30295073001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	ND	20	20	24.4	24.9	89	91	85-115	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

QUALIFIERS

Project: Liverpool Terminal-Cold Spring
Pace Project No.: 30295911

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

SAMPLE QUALIFIERS

Sample: 1675939

[1] The internal standard recoveries in the continuing calibration verification (CCV) associated with sample exceed the upper control limit. The reported results should be considered estimated values.

Sample: 1675940

[1] The internal standard recoveries in the continuing calibration verification (CCV) associated with sample exceed the upper control limit. The reported results should be considered estimated values.

BATCH QUALIFIERS

Batch: 344377

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

Batch: 344455

[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 RF below method recommended limit.

3c Sample pH adjusted to <2 in the lab

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.: 30295911

ANALYTE QUALIFIERS

4c	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.
CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
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.
M5	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
ML	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result 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.: 30295911

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30295911001	**MW-204**	EPA 3005A	344191	EPA 6010C	344291
30295911002	**MW-209**	EPA 3005A	344191	EPA 6010C	344291
30295911003	**BMW2**	EPA 3005A	344191	EPA 6010C	344291
30295911004	**BMW3**	EPA 3005A	344191	EPA 6010C	344291
30295911001	**MW-204**	EPA 3005A	344502	EPA 6010C	344521
30295911002	**MW-209**	EPA 3005A	344502	EPA 6010C	344521
30295911003	**BMW2**	EPA 3005A	344502	EPA 6010C	344521
30295911004	**BMW3**	EPA 3005A	344502	EPA 6010C	344521
30295911001	**MW-204**	EPA 3510C	344455	EPA 8270D by SIM	344608
30295911002	**MW-209**	EPA 3510C	344455	EPA 8270D by SIM	344608
30295911003	**BMW2**	EPA 3510C	344455	EPA 8270D by SIM	344608
30295911004	**BMW3**	EPA 3510C	344455	EPA 8270D by SIM	344608
30295911001	**MW-204**	EPA 8260C	344654		
30295911002	**MW-209**	EPA 8260C	344654		
30295911003	**BMW2**	EPA 8260C	344654		
30295911004	**BMW3**	EPA 8260C	344654		
30295911005	**Trip Blank**	EPA 8260C	344377		
30295911001	**MW-204**	SM 2320B-2011	344285		
30295911002	**MW-209**	SM 2320B-2011	344285		
30295911003	**BMW2**	SM 2320B-2011	344285		
30295911004	**BMW3**	SM 2320B-2011	344285		
30295911001	**MW-204**	SM 3500-FeB-2011	344109		
30295911002	**MW-209**	SM 3500-FeB-2011	344109		
30295911003	**BMW2**	SM 3500-FeB-2011	344109		
30295911004	**BMW3**	SM 3500-FeB-2011	344109		
30295911001	**MW-204**	SM 4500NO3F-2011	345037		
30295911002	**MW-209**	SM 4500NO3F-2011	345037		
30295911003	**BMW2**	SM 4500NO3F-2011	345037		
30295911004	**BMW3**	SM 4500NO3F-2011	345037		
30295911001	**MW-204**	ASTM D516-90,02	344108		
30295911002	**MW-209**	ASTM D516-90,02	344108		
30295911003	**BMW2**	ASTM D516-90,02	344108		
30295911004	**BMW3**	ASTM D516-90,02	344108		

Environmental Analysis Request/Chain of Custody

eurofins Pace | Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # ______ Group # ______ Sample # ______

COC # 552225

Client Information

Client: Arcadis	Acct. #:
Project Name/#: Cold Springs Terminal / B0039004.0008	PWSID #:
Project Manager: PJ Hart / Vin Maresco	P.O. #:
Sampler: Austin George / [signature]	Quote #:
State where samples were collected: NY	For Compliance: Yes ☐ No ☐

Matrix: Tissue ☐ Sediment ☐ Soil ☐; Water: Ground ☒ Surface ☐ Potable ☐ NPDES ☐; Other:

Analysis Requested — Preservation and Filtration Codes

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other	Total # of Containers	VOCs 8260 (H)	SVOCs 8270	Nitrate Nitrite (S)	Sulfate, Alkalinity, ferrous Iron	Manganese, Unfiltered (N)	Manganese, Lab filtered	Methane, CO2 (O)				Remarks
MW-204	5/22/19	1115	X			X		11	3	2	1	1	1	1	2				001
MW-209	5/22/19	0915	X			X		11	3	2	1	1	1	1	2				002
BMW2	5/22/19	1145	X			X		11	3	2	1	1	1	1	2				003
BMW3	5/22/19	0945	X			X		11	3	2	1	1	1	1	2				004
Trip blank	5/14/19	/	X			X		2	2										005

Remarks: O = benzalkonium chloride; vin.maresco@arcadis.com; TB ~~006~~ ETS-23-19

For Lab Use Only
FSC: ______
SCR#: ______

Preservation Codes

H=HCl	T=Thiosulfate
N=HNO_3	B=NaOH
S=H_2SO_4	P=H_3PO_4
F=Field Filtered	O=Other

WO#: 30295911
30295911

Turnaround Time (TAT) Requested (please circle)
Standard   Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ______

E-mail address: Vin.Maresco@arcadis.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP)   Type VI (Raw Data Only)
Type III (Reduced non-CLP)   NJ DKQP   TX TRRP-13
NYSDEC Category A or B   MA MCP   CT RCP

Relinquished by	Date	Time	Received by	Date	Time
A. George [signature]	5/22/19	1310	[signature]	5.22.19	1310
[signature]	5.22	1700	[signature] PACE	05/23/19	0940

EDD Required? Yes No
If yes, format: ______

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:
UPS ______ FedEx ______ Other ______

Temperature upon receipt ______ °C

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300
The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0717

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Arcadis

Project # 30295911

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label JVB

LIMS Login EJ

Tracking #: 7752 8609 6623 JVB 05/23/19

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Thermometer Used 11

Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 1.9/2.3c Correction Factor: 0 °C Final Temp: 1.9/2.3

Temp should be above freezing to 6°C

pH paper Lot# 10032481

Date and initials of person examining contents: 05/23/19 JVB

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):	✓			7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:	✓			14.
Filtered volume received for Dissolved tests		✓		15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. 2.5 mL of HNO3 added to nitric for sample BMW3 for pH<2. 1.0mL of H2SO4 added to sulfuric bottle for sample BMW3 for pH<2
All containers meet method preservation requirements.		✓		Initial when completed: JVB Date/time of preservation: 05/23/19 1210 / 05/22/19 1215 Lot # of added preservative: DY49-0361 / 031819-HCl-PX
Headspace in VOA Vials (>6mm):	✓	✓		17. See Comments JVB 05/23/19
Trip Blank Present:	✓			18.
Trip Blank Custody Seals Present	✓			
Rad Samples Screened < 0.5 mrem/hr			✓	Initial when completed: Date:

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: 3 of 11 3 VOAs for BMW-3

JVB 05/23/19

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect proservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

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

June 5, 2019

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

RE: **30295911**

Pace Workorder: 30446

Dear Rachel Christner:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, May 24, 2019. 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 06/05/2019
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 17

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: 30446 30295911

Lab ID	Sample ID	Matrix	Date Collected	Date Received
304460001	30295911 001	Water	5/22/2019 11:15	5/24/2019 12:09
304460002	30295911 002	Water	5/22/2019 09:15	5/24/2019 12:09
304460003	30295911 003	Water	5/22/2019 11:45	5/24/2019 12:09
304460004	30295911 004	Water	5/22/2019 09:45	5/24/2019 12:09

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

PROJECT SUMMARY

Workorder: 30446 30295911

Workorder Comments

The samples 30446 (0001-0004) were collected in an alternate container type, than that assigned to PAES method RSK175. The sample container was BAK preserved and capped with butyl septa.

Only one vial was provided for analysis of method RSK175. In order to assure accurate reporting of all analytes, the equilibrated headspace was transferred to a headspace vial. Results reported at dilution. Samples 30446 (0001-0004).

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

ANALYTICAL RESULTS

Workorder: 30446 30295911

Lab ID: **304460001** Date Received: 5/24/2019 12:09 Matrix: Water

Sample ID: **30295911 001** Date Collected: 5/22/2019 11:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**120**	mg/l	5.0	0.47	1	6/1/2019 12:49	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**410**	ug/l	2.5	0.34	5	5/30/2019 13:00	AK	d

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

ANALYTICAL RESULTS

Workorder: 30446 30295911

Lab ID: **304460002** Date Received: 5/24/2019 12:09 Matrix: Water

Sample ID: **30295911 002** Date Collected: 5/22/2019 09:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**21**	mg/l	5.0	0.47	1	6/1/2019 13:02	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**1.7J**	ug/l	2.5	0.34	5	5/30/2019 13:11	AK	d

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

ANALYTICAL RESULTS

Workorder: 30446 30295911

Lab ID: **304460003** Date Received: 5/24/2019 12:09 Matrix: Water

Sample ID: **30295911 003** Date Collected: 5/22/2019 11:45

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**11**	mg/l	5.0	0.47	1	6/1/2019 13:14	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**2.2J**	ug/l	2.5	0.34	5	5/30/2019 13:21	AK	d

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

ANALYTICAL RESULTS

Workorder: 30446 30295911

Lab ID: **304460004** Date Received: 5/24/2019 12:09 Matrix: Water

Sample ID: **30295911 004** Date Collected: 5/22/2019 09:45

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Carbon Dioxide	**91**	mg/l	5.0	0.47	1	6/1/2019 13:26	TD	n
Analysis Desc: EPA RSK175		Analytical Method: EPA RSK175						
Methane	**1.1J**	ug/l	2.5	0.34	5	5/30/2019 13:32	AK	d

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

ANALYTICAL RESULTS QUALIFIERS

Workorder: 30446 30295911

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.

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

QUALITY CONTROL DATA

Workorder: 30446 30295911

QC Batch: DISG/7565 Analysis Method: EPA RSK175

QC Batch Method: EPA RSK175

Associated Lab Samples: 304460001, 304460002, 304460003, 304460004

METHOD BLANK: 61408

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Methane	ug/l	0.067U	0.067	

LABORATORY CONTROL SAMPLE & LCSD: 61409 61410

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Methane	ug/l	44	42	42	94	96	85-115	1.5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 61411 61412 Original: 304400005

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK											
Methane	ug/l	2.2	44	57	49	120	100	70-130	15	20	d

SAMPLE DUPLICATE: 61416 Original: 304500001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
RISK						
Methane	ug/l	5.7	6.1	6.2	20	

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

QUALITY CONTROL DATA

Workorder: 30446 30295911

QC Batch: DISG/7570 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 304460001, 304460002, 304460003, 304460004

METHOD BLANK: 61457

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Carbon Dioxide	mg/l	0.47U	0.47	n

LABORATORY CONTROL SAMPLE & LCSD: 61459 61461

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Carbon Dioxide	mg/l	120	140	140	116	118	80-120	1.6	20	n

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 61462 61463 Original: 304400005

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	26	120	160	170	118	127	70-130	6.3	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 QUALIFIERS

Workorder: 30446 30295911

QUALITY CONTROL PARAMETER QUALIFIERS

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: 30446 30295911

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
304460001	30295911 001			EPA RSK175	DISG/7565
304460002	30295911 002			EPA RSK175	DISG/7565
304460003	30295911 003			EPA RSK175	DISG/7565
304460004	30295911 004			EPA RSK175	DISG/7565
304460001	30295911 001			AM20GAX	DISG/7570
304460002	30295911 002			AM20GAX	DISG/7570
304460003	30295911 003			AM20GAX	DISG/7570
304460004	30295911 004			AM20GAX	DISG/7570

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.:
P.O. No: ASR- 30295911

Request Date: 5/24/19
Shipped By: FedEx

Analysis Due Date: 5/31/2019

Certification Required: NY

Page 1 of 1

Pace Project No.: 30295911
Report/Invoice to: Rachel Christner

	Pace Sample ID:	Matrix:	Collection Date:	Time:	Analysis Requested:	Analytical Method:	Preservative Type:
1	30295911 001	WT	5/22/19	11:15	Methane	RSK-175	BAK
2					Carbon Dioxide	AM20GAX	BAK
3	30295911 002	WT	5/22/19	9:15	Methane	RSK-175	BAK
4					Carbon Dioxide	AM20GAX	BAK
5	30295911 003	WT	5/22/19	11:45	Methane	RSK-175	BAK
6					Carbon Dioxide	AM20GAX	BAK
7	30295911 004	WT	5/22/19	9:45	Methane	RSK-175	BAK
8					Carbon Dioxide	AM20GAX	BAK
9							
10							
11							
12							

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) (Date) (Time)

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

Received 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.

Cooler Receipt Form

Client Name: _____ Project: _____ Lab Work Order: _____

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:_____ 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 :_____ Date:_____

Project Manager Review :_____ Date:_____

Environmental Analysis Request/Chain of Custody

eurofins Pace | Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # _____ Group # _____ Sample # _____

COC # 552225

Client Information

Client: Arcadis	Acct. #:
Project Name/#: Cold Springs Terminal / Bam004.0008	PWSID #:
Project Manager: PJ Hart / Vin Maresco	P.O. #:
Sampler: Austin George / CA Dge	Quote #:
State where samples were collected: NY	For Compliance: Yes ☐ No ☐

Matrix: Soil ☐ Sediment ☐ Tissue ☐ | Water ☐ Potable ☐ Ground ☒ Surface ☐ NPDES ☐ | Other: ___

Analysis Requested

Preservation and Filtration Codes: H | | S | | N | | O

For Lab Use Only

FSC: _____

SCR#: _____

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 P=H_3PO_4
F=Field Filtered O=Other

Remarks

O = benzaldehyde chloride

vin.maresco@arcadis.com

Sample Identification	Collected Date	Collected Time	Grab	Composite	Total # of Containers	VOCs 8260	SVOCs 8270	Nitrate Nitrite	Sulfate, Alkalinity, Forms Iron	Manganese, Unfiltered	Manganese, Lab filtered	Methane, CO2						Remarks
MW-204	5/22/19	1115	X		11	3	2	1	1	1	1	2						001
MW-209	5/22/19	0915	X		11	3	2	1	1	1	1	2						002
BMW2	5/22/19	1145	X		11	3	2	1	1	1	1	2						003
BMW3	5/22/19	0945	X		11	3	2	1	1	1	1	2						004
Trip blank	5/14/19	/	X		2	2												005
																		TB ~~0010~~ ETS-23-19

WO# : 30295911

30295911

Turnaround Time (circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: _____

E-mail address: Vin.Maresco@arcadis.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)

Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13

NYSDEC Category A or B | MA MCP | CT RCP

Relinquished by	Date	Time	Received by	Date	Time
A. George	5/22/19	1310		5.22.19	13:0
	5.22	1700		05/23/19	0942

EDD Required? Yes No

If yes, format: _____

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: UPS _____ FedEx _____ Other _____

Temperature upon receipt _____ °C

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical Client Name: Arcadis Project # 30295911

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other _____

Label JVB
LIMS Login ES

Tracking #: 7752 8609 6623 JVB 05/23/19

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals Intact: ☑ yes ☐ no

Thermometer Used 11 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 1.9/2.3°C Correction Factor: 0 °C Final Temp: 1.9/2.3

Temp should be above freezing to 6°C

pH paper Lot# 10172481 Date and initials of person examining contents: 05/23/19 JVB

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):	✓			7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:	✓			14.
Filtered volume received for Dissolved tests		✓		15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. 2.5 mL of HNO3 added to nitric for sample BMW3 for pH<2. 1.0 mL of H2SO4 added to sulfuric bottle for sample BMW3 for pH<2. Initial when completed: JVB Date/time of preservation: 05/23/19 1210 / 05/23/19 1215 Lot # of added preservative: DL9-0361 / 031819-4C PX
All containers meet method preservation requirements.		✓		
Headspace in VOA Vials (>6mm):	✓	✓		17. See Comments / JVB 05/23/19
Trip Blank Present:	✓			18.
Trip Blank Custody Seals Present	✓			
Rad Samples Screened < 0.5 mrem/hr			✓	Initial when completed: _____ Date: _____

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: 3 of 3 VOAs for BMW-3 JVB 05/23/19

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

J:\QAQC\Master\Document Management\Sample Mgt\Sample Condition Upon Receipt Pittsburgh (C056-9 5April2019)