AECOM
4051 Ogletown Road
Newark
DE, 19713
USA
aecom.com

Project name:
Montague Site

Project ref:
Chemours: 507756
AECOM: 60561815

To:
Ronda Blayer, MDEQ
Dale Bridgford, MDEQ

CC:
Sathya Yalvigi, Chemours
Craig A. Bartlett, Chemours

From:
George E. Gregory III, AECOM

Date:
July 18, 2019

Memo

Subject: Thiocyanate Ion (SCN) Sampling Results – May 2019
Chemours Montague Site, Montague, Michigan

Background

Based on a conference call conducted January 14, 2019 and subsequent email discussions between Ronda Blayer, Dale Bridgford (MDEQ), Sathya Yalvigi (Chemours) and Rick Rediske, AECOM has performed groundwater sampling of five monitoring wells, three interceptor wells, and the outfall for analysis of thiocyanate ion (SCN).

The purpose of the sampling was to determine if SCN remains present in the groundwater downgradient near the Lime Pile, which had historically released SCN. That release of inorganic constituents to groundwater was the initial purpose of the interceptor well system, which was installed in 1963 and has operated since that time. The extraction systems purpose is to prevent groundwater containing constituents related to site activity from venting to White Lake.

This memo documents the field activities and results of the SCN sampling and analysis.

Sampling Activities – May 2019

On May 29, 30, and 31, 2019, Bracken Netcott and Andrew Boyce of AECOM collected samples of water from the locations listed in Table 1. This sampling was conducted coincident with the regularly scheduled, first half 2019 annual/semiannual event (1H2019).

Samples were collected from monitoring wells using low-flow purge method with a Monsoon-brand submersible pump. Samples from the three interceptor wells (with the prefix “IW”) and the outfall were sampled directly from their sampling ports.

Table 2 lists stabilized field parameter data collected from wells during the purge of the monitoring wells and sample ports. Purge parameter data were not collected for the National Pollutant Discharge Elimination System (NPDES) outfall sample. Field purge notes are included as Appendix A. In addition to the samples listed in Table 1, the AECOM team also collected a duplicate and a field blanks to assess the potential for cross contamination.

The field team placed samples on ice and shipped them under chain of custody to Pace Analytical Laboratories in Greensburg Pennsylvania. The shipment occurred on Friday May 31, 2019. The laboratory received the sampling coolers on Monday June 3, 2019 and the ice had melted. Samples were extracted within hold times

and analyzed for SM 4500CNM-2011. Appendix B contains the laboratory report with the results from the sampling event.

Results of Sampling

Results from the May sampling event are shown in Table 3. One well had detectable SCN. All other samples were non-detect at a reporting limit of 0.1 milligrams per liter (mg/L), All samples were analyzed to the method detection limit (MDL) of 0.041 mg/L. Therefore, results with a U qualifier were not detected as low as the MDL. If there had been a detection above the MDL but below the reporting limit of 0.1 mg/L, that result would have had a "J" qualifier.

Results for all locations are posted on Figure 1.

- The detection was found at well MW-104-045. This well is at the southeast cover of the Lime Pile and was the most likely well to have any constituents related to the pile. It is relatively shallow with a total depth of 45 feet. This location is upgradient of three interceptor wells, and it is within the capture zone of the extraction system.
- All three interceptor wells and the outfall were non-detect for SCN indicating that most of the water being captured by the system is free of SCN at the reporting limits.
- All other samples from monitoring wells were non-detect indicating that the extent of the SCN is limited to the immediate vicinity of the Lime Pile. Groundwater from near MW-104-045 does not discharge to White Lake.
- As noted above, samples were received by the laboratory after the ice had melted. Samples were however treated with field preservative when they were collected in the sample bottles. The short period of time that the samples were above the temperature limit is therefore believed to be unlikely to have significantly affected sample results.

Equipment and field blank samples also had no SCN above the reporting limit indicated in Table 3. These non-detect results in the blanks suggest that sufficient precautions were taken during sampling that the detection identified in the primary field samples is valid and is not likely due to cross-contamination.

Summary

The results from this sampling event indicate that SCN remains present in groundwater in the immediate vicinity of the Lime Pile. Groundwater in this area is within the capture zone of the current interceptor well system. Water from the interceptor wells and outfall are non-detect for SCN.

Based on the limited extent of the SCN impact and that it is within the extraction system capture zone, no additional sampling is recommended.

If you have any questions or comments about the results, please contact me at 832-422-4423. For other questions related to the project, please contact Sathya Yalvigi at 302-773-4291.

Sincerely,

George E. Gregory III
Senior Geologist/Project Manager
AECOM Corporation

Tables

Table 1
Wells Sampled for Thiocyanate Ion
1H2019 Groundwater Monitoring Results
Chemours Montague Works
Montague, Michigan

Sample ID	X Coordinate	Y Coordinate	General Location
MW-210-080	12582289.86	696547.76	Upgradient well
IW-06-140	12583438.90	692991.10	Downgradient IW for Lime Pile
IW-08-142	12583820.60	693160.27	Downgradient IW for Lime Pile
IW-09-140	12583717.30	693480.70	Downgradient IW for Lime Pile
MW-104-045	12583264.35	694320.21	At downgradient edge of Lime Pile
MW-023-028	12582493.05	694320.70	Cross gradient of Lime Pile
MW-024-045	12583549.25	695758.83	Cross gradient of Lime Pile
MW-LPW-056	12582992.69	695779.68	Within north portion of Lime Pile
Outfall			NPDES Outfall Piping

Note: coordinates are expressed in Michigan South State Plane system.

Table 2
Field Purge Parameters
1H2019 Groundwater Monitoring Results
Chemours Montague Works
Montague, Michigan

Sample Location	Date Time	pH	Temperature (C)	Spec. Cond. umhos/cm	DO (mg/l)	Turbidity (ntu)	ORP (mv)	Depth to Water (ft)	Turbidity (qualitative)
May 2019 Thiocyanate Sampling									
MW-210-080	14:28 05/29/2019	7.60	11.97	346	7.76	0.00	69	37.27	clear
IW-06-140	08:55 05/30/2019	8.01	10.20	368	9.90	6.80	85	NM	clear
IW-08-142	10:10 05/30/2019	8.25	10.50	432	9.17	2.00	-126	NM	clear
IW-09-140	08:48 05/30/2019	8.70	10.70	410	7.01	15.00	-85	NM	cloudy
MW-104-045	11:00 05/31/2019	11.05	11.60	542	3.93	141.00	86	3.93	cloudy
MW-023-028	10:12 05/31/2019	8.82	9.80	84	8.97	9.63	83	27.8	some red
MW-024-045	10:41 05/31/2019	8.12	11.00	242	10.48	20.00	111	36.1	clear
MW-LPW-056	10:04 05/31/2019	7.65	11.90	488	7.59	51.00	72	38.3	brown
Outfall	09:47 05/31/2019	NM							

NM - Not measured (interceptor wells are not measured when operating)
NR - No Response (below instrument detection limits)

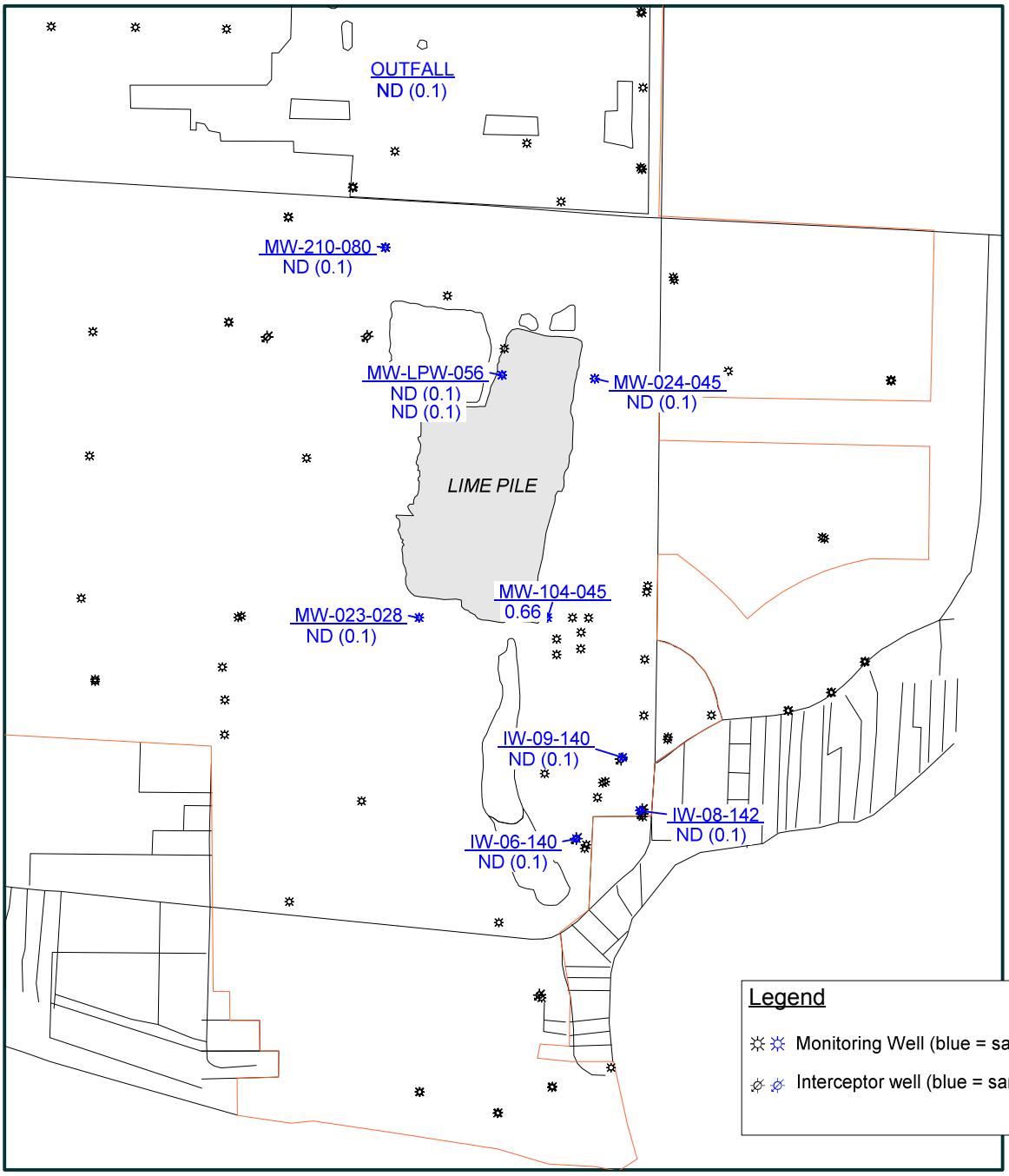
Table 3
Thiocyanate Ion Results
1H2019 Groundwater Monitoring Results
Chemours Montague Works
Montague, Michigan

Sample ID	Location ID	Analyte		Thiocyanate
		Method		SM 4500CNM-2011
		Date	Purpose	mg/L
May 2019 Thiocyanate Sampling				
GW1H19-MW-104-045	MW-104-045	5/31/19	Regular Sample	0.66
GW1H19-MW-023-028	MW-023-028	5/31/19	Regular Sample	ND (0.1)
GW1H19-MW-024-045	MW-024-045	5/31/19	Regular Sample	ND (0.1)
GW1H19-MW-LPW-056	MW-LPW-056	5/31/19	Regular Sample	ND (0.1)
GW1H19-MW-OUTFALL-001	MW-OUTFALL-001	5/31/19	Regular Sample	ND (0.1)
GW1H19-MW-LPW-056-D	MW-LPW-056	5/31/19	Field Duplicate	ND (0.1)
EB-05 19-11	EB-05 19-11	5/31/19	Field Blank	ND (0.1)
GW1H19-MW-210-80	MW-210-080	5/29/19	Regular Sample	ND (0.1)
GW1H19-IW-6-140	IW-06-140	5/30/19	Regular Sample	ND (0.1)
GW1H19-IW-8-142	IW-08-142	5/30/19	Regular Sample	ND (0.1)
GW1H19-IW-9-140	IW-09-140	5/30/19	Regular Sample	ND (0.1)

ND = Non detect at stated reporting limit
J = Estimated result

GW data from Thiocyanate sampling.xlsx:Table 3
7/18/2019

Figures



Sampling was conducted May 29, 30, and 31, 2019.
Sampling locations are posted and labeled dark blue.
Results are expressed in milligrams per liter (mg/L).

AECOM
4051 Ogletown Road, Suite 300
Newark, DE 19713

TITLE:
Thiocyanate Sampling Results
Chemours Montague Site
Montague, Michigan

DWN:	APPD:	PROJECT NO:
GEG		60561815
CHKD:	REV:	FIGURE NO:
		1
DATE: 07/02/2019		

Appendix A

Field Notes from May 2019

Thi Diable

Chemours Montague Sampling Field Notes

Site: Montague Event:1h19 Personnel: Bracken Netcott

Prjoect Leader: George Gregory **Project #/Task # :** 0-Jan

Well ID: MS-mw210-80 **Well Depth:** 82.05 ft 40

Purge Start Time: 14:16 **Date:** 5-29-19 **Pump:** Monsoon

Initial Depth to Water: 37.27'

Time	Temp ©	nce us/cm	DO mg/l	PH	Redox ORP	Turbidity NTU	Color	Odor	DTW
14:18	11.97	344	8.71	7.36	+82	0.0	clear	—	37.30'
14:23	11.98	345	7.77	7.57	+71	0.0	clear	—	37.30'
14:28	11.97	346	7.76	7.60	+69	0.0	clear	—	37.30'

Collection Time: 14:28 **Stabile Depth to Water:** 37.30'

Comments:

TLM

Chemours Montague Sampling Field Notes

Site: Montague Event:1h19 Personnel: Bracken Netcott

Prjoect Leader: George Gregory **Project #/Task # :** 0-Jan

Well ID: MS-iw6-140 **Well Depth:** 140 ft

Purge Start Time: 855 **Date:** 5-30-19 **Pump:** ~~Monsoon~~ Bucket

Initial Depth to Water: _____

Time	Temp ©	Conductance us/cm	DO mg/l	PH	Redox ORP	Turbidity NTU	Color	Odor	DTW
855	16.2	360	9.7	8.01	.85	6.8	Cl	YES	

Collection Time: 855 **Stabile Depth to Water:** _____

Comments:

4h4

Chemours Montague Sampling Field Notes

Site: Montague Event:1h19 Personnel: Bracken Netcott

Prjoect Leader: George Gregory **Project #/Task # :** 0-Jan

Well ID: MS-iw9-140 **Well Depth:** 112 ft

Purge Start Time: 848 **Date:** 5-30-19 **Pump:** Bucket ~~Monsoon~~

Initial Depth to Water: _____

Time	Temp ©	Conductance us/cm	DO mg/l	PH	Redox ORP	Turbidity NTU	Color	Odor	DTW
848	10.7	410	7.01	8.70	-85	~~37~~ 15	cloudy	YES	

Collection Time: 848 **Stabile Depth to Water:** _____

Comments:

TH9

Chemours Montague Sampling Field Notes

Site: Montague Event:1h19 Personnel: Bracken Netcott

Prjoect Leader: George Gregory **Project #/Task # :** 0-Jan

Well ID: MS-iw8-140 **Well Depth:** 140 ft

Purge Start Time: 950 **Date:** 5-30 **Pump:** Bucket ~~Monsoon~~

Initial Depth to Water: _____

Time	Temp ©	Conductance us/cm	DO mg/l	PH	Redox ORP	Turbidity NTU	Color	Odor	DTW
10:5	10.5	432	9.19	8.25	-126	2.0	Cl	ND	

Collection Time: _____ **Stabile Depth to Water:** _____

Comments:

Chemours Montague Sampling Field Notes

Site: Montague Event:1h19 Personnel: Bracken Netcott
Prjoect Leader: George Gregory **Project #/Task # :** 0-Jan

Well ID: Mw-23-28 **Well Depth:** 28 ft

Purge Start Time: 10 11 **Date:** 5-31-14 **Pump:** Bailer. Monsoon

Initial Depth to Water: 27.80

Time	Temp ©	Conductance us/cm	DO mg/l	PH	Redox ORP	Turbidity NTU	Color	Odor	DTW
1012	9.5	84	8.97	8.82	83	9.63	~~Sm Rust~~ Some RED	No	

Collection Time: 10:12 **Stabile Depth to Water:** 27.80

Comments:

Chemours Montague Sampling Field Notes

Site: Montague Event:1h19 Personnel: Bracken Netcott
Prjoect Leader: George Gregory **Project #/Task # :** 0-Jan

Well ID: Mw-24-45 **Well Depth:** 45 ft

Purge Start Time: 10:30 **Date:** 5-31-19 **Pump:** Monsoon

Initial Depth to Water: 36.10

Time	Temp ©	Conductance us/cm	DO mg/l	PH	Redox ORP	Turbidity NTU	Color	Odor	DTW
10:31	11.0	236	10.29	7.71	111.1	6.20	clear	—	36.30'
10:36	11.0	246	10.44	8.12	110	11.6			
1041	11	242	10.48	8.12	111	20 ∞			

Collection Time: 10 41 **Stabile Depth to Water:** 36.30

Comments:

Chemours Montague Sampling Field Notes

Site: Montague Event:1h19 **Personnel:** Bracken Netcott
Prjoect Leader: George Gregory **Project #/Task # :** 0-Jan

Well ID: Mw-lpw-56 **Well Depth:** 56 ft

Purge Start Time: 933 **Date:** 5-31-19 **Pump:** Monsoon

Initial Depth to Water: 38.30

Time	Temp ©	Conductance us/cm	DO mg/l	PH	Redox ORP	Turbidity NTU	Color	Odor	DTW
~~+2933~~	12	263	1.88	8.39	-155	185	Brown	Smells	like
938	12.1	354	5.20	7.89	60.8	231		lime	
943	12.1	424	7.51	7.78	21.1	134	Brown	lime	38.30'
948	12.1	440	7.64	7.74	37.6	102	Brown	lime	38.30'
0953	12.1	463	7.63	7.70	57.0	70	Brown	lime	38.30'
958	12.0	477	7.66	7.66	71	51			
1003	11.9	486	7.54	7.65	72	51			

Collection Time: 1004 **Stabile Depth to Water:** 38.30

Comments:

Chemours Montague Sampling Field Notes

Site: Montague Event:1h19 Personnel: Bracken Netcott
Prjoect Leader: George Gregory **Project #/Task # :** 0-Jan

Well ID: Mw-104-45 **Well Depth:** 45 ft

Purge Start Time: 1055 **Date:** 5-31-19 **Pump:** ~~Monsoon~~ Bailer

Initial Depth to Water: 37.68

Time	Temp ©	Conductance us/cm	DO mg/l	PH	Redox ORP	Turbidity NTU	Color	Odor	DTW
10:59	11.6	542	3.93	11.05	85.7	141	cloudy clear	Lime	37.68

Collection Time: 11:00 **Stabile Depth to Water:** 37.68

Comments:

Appendix B

Laboratory Reports from May 2019 Sampling

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

June 13, 2019

George Gregory
AECOM
Sabre Building, Suite 300
4051 Ogletown Road
Newark, DE 19713

RE: Project: GW MONITORING 1H19
Pace Project No.: 30297474

Dear George Gregory:
Enclosed are the analytical results for sample(s) received by the laboratory on June 03, 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.

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

Sincerely,

Laura M. Pirilla
laura.pirilla@pacelabs.com
(724)850-5616
Project Manager

Enclosures

cc: Barbara McGraw, AECOM
Dyana Sagges, AECOM

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

CERTIFICATIONS

Project: GW MONITORING 1H19
Pace Project No.: 30297474

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: GW MONITORING 1H19
Pace Project No.: 30297474

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30297474001	**GW1H19-MW-104-045**	Water	05/31/19 11:00	06/03/19 09:40
30297474002	**GW1H19-MW-023-028**	Water	05/31/19 10:11	06/03/19 09:40
30297474003	**GW1H19-MW-024-045**	Water	05/31/19 10:41	06/03/19 09:40
30297474004	**GW1H19-MW-LPW-056**	Water	05/31/19 10:03	06/03/19 09:40
30297474005	**GW1H19-MW-OUTFALL-001**	Water	05/31/19 09:47	06/03/19 09:40
30297474006	**GW1H19-MW-LPW-056-D**	Water	05/31/19 10:03	06/03/19 09:40
30297474007	**EB-05 19-11**	Water	05/31/19 10:00	06/03/19 09:40
30297474008	**GW1H19-MW-210-80**	Water	05/29/19 14:28	06/03/19 09:40
30297474009	**GW1H19-IW-6-140**	Water	05/30/19 09:24	06/03/19 09:40
30297474010	**GW1H19-IW-8-142**	Water	05/30/19 10:10	06/03/19 09:40
30297474011	**GW1H19-IW-9-140**	Water	05/30/19 10:05	06/03/19 09:40

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

SAMPLE ANALYTE COUNT

Project: GW MONITORING 1H19
Pace Project No.: 30297474

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30297474001	**GW1H19-MW-104-045**	SM 4500CNM-2011	RTB	1
30297474002	**GW1H19-MW-023-028**	SM 4500CNM-2011	RTB	1
30297474003	**GW1H19-MW-024-045**	SM 4500CNM-2011	RTB	1
30297474004	**GW1H19-MW-LPW-056**	SM 4500CNM-2011	RTB	1
30297474005	**GW1H19-MW-OUTFALL-001**	SM 4500CNM-2011	RTB	1
30297474006	**GW1H19-MW-LPW-056-D**	SM 4500CNM-2011	RTB	1
30297474007	**EB-05 19-11**	SM 4500CNM-2011	RTB	1
30297474008	**GW1H19-MW-210-80**	SM 4500CNM-2011	RTB	1
30297474009	**GW1H19-IW-6-140**	SM 4500CNM-2011	RTB	1
30297474010	**GW1H19-IW-8-142**	SM 4500CNM-2011	RTB	1
30297474011	**GW1H19-IW-9-140**	SM 4500CNM-2011	RTB	1

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

ANALYTICAL RESULTS

Project: GW MONITORING 1H19
Pace Project No.: 30297474

Sample: GW1H19-MW-104-045 **Lab ID: 30297474001** Collected: 05/31/19 11:00 Received: 06/03/19 09:40 Matrix: Water

Comments: • Samples were received at a temperature of 19.3 degrees C, no solid ice was present. Samples did not meet the requirement for thermal preservation.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNM Thiocyanate	Analytical Method: SM 4500CNM-2011								
Thiocyanate	**0.66**	mg/L	0.10	0.041	1		06/11/19 18:31		

Sample: GW1H19-MW-023-028 **Lab ID: 30297474002** Collected: 05/31/19 10:11 Received: 06/03/19 09:40 Matrix: Water

Comments: • Samples were received at a temperature of 19.3 degrees C, no solid ice was present. Samples did not meet the requirement for thermal preservation.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNM Thiocyanate	Analytical Method: SM 4500CNM-2011								
Thiocyanate	**0.10 U**	mg/L	0.10	0.041	1		06/11/19 18:34		

Sample: GW1H19-MW-024-045 **Lab ID: 30297474003** Collected: 05/31/19 10:41 Received: 06/03/19 09:40 Matrix: Water

Comments: • Samples were received at a temperature of 19.3 degrees C, no solid ice was present. Samples did not meet the requirement for thermal preservation.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNM Thiocyanate	Analytical Method: SM 4500CNM-2011								
Thiocyanate	**0.10 U**	mg/L	0.10	0.041	1		06/11/19 18:35		

Sample: GW1H19-MW-LPW-056 **Lab ID: 30297474004** Collected: 05/31/19 10:03 Received: 06/03/19 09:40 Matrix: Water

Comments: • Samples were received at a temperature of 19.3 degrees C, no solid ice was present. Samples did not meet the requirement for thermal preservation.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNM Thiocyanate	Analytical Method: SM 4500CNM-2011								
Thiocyanate	**0.10 U**	mg/L	0.10	0.041	1		06/11/19 18:36		

Sample: GW1H19-MW-OUTFALL-001 **Lab ID: 30297474005** Collected: 05/31/19 09:47 Received: 06/03/19 09:40 Matrix: Water

Comments: • Samples were received at a temperature of 19.3 degrees C, no solid ice was present. Samples did not meet the requirement for thermal preservation.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNM Thiocyanate	Analytical Method: SM 4500CNM-2011								
Thiocyanate	**0.10 U**	mg/L	0.10	0.041	1		06/11/19 18:37		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: GW MONITORING 1H19
Pace Project No.: 30297474

Sample: GW1H19-MW-LPW-056-D **Lab ID: 30297474006** Collected: 05/31/19 10:03 Received: 06/03/19 09:40 Matrix: Water

Comments: • Samples were received at a temperature of 19.3 degrees C, no solid ice was present. Samples did not meet the requirement for thermal preservation.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNM Thiocyanate	Analytical Method: SM 4500CNM-2011								
Thiocyanate	**0.10 U**	mg/L	0.10	0.041	1		06/11/19 18:38		

Sample: EB-05 19-11 **Lab ID: 30297474007** Collected: 05/31/19 10:00 Received: 06/03/19 09:40 Matrix: Water

Comments: • Samples were received at a temperature of 19.3 degrees C, no solid ice was present. Samples did not meet the requirement for thermal preservation.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNM Thiocyanate	Analytical Method: SM 4500CNM-2011								
Thiocyanate	**0.10 U**	mg/L	0.10	0.041	1		06/11/19 18:39		

Sample: GW1H19-MW-210-80 **Lab ID: 30297474008** Collected: 05/29/19 14:28 Received: 06/03/19 09:40 Matrix: Water

Comments: • Samples were received at a temperature of 19.3 degrees C, no solid ice was present. Samples did not meet the requirement for thermal preservation.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNM Thiocyanate	Analytical Method: SM 4500CNM-2011								
Thiocyanate	**0.10 U**	mg/L	0.10	0.041	1		06/11/19 18:40		

Sample: GW1H19-IW-6-140 **Lab ID: 30297474009** Collected: 05/30/19 09:24 Received: 06/03/19 09:40 Matrix: Water

Comments: • Samples were received at a temperature of 19.3 degrees C, no solid ice was present. Samples did not meet the requirement for thermal preservation.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNM Thiocyanate	Analytical Method: SM 4500CNM-2011								
Thiocyanate	**0.10 U**	mg/L	0.10	0.041	1		06/11/19 18:41		

Sample: GW1H19-IW-8-142 **Lab ID: 30297474010** Collected: 05/30/19 10:10 Received: 06/03/19 09:40 Matrix: Water

Comments: • Samples were received at a temperature of 19.3 degrees C, no solid ice was present. Samples did not meet the requirement for thermal preservation.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNM Thiocyanate	Analytical Method: SM 4500CNM-2011								
Thiocyanate	**0.10 U**	mg/L	0.10	0.041	1		06/11/19 18:42		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: GW MONITORING 1H19
Pace Project No.: 30297474

Sample: GW1H19-IW-9-140 **Lab ID: 30297474011** Collected: 05/30/19 10:05 Received: 06/03/19 09:40 Matrix: Water

Comments: • Samples were received at a temperature of 19.3 degrees C, no solid ice was present. Samples did not meet the requirement for thermal preservation.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500CNM Thiocyanate	Analytical Method: SM 4500CNM-2011								
Thiocyanate	**0.10 U**	mg/L	0.10	0.041	1		06/11/19 18:43		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA

Project: GW MONITORING 1H19
Pace Project No.: 30297474

QC Batch: 346498 Analysis Method: SM 4500CNM-2011
QC Batch Method: SM 4500CNM-2011 Analysis Description: 4500CNM Thiocyanate
Associated Lab Samples: 30297474001, 30297474002, 30297474003, 30297474004, 30297474005, 30297474006, 30297474007, 30297474008, 30297474009, 30297474010, 30297474011

METHOD BLANK: 1685694 Matrix: Water
Associated Lab Samples: 30297474001, 30297474002, 30297474003, 30297474004, 30297474005, 30297474006, 30297474007, 30297474008, 30297474009, 30297474010, 30297474011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Thiocyanate	mg/L	0.10 U	0.10	0.041	06/11/19 18:29	

LABORATORY CONTROL SAMPLE: 1685695

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Thiocyanate	mg/L	0.5	0.48	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1685696 1685697

Parameter	Units	30297474001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Thiocyanate	mg/L	0.66	0.8	0.8	1.5	1.5	108	107	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

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Greensburg, PA 15601
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QUALIFIERS

Project: GW MONITORING 1H19
Pace Project No.: 30297474

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.

Pace Analytical Services, LLC
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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: GW MONITORING 1H19
Pace Project No.: 30297474

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30297474001	**GW1H19-MW-104-045**	SM 4500CNM-2011	346498		
30297474002	**GW1H19-MW-023-028**	SM 4500CNM-2011	346498		
30297474003	**GW1H19-MW-024-045**	SM 4500CNM-2011	346498		
30297474004	**GW1H19-MW-LPW-056**	SM 4500CNM-2011	346498		
30297474005	**GW1H19-MW-OUTFALL-001**	SM 4500CNM-2011	346498		
30297474006	**GW1H19-MW-LPW-056-D**	SM 4500CNM-2011	346498		
30297474007	**EB-05 19-11**	SM 4500CNM-2011	346498		
30297474008	**GW1H19-MW-210-80**	SM 4500CNM-2011	346498		
30297474009	**GW1H19-IW-6-140**	SM 4500CNM-2011	346498		
30297474010	**GW1H19-IW-8-142**	SM 4500CNM-2011	346498		
30297474011	**GW1H19-IW-9-140**	SM 4500CNM-2011	346498		

WO# : 30297474

30297474

CHA ocument

The C st be completed accurately.

Page : 1 Of 1

Section A
Required Client Information:

Company:	AECOM
Address:	Sabre Building, Suite 300, 4051 Ogletown Road, Newark, DE 19713
Email:	dyana.sagges@aecom.com
Phone: (302)781-5947	Fax:
Requested Due Date:	

Section B
Required Project Information:

Report To:	Dyana C. Sagges
Copy To:	George Gregory
	Barbara McGraw
Purchase Order #:	
Project Name:	GW MONITORING 1H19
Project #:	

Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote:	
Pace Project Manager:	laura.pirilla@pacelabs.com,
Pace Profile #:	10656

Regulatory Agency

State / Location
MI

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique MATRIX CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Other OT, Tissue TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Requested Analysis Filtered (Y/N): Thiocyanate	Residual Chlorine (Y/N)	
1	GW1H19-MW-104-045	WT	g			5-31-19	1100		1			1						n	X		001
2	GW1H19-MW-023-028	WT	g			5-31-19	1011		1			1							X		002
3	GW1H19-MW-024-045	WT	g			5-31-19	1041		1			1							X		003
4	GW1H19-MW-LPW-056	WT	g			5-31-19	1003		3			3							X	RQS MS/MSD	004
5	GW1H19-OUTFALL-001	WT	g			5-31-19	947		1			1							X		005
6	GW1H19-MW-LPW-056-D	WT	g			5-31-19	~~1003~~		1			1							X		006
7	EB-05 19-11	WT	g			5-31-19	1000		1			1							X		007
8	GW1H19-MW-210-80					5-29-19	1428														008
9	GW1H19-IW-6-140					5-30-19	924														009
10	GW1H19-IW-8-142					5-30-19	1010														010
11	GW1H19-IW-9-140					5-30-19	1005														011
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
		5-31-19	1200		6319	0940	19.3	4	N	4

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon NETCOTT

SIGNATURE of SAMPLER: DATE Signed: 5-31-19

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: AECOM Project # # 30297474

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

Label MJ
LIMS Login MJ

Tracking #: 494290613531

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

Thermometer Used 10 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 19.3 °C Correction Factor: +0.0 °C Final Temp: 19.3 °C

Temp should be above freezing to 6°C

pH paper Lot# 6D4281 Date and Initials of person examining contents: MJS 6-3-19

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. Sample GW1H19-MW-LPW-0556 time on sample is 1000. Sample GW1H19-MW-LPW-0560-D has a time on sample as 1000. Sample EB-05 has a time of 0735
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. Samples were received out of temp
All containers meet method preservation requirements.		✓		Initial when completed MJS Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
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: _____

☐ **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.