



engineering and constructing a better tomorrow

July 25, 2018

Mr. Benjamin Rung

Project Manager

Division of Environmental Remediation

Remedial Bureau E, 12th Floor

New York State Department of Environmental Conservation

625 Broadway

Albany, New York 12233-7016

Subject: **Erdle Perforating Company (NYSDEC Site 828072)**
May 2018 Post-ERH Remediation Groundwater Sampling Report
MACTEC Engineering and Consulting, P. C., Project No. 3617137306

Dear Mr. Rung:

MACTEC Engineering and Consulting, P.C. (MACTEC), under contract to the New York State Department of Environmental Conservation (NYSDEC) is submitting this Letter Report (Report) for groundwater sampling at the Erdle Perforating Company (Erdle) site (Site). The Site is listed as Class 2 hazardous waste Site No. 828072 in the Registry of Hazardous Waste Sites in New York State (Figure 1).

At the request of the NYSDEC Project Manager, MACTEC conducted a focused groundwater sampling event under Work Assignment No. D007619-26 to assess groundwater conditions at and in the vicinity of the Site after the NYSDEC implemented the selected remedy for the soil source area (i.e., electrical resistance heating [ERH]) from November 2014 through June 2016.

BACKGROUND

The Erdle Site is located at 100 Pixley Industrial Parkway in the Town of Gates, Monroe County (Figure 1). The Site property, approximately 9.2 acres in size, is bounded on the south by a marsh and Conrail railroad tracks and an undeveloped wooded area further south of the railroad tracks, on

the north and east by light industry, and on the west by open land and Interstate 490. A residential development (Hidden Valley Development) is located south of the Site (south of the wooded area). The Site is currently zoned for industrial purposes including manufacturing and processing. The Site and surrounding developed areas are serviced by public water (MACTEC, 2010). Figure 2 shows the Site, surrounding area, and the existing monitoring well network.

Erdle Company manufactures perforated sheet metal products. The facility was constructed in 1968 on what was then farmland and used trichloroethene (TCE) during its manufacturing process to remove perforating oils. From the early 1970s to 1987, waste TCE was collected prior to disposal in an underground storage tank (UST) adjacent to the southwestern edge of the building. Waste oils were also stored in an underground tank next to the TCE tank. In February 1987, spent TCE, previously stored in a 2,000-gallon UST, was determined to have leaked and impacted soil and groundwater in the vicinity of the Site. The TCE tank and several other tanks on the property were removed in 1987 along with approximately 100 cubic yards of contaminated soil. In 1992 TCE was detected in groundwater at concentrations exceeding regulatory standards in samples collected by Erdle.

From 1994 through 2005, Erdle implemented a Remedial Investigation (RI)/Feasibility Study (FS) Order on Consent (the Order) with the NYSDEC. Results of the RI/FS determined that on-site groundwater contained concentrations of volatile organic compounds (VOCs) above NYSDEC Class GA groundwater standards. Based on these results, the NYSDEC determined that the nature and extent of the off-site groundwater contamination required further investigation and delineation. In addition, soil vapor intrusion investigations of residences in the Hidden Valley Development indicated that further action was required.

In September 2006, Erdle was determined to be in violation of the Order due to its failure to comply with the terms. Therefore, the Site was referred to the New York State Superfund program and MACTEC conducted an RI/FS between 2007 and 2010.

Following completion of several field investigations, a Record of Decision was issued in 2010 that outlined the remedial approach for the Site (NYSDEC, 2010). The selected remedy includes installation of an in-situ ERH system for source area soil and groundwater (final

completion in 2016) and potential implementation of in-situ enhanced biodegradation of groundwater depending on the effectiveness of the ERH at source area.

Groundwater sampling was conducted just prior to the ERH operations in April 2015 to establish a baseline prior to implementation of the remedial action. Operation of the ERH system was conducted from June 2015 through April 2016. Subsequent to the ERH operations, groundwater sampling of the ERH treatment area wells was conducted in May 2016 (MACTEC, 2017).

This Report describes the groundwater sampling conducted at the request of the NYSDEC to further evaluate the effectiveness of the ERH treatment at selected site wells in May 2018.

FIELD ACTIVITIES

The performance of the groundwater sampling was governed by MACTEC's Field Activities Plan (MACTEC, 2018) submitted to the NYSDEC in May 2018 and the email Addendum to the NYSDEC, dated May 8, 2018. The NYSDEC call-out contractor TestAmerica Laboratories, Inc., provided the laboratory analytical services. The field activities were performed by MACTEC during the week of May 21, 2018.

The groundwater sampling program included recording water level measurements and collecting groundwater samples from 17 selected Site monitoring wells for Target Compound List VOCs by Method 8260C. Wells located on Site and immediately downgradient from the Site were chosen for analysis to assess the effectiveness of the source area soil ERH remedial action.

A subset of four wells (upgradient, source area, downgradient) were sampled for low-level 1,4-dioxane analysis by United States Environmental Protection Agency (USEPA) Method 8270 selective ion monitoring and per- and polyfluoroalkyl substances (PFAS) by Modified USEPA Method 537 to evaluate the presence / absence of the emerging contaminants at the Site.

Water Level Measurements. Water levels (depth to water) were recorded on the field sampling log for each well sampled, prior to performing groundwater sampling. Several of the wells had closed caps with pre-installed sample tubing, which did not allow for the collection of monitoring well

measurements. Groundwater measurements were generally similar to those recorded previously; groundwater has been interpreted to flow primarily to the south from the Site.

Groundwater Sampling. Sampling of the 17 wells was conducted using low-flow sampling techniques. Field measurements for pH, temperature, specific conductivity, oxidation reduction potential, and dissolved oxygen were collected through a flow-through cell from each monitoring well during pre-sample purging. Turbidity was measured separately with a turbidity meter. Field measurements and monitoring well sampling activities were documented on Low Flow Groundwater Data Records included in Attachment 1.

The sampling procedures for the four wells selected for sampling of PFAS included replacing the low density polyethylene tubing that was located in the wells (if present) with high density polyethylene tubing and redeveloping the wells immediately prior to sampling.

Groundwater purged during monitoring well sampling was containerized and treated on-site using a portable granular activated carbon unit and allowed to infiltrate into the ground in a pervious area of the Site.

Used disposable equipment and personal protective clothing was double bagged in polyethylene trash bags and sealed with twist ties. The disposable equipment was disposed of as nonhazardous municipal solid waste.

ANALYTICAL RESULTS

Laboratory analytical results were validated and found to be usable as reported by the laboratory, or qualified as documented in the Data Usability Summary Report (DUSR). Analytical data for the groundwater samples collected in May 2018 are summarized in Table 1 for VOCs and Table 2 for 1,4-dioxane and PFAS. Analytical results and the DUSR are included in Attachment 2.

VOCs. Figure 3 presents results for the primary contaminants of concern, TCE, cis-1,2-dichloroethene (cis-1,2-DCE), and vinyl chloride (VC) for the wells sampled in 2018. The wells with the highest concentrations of chlorinated VOCs (CVOCs) are MW-2A and MW-3A, both of

which are in the same area of the Site that has historically shown the highest contaminant concentrations.

The VOC groundwater data were reviewed to evaluate contaminant concentrations pre- and post-ERH remedial action. Concentrations of the CVOCs detected in groundwater were compared for the following time periods:

- prior to commencement of ERH treatment (April 2015)
- one month after the completion of ERH treatment (May 2016)
- two years and one month following the completion of the ERH (May 2018)

For monitoring wells MW-8, MW8D, MW-9, and MW-9D, data from July 2008, July 2012, and May 2018 were also used in the comparison.

As shown on Figure 3, although concentrations continue to exceed groundwater standards, total CVOC groundwater concentrations in the overburden source area at MW-3A have decreased from 409,700 micrograms per liter ($\mu\text{g/L}$) in April 2015 to 2,750 $\mu\text{g/L}$ in May 2018. CVOC concentrations in most of the source area monitoring wells have decreased since 2015, with the exception of MW-3D, which appears to have increased since the completion of the ERH treatment from a total CVOC concentration of 57.5 $\mu\text{g/L}$ at the completion of the ERH treatment in 2015, to 1,520 $\mu\text{g/L}$ in May 2018. Nine wells downgradient of the former source area were also sampled in 2018. Although concentrations of total CVOCs in most wells appear to have decreased since 2012 (prior to the ERH treatment), concentrations in some of the wells remained fairly consistent or increased over the same time period.

In general, groundwater concentrations have decreased at most monitored locations in and downgradient of the source area as reported pre- and post-ERH treatment; however, New York Class GA groundwater standards are currently exceeded at many locations at and downgradient of the Site. Further, degradation of TCE to cis-1,2-DCE and VC is generally observed; however, based on the wells sampled, it appears to be occurring at differing rates.

1,4-Dioxane. 1,4-Dioxane was historically used as a stabilizer and corrosion inhibitor for certain

chlorinated solvents, particularly trichloroethane (USEPA, 2014), but its presence had not previously been evaluated at the Site. Four wells (MW-5, MW-5D, MW-8, and MW-8D) were sampled for 1,4-dioxane during the May 2018 sampling event. Table 2 presents the analytical results. New York State has not published standards or guidance values for 1,4-dioxane, so the results are compared to the USEPA Regional Screening Levels (RSLs) from May 2016 for residential tap water, 0.46 µg/L. 1,4-Dioxane was detected in all four of the wells sampled. Three of the four detections exceeded the RSL, with the highest concentration (2.9 µg/L) detected in the upgradient well MW-5.

PFAS Parameters. Four wells (MW-5, MW-5D, MW-8, and MW-8D) were sampled for PFAS constituents. NYSDEC standards or guidance values for groundwater have not been established for PFAS compounds, however, in May 2016 the USEPA issued a Drinking Water Health Advisory of 70 nanograms per liter for perflourooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFAS) combined. Table 2 presents PFAS results for the four wells. PFAS were detected; however, the detections were at concentrations below the USEPA Advisory Limit, and the highest concentrations of PFOA and PFAS were observed in the upgradient well MW-5.

If you have questions on the information provided herein, please do not hesitate to contact us at (207) 775-5401.

Sincerely,



Rebecca Brosnan
Senior Scientist



Jayme Connolly
Project Manager

Enclosures

- | | |
|----------|--------------------------------------------------------------|
| Figure 1 | Site Location |
| Figure 2 | Site Features |
| Figure 3 | Groundwater Sampling Results at Select Monitoring Wells |
| Table 1 | Volatile Organic Compounds in Groundwater |
| Table 2 | 1,4-Dioxane and Per- and Poly-fluoroalkyl Substances Results |

Attachment 1 Field Data Records

Attachment 2 Data Usability Summary Report

REFERENCES

MACTEC Engineering and Consulting, P.C. (MACTEC), 2018. 2018 Post Remedial Action Groundwater Sampling - Field Activities Plan, Erdle Perforating Company Site; Site Number 828072 May 2018.

MACTEC, 2017. Construction Completion Report, Erdle Perforating Company Remedial Action., Site No. 828072, prepared for the New York State Department of Environmental Conservation. March 2017.

MACTEC, 2010. Final Remedial Investigation/Feasibility Study Report, Erdle Perforating Company, prepared for the New York State Department of Environmental Conservation. June 2010.

New York State Department of Environmental Conservation (NYSDEC), 2010. Record of Decision, Erdle Perforating Site, State Superfund Project, Town of Gates, Monroe County, Site No. 828072. December 2010.

USEPA, 2014. Technical Fact Sheet – 1,4-Dioxane. January 2014.

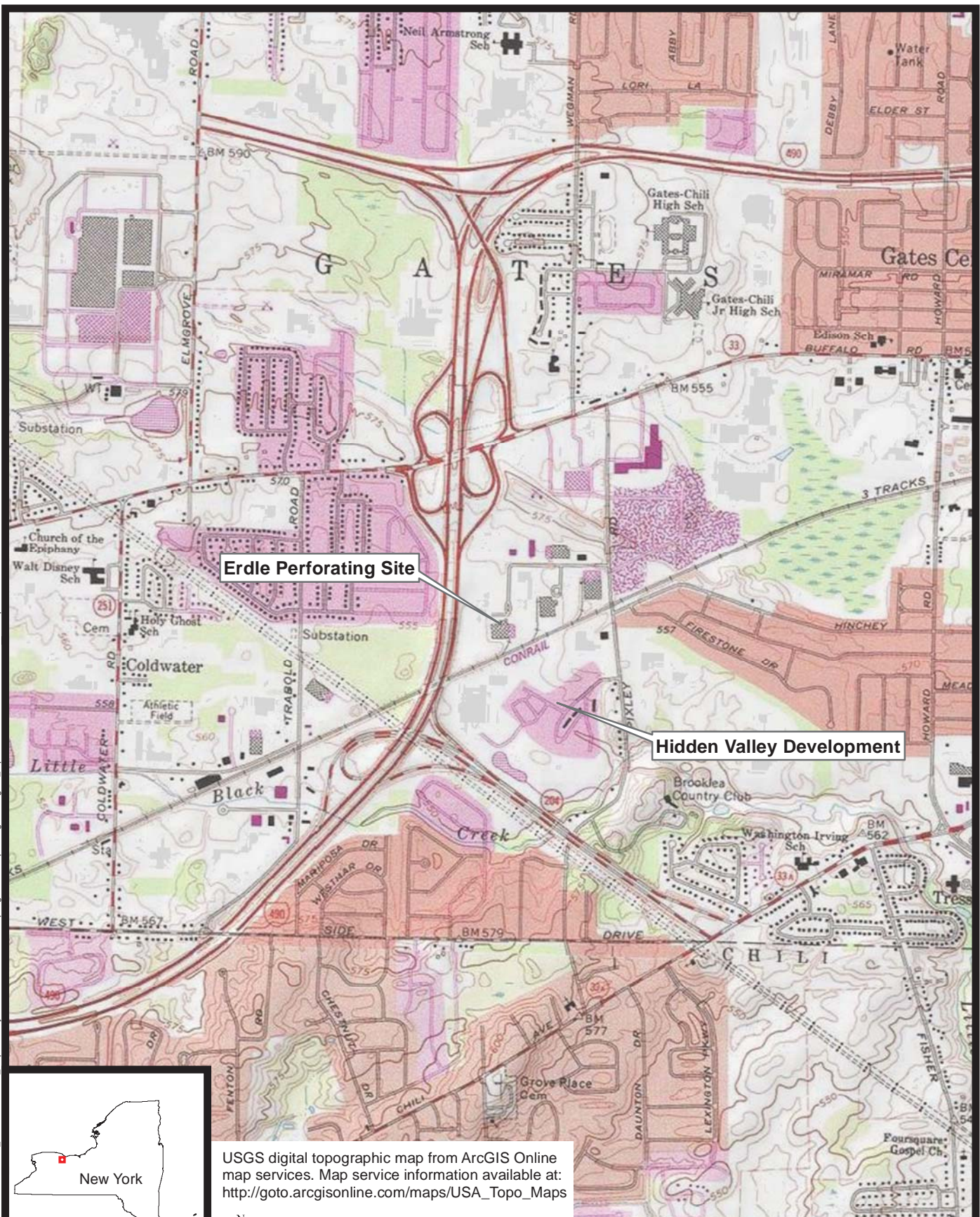
LIST OF ACRONYMS AND ABBREVIATIONS

cis-1,2-DCE	cis-1,2-dichloroethene
CVOC	Chlorinated Volatile Organic Compound
DCE	dichloroethene
DUSR	Data Usability Summary Report
Erdle	Erdle Perforating Company
ERH	electrical resistance heating
MACTEC	MACTEC Engineering & Consulting, P.C.
µg/L	micrograms per liter
NYSDEC	New York State Department of Environmental Conservation
the Order	Remedial Investigation Feasibility Study Order on Consent
PCE	tetrachloroethene
PFAS	polyflouroalkyl substances
PFOA	perflourooctanoic acid
RI	Remedial Investigation
RSL	Regional Screening Levels
Site	Dinaburg Distributing site
TCE	trichloroethylene
USEPA	United States Environmental Protection Agency
UST	underground storage tank

VC vinyl chloride
VOC volatile organic compound

FIGURES

Document: P:\Projects\ysdect\Contracts D004434 and D004444\Projects\Erdle Perforating Company\4.0 Project Deliverables\4.5 Databases\GIS\Map_Documents\Erdle_Site_Location_8.5x11P.mxd
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USGS digital topographic map from ArcGIS Online map services. Map service information available at: http://goto.arcgisonline.com/maps/USA_Topo_Maps



Prepared/Date: BRP 04/25/18
Checked/Date: JPC 04/27/18

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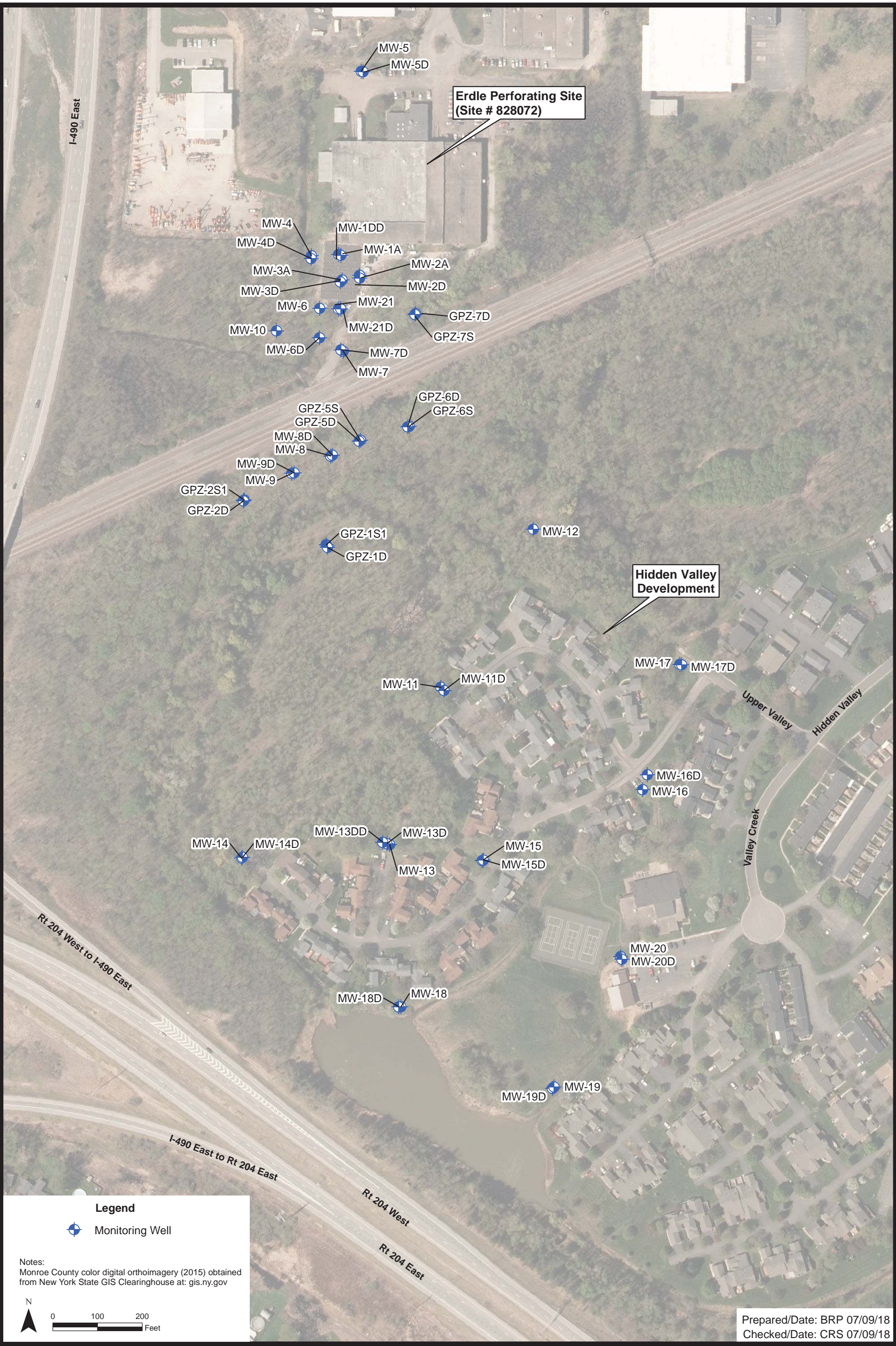
2018 GROUNDWATER SAMPLING
ERDLE PERFORATING SITE
GATES, NEW YORK



SITE LOCATION

Project 3617137306 Figure 1

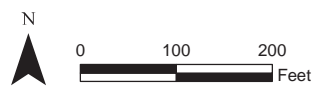
Document: P:\Projects\jysdect\Contract D007619\Projects\Erdle - CO4.0_Deliverables\4.1_Reports\2018-Groundwater-Sampling\Figure 2 - Site Features.pdf 07/09/2018 9:16 AM brian.peters



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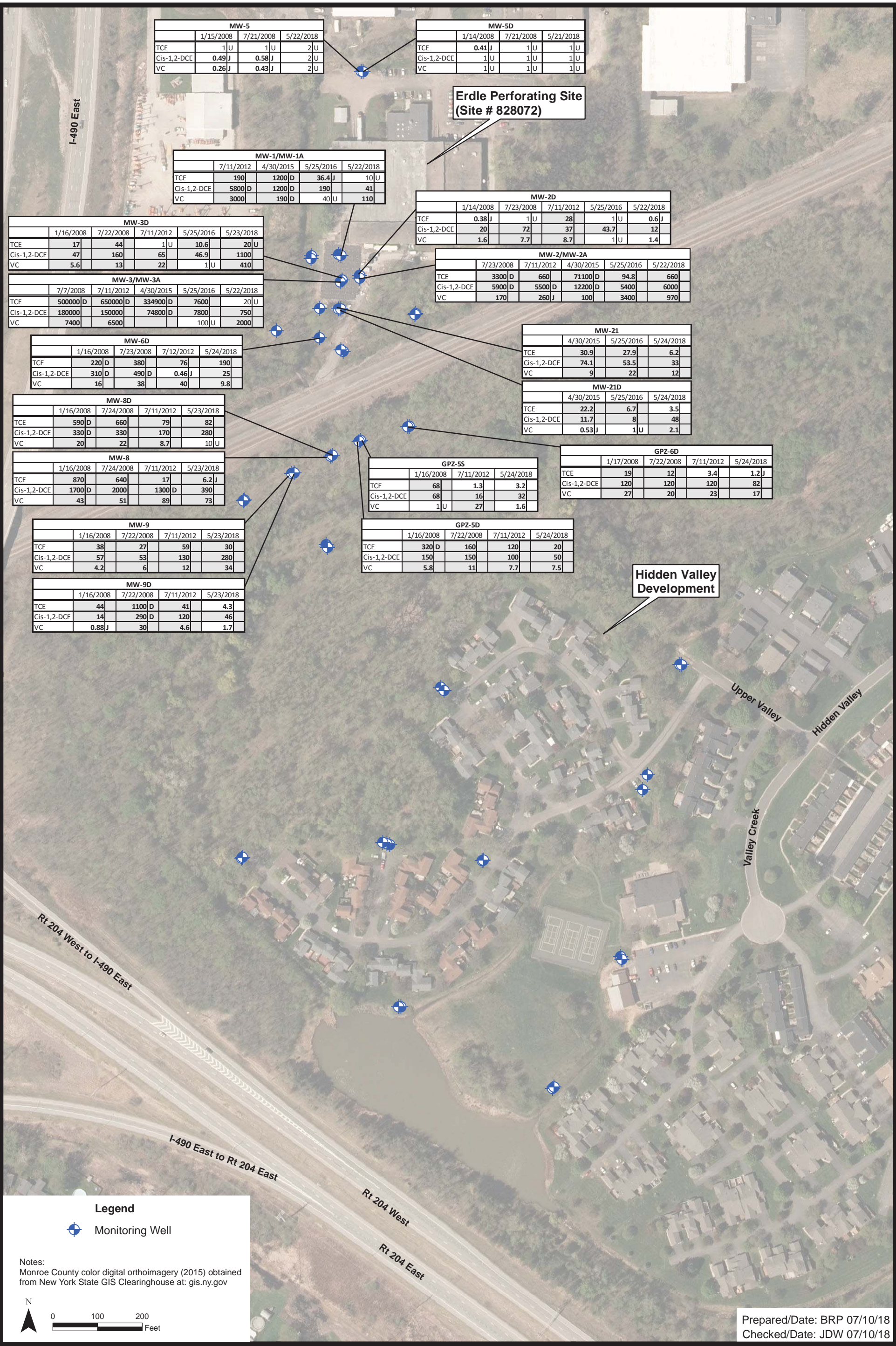
Monitoring Well

Notes:
Monroe County color digital orthoimagery (2015) obtained from New York State GIS Clearinghouse at: gis.ny.gov



Prepared/Date: BRP 07/09/18
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Document: P:\Projects\physidect\Contract D007619\Projects\Erdle - COX\0_Deliverables\4.1_Reports\2018-Groundwater-Sampling\Figure 3 - Results.pdf 07/10/2018 10:41 AM brian.petres



MW-5			
	1/15/2008	7/21/2008	5/22/2018
TCE	1 U	1 U	2 U
Cis-1,2-DCE	0.49 J	0.58 J	2 U
VC	0.26 J	0.43 J	2 U

MW-5D			
	1/14/2008	7/21/2008	5/21/2018
TCE	0.41 J	1 U	1 U
Cis-1,2-DCE	1 U	1 U	1 U
VC	1 U	1 U	1 U

**Erdle Perforating Site
(Site # 828072)**

MW-1/MW-1A				
	7/11/2012	4/30/2015	5/25/2016	5/22/2018
TCE	190	1200 D	36.4 J	10 U
Cis-1,2-DCE	5800 D	1200 D	190	41
VC	3000	190 D	40 U	110

MW-2D					
	1/14/2008	7/23/2008	7/11/2012	5/25/2016	5/22/2018
TCE	0.38 J	1 U	28	1 U	0.6 J
Cis-1,2-DCE	20	72	37	43.7	12
VC	1.6	7.7	8.7	1 U	1.4

MW-3D					
	1/16/2008	7/22/2008	7/11/2012	5/25/2016	5/23/2018
TCE	17	44	1 U	10.6	20 U
Cis-1,2-DCE	47	160	65	46.9	1100
VC	5.6	13	22	1 U	410

MW-2/MW-2A					
	7/23/2008	7/11/2012	4/30/2015	5/25/2016	5/22/2018
TCE	3300 D	660	71100 D	94.8	660
Cis-1,2-DCE	5900 D	5500 D	12200 D	5400	6000
VC	170	260 J	100	3400	970

MW-3/MW-3A					
	7/7/2008	7/11/2012	4/30/2015	5/25/2016	5/22/2018
TCE	500000 D	650000 D	334900 D	7600	20 U
Cis-1,2-DCE	180000	150000	74800 D	7800	750
VC	7400	6500		100 U	2000

MW-21			
	4/30/2015	5/25/2016	5/24/2018
TCE	30.9	27.9	6.2
Cis-1,2-DCE	74.1	53.5	33
VC	9	22	12

MW-6D				
	1/16/2008	7/23/2008	7/12/2012	5/24/2018
TCE	220 D	380	76	190
Cis-1,2-DCE	310 D	490 D	0.46 J	25
VC	16	38	40	9.8

MW-21D			
	4/30/2015	5/25/2016	5/24/2018
TCE	22.2	6.7	3.5
Cis-1,2-DCE	11.7	8	48
VC	0.53 J	1 U	2.1

MW-8D				
	1/16/2008	7/24/2008	7/11/2012	5/23/2018
TCE	590 D	660	79	82
Cis-1,2-DCE	330 D	330	170	280
VC	20	22	8.7	10 U

GPZ-6D				
	1/17/2008	7/22/2008	7/11/2012	5/24/2018
TCE	19	12	3.4	1.2 J
Cis-1,2-DCE	120	120	120	82
VC	27	20	23	17

MW-8				
	1/16/2008	7/24/2008	7/11/2012	5/23/2018
TCE	870	640	17	6.2 J
Cis-1,2-DCE	1700 D	2000	1300 D	390
VC	43	51	89	73

GPZ-5S			
	1/16/2008	7/11/2012	5/24/2018
TCE	68	1.3	3.2
Cis-1,2-DCE	68	16	32
VC	1 U	27	1.6

MW-9				
	1/16/2008	7/22/2008	7/11/2012	5/23/2018
TCE	38	27	59	30
Cis-1,2-DCE	57	53	130	280
VC	4.2	6	12	34

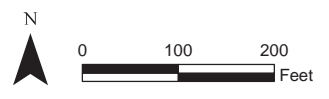
GPZ-5D				
	1/16/2008	7/22/2008	7/11/2012	5/24/2018
TCE	320 D	160	120	20
Cis-1,2-DCE	150	150	100	50
VC	5.8	11	7.7	7.5

MW-9D				
	1/16/2008	7/22/2008	7/11/2012	5/23/2018
TCE	44	1100 D	41	4.3
Cis-1,2-DCE	14	290 D	120	46
VC	0.88 J	30	4.6	1.7

**Hidden Valley
Development**

Legend
 Monitoring Well

Notes:
 Monroe County color digital orthoimagery (2015) obtained from New York State GIS Clearinghouse at: gis.ny.gov



Prepared/Date: BRP 07/10/18
 Checked/Date: JDW 07/10/18

TABLES

Table 1: Volatile Organic Compounds in Groundwater

	Location ID	GPZ-5S		GPZ-5D		GPZ-6D		MW-1A		MW-2A		MW-2D	
	Field Sample Date	5/24/2018		5/24/2018		5/24/2018		5/22/2018		5/22/2018		5/22/2018	
	Field Sample ID	828072-GPZ5S018		828072-GPZ5D025		828072-GPZ6D028		828072-MW01A008		828072-MW02A008		828072-MW02D020	
	Field Sample Depth (ft bgs)	18		25		28		08		08		20	
	QC Code	FS		FS		FS		FS		FS		FS	
Parameter Name	Criteria	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	0.66	J	1		4.7		10	U	200	U	0.8	J
2-Butanone	5	10	U	10	U	20	U	120		2000	U	10	U
Acetone	50*	3.4	J	10	U	20	U	460	J	2000	U	10	U
Cis-1,2-Dichloroethene	5	32		50		82		41		6000		12	
Toluene	5	1	U	1	U	2	U	11		200	U	1	U
trans-1,2-Dichloroethene	5	1	U	1	U	2	U	10	U	200	U	1	U
Trichloroethene	5	3.2		20		1.2	J	10	U	660		0.6	J
Vinyl chloride	2	1.6		7.5		17		110		970		1.4	

Notes:

Results reported in micrograms per liter (µg/L)
 Only detected compounds shown.
 Samples analyzed for VOCs by EPA Method SW8260B
 ft bgs = feet below ground surface
 QC Code:
 FS = Field Sample
 FD = Field Sample
 Qualifiers:
 U = Not detected greater than the reporting limit
 J = Estimated value
 D = Result from diluted run
 Criteria = Groundwater guidance or standard values from Technical and Operational Guidance Series (TOGS) 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (NYSDEC, 1998).
 * = Guidance Value

Bold = Compound detected in sample

Highlighted results exceed criteria

Table 1 Volatile Organic Compounds in Groundwater

Parameter Name	Criteria	Location ID		MW-3A		MW-3D		MW-5		MW-5D		MW-6D		MW-8	
		Field Sample Date		5/22/2018		5/23/2018		5/22/2018		5/21/2018		5/24/2018		5/23/2018	
		Field Sample ID		828072-MW03A008		828072-MW03D014		828072-MW005006		828072-MW05D010		828072-MW06D015		828072-MW008023	
		Field Sample Depth (ft bgs)		08		14		06		10		15		23	
		QC Code		FS		FS		FS		FS		FS		FS	
Parameter Name	Criteria	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	20	U	20	U	2	U	0.42	J	4	U	10	U		
2-Butanone	5	250		76	J	20	U	10	U	40	U	100	U		
Acetone	50*	950	J	370	J	10	J	10	U	40	U	100	U		
Cis-1,2-Dichloroethene	5	750		1100		2	U	1	U	190		390			
Toluene	5	20	U	20	U	2	U	1	U	4	U	10	U		
trans-1,2-Dichloroethene	5	20	U	20	U	2	U	1	U	4	U	10	U		
Trichloroethene	5	20	U	20	U	2	U	1	U	25		6.2	J		
Vinyl chloride	2	2000		410		2	U	1	U	9.8		73			

Notes:
 Results reported in micrograms per liter (µg/L)
 Only detected compounds shown.
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 * = Guidance Value
Bold = Compound detected in sample
Highlighted results exceed criteria

Table 1 Volatile Organic Compounds in Groundwater

Parameter Name	Criteria	Location ID		MW-8D		MW-9		MW-9D		MW-21		MW-21D		MW-21D	
		Field Sample Date		5/23/2018		5/23/2018		5/23/2018		5/24/2018		5/24/2018		5/24/2018	
		Field Sample ID		828072-MW08D033		828072-MW09025		828072-MW09D035		828072-MW021012		828072-MW21D020		828072-MW21D020 DUP	
		Field Sample Depth (ft bgs)		33		25		35		12		20		20	
		QC Code		FS		FS		FS		FS		FS		FD	
Parameter Name	Criteria	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
1,1-Dichloroethane	5	10	U	10	U	1	U	0.78	J	0.79	J	0.72	J		
2-Butanone	5	100	U	100	U	10	U	10	U	10	U	10	U	10	U
Acetone	50*	100	U	100	U	10	U	10	U	10	U	10	U	10	U
Cis-1,2-Dichloroethene	5	280		280		46		33		48		46			
Toluene	5	10	U	10	U	1	U	1	U	1	U	1	U	1	U
trans-1,2-Dichloroethene	5	10	U	10	U	4.3		1	U	1	U	1	U	1	U
Trichloroethene	5	82		30		4.3		6.2		3.5		3.6			
Vinyl chloride	2	10	U	34		1.7		12		2.1		2.1			

Notes:

Results reported in micrograms per liter (µg/L)
 Only detected compounds shown.
 Samples analyzed for VOCs by EPA Method SW8260B
 ft bgs = feet below ground surface
 QC Code:
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 * = Guidance Value

Bold = Compound detected in sample

Highlighted results exceed criteria

Table 2: 1,4-Dioxane and Per- and Poly-fluoroalkyl Substances Results

Parameter	Location	MW-5	MW-5D	MW-8	MW-8D
	Sample Date	5/22/2018	5/21/2018	5/23/2018	5/23/2018
Sample ID	828072-MW005006	828072-MW05D010	828072-MW008023	828072-MW08D033	
Sample Depth	06	10	23	33	
Result	Qualifier	Result	Qualifier	Result	Qualifier
PFOAS (ng/l)		Criteria			
Perfluorobutanesulfonic acid	NA	11 J	0.7 J	0.41 J	0.74 J
Perfluorobutanoic acid	NA	29	26	44	27
Perfluoroheptanoic acid	NA	3.5	2.9	0.89 J	2.4
Perfluorohexanoic acid	NA	8.2	8.6	4.3	7.5
Perfluorooctanesulfonic acid (PFAS)	NA	2.3	2 U	2 U	2 U
Perfluorooctanoic acid (PFOA)	NA	6.1	1.7 J	2 U	1.5 J
Perfluoropentanoic acid	NA	11	10	7.3	10
Sum of PFOAS and PFAS	70	8.4	3.7	4	3.5
1,4-Dioxane (µg/L)					
1,4-Dioxane	0.16	2.9	0.12 J	1.1	0.53

Notes:

Samples analyzed for per-and poly-flourinated compounds (PFOAS) by USEPA Modified Method 537 and for 1,4-Dioxane by USEPA Method 8260 with selective ion monitoring.

Results in micrograms per liter (µg/L) and nanograms per liter (ng/L)

Only detected compounds shown (detections in bold)

Qualifiers: U = not detected; J = estimated value

ft bgs = feet below ground surface

Criteria = Environmental Protection Agency Advisory Limit/Screening Level

Highlighted cell exceeds criteria

NA = no criteria available

ATTACHMENT 1

FIELD DATA RECORDS

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER 3617137306.01.****	
SAMPLE ID 828072-MW01A008	SAMPLE TIME 1735

LOCATION ID MW-1A	DATE 5/22/18
START TIME 1550	END TIME 1740
SITE NAME/NUMBER 828072	PAGE 1 OF 2

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) _____ FT	FINAL DTW (BMP) _____ FT	PROT. CASING STICKUP (AGS) 29 FT	TOC/TOR DIFFERENCE _____ FT
WELL DEPTH (BMP) _____ FT	SCREEN LENGTH _____ FT	PID AMBIENT AIR _____ PPM	REFILL TIMER SETTING _____ SEC
WATER COLUMN _____ FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041) _____ GAL	PID WELL MOUTH _____ PPM	DISCHARGE TIMER SETTING _____ SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) _____ GAL	TOTAL VOL. PURGED 3.3 GAL	DRAWDOWN/TOTAL PURGED _____	PRESSURE TO PUMP _____ PSI

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1554										BEGIN PURGING
1620	-	170	13.5	3.125	7.0	1.7	15.4	-91	-	Dark Greenish Yellow color and
1625	-	170	13.1	3.164	6.9	1.0	9.6	-89	-	organic odor
1630	-	170	13.1	3.172	6.9	0.7	12.1	-95	-	
1635	-	170	13.2	3.174	6.9	0.6	16.9	-168	-	1.5 Gallons
							29			Surficial pumps
1645	-	135	13.5	3.160	6.9	0.5	29	-239	-	
1650	-	135	13.6	3.141	6.9	0.5	27	-248	-	
1655	-	140	13.7	3.093	6.9	0.4	35	-273	-	
1700	-	145	13.7	3.076	6.9	0.4	36	-297	-	
1705	-	145	13.6	3.054	6.9	0.4	32	-311	-	2.5 Gallons
1710	-	140	13.6	3.031	6.9	0.4	25	-305	-	

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

13	2.996	6.8	0.4	18	-320
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TEMP: nearest degree (ex. 10.1 = 10)
 COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
 pH: nearest tenth (ex. 5.53 = 5.5)
 DO: nearest tenth (ex. 3.51 = 3.5)
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
 ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input checked="" type="checkbox"/> METHANOL <input type="checkbox"/> OTHER <i>Denitrated</i>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE tubing <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <input type="checkbox"/> PID <input checked="" type="checkbox"/> WQ METER <input checked="" type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> PUMP <i>Geopump</i> <input type="checkbox"/> OTHER <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ml	<input checked="" type="checkbox"/>		
<input type="checkbox"/> 1-4 Dioxan							
<input type="checkbox"/> PFCs							

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES NO

NO-PURGE METHOD UTILIZED YES NO

NUMBER OF GALLONS GENERATED 3.3

If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

Sampler Signature: *Jerry Rawelick* Print Name: Jerry Rawelick

Checked By: C. Staples Date: 5/31/18

SKETCH/NOTES

• MW-1A

• MW-3A • MW-3P • MW-2D • MW-2A

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME: Erdle Perforating Company - 2018 Pest RA Groundwater Sampling	
PROJECT NUMBER	3617137306.01.***
SAMPLE ID	828072-MW011A08
SAMPLE TIME	1735

LOCATION ID	MW-1A	DATE	5/22/18
START TIME	1550	END TIME	1740
SITE NAME NUMBER	828076	PAGE	2 OF 2

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER NA

WELL INTEGRITY

CAP	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	N/A <input type="checkbox"/>
CASINO	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	N/A <input type="checkbox"/>
LOCKED COLLAR	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	N/A <input type="checkbox"/>

INITIAL DTW (BMP)	<u> </u> FT	FINAL DTW (BMP)	<u> </u> FT	PROT. CASING STICKUP (AGS)	<u>2.9</u> FT	TOC/TOR DIFFERENCE	<u>NA</u> FT
WELL DEPTH (BMP)	<u> </u> FT	SCREEN LENGTH	<u> </u> FT	PID AMBIENT AIR	<u> </u> PPM	REFILL TIMER SETTING	<u> </u> SEC
WATER COLUMN	<u> </u> FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041)	<u> </u> GAL	PID WELL MOUTH	<u> </u> PPM	DISCHARGE TIMER SETTING	<u> </u> SEC
CALCULATED GAL/VOL (column X well diameter: squared X 0.041)	<u> </u> GAL	TOTAL VOL PURGED	<u>3.3</u> GAL	DRAWDOWN/ TOTAL PURGED	<u> </u>	PRESSURE TO PUMP	<u> </u> PSI

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)

TIME	DTW (FT) * 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% < 10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1554										BEGIN PURGING
1715	-	145	13.4	3.004	6.8	0.4	20	-308	-	
1720	-	150	13.4	2.955	6.8	0.4	17	-315	-	
1725	-	150	13.4	2.936	6.8	0.4	18	-318	-	3.3 gallons
<i>[Large diagonal line through the table]</i>										

* sealed well cap - could not open for water level

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

13 2.940 6.8 0.4 18 -320

TEMP: nearest degree (est. 10.1 = 10)
 COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
 pH: nearest tenth (ex. 5.53 = 5.5)
 DO: nearest tenth (ex. 3.51 = 3.5)
 TURB: 3 SF max, nearest tenth (6.19 = 6.3, 101 = 101)
 ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<p><input checked="" type="checkbox"/> PERISTALTIC</p> <p><input type="checkbox"/> SUBMERSIBLE</p> <p><input type="checkbox"/> BLADDER</p> <p><input type="checkbox"/> WATERA</p> <p><input type="checkbox"/> OTHER</p> <p><input type="checkbox"/> OTHER</p>	<p>DECON FLUIDS USED</p> <p><input type="checkbox"/> LIQUINOX</p> <p><input type="checkbox"/> DEIONIZED WATER</p> <p><input type="checkbox"/> POTABLE WATER</p> <p><input type="checkbox"/> NITRIC ACID</p> <p><input type="checkbox"/> HEXANE</p> <p><input type="checkbox"/> METHANOL</p> <p><input checked="" type="checkbox"/> OTHER <u>Deionized</u></p>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <p><input checked="" type="checkbox"/> SILICON TUBING</p> <p><input checked="" type="checkbox"/> TEFLON TUBING</p> <p><input type="checkbox"/> TEFLON LINED TUBING</p> <p><input type="checkbox"/> HDPE TUBING</p> <p><input checked="" type="checkbox"/> LDPE TUBING <u>Ⓢ</u></p> <p><input type="checkbox"/> OTHER</p> <p><input type="checkbox"/> OTHER</p>	<p>EQUIPMENT USED</p> <p><input checked="" type="checkbox"/> S. STEEL PUMP MATERIAL</p> <p><input type="checkbox"/> PVC PUMP MATERIAL</p> <p><input type="checkbox"/> GEOPROBE SCREEN</p> <p><input type="checkbox"/> TEFLON BLADDER</p> <p><input type="checkbox"/> OTHER</p> <p><input type="checkbox"/> OTHER</p> <p><input type="checkbox"/> OTHER</p>	<p><input checked="" type="checkbox"/> WL METER</p> <p><input type="checkbox"/> PID</p> <p><input checked="" type="checkbox"/> WQ METER</p> <p><input checked="" type="checkbox"/> TURB. METER</p> <p><input checked="" type="checkbox"/> PUMP <u>Geopump</u></p> <p><input type="checkbox"/> OTHER</p> <p><input type="checkbox"/> FILTERS NO. _____ TYPE _____</p>
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	E260	N	4 deg C, HCl	3x40ml	<input checked="" type="checkbox"/>		
<input type="checkbox"/> 1-4 Dioxan							
<input type="checkbox"/> PFCs							

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES NO

NO-PURGE METHOD UTILIZED YES NO

NUMBER OF GALLONS GENERATED 3.3

If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

SKETCH/NOTES

• MW-1A

• MW-3A • MW-3D • MW-2D • MW-2A

Checked By: [Signature]

Date: 5/31/18

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME: Erdle Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER	3617137306.01.****
SAMPLE ID	828072 - MW02A-005
SAMPLE TIME	1330

LOCATION ID	MW-2A	DATE	5/22/18
START TIME	1100	END TIME	1335
SITE NAME/NUMBER	828072	PAGE	1 OF 1

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER NA

WELL INTEGRITY

	YES	NO	N/A
CAP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CASING	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LOCKED COLLAR	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP)	<u>UNK</u> FT	FINAL DTW (BMP)	_____ FT	PROT. CASING STICKUP (AGS)	_____ FT	TOC/TOR DIFFERENCE	_____ FT
WELL DEPTH (BMP)	<u>UNK</u> FT	SCREEN LENGTH	_____ FT	PID AMBIENT AIR	_____ PPM	REFILL TIMER SETTING	_____ SEC
WATER COLUMN	<u>UNK</u> FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041)	_____ GAL	PID WELL MOUTH	_____ PPM	DISCHARGE TIMER SETTING	_____ SEC
CALCULATED GAL/VOL. (column X well diameter squared X 0.041)	_____ GAL	PURGED (ml. per minute X total minutes X 0.00026 gal/ml)	<u>2.5</u> GAL	DRAWDOWN/TOTAL PURGED	_____	PRESSURE TO PUMP	_____ PSI

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)

TIME	DTW (FT) * 0.0-0.33 ft Drawdown	PURGE RATE (ml/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% < 10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1100										BEGIN PURGING * sealed cap - could not open for DTW
1135	-	110	-	-	-	-	2.7	-	UNK	1 Gallon purged
1145	-	-	-	-	-	-	6.5	-		Stopping purge for now.
1235										Resume purging
1245	-	100	13.1	1.588	6.8	2.6	7.1	-29		
1250	-	105	13.6	1.547	6.8	1.7	2.9	-29		
1255	-	105	13.8	1.539	6.8	1.4	4.5	-20		
1300	-	105	13.9	1.534	6.8	1.2	2.8	-21		
1305	-	110	13.9	1.528	6.8	1.0	1.9	-22		
1310	-	110	13.7	1.522	6.8	0.9	3.5	-26		
1315	-	110	13.6	1.508	6.8	0.9	2.0	-28		
1320	-	110	13.6	1.496	6.8	0.8	2.2	-31		

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])

14	1.506	6.8	0.8	2.2	-
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TEMP.: nearest degree (ex. 10.1 = 10)
 COND.: 3 SF max (ex. 3333 = 3330, 0.495 = 0.496)
 pH: nearest tenth (ex. 5.53 = 5.5)
 DO: nearest tenth (ex. 3.51 = 3.5)
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
 ORP: 2 SF (4.1 = 4, 191 = 190)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input type="checkbox"/> METHANOL <input checked="" type="checkbox"/> OTHER <u>Dedicated</u>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	<p>WQ METER</p> <input checked="" type="checkbox"/> WL METER _____ <input type="checkbox"/> PID _____ <input checked="" type="checkbox"/> WQ METER <u>952556 MDS</u> <input checked="" type="checkbox"/> TURB. METER <u>HAZARD</u> <input checked="" type="checkbox"/> PUMP <u>Campop</u> <input type="checkbox"/> OTHER _____ <input type="checkbox"/> FILTERS NO _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ml	<input checked="" type="checkbox"/>		
<input type="checkbox"/> 1-4 Dioxan							
<input type="checkbox"/> PFCs							

PURGE OBSERVATIONS

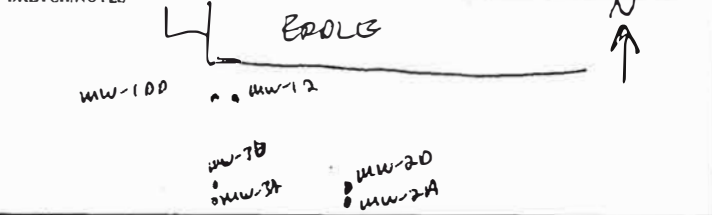
PURGEWATER CONTAINERIZED YES NO

NO-PURGE METHOD UTILIZED YES NO

NUMBER OF GALLONS GENERATED 2.5

If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

SKETCH/NOTES



Sampler Signature: Jerry Rawcliffe

Print Name: Jerry Rawcliffe

Checked By: C. Straly

Date: 5/31/18

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME: Erdle Perforating Company - 2018 Post RA Groundwater Sampling

PROJECT NUMBER: 3617137306.01****

SAMPLE ID: 828072-MW020020 SAMPLE TIME: 1230

LOCATION ID: MW-2D DATE: 5/22/18

START TIME: 1015 END TIME: 1235

SITE NAME/NUMBER: 828072 PAGE: 1 OF 2

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY

YES NO N/A

CAP

CASING

LOCKED

COLLAR

INITIAL DTW (BMP): 3.94 FT FINAL DTW (BMP): 3.89 FT PROT. CASING STICKUP (AGS): 1.6 FT TOC/TOR DIFFERENCE: NA FT

WELL DEPTH (BMP): 21.4 FT SCREEN LENGTH: OPEN HOLE FT PID AMBIENT AIR: _____ PPM REFILL TIMER SETTING: _____ SEC

WATER COLUMN: 17.96 FT DRAWDOWN VOLUME: .07 GAL PID WELL MOUTH: _____ PPM DISCHARGE TIMER SETTING: _____ SEC

CALCULATED GAL/VOL: 26.4 GAL TOTAL VOL. PURGED: 6 GAL DRAWDOWN/TOTAL PURGED: 101 PRESSURE TO PUMP: _____ PSI

(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)

TIME	DTW (FT)	PURGE RATE (mL/min)	TEMP. (°C)	SP. CONDUCTANCE (mS/cm)	pH (units)	DISS. O ₂ (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1029	BEGIN PURGING									
1045	3.94	165	13.2	2.783	7.2	1.0	120	-77	20	
1055	3.42	175	13.2	2.785	7.2	0.5	67	-89		
1100	3.92	170	13.2	2.785	7.2	0.6	61	-88		
1106	3.92	170	13.2	2.786	7.2	0.6	54	-88		
1110	3.92	180	13.2	2.786	7.2	0.6	48	-87		
1130	3.90	170	13.5	2.788	7.2	1.0	43	-87		
1135	3.90	170	13.5	2.789	7.2	1.0	33	-86		
1140	3.90	180	13.5	2.789	7.2	0.9	31	-87		
1145	3.90	180	13.5	2.790	7.2	0.8	23	-86		
1150	3.89	165	13.5	2.790	7.2	0.8	21	-86		
1155	3.89	180	13.6	2.791	7.2	0.8	18	-86		

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])

1.4 2.790 7.2 0.6 8.8 -88

TEMP: nearest degree (ex. 10.1 = 10)
COND: 3 SF max (ex. 3333 = 3330, 0.006 = 0.006)
pH: nearest tenth (ex. 5.53 = 5.5)
DO: nearest tenth (ex. 3.51 = 3.5)
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
DRP: 3 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

TYPE OF PUMP: PERISTALTIC SUBMERSIBLE BLADDER

DECON FLUIDS USED: LIQUINOX DEIONIZED WATER POTABLE WATER NITRIC ACID HEXANE METHANOL OTHER Dedicated

TUBING/PUMP/BLADDER MATERIALS: SILICON TUBING TEFLON TUBING TEFLON LINED TUBING HDPE TUBING LDPE TUBING OTHER _____

EQUIPMENT US EQ: S. STEEL PUMP MATERIAL PVC PUMP MATERIAL GEOPROBE SCREEN TEFLON BLADDER OTHER _____

EQUIPMENT US EQ: WL METER PID WQ METER TURB. METER PUMP Geopump OTHER _____

ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ml	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<input type="checkbox"/> 1,4 Dioxan				3x40ml			
<input type="checkbox"/> PFCs				3x40ml			

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES NO

NO-PURGE METHOD UTILIZED: YES NO

NUMBER OF GALLONS GENERATED: 6

If yes, purge approximately 1 standing volume prior to sampling or _____ mL for this sample location.

SKETCH/NOTES

mw-100, mw-1A0, mw-2D, mw-2

6" steel cased openhole bedrock well.

Checked By: C. Stopler Date: 5/31/18

Signature: Terry Rawcliffe Print Name: Terry Rawcliffe

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME: Erdle Perforating Company - 2018 Post RA Groundwater Sampling
 PROJECT NUMBER: 3617137306.01.****
 SAMPLE ID: 828072-MWU20020
 SAMPLE TIME: 1230

LOCATION ID: MW-20
 DATE: 5/22/18
 START TIME: 1015
 END TIME: 1235
 SITE NAME/NUMBER: 828072
 PAGE: 2 OF 2

WELL DIAMETER (INCHES): 1 2 4 6 8 OTHER _____
 TUBING ID (INCHES): 1/8 1/4 3/8 1/2 5/8 OTHER _____
 MEASUREMENT POINT (MP): TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY
 YES NO N/A
 CAP
 CASING
 LOCKED
 COLLAR

INITIAL DTW (BMP): 3.44 FT FINAL DTW (BMP): 3.89 FT PROT. CASING STICKUP (AGS): 1.6 FT TOC/TOR DIFFERENCE: NA FT
 WELL DEPTH (BMP): 21.9 FT SCREEN LENGTH: UNK FT PID AMBIENT AIR: _____ PPM REFILL TIMER SETTING: _____ SEC
 WATER COLUMN: 17.96 FT DRAWDOWN VOLUME: .07 GAL PID WELL MOUTH: _____ PPM DISCHARGE TIMER SETTING: _____ SEC
 CALCULATED GALVOL: 26.4 GAL TOTAL VOL. PURGED: 6 GAL DRAWDOWN/TOTAL PURGED: .01 PSI
(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)

TIME	DTW (FT)	PURGE RATE (mL/min)	TEMP. (°C)	SP. CONDUCTANCE (mS/cm)	pH (units)	DISS. O ₂ (mg/L)	TURBIDITY (ntu)	REDOX (mV)	PUMP INTAKE DEPTH (ft)	COMMENTS
1029	BEGIN PURGING									
1200	3.58	190	13.6	2.790	7.2	0.7	16	-87	20' TOC	
1205	3.85	190	13.6	2.793	7.2	0.7	13	-87		
1210	3.86	190	13.6	2.792	7.2	0.7	12	-87		
1215	3.88	190	13.7	2.788	7.2	0.6	10.8	-88		
1220	3.89	190	13.9	2.791	7.2	0.6	8.8	-88		
1230	collect sample									

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])

14	2.791	7.2	0.6	8.8	-88
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TKMFD: nearest degree (ex. 10.1 = 10)
 COND: 3 SF max (ex. 3333 = 3330, 0.695 = 0.696)
 pH: nearest tenth (ex. 5.53 = 5.5)
 DO: nearest tenth (ex. 3.51 = 3.5)
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
 ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

TYPE OF PUMP <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	DECON FLUIDS USED <input type="checkbox"/> DIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input checked="" type="checkbox"/> METHANOL <input type="checkbox"/> OTHER: <u>Dedicated</u>	TUBING/PUMP/BLADDER MATERIALS <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	EQUIPMENT USED <input checked="" type="checkbox"/> WL METER _____ <input type="checkbox"/> PID _____ <input checked="" type="checkbox"/> WQ METER: <u>YSI 3056 (4)</u> <input checked="" type="checkbox"/> TURB. METER: <u>HI 9142 (2)</u> <input checked="" type="checkbox"/> PUMP: <u>Geopac</u> <input type="checkbox"/> OTHER _____ <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
VOC	8260	N	4 deg C, HCl	3x40ml	✓	✓	
1-4 Dioxan				3x40ml			
PFCs				3x40ml			
also MS/MSD							

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES NO
 NO-PURGE METHOD UTILIZED: YES NO
 NUMBER OF GALLONS GENERATED: 6
 If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

SKETCH/NOTES

Erdle ↑
 MW-100, MW-1A
 MW-30
 MW-3
 MW-20
 MW-2

Sample Signature: Jerry Rawe
 Checked By: C. Stoper
 Print Name: Jerry Rawe
 Date: 5/31/18

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME: Edle Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER	3517137306.01.****
SAMPLE ID	828072-MW03A 008
SAMPLE TIME	1615

LOCATION ID	MW-3A	DATE	5/22/18
START TIME	1400	END TIME	1620
SITE NAME/NUMBER	828072	PAGE	1 OF 2

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER NA

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP)	— FT	FINAL DTW (BMP)	— FT	PROT. CASING STICKUP (AGS)	— FT	TOC/TOR DIFFERENCE	UNK FT
WELL DEPTH (BMP)	— FT	SCREEN LENGTH	— FT	PID AMBIENT AIR	— PPM	REFILL TIMER SETTING	— SEC
WATER COLUMN	— FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041)	— GAL	PID WELL MOUTH	— PPM	DISCHARGE TIMER SETTING	— SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041)	— GAL	TOTAL VOL. PURGED	3.5 GAL	DRAWDOWN/TOTAL PURGED	—	PRESSURE TO PUMP	— PSI

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)

TIME	DTW (FT) X 0.0-0.33ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 1%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1408										BEGIN PURGING * could not open well - no DTW measurement
1415	—	200	—	—	—	9.7	—	—	—	
1435	—	140 (lowest rate)	—	—	—	7.5	—	—	—	1.1 Gallons
1441	—	Stop purge for now	—	—	—	—	—	—	—	1.5 Gallons
1515	—	135	14.1	2.155	6.9	2.4	7.5	-91	—	Yellow tint and strong organic odor
1520	—	135	13.1	2.063	6.8	1.4	5.1	-110	—	
1525	—	135	13.0	2.045	6.8	1.3	4.9	-114	—	
1530	—	135	12.8	2.017	6.8	1.0	5.7	-119	—	
1535	—	140	12.6	1.985	6.8	0.9	5.6	-103	—	
1540	—	140	12.6	1.952	6.8	1.0	7.0	-87	—	
1545	—	140	12.5	1.914	6.7	0.9	6.7	-91	—	
1550	—	135	12.6	1.858	6.7	0.8	7.2	-98	—	

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

13	1.78	6.6	0.7	7.8	-99
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TEMP: nearest degree (ex. 10.1 = 10)
 COND: 3 SF max (ex. 3333 = 3330, 0.096 = 0.096)
 pH: nearest tenth (ex. 5.53 = 5.5)
 DO: nearest tenth (ex. 3.51 = 3.5)
 TURB: 3 SF max, rounded tenth (6.19 = 6.2, 101 = 101)
 ORP: 2 SF (44.1 = 44, 121 = 120)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input type="checkbox"/> METHANOL <input checked="" type="checkbox"/> OTHER <u>Deduced</u>	<p>TUBING/PUMP/BI ADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <input type="checkbox"/> PID <input checked="" type="checkbox"/> WQ METER <input checked="" type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> PUMP <u>Geopump</u> <input type="checkbox"/> OTHER <input type="checkbox"/> FILTERS NO TYPE
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
VOC	8260	N	4 deg C, HCl	2x40ml	✓		
1-4 Dioxan							
PFCs							

PURGE OBSERVATIONS

PURGE WATER CONTAMINIZED YES NO

NO-PURGE METHOD UTILIZED YES NO

NUMBER OF GALLONS GENERATED 3.5

If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

SKETCH/NOTES

EROLE ↑

• • MW-1A

MW-3A • MW-30 • MW-20 • MW-2A

Checked By: C. Staples Date: 5/31/18

Print Name: Jerry Rawcliff

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME: Erdle Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER: 3617137306.01****	
SAMPLE ID: 828072-MW03A-008	SAMPLE TIME: 1615

LOCATION ID: MW-3A	DATE: 5/22/18
START TIME: 1400	END TIME: 1620
SITE NAME/NUMBER: 828072	PAGE: 2 OF 2

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER: NA

WELL INTEGRITY

	YES	NO	N/A
CAP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CASING	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LOCKED COLLAR	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP): _____ FT	FINAL DTW (BMP): _____ FT	PROT. CASING STICKUP (AGS): _____ FT	TOC/TOR DIFFERENCE: NA FT
WELL DEPTH (BMP): _____ FT	SCREEN LENGTH: _____ FT	PID AMBIENT AIR: _____ PPM	REFILL TIMER SETTING: _____ SEC
WATER COLUMN: _____ FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041): _____ GAL	PID WELL MOUTH: _____ PPM	DISCHARGE TIMER SETTING: _____ SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041): _____ GAL	TOTAL VOL. PURGED: 3.5 GAL	DRAWDOWN/TOTAL PURGED: _____	PRESSURE TO PUMP: _____ PSI

TIME	DTW (FT)	PURGE RATE	TEMP. (°C)	SP. CONDUCTANCE	pH (units)	DISS. O ₂ (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
3-5 Minutes	0.0-0.33 ft Drawdown	(mL/min)	(+/- 3 degrees)	(µmS/cm) (+/- 3%)	(+/- 0.1 units)	(+/- 10%)	(+/- 10% < 10 ntu)	(+/- 10 mv)		
1408	BEGIN PURGING									
1555	150	150	12.6	1.823	6.7	0.7	7.2	-98	-	Purge at lowest setting
1600	140	140	12.7	1.801	6.7	0.7	7.8	-100		
1605	140	140	12.8	1.778	6.6	0.7	7.8	-99		
1615	- collect sample									

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

13 1.780 6.6 0.7 7.8 -99

TEMP: nearest degree (ex. 10.1 = 10)
 COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
 pH: nearest tenth (ex. 5.53 = 5.5)
 DO: nearest tenth (ex. 3.51 = 3.5)
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
 ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP:</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>DECON FLUIDS USED:</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input checked="" type="checkbox"/> METHANOL <input type="checkbox"/> OTHER: <u>deductor</u>	<p>TUBING/PUMP/BLADDER MATERIALS:</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>S. STEEL PUMP MATERIAL:</p> <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>EQUIPMENT USED:</p> <input checked="" type="checkbox"/> WL METER <input type="checkbox"/> PID <input checked="" type="checkbox"/> WQ METER <input checked="" type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> PUMP: <u>Deeping</u> <input type="checkbox"/> OTHER <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
VOC	8260	N	4 deg. C. HCl	3 ml	<input checked="" type="checkbox"/>		
1-4 Dioxan							
PFCs							

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES NO

NO-PURGE METHOD UTILIZED: YES NO

NUMBER OF GALLONS GENERATED: 3.5

If yes, purged approximately 1 standing volume prior to sampling or _____ ml. for this sample location.

SKETCH/NOTES

ERDLE ↑

MW-3A

MW-3A

MW-3A

MW-3A

Checked By: Jerry Rawcliffe

Date: 5/31/18

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME: Erdie Perforating Company - 2018 Post RA Groundwater Sampling
 PROJECT NUMBER: 3617137306.01****
 SAMPLE ID: 828072-MW03D014
 SAMPLE TIME: 0830 5/27/18

LOCATION ID: MW-3D
 DATE: 5/27/18 - 5/23/18
 START TIME: 1250
 END TIME: 5/23/18 0840
 SITE NAME/NUMBER: 828072
 PAGE: 1 OF 2

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____
 TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____
 MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY
 YES NO N/A
 CAP
 CASING
 LOCKED
 COLLAR

INITIAL DTW (BMP): 3.29 FT FINAL DTW (BMP): 6.80 FT PROT. CASING STICKUP (AGS): 1.9 FT TOC/TOR DIFFERENCE: NA FT
 WELL DEPTH (BMP): 14.9 FT SCREEN LENGTH: OPEN TOOLS FT PID AMBIENT AIR: _____ PPM REFILL TIMER SETTING: _____ SEC
 WATER COLUMN: 11.6 FT DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041): 5.1 GAL PID WELL MOUTH: _____ PPM DISCHARGE TIMER SETTING: _____ SEC
 CALCULATED GAL/VOL (column X well diameter squared X 0.041): 17.0 GAL TOTAL VOL PURGED: 5.5 GAL DRAWDOWN/TOTAL PURGED: .93 PRESSURE TO PUMP: _____ PSI

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% < 10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1302	BEGIN PURGING									
1350	4.98	200	13.7	3.704	8.7	0.4	17	-126	14	
1355	5.12	130	13.8	3.714	8.8	0.4	-	-202		
1400	5.22	130	14.5	3.705	8.9	0.5	9.8	-159		1.0 Gallons
1405	5.35	130	15.0	3.713	8.8	0.4	9.7	-156		
1410	5.44	125	15.3	3.719	8.8	0.4	-	-146		
1430	5.84	120	14.8	3.725	8.8	0.4	9.6	-115		Spoke with C. Gaskin
1440	6.04	125	14.6	3.726	8.8	0.4	8.2	-116		Ops Manager
1455	6.15	120	15.5	3.717	8.9	0.4	9.2	-109		
1500	6.29	120	14.6	3.727	9.0	0.4	8.9	-110		
1505	6.38	120	14.6	3.719	8.9	0.4	8.7	-114		
1510	6.44	120	14.5	3.719	8.9	0.4	8.3	-120		

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

13	3.660	9	1.0	8.6	-16
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TEMP.: nearest degree (ex. 10.1 = 10)
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
 pH: nearest tenth (ex. 5.53 = 5.5)
 DO: nearest tenth (ex. 3.51 = 3.5)
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
 ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

TYPE OF PUMP <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	DECON FLUIDS USED <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input type="checkbox"/> METHANOL <input type="checkbox"/> OTHER _____	TUBING/PUMP/BLADDER MATERIALS <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input checked="" type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	EQUIPMENT USED <input checked="" type="checkbox"/> WL METER _____ <input type="checkbox"/> PID _____ <input checked="" type="checkbox"/> WQ METER _____ <input checked="" type="checkbox"/> TURB. METER _____ <input checked="" type="checkbox"/> PUMP <u>Geoprobe</u> <input type="checkbox"/> OTHER _____ <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x42al	<input checked="" type="checkbox"/>		
<input type="checkbox"/> 1-4 Dioxan							
<input type="checkbox"/> PFCs							

PURGE OBSERVATIONS
 PURGE WATER CONTAINERIZED: YES NO
 NO-PURGE METHOD UTILIZED: YES NO
 NUMBER OF GALLONS GENERATED: 5.5
 If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.
 Sampler Signature: Jerry Rawcliffe
 Checked By: C. S. Stokes
 Date: 5/31/18

SKETCH/NOTES
 Very little recharge.
 Purge is mostly drawdown
 Purge for 2+ hours going to allow recharge and collect grab sample.
 MW-1A
 MW-3A
 MW-3D
 MW-2D
 MW-2A

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME: Erdle Perforating Company - 2018 Post RA Groundwater Sampling
 PROJECT NUMBER: 3617137306.01****
 SAMPLE ID: 828076-MW03D014
 SAMPLE TIME: 0830 5/23/18

LOCATION ID: MW-3D
 DATE: 5/22-5/23/18
 START TIME: 5/22 1250
 END TIME: 0840 5/23/18
 SITE NAME/NUMBER: 828072
 PAGE: 2 OF 2

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____
 TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____
 MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY
 YES NO N/A
 CAP
 CASING
 LOCKED
 COLLAR

INITIAL DTW (BMP): 4.98 FT FINAL DTW (BMP): 6.80 FT PROT. CASING STICKUP (AGS): 1.9 FT TOC/TOR DIFFERENCE: NA FT
 WELL DEPTH (BMP): 14.9 FT SCREEN LENGTH: U.W.C. OPEN HOLE FT PID AMBIENT AIR: _____ PPM REFILL TIMER SETTING: _____ SEC
 WATER COLUMN: 11.6 FT DRAWDOWN VOLUME: 5.1 GAL PID WELL MOUTH: _____ PPM DISCHARGE TIMER SETTING: _____ SEC
 CALCULATED GAL/VOL: 17.0 GAL TOTAL VOL. PURGED: 5.5 GAL DRAWDOWN/TOTAL PURGED: .93 PRESSURE TO PUMP: _____ PSI
(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

TIME	DTW (FT)	PURGE RATE	TEMP. (°C)	SP. CONDUCTANCE	pH (units)	DISS. O ₂ (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1302	BEGIN PURGING									
0806	6.21	5/23/18							14	
0813	6.46	170	12.7	3.646	8.4	1.7	9.2	77		
0818	6.64	180	12.6	3.661	9.0	1.2	8.4	25		
0823	6.80	180	12.6	3.661	9.1	1.0	8.6	-16		
0830	collect sample									

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

13 3.666 9 1.0 8.6 -16

TEMP.: nearest degree (ex. 10.1 = 10)
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
 pH: nearest tenth (ex. 5.53 = 5.5)
 DO: nearest tenth (ex. 3.51 = 3.5)
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
 ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input type="checkbox"/> METHANOL <input checked="" type="checkbox"/> OTHER: <u>Dedicated</u>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input checked="" type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <input type="checkbox"/> PID <input type="checkbox"/> WQ METER <input type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> PUMP: <u>Acropump</u> <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____ <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ml	<input checked="" type="checkbox"/>		
<input type="checkbox"/> 1-4 Dioxan							
<input type="checkbox"/> PFCs							

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES NO
 NO-PURGE METHOD UTILIZED: YES NO
 NUMBER OF GALLONS GENERATED: 5.5
 If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

SKETCH/NOTES

Handwritten sketch of a well layout with labels: MW-1A, MW-3A, MW-3B, MW-3D, MW-2D, MW-2A.

Sampler Signature: [Signature] Print Name: Jerry Rawcliffe
 Checked By: C. S. [Signature] Date: 5/31/18

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdie Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER 3617137306.01****	
SAMPLE ID 828072-MW005006	SAMPLE TIME 0910

LOCATION ID MW-5	DATE 5/21/18-5/22/18
START TIME 1710	END TIME 5/22/18 0930
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 0.0 FT	FINAL DTW (BMP) 7.91 FT	PROT. CASING STICKUP (AGS) Flush FT	TOC/TOR DIFFERENCE 0.28 FT
WELL DEPTH (BMP) 7.95 FT	SCREEN LENGTH UNK FT	PID AMBIENT AIR — PPM	REFILL TIMER SETTING — SEC
WATER COLUMN 7.95 FT	DRAWDOWN VOLUME (initial DTW- final DTW X well diam. squared X 0.041) 1.3 GAL	PID WELL MOUTH — PPM	DISCHARGE TIMER SETTING — SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) 1.3 GAL	TOTAL VOL. PURGED 4 GAL	DRAWDOWN/ TOTAL PURGED —	PRESSURE TO PUMP — PSI

TIME	DTW (FT)	PURGE RATE (mL/min)	TEMP. (°C)	SP. CONDUCTANCE (mS/cm)	pH (units)	DISS. O ₂ (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1719	BEGIN PURGING									
1725	2.22	250	16.8	11.30	6.5	0.8	70	7.1	7.9'	
1730	3.81	215	18.2	9.876	6.6	2.2	76	-1		
1738	4.15	180	13.9	11.62	6.5	4.5	101	12.5		
1745	4.69	180	—	—	—	—	4.3	—		
Going to allow to purge while I monitor MW-5D										
1840	7.12	170	—	—	—	—	8.0	—		1850 Dry-logged
0845	5.96	5/22/18	—	—	—	—	7.0	—		Collecting grab ≈ 4 Gallons
0900	—	—	—	—	—	—	18.2	—		sample
0905	—	—	—	—	—	—	2.0	—		
0910	Collect sample									

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])

14 11.62 6.5 4.5 2.0 13

TEMP.: nearest degree (ex. 10.1 = 10)
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
pH: nearest tenth (ex. 5.53 = 5.5)
DO: nearest tenth (ex. 3.51 = 3.5)
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input type="checkbox"/> METHANOL <input checked="" type="checkbox"/> OTHER <i>Dedicated</i>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER _____ <input type="checkbox"/> PID _____ <input checked="" type="checkbox"/> WQ METER _____ <input type="checkbox"/> TURB. METER _____ <input checked="" type="checkbox"/> PUMP <i>Geopump</i> <input type="checkbox"/> OTHER _____ <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x100ml	✓		
<input checked="" type="checkbox"/> 1-4 Dioxan	8270	↓	4°C	2x1L/40	✓		
<input checked="" type="checkbox"/> PFCs		↓	4°C	2x250ml poly r	✓		

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES NO

NO-PURGE METHOD UTILIZED YES NO

NUMBER OF GALLONS GENERATED _____

If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

Sampler Signature: *Jerry Pauloff* Print Name: *Derry Rawcliffe*

Checked By: *C. Stapher* Date: *5/31/18*

SKETCH/NOTES

mw-5 mw 5D Apple tree

Asphalt

Historically purges dry. will purge dry and sample recharge

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdie Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER 3617137306.01.****	
SAMPLE ID 828072-MW05D010	SAMPLE TIME 1840

LOCATION ID MW-5D	DATE 5/21/18
START TIME 1520	END TIME 1845
SITE NAME/NUMBER 828072	PAGE 1 OF 1

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 1.42' FT	FINAL DTW (BMP) 1.42' FT	PROT. CASING STICKUP (AGS) 0.2 FT	TOC/TOR DIFFERENCE NA FT
WELL DEPTH (BMP) 12.05 FT	SCREEN LENGTH UNK FT	PID AMBIENT AIR _____ PPM	REFILL TIMER SETTING _____ SEC
WATER COLUMN 10.63 FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041) 0 GAL	PID WELL MOUTH _____ PPM	DISCHARGE TIMER SETTING _____ SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) 15.6 GAL	TOTAL VOL. PURGED 16.5 GAL	DRAWDOWN/TOTAL PURGED _____	PRESSURE TO PUMP _____ PSI

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% < 10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (R)	COMMENTS
1600	BEGIN PURGING Initial rate = 700 ml/min to purge 1 well volume									
1639	1.44	700							11.5	5 gallons
1710	1.41	≈700								10 gallons
1740	1.43	≈650								15 gallons
1755	1.42	210	13.0	2.948	7.4	1.1	11.4	-54	11.5	
1800	1.42	210	13.0	2.890	7.3	1.0	11.7	-62		Pump at lowest setting
1805	1.42	205	12.9	2.866	7.3	0.8	12.9	-66		205 ml/min
1816	1.42	205	12.9	2.858	7.3	0.8	11.5	-72		
1815	1.42	205	12.8	2.856	7.3	0.7	10.1	-64		
1818	—	—	—	—	—	—	10.3	—		
1840	- collect sample									

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

13	2.880	7.3	0.7	10.3	-64
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TEMP.: nearest degree (ex. 10.1 = 10)
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
pH: nearest tenth (ex. 5.53 = 5.5)
DO: nearest tenth (ex. 3.51 = 3.5)
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER	<input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input type="checkbox"/> METHANOL <input checked="" type="checkbox"/> OTHER <i>Dulcified</i>	<input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	<input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	<input checked="" type="checkbox"/> WL. METER <input type="checkbox"/> PID <input type="checkbox"/> WQ METER <input checked="" type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> PUMP <i>Geoprobe</i> <input type="checkbox"/> OTHER _____ <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ml	✓		
<input checked="" type="checkbox"/> 1-4 Dioxan	8270	N	4°C	2x16 AG	✓		
<input checked="" type="checkbox"/> PFCs		N	4°C	2x250 ml poly	✓		

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES NO

NO-PURGE METHOD UTILIZED YES NO

NUMBER OF GALLONS GENERATED 16.5


If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

Sampler Signature: *Jerry Rawcliffe* Print Name: Jerry Rawcliffe

Checked By: C. Stapor Date: 5/31/18

SKETCH/NOTES

MW-5D Apple tree

MW-5 

Need to purge out at least 1 well volume before sampling for PFCs as LDPE tubing was in well.

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER 3617137306.01.****	
SAMPLE ID 828076-MW06D015	SAMPLE TIME 1510

LOCATION ID MW-6D	DATE 5/24/18
START TIME 1345	END TIME 1515
SITE NAME/NUMBER 828076	PAGE 1 OF 1

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY

CAP	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	N/A <input type="checkbox"/>
CASING LOCKED COLLAR	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	N/A <input type="checkbox"/>

INITIAL DTW (BMP) 2.34 FT	FINAL DTW (BMP) 2.34 FT	PROT. CASING STICKUP (AGS) 1.9 FT	TOC/TOR DIFFERENCE NA FT
WELL DEPTH (BMP) 16.0 FT	SCREEN LENGTH UNK FT	PID AMBIENT AIR PPM	REFILL TIMER SETTING SEC
WATER COLUMN 13.7 FT	DRAWDOWN VOLUME 0 GAL	PID WELL MOUTH PPM	DISCHARGE TIMER SETTING SEC
CALCULATED GAL/VOL 20.1 GAL	TOTAL VOL. PURGED 4.5 GAL	DRAWDOWN/ TOTAL PURGED -	PRESSURE TO PUMP PSI

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% < 10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1400	BEGIN PURGING									
1415	2.34	240	12.8	2.782	7.2	3.2	6.8	-96		
1420	2.35	250	12.7	2.783	7.2	2.6	6.0	-96		
1425	2.34	240	12.7	2.780	7.3	2.3	8.0	-101		
1436	2.34	240	12.7	2.784	7.2	1.9	6.9	-98		
1445	2.34	240	12.6	2.788	7.2	1.7	5.0	-98		
1450	2.34	240	12.6	2.787	7.2	1.5	5.1	-98		
1455	2.34	245	12.7	2.784	7.2	1.4	4.6	-98		
1500	2.34	230	12.7	2.784	7.2	1.3	4.6	-97		
1505	2.34	230	12.7	2.780	7.2	1.3	5.9	-96		
1510	Collect sample									

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])

13 2.780 7.2 1.3 5.9 -96

TEMP.: nearest degree (ex. 10.1 = 10)
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
pH: nearest tenth (ex. 5.53 = 5.5)
DO: nearest tenth (ex. 3.51 = 3.5)
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input type="checkbox"/> METHANOL <input checked="" type="checkbox"/> OTHER <i>Dedicated</i>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>S. STEEL PUMP MATERIAL PVC PUMP MATERIAL GEOPROBE SCREEN TEFLON BLADDER OTHER OTHER OTHER</p>	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <input type="checkbox"/> PID <input type="checkbox"/> WQ METER <input type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> PUMP <i>Geopac</i> <input type="checkbox"/> OTHER <input type="checkbox"/> FILTERS NO. TYPE
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ml	✓		
<input type="checkbox"/> 1-4 Dioxan							
<input type="checkbox"/> PFCs							

PURGE OBSERVATIONS

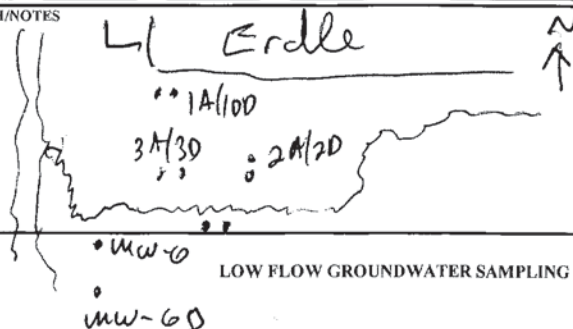
PURGE WATER CONTAINERIZED YES NO

NO-PURGE METHOD UTILIZED YES NO

NUMBER OF GALLONS GENERATED 4.5

If yes, purged approximately 1 standing volume prior to sampling or _____ for this sample location.

SKETCH/NOTES



Sampler Signature: *Jerry Rawcliffe* Print Name: Jerry Rawcliffe

Checked By: C. Staples Date: 5/31/18

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdie Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER 3617137306.01****	
SAMPLE ID 828072-MW008023	SAMPLE TIME 1200

LOCATION ID MW-8	DATE 5/23/18
START TIME 1010	END TIME 1215
SITE NAME/NUMBER 828076	PAGE 1 OF 2

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 14.03 FT	FINAL DTW (BMP) 15.16 FT	PROT. CASING STICKUP (AGS) 1.5 FT	TOC/TOR DIFFERENCE 0.11 Above cur
WELL DEPTH (BMP) 2910 FT	SCREEN LENGTH UNK FT	PID AMBIENT AIR — PPM	REFILL TIMER SETTING — SEC
WATER COLUMN 13.97 FT	DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041) .18 GAL	PID WELL MOUTH — PPM	DISCHARGE TIMER SETTING — SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) 2.24 GAL	TOTAL VOL. PURGED 2.27 GAL	DRAWDOWN/TOTAL PURGED .07	PRESSURE TO PUMP — PSI

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% < 10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1031	BEGIN PURGING									
1045	14.67	190	11.1	3.367	6.7	9.4	—	-76	±23'	
1051	14.88	200	11.1	3.358	6.7	5.1	14	-76		
1100	15.07	200	11.1	3.356	6.7	2.9	11	-79		
1105	15.10	140	11.3	3.356	6.7	2.4	9.7	-80		
1110	15.14	140	11.5	3.356	6.7	2.1	7.8	-75		
1115	15.14	110	11.5	3.361	6.7	1.7	7.4	-80		
1120	15.15	110	11.5	3.353	6.7	1.5	7.4	-87		
1125	15.15	110	11.6	3.346	6.7	1.3	5.9	-90		
1130	15.15	105	11.7	3.341	6.7	1.2	5.1	-90		
1135	15.15	110	11.8	3.327	6.7	1.0	4.5	-84		
1140	15.15	110	11.8	3.335	6.7	1.0	3.8	-83		

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

12 3.320 6.7 1.0 3.1 -80

TEMP: nearest degree (ex. 10.1 = 10)
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
pH: nearest tenth (ex. 5.53 = 5.5)
DO: nearest tenth (ex. 3.51 = 3.5)
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input type="checkbox"/> METHANOL <input checked="" type="checkbox"/> OTHER <i>Dedicated</i>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input checked="" type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <input type="checkbox"/> PID <input checked="" type="checkbox"/> WQ METER <input checked="" type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> PUMP <i>Geopmp</i> <input type="checkbox"/> OTHER <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ml	✓		
<input checked="" type="checkbox"/> 1-4 Dioxan	8270	✓	4°C	2x1LAC	✓		
<input checked="" type="checkbox"/> PFCs			4°C	2x250ml poly	✓		

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES NO

NO-PURGE METHOD UTILIZED YES NO

NUMBER OF GALLONS GENERATED 2.7

If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

SKETCH/NOTES

RR tracks

wet sands
may mud ridge
 MW-8 MW-80 MW-4/AD GPZ-55/50 GPZ-65/60
SWAMP

Sampler Signature: *Jerry Rawcliffe*
 Checked By: *OC Steiner*

Print Name: *Jerry Rawcliffe*
 Date: *5/31/18*

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER 3617137306.01.****	
SAMPLE ID 828072-MW008083	SAMPLE TIME 1200

LOCATION ID MW-8	DATE 5/31/18
START TIME 1010	END TIME 1215
SITE NAME/NUMBER 828076	PAGE 2 OF 2

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) <input type="text" value="14.03"/> FT	FINAL DTW (BMP) <input type="text" value="15.16"/> FT	PROT. CASING STICKUP (AGS) <input type="text" value="1.5"/> FT	TOC/TOR DIFFERENCE <input type="text" value="0.11 above"/> FT
WELL DEPTH (BMP) <input type="text" value="28.0"/> FT	SCREEN LENGTH <input type="text" value="UNK"/> FT	PID AMBIENT AIR <input type="text" value="—"/> PPM	REFILL TIMER SETTING <input type="text" value="—"/> SEC
WATER COLUMN <input type="text" value="13.97"/> FT	DRAWDOWN VOLUME <input type="text" value="1.18"/> GAL <small>(initial DTW - final DTW X well diam. squared X 0.041)</small>	PID WELL MOUTH <input type="text" value="—"/> PPM	DISCHARGE TIMER SETTING <input type="text" value="—"/> SEC
CALCULATED GAL/VOL <input type="text" value="2.24"/> GAL <small>(column X well diameter squared X 0.041)</small>	TOTAL VOL. PURGED <input type="text" value="2.7"/> GAL <small>(mL per minute X total minutes X 0.00026 gal/mL)</small>	DRAWDOWN/ TOTAL PURGED <input type="text" value="1.07"/>	PRESSURE TO PUMP <input type="text" value="—"/> PSI

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)										
TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% < 10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1031	BEGIN PURGING									
1145	15.16	110	11.9	3.328	6.7	1.0	3.5	-81	23	
1150	15.16	110	11.9	3.321	6.7	1.0	3.1	-80		
1200	Collect Sample									
/										

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SFI))

12 3,320 6.7 1.0 3.1 -80

TEMP.: nearest degree (ex. 10.1 = 10)
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
 pH: nearest tenth (ex. 5.53 = 5.5)
 DO: nearest tenth (ex. 3.51 = 3.5)
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
 ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATTERA <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input checked="" type="checkbox"/> METHANOL <input type="checkbox"/> OTHER <i>Delcated</i>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input checked="" type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <input type="checkbox"/> PID <input checked="" type="checkbox"/> WQ METER <input checked="" type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> PUMP <i>Geopump</i> <input type="checkbox"/> OTHER <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ml	<input checked="" type="checkbox"/>		
<input checked="" type="checkbox"/> 1-4 Dioxan	8270	↓	4°C	2x110ml	<input checked="" type="checkbox"/>		
<input checked="" type="checkbox"/> PFCs		↓	4°C	2x750 poly	<input checked="" type="checkbox"/>		

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES NO

NO-PURGE METHOD UTILIZED YES NO

NUMBER OF GALLONS GENERATED

If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

SKETCH/NOTES

~~TRR~~

Wet Sunlit

man made ridge mws *mw-9/96 GP2-55/57 GP2-65/60*

Sunlit

Sample Signature: *Jerry Rawcliffe*

Checked By: *C. St...*

Print Name: *Jerry Rawcliffe*

Date: *5/31/18*



511 Congress Street, Portland Maine 04101

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME: Erdle Perforating Company - 2018 Post RA Groundwater Sampling
 PROJECT NUMBER: 3617137306.01.****
 SAMPLE ID: 828076-MW8DU33
 SAMPLE TIME: 1425

LOCATION ID: MW-8D
 DATE: 5/23/18
 START TIME: 1010
 END TIME: 1435
 SITE NAME/NUMBER: 828076
 PAGE: 1 OF 2

WELL DIAMETER (INCHES): 1 2 4 6 8 OTHER _____
 TUBING ID (INCHES): 1/8 1/4 3/8 1/2 5/8 OTHER _____
 MEASUREMENT POINT (MP): TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY
 YES NO N/A
 CAP:
 CASING:
 LOCKED COLLAR:

INITIAL DTW (BMP): 13.35 FT
 FINAL DTW (BMP): 13.35 FT
 PROT. CASING STICKUP (AGS): 1.4 FT
 TOC/TOR DIFFERENCE: NA FT
 WELL DEPTH (BMP): 38.1 FT
 SCREEN LENGTH: UNK FT
 PID AMBIENT AIR: _____ PPM
 REFILL TIMER SETTING: _____ SEC
 WATER COLUMN: 29.75 FT
 DRAWDOWN VOLUME: 0 GAL
 PID WELL MOUTH: _____ PPM
 DISCHARGE TIMER SETTING: _____ SEC
 CALCULATED GAL/VOL: 36 GAL
 TOTAL VOL. PURGED: 37 GAL
 DRAWDOWN/TOTAL PURGED: _____
 PRESSURE TO PUMP: _____ PSI

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% < 10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1023										BEGIN PURGING
1047	13.35	~800	-	-	-	-	80	-	~33	5 gallons
1110	13.36	~800	-	-	-	-	67	-		10
1134	13.35		-	-	-	-	38	-		15
1158	13.35		-	-	-	-	27	-		20
1223	13.35		-	-	-	-	22	-		25
1250	13.35		-	-	-	-	11	-		30
1318	13.35		-	-	-	-	-	-		35
1325	13.35	160	15.2	2.837	7.1	4.1	40	-88		
1330	13.35	170	14.4	2.843	7.1	3.1	27	-88		
1335	13.35		14.0	2.830	7.1	2.3	21	-91		
1340	13.35		13.8	2.832	7.1	1.9	19	-101		

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures)(SF)

14 2.830 7.2 1.0 20 -100

TEMP.: nearest degree (ex. 10.1 = 10)
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
 pH: nearest tenth (ex. 5.53 = 5.5)
 DO: nearest tenth (ex. 3.51 = 3.5)
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
 ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATTERA <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input type="checkbox"/> METHANOL <input type="checkbox"/> OTHER	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>EQUIPMENT USED</p> <input type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>EQUIPMENT USED</p> <input type="checkbox"/> WL METER <input type="checkbox"/> PID <input type="checkbox"/> WQ METER <input type="checkbox"/> TURB. METER <input type="checkbox"/> PUMP <input type="checkbox"/> OTHER FILTERS NO. _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
VOC	8260	N	4 deg C, HCl	3x 40ml			
1-4 Dioxan	8270	L	4°C	2x 160ml			
PFCs			4°C	2x 250ml poly			

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES NO
 NO-PURGE METHOD UTILIZED: YES NO
 NUMBER OF GALLONS GENERATED: 37
 If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

SKETCH/NOTES

RR roads

 Manmade Ridge mw-9/90, mw-8D, mw-8D, GPZ-55/0, GPZ-64/0
 SW JMW

Sample Signature: *Jerry Rawcliffe*
 Checked By: C. Stepler
 Date: 5/31/18

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER 3617137306.01.****	
SAMPLE ID 828076-MW08D033	SAMPLE TIME 1425

LOCATION ID MW-8D	DATE 5/23/18
START TIME 1010	END TIME 1435
SITE NAME/NUMBER 828076	PAGE 2 OF 2

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 13.35 FT	FINAL DTW (BMP) 13.35 FT	PROT. CASING STICKUP (AGS) 1.4 FT	TOC/TOR DIFFERENCE NA FT
WELL DEPTH (BMP) 38.1 FT	SCREEN LENGTH UNIK FT	PID AMBIENT AIR PPM	REFILL TIMER SETTING SEC
WATER COLUMN 24.75 FT	DRAWDOWN VOLUME (initial DTW- final DTW X well diam. squared X 0.041) 0 GAL	PID WELL MOUTH PPM	DISCHARGE TIMER SETTING SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) 36 GAL	TOTAL VOL. PURGED (mL per minute X total minutes X 0.00026 gal/mL) 37 GAL	DRAWDOWN/ TOTAL PURGED PSI	PRESSURE TO PUMP PSI

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1023										BEGIN PURGING
1345	13.35	165	13.9	2.824	7.2	1.7	29	-90	≈33	
1350	13.35	160	13.8	2.828	7.2	1.4	22	-101		
1355	13.35	160	13.7	2.832	7.2	1.3	21	-102		
1400	13.35	160	13.7	2.826	7.2	1.3	24	-103		
1405	13.35	160	13.7	2.834	7.2	1.1	27	-104		
1410	13.35	160	13.6	2.835	7.2	1.1	22	-103		
1415	13.35	155	13.8	2.827	7.2	1.0	20	-101		
1425	Collect sample									

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

14 2.830 7.2 1.0 20 -100

TEMP.: nearest degree (ex. 10.1 = 10)
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
pH: nearest tenth (ex. 3.53 = 3.5)
DO: nearest tenth (ex. 3.51 = 3.5)
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input type="checkbox"/> METHANOL <input checked="" type="checkbox"/> OTHER <i>Deionized</i>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input checked="" type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> W. METER <input type="checkbox"/> PID <input checked="" type="checkbox"/> WQ METER <input checked="" type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> PUMP <i>Geopump</i> <input type="checkbox"/> OTHER <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40gal	<input checked="" type="checkbox"/>		
<input checked="" type="checkbox"/> 1-4 Dioxan	8270	↓	4°C	2x16AC	<input checked="" type="checkbox"/>		
<input checked="" type="checkbox"/> PFCs			4°C	2x250ulpoly	<input checked="" type="checkbox"/>		

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES NO

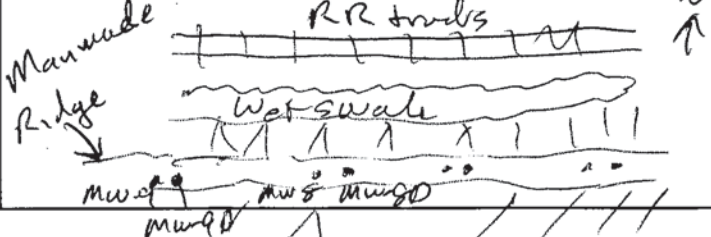
NO-PURGE METHOD UTILIZED YES NO

NUMBER OF GALLONS GENERATED **37**

If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

Sampler Signature: *Jerry Rawcliffe*
 Checked By: *C. Staples*
 Print Name: Jerry Rawcliffe
 Date: 5/31/18

SKETCH/NOTES



511 Congress Street, Portland Maine 04101

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER 3617137306.01.****	
SAMPLE ID 828076-MW09025	SAMPLE TIME 1520

LOCATION ID MW-9	DATE 5/23/18
START TIME 1255	END TIME 1525
SITE NAME/NUMBER 828076	PAGE 1 OF 1

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 15.58 FT	FINAL DTW (BMP) 15.61 FT	PROT. CASING STICKUP (AGS) 1.9 FT	TOC/TOR DIFFERENCE 0.07 above FT
WELL DEPTH (BMP) 30.1 FT	SCREEN LENGTH UNK FT	PID AMBIENT AIR PPM	REFILL TIMER SETTING SEC
WATER COLUMN 14.52 FT	DRAWDOWN VOLUME 1005 GAL <small>(initial DTW - final DTW X well diam. squared X 0.041)</small>	PID WELL MOUTH PPM	DISCHARGE TIMER SETTING SEC
CALCULATED GAL/VOL 2.3 GAL <small>(column X well diameter squared X 0.041)</small>	TOTAL VOL. PURGED 4.0 GAL <small>(mL per minute X total minutes X 0.00026 gal/mL)</small>	DRAWDOWN/ TOTAL PURGED 1001	PRESSURE TO PUMP PSI

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)										
TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% < 10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1315	BEGIN PURGING									
1338	15.60	120	-	-	-	-	2.5	-	~28	
1440	15.60	130	12.1	2.533	6.9	1.0	2.5	-114		2.7 gallons purged
1447	15.60	130	12.1	2.530	6.9	1.0	1.1	-117		
1455	15.60	130	12.1	2.527	6.9	0.9	1.4	-118		
1500	15.60	130	12.2	2.525	6.9	0.9	1.2	-120		
1505	15.60	130	12.2	2.524	6.9	0.8	2.1	-120		
1510	15.61	130	12.2	2.526	6.9	0.7	1.8	-121		
1515	15.61	130	12.3	2.523	7.0	0.7	1.0	-122		
1520	Collect sample									

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])

12 2.520 7.0 0.7 1.0 -120

TEMP.: nearest degree (ex. 10.1 = 10)
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
pH: nearest tenth (ex. 5.53 = 5.5)
DO: nearest tenth (ex. 3.51 = 3.5)
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input type="checkbox"/> METHANOL <input checked="" type="checkbox"/> OTHER <i>Delcatal</i>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <input type="checkbox"/> PID <input checked="" type="checkbox"/> WQ METER <input checked="" type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> PUMP <i>Geopump</i> <input type="checkbox"/> OTHER <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ml	<input checked="" type="checkbox"/>		
<input type="checkbox"/> 1-4 Dioxan							
<input type="checkbox"/> PFCs							

PURGE OBSERVATIONS

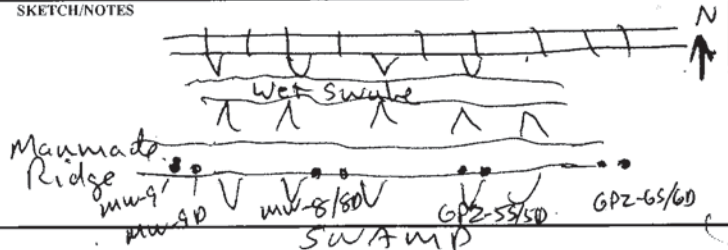
PURGE WATER CONTAINERIZED YES NO

NO-PURGE METHOD UTILIZED YES NO

NUMBER OF GALLONS GENERATED 4

If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

SKETCH/NOTES



Sampler Signature: *Jerry Rawcliffe*
 Checked By: *C. Staples*
 Print Name: *Jerry Rawcliffe*
 Date: *5/31/18*



511 Congress Street, Portland Maine 04101

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME: Erdle Perforating Company - 2018 Post RA Groundwater Sampling
 PROJECT NUMBER: 3617137306.01****
 SAMPLE ID: 828076-M090 035
 SAMPLE TIME: 1625

LOCATION ID: MW-90
 DATE: 5/23/18
 START TIME: 1445
 END TIME: 1630
 SITE NAME/NUMBER: 828076
 PAGE: 1 OF 1

WELL DIAMETER (INCHES): 1 2 4 6 8 OTHER _____
 TUBING ID (INCHES): 1/8 1/4 3/8 1/2 5/8 OTHER _____
 MEASUREMENT POINT (MP): TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY
 YES NO N/A
 CAP:
 CASING:
 LOCKED:
 COLLAR:

INITIAL DTW (BMP): 15.58 FT
 FINAL DTW (BMP): 15.59 FT
 PROT. CASING STICKUP (AGS): 2.1 FT
 TOC/TOR DIFFERENCE: NA FT
 WELL DEPTH (BMP): 48' (Horizontal) FT
 SCREEN LENGTH: 0.016 FT
 PID AMBIENT AIR: _____ PPM
 REFILL TIMER SETTING: _____ SEC
 WATER COLUMN: 32.4 FT
 DRAWDOWN VOLUME: 0.016 GAL
 PID WELL MOUTH: _____ PPM
 DISCHARGE TIMER SETTING: _____ SEC
 CALCULATED GAL/VOL: 47.6 GAL
 TOTAL VOL. PURGED: 3 GAL
 DRAWDOWN/TOTAL PURGED: .005 PSI
(column X well diameter squared X 0.041)
(initial DTW - final DTW X well diam. squared X 0.041)
(mL. per minute X total minutes X 0.00026 gal/mL)

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)										
TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1451	BEGIN PURGING									
1500	15.58	130	-	-	-	-	29	-		
1525	15.59	130	13.4	2.280	9.0	6.1	25	-180		
1545	15.59	130	13.3	2.280	9.2	0.5	21	-151		
1550	15.59	130	13.3	2.273	9.2	0.4	20	-167		
1555	15.59	130	13.1	2.274	9.1	0.4	19	-146		
1600	15.59	130	13.2	2.272	9.1	0.4	20	-162		
1605	15.59	-	13.2	2.272	9.1	0.4	19	-143		
1610	15.59	130	13.1	2.273	9.1	0.4	19	-133		
1615	15.59	130	13.1	2.272	9.1	0.4	20	-143		
1625	Collect sample									

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))
 TEMP: nearest degree (ex. 10.1 = 10)
 COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
 pH: nearest tenth (ex. 5.53 = 5.5)
 DO: nearest tenth (ex. 3.51 = 3.5)
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
 ORP: 2 SF (44.1 = 44, 191 = 190)

13 2.270 9.1 0.4 20 -140

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input type="checkbox"/> METHANOL <input checked="" type="checkbox"/> OTHER <i>Dedicated</i>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <input type="checkbox"/> PID <input checked="" type="checkbox"/> WQ METER <input checked="" type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> PUMP <i>Geopump</i> <input type="checkbox"/> OTHER <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ml	<input checked="" type="checkbox"/>		
<input type="checkbox"/> 1-4 Dioxan							
<input type="checkbox"/> PFCs							

PURGE OBSERVATIONS
 PURGE WATER CONTAINERIZED: YES NO
 NO-PURGE METHOD UTILIZED: YES NO
 NUMBER OF GALLONS GENERATED: **x 3**
 If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

Sampler Signature: *Jerry Rawcliffe*
 Checked By: C. Stepler
 Print Name: Jerry Rawcliffe
 Date: 5/23/18

SKETCH/NOTES

 mw-90

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME: Erdle Perforating Company - 2018 Post RA Groundwater Sampling
 PROJECT NUMBER: 3617137306.01,****
 SAMPLE ID: 828026-MW⁰²¹012
 SAMPLE TIME: 1645

LOCATION ID: MW-21
 DATE: 5/24/18
 START TIME: 1555
 END TIME: 1700
 SITE NAME/NUMBER: 828026
 PAGE: 1 OF 1

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____
 TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____
 MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER: NA Sealed well

WELL INTEGRITY
 YES NO N/A
 CAP
 CASING
 LOCKED
 COLLAR

INITIAL DTW (BMP): _____ FT FINAL DTW (BMP): _____ FT PROT. CASING STICKUP (AGS): 2.6 FT TOC/TOR DIFFERENCE: _____ FT
 WELL DEPTH (BMP): _____ FT SCREEN LENGTH: _____ FT PID AMBIENT AIR: _____ PPM REFILL TIMER SETTING: _____ SEC
 WATER COLUMN: _____ FT DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041): _____ GAL PID WELL MOUTH: _____ PPM DISCHARGE TIMER SETTING: _____ SEC
 CALCULATED GAL/VOL (column X well diameter squared X 0.041): _____ GAL TOTAL VOL. PURGED: 1.8 GAL DRAWDOWN/TOTAL PURGED: _____ PSI
(mL per minute X total minutes X 0.00026 gal/mL)

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)										
TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% < 10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1558	BEGIN PURGING									
1605	-	160	12.8	2.638	7.1	1.5	1.8	-52	-	
1615	-	165	12.8	2.632	7.1	1.0	1.5	-62		
1620	-	150	13.0	2.634	7.1	1.0	2.5	-62		
1625	-	160	12.9	2.663	7.1	1.0	1.1	-65		
1630	-	145	13.1	2.671	7.1	0.9	1.1	-65		
1635	-	150	13.0	2.689	7.1	0.9	1.2	-66		
1640	-	150	12.9	2.694	7.1	0.9	2.5	-66		
1645	Collect sample									

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

13	2.69	7.1	0.9	2.5	-66
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TEMP: nearest degree (ex. 10.1 = 10)
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
 pH: nearest tenth (ex. 5.53 = 5.5)
 DO: nearest tenth (ex. 3.51 = 3.5)
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
 ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

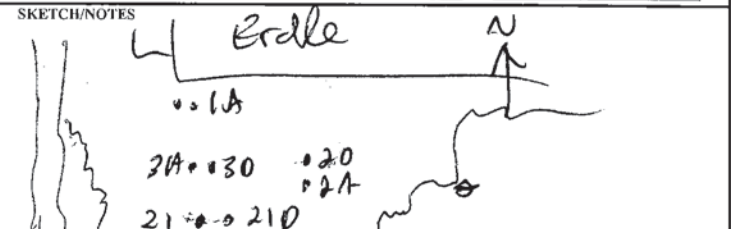
TYPE OF PUMP: PERISTALTIC SUBMERSIBLE BLADDER
 DECON FLUIDS USED: LIQUINOX, DEIONIZED WATER, POTABLE WATER, NITRIC ACID, HEXANE, METHANOL, OTHER: Dedicated
 TUBING/PUMP/BLADDER MATERIALS: SILICON TUBING, TEFLON TUBING, TEFLON LINED TUBING, HDPE TUBING, LDPE TUBING, OTHER
 EQUIPMENT USED: WL METER, PID, WQ METER, TURB. METER, PUMP: Geopump, OTHER, FILTERS

ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ul	<input checked="" type="checkbox"/>		
<input type="checkbox"/> 1-4 Dioxan							
<input type="checkbox"/> PFCs							

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED: YES NO
 NO-PURGE METHOD UTILIZED: YES NO
 NUMBER OF GALLONS GENERATED: 1.8
 If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.
 Sampler Signature: *Jerry Rawcliffe* Print Name: Jerry Rawcliffe
 Checked By: C. Staples Date: 5/31/18



LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER 3617137306.01****	
SAMPLE ID 828076-MW 210020	SAMPLE TIME 1555

LOCATION ID MW-21D	DATE 5/24/18
START TIME 1350	END TIME 1600
SITE NAME/NUMBER 828076	PAGE 1 OF 1

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER NA Sealed well

INITIAL DTW (BMP) _____ FT FINAL DTW (BMP) _____ FT PROT. CASING STICKUP (AGS) 3.3 FT TOC/TOR DIFFERENCE NA FT

WELL DEPTH (BMP) _____ FT SCREEN LENGTH DNK FT PID AMBIENT AIR _____ PPM REFILL TIMER SETTING _____ SEC

WATER COLUMN _____ FT DRAWDOWN VOLUME _____ GAL PID WELL MOUTH _____ PPM DISCHARGE TIMER SETTING _____ SEC

INITIAL DTW - final DTW X well diam. squared X 0.041

CALCULATED GAL/VOL _____ GAL TOTAL VOL. PURGED 3.1 GAL DRAWDOWN/ TOTAL PURGED _____ PRESSURE TO PUMP _____ PSI

(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CAP		
CASING		
LOCKED		
COLLAR		

TIME 3-5 Minutes	DTW (FT) * 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% <10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1400										BEGIN PURGING * cap on well - could not open for water level
1530	-	145	13.8	2.821	7.1	0.9	6.1	-65	-	2.1 Calhous
1535	-	190	13.8	2.821	7.1	1.0	0.7	-66		
1540	-	190	13.8	2.822	7.1	1.0	0.9	-64		
1545	-	180	13.8	2.825	7.1	0.9	0.2	-67		
1550	-	180	13.9	2.824	7.1	0.9	0.4	-66		
1555										collect sample

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

14 2.820 7.1 0.9 0.4 -66

TEMP.: nearest degree (ex. 10.1 = 10)
COND.: 3 SF max (ex. 3333 = 3330, 0.6% = 0.696)
pH: nearest tenth (ex. 3.51 = 3.5)
DO: nearest tenth (ex. 3.51 = 3.5)
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input type="checkbox"/> METHANOL <input checked="" type="checkbox"/> OTHER <u>Dedicated</u>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <input type="checkbox"/> PID <input checked="" type="checkbox"/> WQ METER <input checked="" type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> PUMP <u>Geopump</u> <input type="checkbox"/> OTHER <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ml	<input checked="" type="checkbox"/>	PVP	
<input type="checkbox"/> 1-4 Dioxan							
<input type="checkbox"/> PFCs							

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES NO

NO-PURGE METHOD UTILIZED YES NO

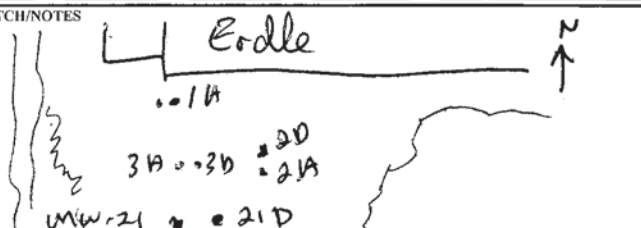
NUMBER OF GALLONS GENERATED 3.1

If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

Sampler Signature: Jerry Rawchick Print Name: Jerry Rawchick

Checked By: C. Stepler Date: 5/31/18

SKETCH/NOTES



LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER	3617137306.01.****
SAMPLE ID	828076-GP255018
SAMPLE TIME	1010

LOCATION ID	GPZ-55	DATE	5/23/18 - 5/24/18
START TIME	1630 5/23	END TIME	1015 5/24
SITE NAME/NUMBER	828076	PAGE	1 OF 2

WELL DIAMETER (INCHES)	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 4 <input type="checkbox"/> 6 <input type="checkbox"/> 8 <input type="checkbox"/> OTHER _____	WELL INTEGRITY	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> N/A <input type="checkbox"/>
TUBING ID (INCHES)	<input checked="" type="checkbox"/> 1/8 <input type="checkbox"/> 1/4 <input type="checkbox"/> 3/8 <input type="checkbox"/> 1/2 <input type="checkbox"/> 5/8 <input type="checkbox"/> OTHER _____	CAP	<input checked="" type="checkbox"/>
MEASUREMENT POINT (MP)	<input checked="" type="checkbox"/> TOP OF RISER (TOR) <input type="checkbox"/> TOP OF CASING (TOC) <input type="checkbox"/> OTHER _____	CASING	<input checked="" type="checkbox"/>
INITIAL DTW (BMP)	13.18 FT	LOCKED	<input checked="" type="checkbox"/>
FINAL DTW (BMP)	14.9 FT	COLLAR	<input checked="" type="checkbox"/>
WELL DEPTH (BMP)	18.5 FT	TOC/TOR DIFFERENCE	NA FT
SCREEN LENGTH	unk FT	REFILL TIMER SETTING	— SEC
WATER COLUMN	3.32 FT	DISCHARGE TIMER SETTING	— SEC
DRAWDOWN VOLUME (initial DTW - final DTW X well diam. squared X 0.041)	0.07 GAL	PRESSURE TO PUMP	— PSI
TOTAL VOL. PURGED (mL per minute X total minutes X 0.00026 gal/mL)	4.6 GAL		
CALCULATED GAL/VOL (column X well diameter squared X 0.041)	0.22 GAL		
DRAWDOWN/ TOTAL PURGED	0.05		

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)

TIME	DTW (FT)	PURGE RATE (mL/min)	TEMP. (°C)	SP. CONDUCTANCE (mS/cm)	pH (units)	DISS. O ₂ (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1636	BEGIN PURGING									
1639	14.04	155	10.9	2.641	6.6	6.3	9.4	-4.9		
1645	14.23	180	9.9	2.644	6.5	4.0	4.7	12		
1650	14.35	175	9.6	2.686	6.5	2.9	3.2	-14		
1655	14.42	180	9.7	2.747	6.5	2.6	26	-24		
1700	14.54	180	9.6	2.796	6.5	2.3	10	-31		
5/24/18										
0836	13.24	Resume purging								
0856	14.50	140	8.4	2.810	6.5	10.3	1.5	120		
0906	14.59	150	8.9	2.826	6.5	5.4	1.0	115		
0915	14.67	150	9.0	2.822	6.5	4.0	0.9	114		
0920	14.72	150	9.0	2.822	6.5	3.6	0.8	114		

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

9	2.800	6.5	1.8	0.5	110
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TEMP.: nearest degree (ex. 10.1 = 10)
 COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
 pH: nearest tenth (ex. 3.53 = 3.5)
 DO: nearest tenth (ex. 3.51 = 3.5)
 TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
 ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input checked="" type="checkbox"/> METHANOL <input type="checkbox"/> OTHER: <u>Dedicated</u>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> S. STEEL PUMP MATERIAL <input type="checkbox"/> PVC PUMP MATERIAL <input type="checkbox"/> GEOPROBE SCREEN <input type="checkbox"/> TEFLON BLADDER <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER _____ <input type="checkbox"/> PID _____ <input checked="" type="checkbox"/> WQ METER _____ <input checked="" type="checkbox"/> TURB. METER _____ <input checked="" type="checkbox"/> PUMP <u>Comtrip</u> <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____ FILTERS NO. _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ml	<input checked="" type="checkbox"/>		
<input type="checkbox"/> 1-4 Dioxan							
<input type="checkbox"/> PFCs							

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	NUMBER OF GALLONS GENERATED	_____
NO-PURGE METHOD UTILIZED	YES <input type="checkbox"/> NO <input type="checkbox"/>	If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.	_____

SKETCH/NOTES

Man Made ridge GPZ 50 → GPZ-55 → GPZ-60 → GPZ-65

Range swale

GP

Sampler Signature: *Jerry Rawcliff*
 Checked By: *E. Stepler*

Print Name: *Jerry Rawcliff*
 Date: *5/31/18*

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER 3617137306.01****	
SAMPLE ID 828026-GP255018	SAMPLE TIME 1010

LOCATION ID GP2-55	DATE 5/24/18
START TIME 5/23/18 1630	END TIME 1015
SITE NAME/NUMBER 878076	PAGE 2 OF 2

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 13.18 FT	FINAL DTW (BMP) 14.90 FT	PROT. CASING STICKUP (AGS) 1.6 FT	TOC/TOR DIFFERENCE NA FT
WELL DEPTH (BMP) 16.5 FT	SCREEN LENGTH unk FT	PID AMBIENT AIR - PPM	REFILL TIMER SETTING - SEC
WATER COLUMN 5.32 FT	DRAWDOWN VOLUME 6.07 GAL	PID WELL MOUTH - PPM	DISCHARGE TIMER SETTING - SEC
CALCULATED GAL/VOL 0.22 GAL	TOTAL VOL. PURGED 4.6 GAL	DRAWDOWN/TOTAL PURGED 0.05	PRESSURE TO PUMP - PSI

(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% < 10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
0836	BEGIN PURGING 5/24/18									
0925	14.76	160	9.0	2.817	6.5	3.3	0.8	115	18	
0930	14.77	160	9.0	2.814	6.5	3.0	0.6	115		
0935	14.78	140	9.1	2.808	6.5	2.7	0.7	114		
0940	14.81	140	9.1	2.814	6.5	2.5	1.0	114		
0945	14.82	140	9.1	2.810	6.5	2.4	1.1	113		
0955	14.85	150	9.1	2.805	6.5	1.9	0.9	113		
1000	14.88	150	9.1	2.803	6.5	1.9	-	113		
1005	14.90	150	9.1	2.803	6.5	1.8	0.5	113		
1010	Collect sample									

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures[SF])

9 2.800 6.5 1.8 0.5 110

TEMP.: nearest degree (ex. 10.1 = 10)
COND.: 3 SF max (ex. 3333 = 3330, 0.096 = 0.096)
pH: nearest tenth (ex. 5.53 = 5.5)
DO: nearest tenth (ex. 3.51 = 3.5)
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input type="checkbox"/> METHANOL <input checked="" type="checkbox"/> OTHER <i>Dedicated</i>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <input type="checkbox"/> PID <input type="checkbox"/> WQ METER <input checked="" type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> PUMP <i>Geopump</i> <input type="checkbox"/> OTHER <input type="checkbox"/> FILTERS NO. _____ TYPE _____
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ml	<input checked="" type="checkbox"/>		
<input type="checkbox"/> 1-4 Dioxan							
<input type="checkbox"/> PPCs							

PURGE OBSERVATIONS

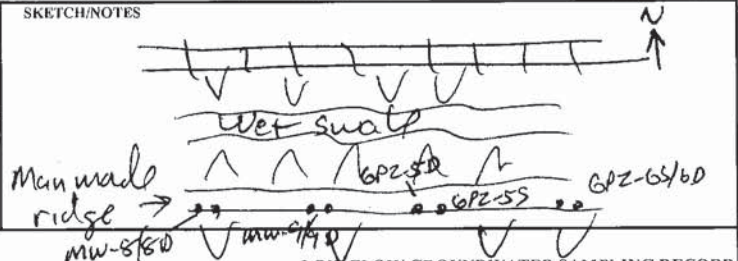
PURGE WATER CONTAINERIZED YES NO

NO-PURGE METHOD UTILIZED YES NO

NUMBER OF GALLONS GENERATED 3.7

If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

SKETCH/NOTES



Sampler Signature: *Jerry Rawcliffe*
 Checked By: *C. Styer*
 Print Name: *Jerry Rawcliffe*
 Date: *5/31/18*

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER 3617137306.01.****	
SAMPLE ID 828076-6P25D025	SAMPLE TIME 1055

LOCATION ID 6P2-5D	DATE 5/24/18
START TIME 0900	END TIME 1105
SITE NAME/NUMBER 828076	PAGE 1 OF 1

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

WELL INTEGRITY

YES	NO	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

INITIAL DTW (BMP) 14.51 FT	FINAL DTW (BMP) 15.76 FT	PROT. CASING STICKUP (AGS) 3.0 FT	TOC/TOR DIFFERENCE NA FT
WELL DEPTH (BMP) 28.10 FT	SCREEN LENGTH UNK FT	PID AMBIENT AIR — PPM	REFILL TIMER SETTING — SEC
WATER COLUMN 13.5 FT	DRAWDOWN VOLUME .05 GAL	PID WELL MOUTH — PPM	DISCHARGE TIMER SETTING — SEC
CALCULATED GAL/VOL (column X well diameter squared X 0.041) 0.5 GAL	TOTAL VOL. PURGED 4.0 GAL	DRAWDOWN/TOTAL PURGED .01	PRESSURE TO PUMP — PSI

FIELD PARAMETERS WITH PROGRAM STABILIZATION CRITERIA (AS LISTED IN THE QAPP)

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% < 10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
0904	BEGIN PURGING									
0910	15.60	140	—	—	—	—	35	—		
0932	15.62	145	—	—	—	—	5.8	—		
1020	15.61	145	11.2	2.664	6.9	0.9	2.7	-30		
1025	15.61	145	11.3	2.661	6.9	0.8	3.9	-32		
1040	15.76	175	11.3	2.647	7.0	0.7	6.0	-56		
1045	15.76	175	11.3	2.645	7.0	0.6	6.0	-58		
1050	15.76	175	11.3	2.648	7.0	0.6	5.2	-55		
1055	Collect sample									

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

11 2.650 7.0 0.6 5.2 -55

TEMP: nearest degree (ex. 10.1 = 10)
COND: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
pH: nearest tenth (ex. 5.53 = 5.5)
DO: nearest tenth (ex. 3.51 = 3.5)
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION

<p>TYPE OF PUMP</p> <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>DECON FLUIDS USED</p> <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input checked="" type="checkbox"/> METHANOL <input type="checkbox"/> OTHER <i>Dedicated</i>	<p>TUBING/PUMP/BLADDER MATERIALS</p> <input checked="" type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER <input type="checkbox"/> OTHER	<p>EQUIPMENT USED</p> <input checked="" type="checkbox"/> WL METER <input type="checkbox"/> PID <input checked="" type="checkbox"/> WQ METER <input type="checkbox"/> TURB. METER <input checked="" type="checkbox"/> PUMP <i>Geopump</i> <input type="checkbox"/> OTHER <input type="checkbox"/> FILTERS NO. TYPE
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ANALYTICAL PARAMETERS

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ml	<input checked="" type="checkbox"/>		
<input type="checkbox"/> 1-4 Dioxan							
<input type="checkbox"/> PFCs							

PURGE OBSERVATIONS

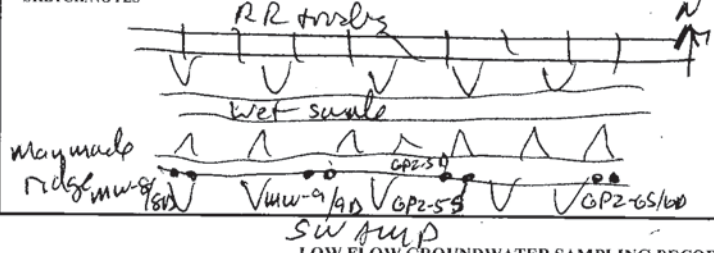
PURGE WATER CONTAINERIZED YES NO

NO-PURGE METHOD UTILIZED YES NO

NUMBER OF GALLONS GENERATED **≈ 4.0**

If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

SKETCH/NOTES



Sampler Signature: *Jerry Rawcliffe* Print Name: **Jerry Rawcliffe**

Checked By: *E. Stepler* Date: **5/31/18**



511 Congress Street, Portland Maine 04101

LOW FLOW GROUNDWATER SAMPLING RECORD

PROJECT NAME Erdle Perforating Company - 2018 Post RA Groundwater Sampling	
PROJECT NUMBER 3617137306.01****	
SAMPLE ID 828076-GPZ6D028	SAMPLE TIME 1145

LOCATION ID 6PZ-6D	DATE 5/24/18
START TIME 1030	END TIME 1155
SITE NAME/NUMBER 828076	PAGE 1 OF 1

WELL DIAMETER (INCHES) 1 2 4 6 8 OTHER _____

TUBING ID (INCHES) 1/8 1/4 3/8 1/2 5/8 OTHER _____

MEASUREMENT POINT (MP) TOP OF RISER (TOR) TOP OF CASING (TOC) OTHER _____

INITIAL DTW (BMP) 14.70 FT FINAL DTW (BMP) 15.08 FT PROT. CASING STICKUP (AGS) 2.5 FT TOC/TOR DIFFERENCE NA FT

WELL DEPTH (BMP) 28.9 FT SCREEN LENGTH UNK FT PID AMBIENT AIR _____ PPM REFILL TIMER SETTING _____ SEC

WATER COLUMN 14.2 FT DRAWDOWN VOLUME .02 GAL PID WELL MOUTH _____ PPM DISCHARGE TIMER SETTING _____ SEC

CALCULATED GAL/VOL 0.6 GAL TOTAL VOL. PURGED 2 GAL DRAWDOWN/TOTAL PURGED .008 PRESSURE TO PUMP _____ PSI

(column X well diameter squared X 0.041) (mL per minute X total minutes X 0.00026 gal/mL)

WELL INTEGRITY

YES	NO	N/A
___	___	___
___	___	___
___	___	___
___	___	___

TIME 3-5 Minutes	DTW (FT) 0.0-0.33 ft Drawdown	PURGE RATE (mL/min)	TEMP. (°C) (+/- 3 degrees)	SP. CONDUCTANCE (mS/cm) (+/- 3%)	pH (units) (+/- 0.1 units)	DISS. O ₂ (mg/L) (+/- 10%)	TURBIDITY (ntu) (+/- 10% < 10 ntu)	REDOX (mv) (+/- 10 mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1036	BEGIN PURGING									
1110	14.94	80	12.2	2.101	7.1	1.1	5.5	-67		≈ 0.8 Cellulose
1115	15.01	135	12.0	2.117	7.1	0.9	3.9	-67		
1120	15.04	130	11.7	2.129	7.1	0.7	3.6	-59		
1125	15.05	125	11.8	2.157	7.1	0.7	2.7	-63		
1130	15.04	120	11.9	2.171	7.1	0.6	2.3	-69		
1135	15.08	145	11.9	2.181	7.1	0.6	1.8	-67		
1140	15.08	140	11.8	2.189	7.1	0.5	1.7	-65		
1145	Collect sample									

FINAL STABILIZED FIELD PARAMETERS (to appropriate significant figures(SF))

12 2.189 7.1 0.5 1.7 -65

TEMP.: nearest degree (ex. 10.1 = 10)
COND.: 3 SF max (ex. 3333 = 3330, 0.696 = 0.696)
pH: nearest tenth (ex. 5.53 = 5.5)
DO: nearest tenth (ex. 3.51 = 3.5)
TURB: 3 SF max, nearest tenth (6.19 = 6.2, 101 = 101)
ORP: 2 SF (44.1 = 44, 191 = 190)

EQUIPMENT DOCUMENTATION			
TYPE OF PUMP <input checked="" type="checkbox"/> PERISTALTIC <input type="checkbox"/> SUBMERSIBLE <input type="checkbox"/> BLADDER <input type="checkbox"/> WATERA <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	DECON FLUIDS USED <input type="checkbox"/> LIQUINOX <input type="checkbox"/> DEIONIZED WATER <input type="checkbox"/> POTABLE WATER <input type="checkbox"/> NITRIC ACID <input type="checkbox"/> HEXANE <input type="checkbox"/> METHANOL <input checked="" type="checkbox"/> OTHER <u>Dedicated</u>	TUBING/PUMP/BLADDER MATERIALS <input type="checkbox"/> SILICON TUBING <input type="checkbox"/> TEFLON TUBING <input type="checkbox"/> TEFLON LINED TUBING <input type="checkbox"/> HDPE TUBING <input checked="" type="checkbox"/> LDPE TUBING <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____	EQUIPMENT USED <input checked="" type="checkbox"/> WL METER _____ <input type="checkbox"/> PID _____ <input type="checkbox"/> WQ METER _____ <input type="checkbox"/> TURB. METER _____ <input checked="" type="checkbox"/> PUMP <u>Geopump</u> <input type="checkbox"/> OTHER _____ <input type="checkbox"/> FILTERS NO. _____ TYPE _____

PARAMETER	METHOD NUMBER	FIELD FILTERED	PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE COLLECTED	QC COLLECTED	SAMPLE BOTTLE ID NUMBERS
<input checked="" type="checkbox"/> VOC	8260	N	4 deg C, HCl	3x40ul	<input checked="" type="checkbox"/>		
<input type="checkbox"/> 1,4 Dioxan							
<input type="checkbox"/> PFCs							

PURGE OBSERVATIONS

PURGE WATER CONTAINERIZED YES NO

NO-PURGE METHOD UTILIZED YES NO

NUMBER OF GALLONS GENERATED 2

If yes, purged approximately 1 standing volume prior to sampling or _____ mL for this sample location.

Sampler Signature: Jerry Rawliff Print Name: Jerry Rawliff

Checked By: C. Styer Date: 5/31/18

SKETCH/NOTES

RP rocks

Well swale

Man made ridge

mu 9/90 mu 8/80 mu 6/60 mu 4/40

6PZ-6D 6PZ-53/50 6PZ-6D

SW pump

FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: Erdle Perforating Company
 PROJECT NUMBER: 3617137306
 PROJECT LOCATION: Gates, NY
 WEATHER CONDITIONS (AM): Mossy Run 70°F light breeze
 WEATHER CONDITIONS (PM): _____

TASK NO: 01.**** DATE: 5/21/18
 MACTEC CREW: LF GW
 SAMPLER NAME: Jerry Raycliffe
 SAMPLER SIGNATURE: [Signature]
 CHECKED BY: CE DATE: 5/21/18

MULTI-PARAMETER WATER QUALITY METER

METER TYPE YSI
 MODEL NO. 556 MPS
 UNIT ID NO. M015-US

AM CALIBRATION
 Start Time 1430 / End Time 1520

POST CALIBRATION CHECK
 Start Time 1840 / End Time 1850

Units	Standard Value	Meter Value	*Acceptance Criteria (AM)	Standard Value	Meter Value	*Acceptance Criteria (PM)
pH (4) SU	4.0	<u>4.04</u>	+/- 0.1 pH Units			
pH (7) SU	7.0	<u>7.00</u>	+/- 0.1 pH Units	7.0	<u>7.09</u>	+/- 0.3 pH Units
pH (10) SU	10.0	<u>—</u>	+/- 0.1 pH Units			
Redox +/- mV	240	<u>240.0</u>	+/- 10 mV	240	<u>246.7</u>	+/- 10 mV
Conductivity mS/cm	1.413	<u>1.413</u>	+/- 0.5 % of standard	1.413	<u>1.409</u>	+/- 5% of standard
DO (saturated) %	100	<u>99.4</u>	+/- 2% of standard		<u>90.5</u> **	
DO (saturated) mg/L ¹ (see Chart 1)	<u>28.1</u>	<u>99.48</u>	+/- 0.2 mg/L		<u>7.71</u>	+/- 0.5 mg/L of standard
DO (<0.1) mg/L	<0.1	<u>0.100</u>	<0.5 mg/L			
Temperature °C		<u>25.84</u>			<u>21.76</u>	
Baro. Press. mmHg		<u>754.8</u>			<u>753.8</u>	

TURBIDITY METER

METER TYPE HACH
 MODEL NO. 2100Q
 UNIT ID NO. M021-34

Units	Standard Value	Meter Value	*Acceptance Criteria (PM)
10 Standard NTU	10	<u>9.72</u>	+/- 5% of standard
20 Standard NTU	20	<u>20.0</u>	+/- 5% of standard
100 Standard NTU	100	<u>99.5</u>	+/- 5% of standard
800 Standard NTU	800	<u>793</u>	+/- 5% of standard

PHOTOIONIZATION DETECTOR

METER TYPE _____
 MODEL NO. _____
 UNIT ID NO. _____

Background	ppmv	<0.1	<0.1	within 5 ppmv of BG
Span Gas	ppmv	100	100	+/- 10% of standard

O₂-LEL 4 GAS METER

METER TYPE _____
 MODEL NO. _____
 UNIT ID NO. _____

Gas	Units	Standard Value	Meter Value	*Acceptance Criteria (PM)
Methane	%	50		+/- 10% of standard
O ₂	%	20.9		+/- 10% of standard
H ₂ S	ppmv	25		+/- 10% of standard
CO	ppmv	50		+/- 10% of standard

OTHER METER

METER TYPE _____
 MODEL NO. _____
 UNIT ID NO. _____

_____	_____	_____	_____	See Notes Below for Additional Information
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- Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above.
 Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source: Portland FOS
 Lot#/Date Produced: _____
 Trip Blank Source: Lab
 Sample Preservatives Source: Lab
 Disposable Filter Type: 0.45µm cellulose
 Calibration Fluids / Standard Source:
 - DO Calibration Fluid (<0.1 mg/L) Portland FOS
 - Other _____
 - Other _____
 - Other _____

	Cal. Standard Lot Number	Exp. Date
pH (4)	<u>76E006</u>	<u>9/19</u>
pH (7)	<u>76H1000</u>	<u>8/19</u>
pH (10)		
ORP	<u>1600</u>	<u>5/22</u>
Conductivity	<u>76H1079</u>	<u>8/18</u>
10 Turb. Stan.	<u>A7215</u>	<u>11/18</u>
20 Turb. Stan.	<u>A7227</u>	<u>11/18</u>
100 Turb. Stan.	<u>A7228</u>	<u>11/18</u>
800 Turb. Stan.	<u>A7233</u>	<u>11/18</u>
PID Span Gas		
O ₂ -LEL Span Gas		
Other		

NOTES: DO out of calibration at end of day

* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.



FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: Erdle Perforating Company
 PROJECT NUMBER: 3617137306
 PROJECT LOCATION: Gates, NY
 WEATHER CONDITIONS (AM): Showers, 55°F, light breeze
 WEATHER CONDITIONS (PM): Overcast, 65-70°, light breeze

TASK NO: 01.**** DATE: 8/24/15
 MACTEC CREW: LFGW
 SAMPLER NAME: Jerry Rawcliffe
 SAMPLER SIGNATURE: [Signature]
 CHECKED BY: CR DATE: 8/25/15

MULTI-PARAMETER WATER QUALITY METER

METER TYPE YSI
 MODEL NO. 556 MPS
 UNIT ID NO. MU15-05

AM CALIBRATION
 Start Time 0805 / End Time 0845

POST CALIBRATION CHECK
 Start Time 1745 / End Time 1800

		Standard Value	Meter Value	*Acceptance Criteria (AM)	Standard Value	Meter Value	*Acceptance Criteria (PM)
	Units						
pH (4)	SU	4.0	<u>4.0</u>	+/- 0.1 pH Units			
pH (7)	SU	7.0	<u>7.0</u>	+/- 0.1 pH Units	7.0	<u>7.02</u>	+/- 0.3 pH Units
pH (10)	SU	10.0	<u>—</u>	+/- 0.1 pH Units			
Redox	+/- mV	240	<u>240.2</u>	+/- 10 mV	240	<u>239.5</u>	+/- 10 mV
Conductivity	mS/cm	1.413	<u>1.410</u>	+/- 0.5 % of standard	1.413	<u>1.407</u>	+/- 5% of standard
DO (saturated)	%	100	<u>101.6</u>	+/- 2% of standard		<u>100</u>	
DO (saturated)	mg/L ¹ (see Chart 1)	<u>9.6</u>	<u>9.50</u>	+/- 0.2 mg/L	<u>9.0</u>	<u>9.08</u>	+/- 0.5 mg/L of standard
DO (<0.1)	mg/L	<0.1	<u>—</u>	<0.5 mg/L		<u>—</u>	
Temperature	°C		<u>17.06</u>			<u>19.79</u>	
Baro. Press.	mmHg		<u>750.5</u>			<u>747.5</u>	

TURBIDITY METER

METER TYPE HACH
 MODEL NO. 2100Q
 UNIT ID NO. M1024-34

Units	Standard Value	Meter Value	*Acceptance Criteria (PM)
10 Standard NTU	10	<u>9.81</u>	+/- 5% of standard
20 Standard NTU	20	<u>20.3</u>	+/- 5% of standard
100 Standard NTU	100	<u>101</u>	+/- 5% of standard
800 Standard NTU	800	<u>792</u>	+/- 5% of standard

PHOTOIONIZATION DETECTOR

METER TYPE _____
 MODEL NO. _____
 UNIT ID NO. _____

Background	ppmv	<0.1	<0.1	within 5 ppmv of BG
Span Gas	ppmv	100	100	+/- 10% of standard

O₂-LEL 4 GAS METER

METER TYPE _____
 MODEL NO. _____
 UNIT ID NO. _____

Methane	%	50	50	+/- 10% of standard
O ₂	%	20.9	20.9	+/- 10% of standard
H ₂ S	ppmv	25	25	+/- 10% of standard
CO	ppmv	50	50	+/- 10% of standard

OTHER METER

METER TYPE _____
 MODEL NO. _____
 UNIT ID NO. _____

_____	_____	_____	_____	See Notes Below for Additional Information
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- Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above.
 Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source: Portland FOS
 Lot#/Date Produced: _____
 Trip Blank Source: Lab
 Sample Preservatives Source: Lab
 Disposable Filter Type: 0.45µm cellulose
 Calibration Fluids / Standard Source:
 - DO Calibration Fluid (<0.1 mg/L) Portland FOS
 - Other _____
 - Other _____
 - Other _____

	Cal. Standard Lot Number	Exp. Date
pH (4)	<u>764006</u>	<u>9/19</u>
pH (7)	<u>7641000</u>	<u>8/19</u>
pH (10)	<u>—</u>	<u>—</u>
ORP	<u>1600</u>	<u>5/22</u>
Conductivity	<u>7641079</u>	<u>8/18</u>
10 Turb. Stan.	<u>A 7215</u>	<u>11/18</u>
20 Turb. Stan.	<u>A 7227</u>	↓
100 Turb. Stan.	<u>A 7228</u>	
800 Turb. Stan.	<u>A 7223B</u>	
PID Span Gas	_____	_____
O ₂ -LEL Span Gas	_____	_____
Other	_____	_____

NOTES:

* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.
 ** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.
 1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.



FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: Erdle Perforating Company
 PROJECT NUMBER: 3617137306
 PROJECT LOCATION: Gates, NY
 WEATHER CONDITIONS (AM): Overcast, 55 calm
 WEATHER CONDITIONS (PM): Clear sun, 70, light breeze

TASK NO: 01.**** DATE: 5/24/18
 MACTEC CREW: LP 6U
 SAMPLER NAME: Jerry Rawcliffe
 SAMPLER SIGNATURE: [Signature]
 CHECKED BY: CR DATE: 5/23/18

MULTI-PARAMETER WATER QUALITY METER

METER TYPE	YSI	AM CALIBRATION		
MODEL NO.	556 MPS	Start Time	/End Time	
UNIT ID NO.	M015-05			
	Units	Standard Value	Meter Value	*Acceptance Criteria (AM)
pH (4)	SU	4.0	<u>4.03</u>	+/- 0.1 pH Units
pH (7)	SU	7.0	<u>7.01</u>	+/- 0.1 pH Units
pH (10)	SU	10.0	<u>—</u>	+/- 0.1 pH Units
Redox	+/- mV	240	<u>240.9</u>	+/- 10 mV
Conductivity	mS/cm	1.413	<u>1.407</u>	+/- 0.5 % of standard
DO (saturated)	%	100	<u>100.0</u>	+/- 2% of standard
DO (saturated) mg/L	¹ (see Chart 1)	<u>9.7</u>	<u>9.81</u>	+/- 0.2 mg/L
DO (<0.1)	mg/L	<0.1	<u>—</u>	<0.5 mg/L
Temperature	°C		<u>16.30</u>	
Baro. Press.	mmHg		<u>757.0</u>	

1940 POST CALIBRATION CHECK		
Standard Value	Meter Value	*Acceptance Criteria (PM)
7.0	<u>7.02</u>	+/- 0.3 pH Units
240	<u>230.4</u>	+/- 10 mV
1.413	<u>1.406</u>	+/- 5% of standard
<u>≈ 8.1</u>	<u>100.0</u>	+/- 0.5 mg/L of standard
	<u>6.28</u>	
	<u>24.9</u>	
	<u>756.9</u>	

TURBIDITY METER		Units	Standard Value	Meter Value	*Acceptance Criteria (PM)
METER TYPE	HACH				
MODEL NO.	2100Q				
UNIT ID NO.	M024-34				
	10 Standard	NTU	10	<u>9.87</u>	+/- 5% of standard
	20 Standard	NTU	20	<u>20.2</u>	+/- 5% of standard
	100 Standard	NTU	100	<u>101</u>	+/- 5% of standard
	800 Standard	NTU	800	<u>795</u>	+/- 5% of standard

Standard Value	Meter Value	*Acceptance Criteria (PM)
10	<u>10.1</u>	+/- 5% of standard
20	<u>20.1</u>	+/- 5% of standard
100	<u>101</u>	+/- 5% of standard
800	<u>800</u>	+/- 5% of standard

PHOTOIONIZATION DETECTOR		Units	Standard Value	Meter Value	*Acceptance Criteria (PM)
METER TYPE	Background	ppmv	<0.1	<u>—</u>	within 5 ppmv of BG
MODEL NO.	<u>—</u>				
UNIT ID NO.	Span Gas	ppmv	100	<u>—</u>	+/- 10% of standard

O ₂ -LEL 4 GAS METER		Units	Standard Value	Meter Value	*Acceptance Criteria (PM)
METER TYPE	Methane	%	50	<u>—</u>	+/- 10% of standard
MODEL NO.	O ₂	%	20.9	<u>—</u>	+/- 10% of standard
UNIT ID NO.	H ₂ S	ppmv	25	<u>—</u>	+/- 10% of standard
	CO	ppmv	50	<u>—</u>	+/- 10% of standard

OTHER METER		Units	Standard Value	Meter Value	*Acceptance Criteria (PM)
METER TYPE	<u>—</u>				
MODEL NO.	<u>—</u>				
UNIT ID NO.	<u>—</u>				

See Notes Below for Additional Information

- Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above.
 Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source: Portland FOS
 Lot#/Date Produced: —
 Trip Blank Source: Lab
 Sample Preservatives Source: Lab
 Disposable Filter Type: 0.45µm cellulose
 Calibration Fluids / Standard Source:
 - DO Calibration Fluid (<0.1 mg/L) Portland FOS
 - Other —
 - Other —
 - Other —

	Cal. Standard Lot Number	Exp. Date
pH (4)	<u>7GT006</u>	<u>9/19</u>
pH (7)	<u>7GH1000</u>	<u>8/19</u>
pH (10)	<u>—</u>	<u>—</u>
ORP	<u>1600</u>	<u>5/22</u>
Conductivity	<u>7GH1079</u>	<u>8/18</u>
10 Turb. Stan.	<u>A 7215</u>	<u>11/18</u>
20 Turb. Stan.	<u>A 7227</u>	<u>—</u>
100 Turb. Stan.	<u>A 7228</u>	<u>—</u>
800 Turb. Stan.	<u>A 7223B</u>	<u>—</u>
PID Span Gas	<u>—</u>	<u>—</u>
O ₂ -LEL Span Gas	<u>—</u>	<u>—</u>
Other	<u>—</u>	<u>—</u>

NOTES:

* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.
 ** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.
 † = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.



FIELD INSTRUMENTATION CALIBRATION RECORD

PROJECT NAME: Erdle Perforating Company
 PROJECT NUMBER: 3617137306
 PROJECT LOCATION: Gates, NY
 WEATHER CONDITIONS (AM): Sunny, 55°F, light breeze
 WEATHER CONDITIONS (PM): Mostly cloudy, 70°F, light breeze

TASK NO: 01.**** DATE: 5/24/15
 MACTEC CREW: LPGW
 SAMPLER NAME: Jerry Lawcliff
 SAMPLER SIGNATURE: [Signature]
 CHECKED BY: CRJ DATE: 5/27/15

MULTI-PARAMETER WATER QUALITY METER

METER TYPE	AM CALIBRATION		
YSI	Start Time	/End Time	
MODEL NO. <u>556 MPS</u>	<u>0720</u>	<u>0755</u>	
UNIT ID NO. <u>M015-05</u>			
Units	Standard Value	Meter Value	*Acceptance Criteria (AM)
pH (4) SU	4.0	<u>4.02</u>	+/- 0.1 pH Units
pH (7) SU	7.0	<u>7.02</u>	+/- 0.1 pH Units
pH (10) SU	10.0	<u>—</u>	+/- 0.1 pH Units
Redox +/- mV	240	<u>242.3</u>	+/- 10 mV
Conductivity mS/cm	1.413	<u>1.413</u>	+/- 0.5 % of standard
DO (saturated) %	100	<u>100.4</u>	+/- 2% of standard
DO (saturated) mg/L ¹ (see Chart 1)	<u>9.9</u>	<u>9.93</u>	+/- 0.2 mg/L
DO (<0.1) mg/L	<0.1	<u>—</u>	<0.5 mg/L
Temperature °C		<u>15.92</u>	
Baro. Press. mmHg		<u>753.1</u>	

POST CALIBRATION CHECK

Standard Value	Meter Value	*Acceptance Criteria (PM)
7.0	<u>7.01</u>	+/- 0.3 pH Units
240	<u>234.0</u>	+/- 10 mV
1.413	<u>1.407</u>	+/- 5% of standard
	<u>100</u>	
<u>28.4</u>	<u>8.45</u>	+/- 0.5 mg/L of standard
	<u>23.82</u>	
	<u>753.4</u>	

TURBIDITY METER

METER TYPE	Units	Standard Value	Meter Value
HACH			
MODEL NO. <u>2100Q</u>			
UNIT ID NO. <u>M024-34</u>			
10 Standard	NTU	10	<u>9.91</u>
20 Standard	NTU	20	<u>20.1</u>
100 Standard	NTU	100	<u>101</u>
800 Standard	NTU	800	<u>798</u>

Standard Value	Meter Value	*Acceptance Criteria (PM)
10	<u>9.86</u>	+/- 5% of standard
20	<u>20.0</u>	+/- 5% of standard
100	<u>100</u>	+/- 5% of standard
800	<u>787</u>	+/- 5% of standard

PHOTOIONIZATION DETECTOR

METER TYPE	Background	ppmv	<0.1
MODEL NO.			
UNIT ID NO.	Span Gas	ppmv	100

Standard Value	Meter Value	*Acceptance Criteria (PM)
<0.1		within 5 ppmv of BG
100		+/- 10% of standard

O₂-LEL 4 GAS METER

METER TYPE	Methane	%	50
MODEL NO.	O ₂	%	20.9
UNIT ID NO.	H ₂ S	ppmv	25
	CO	ppmv	50

Standard Value	Meter Value	*Acceptance Criteria (PM)
50		+/- 10% of standard
20.9		+/- 10% of standard
25		+/- 10% of standard
50		+/- 10% of standard

OTHER METER

METER TYPE	Units	Standard Value	Meter Value
MODEL NO.			
UNIT ID NO.			

Standard Value	Meter Value	*Acceptance Criteria (PM)
		See Notes Below for Additional Information

- Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above.
 Equipment (not) calibrated within the Acceptance Criteria specified for each of the parameters listed above**.

MATERIALS RECORD

Deionized Water Source: Portland FOS
 Lot#/Date Produced: _____
 Trip Blank Source: Lab
 Sample Preservatives Source: Lab
 Disposable Filter Type: 0.45µm cellulose
 Calibration Fluids / Standard Source:
 - DO Calibration Fluid (<0.1 mg/L) Portland FOS
 - Other _____
 - Other _____
 - Other _____

	Cal. Standard Lot Number	Exp. Date
pH (4)	<u>76I006</u>	<u>9/19</u>
pH (7)	<u>76H1000</u>	<u>8/19</u>
pH (10)		
ORP	<u>1600</u>	<u>5/22</u>
Conductivity	<u>76H1079</u>	<u>8/18</u>
10 Turb. Stan.	<u>A 7215</u>	<u>11/16</u>
20 Turb. Stan.	<u>A 7227</u>	
100 Turb. Stan.	<u>A 7228</u>	
800 Turb. Stan.	<u>A 7223B</u>	
PID Span Gas		
O ₂ -LEL Span Gas		
Other		

NOTES:

* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purgng and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.
 ** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.
 1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.



FIELD INSTRUMENTATION CALIBRATION RECORD - PORTLAND FOS

Please Retain For Project Records

PROJECT NAME: Erdle

DATE: 5/15/18 TIME: _____

PROJECT NUMBER: 3617137306.03

CALIBRATED BY: BC

MULTI-PARAMETER WATER QUALITY METER METER TYPE YSI MODEL NO. 556 UNIT ID NO. _____

	Units	Standard Value	Meter Value	Acceptance Criteria*	Cal. Standard Lot #	Exp. Date
pH (4)	SU	4.0	_____	+/- 0.2 pH Units	_____	_____
pH (7)	SU	7.0	_____	+/- 0.2 pH Units	_____	_____
pH (10)	SU	10.0	_____	+/- 0.2 pH Units	_____	_____
Redox	+/- mV	240	_____	+/- 10 mV	_____	_____
Conductivity	mS/cm	1.413	_____	+/- 0.5% of standard	_____	_____
DO (saturated)	%	100	_____	+/- 2% of standard	DO Cal. Solution Source	Prep. Date
DO (saturated)	mg/L	_____	_____	+/- 0.2 mg/L	Portland FOS	_____
DO (<0.1)	mg/L	<0.1	_____	≤ 0.5 mg/L	_____	_____
Baro. Press.	mmHg	_____	_____	_____	NIST Serial #	Certificate #
Temperature	°C	_____	_____	+/- 0.2 °C	4F2160	2448.01

TURBIDITY METER mg/L¹ METER TYPE HACH MODEL NO. 2100Q UNIT ID NO. M024-34

	Units	Standard Value	Meter Value	Acceptance Criteria*	Cal. Standard Lot #	Exp. Date
<0.1 Standard	NTU	<0.1	<u>10.0</u>	w/in 0.3 NTU	<u>A7215</u>	<u>11/18</u>
20 Standard	NTU	20	<u>19.8</u>	+/- 5% of standard	<u>A7227</u>	<u>11/18</u>
100 Standard	NTU	100	<u>99.2</u>	+/- 5% of standard	<u>A7228</u>	<u>11/18</u>
800 Standard	NTU	800	<u>793</u>	+/- 5% of standard	<u>A7223B</u>	<u>11/18</u>

PHOTOIONIZATION DETECTOR METER TYPE _____ MODEL NO. _____ UNIT ID NO. _____

	Units	Standard Value	Meter Value	Acceptance Criteria*	Cal. Standard Lot #	Exp. Date
Background (BG)	ppmv	<0.1	_____	within 5 ppmv of BG	_____	_____
Span Gas	ppmv	100	_____	+/- 10% of standard	_____	_____

O₂-LEL 4 GAS METER METER TYPE _____ MODEL NO. _____ UNIT ID NO. _____

	Units	Standard Value	Meter Value	Acceptance Criteria*	Cal. Standard Lot #	Exp. Date
Methane	%	50	_____	+/- 10% of standard	_____	_____
O ₂	%	20.9	_____	+/- 10% of standard	_____	_____
H ₂ S	ppmv	25	_____	+/- 10% of standard	_____	_____
CO	ppmv	50	_____	+/- 10% of standard	_____	_____

- Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above.
- Equipment (not) calibrated within the Acceptance Criteria** specified for each of the parameters listed above.

NOTES:



* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

1 = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

FIELD INSTRUMENTATION CALIBRATION RECORD - PORTLAND FOS

Please Retain For Project Records

PROJECT NAME: Erdle
 PROJECT NUMBER: 3617137304.03

DATE: 5/16/18 TIME: _____
 CALIBRATED BY: BC

MULTI-PARAMETER WATER QUALITY METER METER TYPE YSI MODEL NO. 556 UNIT ID NO. MO15-05

	Units	Standard Value	Meter Value	Acceptance Criteria*	Cal. Standard Lot #	Exp. Date
pH (4)	SU	4.0	<u>4.00</u>	+/- 0.2 pH Units	<u>7GI006</u>	<u>9/19</u>
pH (7)	SU	7.0	<u>7.00</u>	+/- 0.2 pH Units	<u>7GH1000</u>	<u>8/19</u>
pH (10)	SU	10.0		+/- 0.2 pH Units		
Redox	+/- mV	240	<u>240</u>	+/- 10 mV	<u>1600</u>	<u>05/22</u>
Conductivity	mS/cm	1.413	<u>1.413</u>	+/- 0.5% of standard	<u>7GH1079</u>	<u>8/18</u>
DO (saturated)	%	100	<u>101.2</u>	+/- 2% of standard	DO Cal. Solution Source	Prep. Date
DO (saturated)	mg/L ¹			+/- 0.2 mg/L	Portland FOS	
DO (<0.1)	mg/L	<0.1		≤ 0.5 mg/L		
Baro. Press.	mmHg				NIST Serial #	Certificate #
Temperature	°C	<u>19.5</u>	<u>19.8</u>	+/- 0.2 °C	4F2160	2448.01

TURBIDITY METER mg/L¹ METER TYPE HACH MODEL NO. 2100P UNIT ID NO. _____

	Units	Standard Value	Acceptance Criteria*	Cal. Standard Lot #	Exp. Date
<0.1 Standard	NTU	<0.1	w/in 0.3 NTU		
20 Standard	NTU	20	+/- 5% of standard		
100 Standard	NTU	100	+/- 5% of standard		
800 Standard	NTU	800	+/- 5% of standard		

PHOTOIONIZATION DETECTOR METER TYPE _____ MODEL NO. _____ UNIT ID NO. _____

Background (BG)	ppmv	<0.1	within 5 ppmv of BG	Cal. Standard Lot #	Exp. Date
Span Gas	ppmv	100	+/- 10% of standard		

O₂-LEL 4 GAS METER METER TYPE _____ MODEL NO. _____ UNIT ID NO. _____

Methane	%	50	+/- 10% of standard		
O ₂	%	20.9	+/- 10% of standard	Cal. Standard Lot #	Exp. Date
H ₂ S	ppmv	25	+/- 10% of standard		
CO	ppmv	50	+/- 10% of standard		

- Equipment calibrated within the Acceptance Criteria specified for each of the parameters listed above.
 Equipment (not) calibrated within the Acceptance Criteria** specified for each of the parameters listed above.

NOTES:



* = Unless otherwise noted, calibration procedures and acceptance criteria are in general accordance with USEPA Region 1 SOPs for Field Instrument Calibration (EQASOP-FieldCalibrat) and Low Stress Purging and Sampling (EQASOP-GW001), each dated 1/19/2010. Additional acceptance criteria obtained from instrument specific manufacturer recommendations.

** = If meter reading is not within acceptance criteria, clean/replace probe and re-calibrate, or use calibrated back-up meter if available. If project requirements necessitate use of the instrument, clearly document any deviations from acceptance criteria on all data sheets and log book entries.

¹ = DO Saturated standard value is calculated based on Oxygen Solubility at Indicated Pressure Chart from the USEPA Region 1 SOP for Field Instrument Calibration (EQASOP-FieldCalibrat), dated 1/19/2010.

ATTACHMENT 2

DATA USABILILTY SUMMARY REPORT

**DATA USABILITY SUMMARY REPORT
MAY 2018 GROUNDWATER SAMPLING EVENT
ERDLE PERFORATING COMPANY SITE
GATES, NEW YORK**

1.0 INTRODUCTION

Groundwater samples were collected at the Erdle Perforating Company Site (Site) in Gates, New York, in May 2018 and submitted for off-site laboratory analysis. Samples were analyzed by TestAmerica, Inc., located in Buffalo, New York and Sacramento, California. Samples were analyzed by the following United States Environmental Protection Agency (USEPA) methods:

- Volatile organic compounds (VOCs) by USEPA Method 8260C
- 1,4-dioxane by USEPA Method 8270D Selected Ion Monitoring (SIM)
- Per- and Polyfluorinated alkyl substances (PFAS) by USEPA Method 537 (modified)

Results were reported in the following sample delivery groups (SDGs):

- 480-136477-1
- 480-136557-1

A Data Usability Summary Report (DUSR) review was completed based on the New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation guidance (NYSDEC, 2010). Sample event information included in this DUSR is presented in the following tables:

- Table 1 – Summary of Samples and Analytical Methods
- Table 2 – Summary of Analytical Results
- Table 3 – Summary of Qualification Actions

Laboratory deliverables included:

- Category B deliverable as defined in the NYSDEC Analytical Services Protocols (NYSDEC, 2005).

The DUSR review included the following evaluations. A table of project control limits is presented in Attachment A. DUSR review checklists and applicable laboratory QC summary forms are included in Attachment B to document DUSR checks and QC outliers associated with qualification actions.

- Lab Report Narrative Review
- Data Package Completeness and COC records (Table 1 verification)
- Sample Preservation and Holding Times
- Instrument Calibration (report narrative/lab-qualifier evaluation)
- QC Blanks
- Laboratory Control Samples (LCS)

- Surrogate Spikes (if applicable)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD) (if applicable)
- Field Duplicates
- Target Analyte Identification and Quantitation
- Raw Data (chromatograms), Calculation Checks and Transcription Verifications
- Reporting Limits
- Electronic Data Qualification and Verification

Data qualification actions are applied when necessary based on general procedures in USEPA validation guidelines (USEPA, 2008; USEPA, 2014) and the judgment of the project chemist. The following laboratory or data review qualifiers are used in the final data presentation:

J = concentration is estimated

U = target analyte is not detected above the reported detection limit

Results are interpreted to be usable as reported by the laboratory or as qualified in the following sections.

2.0 POTENTIAL DATA LIMITATIONS

Based on the DUSR review the data meet the data quality objectives; however, the following potential limitations were identified:

- Positive detections of acetone in samples 828072-MW005006, 828072-MW03A008, 828072-MW01A008, 828072-MW03D014 and 828072-GPZ5S018 were qualified estimated (J) based on a high LCS recovery. The qualified results are included on Table 3 with reason code LCS-H.
- Reporting limits for dichlorodifluoromethane in samples 828072-GPZ5D025, 828072-GPZ5S018, 828072-GPZ6D028, 828072-MW021012, 828072-MW21D020 and 828072-MW21D020 DUP were qualified estimated (UJ) based on low LCS recovery. Qualified results are included on Table 3 with reason code LCS-L.
- Low level detections of perfluorohexane sulfonic acid in samples 828072-MW05D010, 828072-MW005006, 828072-MW008023 and 828072-MW08D033 were qualified non-detect (U) at the reporting limit based on a detection in the associated method blank. Qualified results are included on Table 3 with reason code BL1.
- The detection of perfluorobutanesulfonic acid in sample 828072-MW005006 was qualified estimated (J) based on a potential high bias resulting from chromatographic interference. The qualified result is included on Table 3 with reason code CI.
- Reporting limits for a subset of samples are elevated (2X – 200X) based on dilutions required for high concentrations of target compounds.

3.0 ADDITIONAL QC EXCEEDANCES AND OBSERVATIONS

There were no additional observations or quality control exceedances not specifically addressed above (Section 2.0), and sample results are interpreted to be usable as reported by the laboratory.

Reference:

NYSDEC, 2005. "Analytical Services Protocols"; July 2005.

NYSDEC, 2010. "Technical Guidance for Site Investigation and Remediation-Appendix 2B"; DER-10; Division of Environmental Remediation; May 2010.

USEPA, 2014. "Validating Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846 Methods 8260B and 8260C"; USEPA Region II; HW-24; Revision 4; September 2014.

USEPA, 2008. "Validating Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846 Method 8270D"; USEPA Region II; HW-22; Revision 4; October 2008.

Data Validator: Julie Pallozzi

June 26, 2018



Reviewed by: Julie Ricardi

July 2, 2018

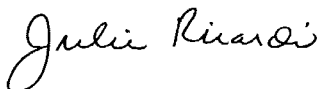


TABLE 1 - SUMMARY OF SAMPLES AND ANALYTICAL METHODS
 DATA USABILITY SUMMARY REPORT
 MAY 2018 GROUNDWATER SAMPLING
 ERDL PERFORATING COMPANY
 GATES, NEW YORK

SDG	Location	Sample ID	Sample Date	Media	Lab ID Method Class Analysis Method Fraction Qc Code	TA-WSC	TALBFLO	TALBFLO
						PFAS 537 (modified) N	VOCs SW8260C N	SVOCs SW8270D-SIM N
480-136477-1	MW-1	828072-MW01A008	5/22/2018	GW	FS		48	
480-136477-1	MW-2	828072-MW02A008	5/22/2018	GW	FS		48	
480-136477-1	MW-2D	828072-MW02D020	5/22/2018	GW	FS		48	
480-136477-1	MW-3	828072-MW03A008	5/22/2018	GW	FS		48	
480-136477-1	MW-3D	828072-MW03D014	5/23/2018	GW	FS		48	
480-136477-1	MW-5	828072-MW005006	5/22/2018	GW	FS	21	48	1
480-136477-1	MW-5D	828072-MW05D010	5/21/2018	GW	FS	21	48	1
480-136477-1	MW-8	828072-MW008023	5/23/2018	GW	FS	21	48	1
480-136477-1	MW-8D	828072-MW08D033	5/23/2018	GW	FS	21	48	1
480-136477-1	MW-9	828072-MW009025	5/23/2018	GW	FS		48	
480-136477-1	MW-9D	828072-MW09D035	5/23/2018	GW	FS		48	
480-136477-1	QC	828072-TRIP BLANK 01	5/23/2018	BW	TB		48	
480-136557-1	GPZ-5D	828072-GPZ5D025	5/24/2018	GW	FS		48	
480-136557-1	GPZ-5S	828072-GPZ5S018	5/24/2018	GW	FS		48	
480-136557-1	GPZ-6D	828072-GPZ6D028	5/24/2018	GW	FS		48	
480-136557-1	MW-21	828072-MW021012	5/24/2018	GW	FS		48	
480-136557-1	MW-21D	828072-MW21D020	5/24/2018	GW	FS		48	
480-136557-1	MW-21D	828072-MW21D020 DUP	5/24/2018	GW	FD		48	
480-136557-1	MW-6D	828072-MW06D015	5/24/2018	GW	FS		48	
480-136557-1	QC	828072-Trip Blank 02	5/24/2018	BW	TB		48	

N = normal
 FS = field sample
 FD = field duplicate
 TB = trip blank
 GW = groundwater
 BW = blank water

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS
 DATA USABILITY SUMMARY REPORT
 MAY 2018 GROUNDWATER SAMPLING
 ERDL PERFORATING COMPANY
 GATES, NEW YORK

				Location		MW-1		MW-2		MW-2D		MW-3	
				Lab SDG		480-136477-1		480-136477-1		480-136477-1		480-136477-1	
				Sample Date		5/22/2018		5/22/2018		5/22/2018		5/22/2018	
				Field Sample ID		828072-MW01A008		828072-MW02A008		828072-MW02D020		828072-MW03A008	
				Qc Code		FS		FS		FS		FS	
Method	Fraction	Parameter	Units	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
SW8260C	N	1,1,1-Trichloroethane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	1,1,2-Trichloroethane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	1,1-Dichloroethane	ug/l	10	U	200	U	0.8	J	20	U		
SW8260C	N	1,1-Dichloroethene	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	1,2-Dibromoethane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	1,2-Dichlorobenzene	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	1,2-Dichloroethane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	1,2-Dichloropropane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	1,3-Dichlorobenzene	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	1,4-Dichlorobenzene	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	2-Butanone	ug/l	120		2000	U	10	U	250			
SW8260C	N	2-Hexanone	ug/l	50	U	1000	U	5	U	100	U		
SW8260C	N	4-Methyl-2-pentanone	ug/l	50	U	1000	U	5	U	100	U		
SW8260C	N	Acetic acid, methyl ester	ug/l	25	U	500	U	2.5	U	50	U		
SW8260C	N	Acetone	ug/l	460	J	2000	U	10	U	950	J		
SW8260C	N	Benzene	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Bromodichloromethane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Bromoform	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Bromomethane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Carbon disulfide	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Carbon tetrachloride	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Chlorobenzene	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Chloroethane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Chloroform	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Chloromethane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Cis-1,2-Dichloroethene	ug/l	41		6000		12		750			
SW8260C	N	Cis-1,3-Dichloropropene	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Cyclohexane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Dibromochloromethane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Dichlorodifluoromethane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Ethylbenzene	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Isopropylbenzene	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Methyl cyclohexane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Methyl Tertbutyl Ether	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Methylene chloride	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Styrene	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Tetrachloroethene	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Toluene	ug/l	11		200	U	1	U	20	U		
SW8260C	N	trans-1,2-Dichloroethene	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	trans-1,3-Dichloropropene	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Trichloroethene	ug/l	10	U	660		0.6	J	20	U		
SW8260C	N	Trichlorofluoromethane	ug/l	10	U	200	U	1	U	20	U		
SW8260C	N	Vinyl chloride	ug/l	110		970		1.4		2000			
SW8260C	N	Xylenes, Total	ug/l	20	U	400	U	2	U	40	U		

ug/l = microgram per liter
 U = not detected
 J = estimated value

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS
DATA USABILITY SUMMARY REPORT
MAY 2018 GROUNDWATER SAMPLING
ERDLE PERFORATING COMPANY
GATES, NEW YORK

Method	Fraction	Parameter	Units	MW-3D		MW-5		MW-5D		MW-8	
				Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
				480-136477-1		480-136477-1		480-136477-1		480-136477-1	
				5/23/2018		5/22/2018		5/21/2018		5/23/2018	
				828072-MW03D014		828072-MW005006		828072-MW05D010		828072-MW008023	
				FS		FS		FS		FS	
SW8260C	N	1,1,1-Trichloroethane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	1,1,2-Trichloroethane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	1,1-Dichloroethane	ug/l	20	U	2	U	0.42	J	10	U
SW8260C	N	1,1-Dichloroethene	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	1,2-Dibromoethane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	1,2-Dichlorobenzene	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	1,2-Dichloroethane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	1,2-Dichloropropane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	1,3-Dichlorobenzene	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	1,4-Dichlorobenzene	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	2-Butanone	ug/l	76	J	20	U	10	U	100	U
SW8260C	N	2-Hexanone	ug/l	100	U	10	U	5	U	50	U
SW8260C	N	4-Methyl-2-pentanone	ug/l	100	U	10	U	5	U	50	U
SW8260C	N	Acetic acid, methyl ester	ug/l	50	U	5	U	2.5	U	25	U
SW8260C	N	Acetone	ug/l	370	J	10	J	10	U	100	U
SW8260C	N	Benzene	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Bromodichloromethane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Bromoform	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Bromomethane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Carbon disulfide	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Carbon tetrachloride	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Chlorobenzene	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Chloroethane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Chloroform	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Chloromethane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Cis-1,2-Dichloroethene	ug/l	1100		2	U	1	U	390	
SW8260C	N	Cis-1,3-Dichloropropene	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Cyclohexane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Dibromochloromethane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Dichlorodifluoromethane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Ethylbenzene	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Isopropylbenzene	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Methyl cyclohexane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Methylene chloride	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Styrene	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Tetrachloroethene	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Toluene	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	trans-1,2-Dichloroethene	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	trans-1,3-Dichloropropene	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Trichloroethene	ug/l	20	U	2	U	1	U	6.2	J
SW8260C	N	Trichlorofluoromethane	ug/l	20	U	2	U	1	U	10	U
SW8260C	N	Vinyl chloride	ug/l	410		2	U	1	U	73	
SW8260C	N	Xylenes, Total	ug/l	40	U	4	U	2	U	20	U

ug/l = microgram per liter

U = not detected

J = estimated value

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS
DATA USABILITY SUMMARY REPORT
MAY 2018 GROUNDWATER SAMPLING
ERDLE PERFORATING COMPANY
GATES, NEW YORK

Method	Fraction	Parameter	Units	MW-8D		MW-9		MW-9D		QC	
				Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
				480-136477-1		480-136477-1		480-136477-1		480-136477-1	
				5/23/2018		5/23/2018		5/23/2018		5/23/2018	
				828072-MW08D033		828072-MW09025		828072-MW09D035		828072-TRIP BLANK 01	
				FS		FS		FS		TB	
SW8260C	N	1,1,1-Trichloroethane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	1,1,2-Trichloroethane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	1,1-Dichloroethane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	1,1-Dichloroethene	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	1,2-Dibromoethane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	1,2-Dichlorobenzene	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	1,2-Dichloroethane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	1,2-Dichloropropane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	1,3-Dichlorobenzene	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	1,4-Dichlorobenzene	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	2-Butanone	ug/l	100	U	100	U	10	U	10	U
SW8260C	N	2-Hexanone	ug/l	50	U	50	U	5	U	5	U
SW8260C	N	4-Methyl-2-pentanone	ug/l	50	U	50	U	5	U	5	U
SW8260C	N	Acetic acid, methyl ester	ug/l	25	U	25	U	2.5	U	2.5	U
SW8260C	N	Acetone	ug/l	100	U	100	U	10	U	10	U
SW8260C	N	Benzene	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Bromodichloromethane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Bromoform	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Bromomethane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Carbon disulfide	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Carbon tetrachloride	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Chlorobenzene	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Chloroethane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Chloroform	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Chloromethane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Cis-1,2-Dichloroethene	ug/l	280		280		46		1	U
SW8260C	N	Cis-1,3-Dichloropropene	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Cyclohexane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Dibromochloromethane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Dichlorodifluoromethane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Ethylbenzene	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Isopropylbenzene	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Methyl cyclohexane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Methylene chloride	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Styrene	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Tetrachloroethene	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Toluene	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	trans-1,2-Dichloroethene	ug/l	10	U	10	U	4.3		1	U
SW8260C	N	trans-1,3-Dichloropropene	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Trichloroethene	ug/l	82		30		4.3		1	U
SW8260C	N	Trichlorofluoromethane	ug/l	10	U	10	U	1	U	1	U
SW8260C	N	Vinyl chloride	ug/l	10	U	34		1.7		1	U
SW8260C	N	Xylenes, Total	ug/l	20	U	20	U	2	U	2	U

ug/l = microgram per liter
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J = estimated value

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS
DATA USABILITY SUMMARY REPORT
MAY 2018 GROUNDWATER SAMPLING
ERDL PERFORATING COMPANY
GATES, NEW YORK

Method	Fraction	Parameter	Units	GPZ-5D		GPZ-5S		GPZ-6D		MW-21	
				480-136557-1		480-136557-1		480-136557-1		480-136557-1	
				5/24/2018		5/24/2018		5/24/2018		5/24/2018	
Field Sample ID	Qc Code	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier		
SW8260C	N	1,1,1-Trichloroethane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	1,1,2-Trichloroethane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	1,1-Dichloroethane	ug/l	1		0.66	J	4.7		0.78	J
SW8260C	N	1,1-Dichloroethene	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	1,2-Dibromoethane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	1,2-Dichlorobenzene	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	1,2-Dichloroethane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	1,2-Dichloropropane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	1,3-Dichlorobenzene	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	1,4-Dichlorobenzene	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	2-Butanone	ug/l	10	U	10	U	20	U	10	U
SW8260C	N	2-Hexanone	ug/l	5	U	5	U	10	U	5	U
SW8260C	N	4-Methyl-2-pentanone	ug/l	5	U	5	U	10	U	5	U
SW8260C	N	Acetic acid, methyl ester	ug/l	2.5	U	2.5	U	5	U	2.5	U
SW8260C	N	Acetone	ug/l	10	U	3.4	J	20	U	10	U
SW8260C	N	Benzene	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Bromodichloromethane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Bromoform	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Bromomethane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Carbon disulfide	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Carbon tetrachloride	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Chlorobenzene	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Chloroethane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Chloroform	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Chloromethane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Cis-1,2-Dichloroethene	ug/l	50		32		82		33	
SW8260C	N	Cis-1,3-Dichloropropene	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Cyclohexane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Dibromochloromethane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Dichlorodifluoromethane	ug/l	1	UJ	1	UJ	2	UJ	1	UJ
SW8260C	N	Ethylbenzene	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Isopropylbenzene	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Methyl cyclohexane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Methylene chloride	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Styrene	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Tetrachloroethene	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Toluene	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	trans-1,2-Dichloroethene	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	trans-1,3-Dichloropropene	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Trichloroethene	ug/l	20		3.2		1.2	J	6.2	
SW8260C	N	Trichlorofluoromethane	ug/l	1	U	1	U	2	U	1	U
SW8260C	N	Vinyl chloride	ug/l	7.5		1.6		17		12	
SW8260C	N	Xylenes, Total	ug/l	2	U	2	U	4	U	2	U

ug/l = microgram per liter
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J = estimated value

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS
DATA USABILITY SUMMARY REPORT
MAY 2018 GROUNDWATER SAMPLING
ERDL PERFORATING COMPANY
GATES, NEW YORK

Method	Fraction	Parameter	Units	MW-21D 480-136557-1 5/24/2018 828072-MW21D020		MW-21D 480-136557-1 5/24/2018 828072-MW21D020 DUP		MW-6D 480-136557-1 5/24/2018 828072-MW06D015		QC 480-136557-1 5/24/2018 828072-Trip Blank 02	
				FS	Qualifier	FD	Qualifier	FS	Qualifier	TB	Qualifier
SW8260C	N	1,1,1-Trichloroethane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	1,1,2,2-Tetrachloroethane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	1,1,2-Trichloroethane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	1,1-Dichloroethane	ug/l	0.79	J	0.72	J	4	U	1	U
SW8260C	N	1,1-Dichloroethene	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	1,2,4-Trichlorobenzene	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	1,2-Dibromo-3-chloropropane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	1,2-Dibromoethane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	1,2-Dichlorobenzene	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	1,2-Dichloroethane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	1,2-Dichloropropane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	1,3-Dichlorobenzene	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	1,4-Dichlorobenzene	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	2-Butanone	ug/l	10	U	10	U	40	U	10	U
SW8260C	N	2-Hexanone	ug/l	5	U	5	U	20	U	5	U
SW8260C	N	4-Methyl-2-pentanone	ug/l	5	U	5	U	20	U	5	U
SW8260C	N	Acetic acid, methyl ester	ug/l	2.5	U	2.5	U	10	U	2.5	U
SW8260C	N	Acetone	ug/l	10	U	10	U	40	U	10	U
SW8260C	N	Benzene	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Bromodichloromethane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Bromoform	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Bromomethane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Carbon disulfide	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Carbon tetrachloride	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Chlorobenzene	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Chloroethane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Chloroform	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Chloromethane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Cis-1,2-Dichloroethene	ug/l	48		46		190		1	U
SW8260C	N	Cis-1,3-Dichloropropene	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Cyclohexane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Dibromochloromethane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Dichlorodifluoromethane	ug/l	1	UJ	1	UJ	4	U	1	U
SW8260C	N	Ethylbenzene	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Isopropylbenzene	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Methyl cyclohexane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Methyl Tertbutyl Ether	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Methylene chloride	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Styrene	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Tetrachloroethene	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Toluene	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	trans-1,2-Dichloroethene	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	trans-1,3-Dichloropropene	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Trichloroethene	ug/l	3.5		3.6		25		1	U
SW8260C	N	Trichlorofluoromethane	ug/l	1	U	1	U	4	U	1	U
SW8260C	N	Vinyl chloride	ug/l	2.1		2.1		9.8		1	U
SW8260C	N	Xylenes, Total	ug/l	2	U	2	U	8	U	2	U

ug/l = microgram per liter
U = not detected
J = estimated value

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS
 DATA USABILITY SUMMARY REPORT
 MAY 2018 GROUNDWATER SAMPLING
 ERDLE PERFORATING COMPANY
 GATES, NEW YORK

			Location	MW-5	MW-5D
			Lab SDG	480-136477-1	480-136477-1
			Sample Date	5/22/2018	5/21/2018
			Field Sample ID	828072-MW005006	828072-MW05D010
			Qc Code	FS	FS
Method	Fraction	Parameter	Units	Result	Qualifier
537 (modified)	N	6:2 fluorotelomer sulfonate	ng/l	20 U	20 U
537 (modified)	N	8:2 Fluorotelomer sulfonate	ng/l	20 U	20 U
537 (modified)	N	N-ethyl perfluorooctanesulfonamidoacetic acid	ng/l	20 U	20 U
537 (modified)	N	N-methyl perfluorooctanesulfonamidoacetic acid	ng/l	20 U	20 U
537 (modified)	N	Perfluorobutanesulfonic acid	ng/l	11 J	0.7 J
537 (modified)	N	Perfluorobutanoic acid	ng/l	29	26
537 (modified)	N	Perfluorodecanesulfonic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluorodecanoic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluorododecanoic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluoroheptanesulfonic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluoroheptanoic acid	ng/l	3.5	2.9
537 (modified)	N	Perfluorohexane sulfonic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluorohexanoic acid	ng/l	8.2	8.6
537 (modified)	N	Perfluorononanoic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluorooctane sulfonamide	ng/l	2 U	2 U
537 (modified)	N	Perfluorooctanesulfonic acid	ng/l	2.3	2 U
537 (modified)	N	Perfluorooctanoic acid	ng/l	6.1	1.7 J
537 (modified)	N	Perfluoropentanoic acid	ng/l	11	10
537 (modified)	N	Perfluorotetradecanoic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluorotridecanoic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluoroundecanoic acid	ng/l	2 U	2 U
SW8270D-SIM	N	1,4-Dioxane	ug/l	2.9	0.12 J

ug/l = microgram per liter
 ng/l = nanogram per liter
 U = not detected
 J = estimated value

TABLE 2 - SUMMARY OF ANALYTICAL RESULTS
 DATA USABILITY SUMMARY REPORT
 MAY 2018 GROUNDWATER SAMPLING
 ERDLE PERFORATING COMPANY
 GATES, NEW YORK

			Location	MW-8	MW-8D
			Lab SDG	480-136477-1	480-136477-1
			Sample Date	5/23/2018	5/23/2018
			Field Sample ID	828072-MW008023	828072-MW08D033
			Qc Code	FS	FS
Method	Fraction	Parameter	Units	Result	Qualifier
537 (modified)	N	6:2 fluorotelomer sulfonate	ng/l	20 U	20 U
537 (modified)	N	8:2 Fluorotelomer sulfonate	ng/l	20 U	20 U
537 (modified)	N	N-ethyl perfluorooctanesulfonamidoacetic acid	ng/l	20 U	20 U
537 (modified)	N	N-methyl perfluorooctanesulfonamidoacetic acid	ng/l	20 U	20 U
537 (modified)	N	Perfluorobutanesulfonic acid	ng/l	0.41 J	0.74 J
537 (modified)	N	Perfluorobutanoic acid	ng/l	44	27
537 (modified)	N	Perfluorodecanesulfonic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluorodecanoic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluorododecanoic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluoroheptanesulfonic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluoroheptanoic acid	ng/l	0.89 J	2.4
537 (modified)	N	Perfluorohexane sulfonic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluorohexanoic acid	ng/l	4.3	7.5
537 (modified)	N	Perfluorononanoic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluorooctane sulfonamide	ng/l	2 U	2 U
537 (modified)	N	Perfluorooctanesulfonic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluorooctanoic acid	ng/l	2 U	1.5 J
537 (modified)	N	Perfluoropentanoic acid	ng/l	7.3	10
537 (modified)	N	Perfluorotetradecanoic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluorotridecanoic acid	ng/l	2 U	2 U
537 (modified)	N	Perfluoroundecanoic acid	ng/l	2 U	2 U
SW8270D-SIM	N	1,4-Dioxane	ug/l	1.1	0.53

ug/l = microgram per liter
 ng/l = nanogram per liter
 U = not detected
 J = estimated value

TABLE 3 - SUMMARY OF QUALIFICATION ACTIONS
 DATA USABILITY SUMMARY REPORT
 MAY 2018 GROUNDWATER SAMPLING
 ERDLE PERFORATING COMPANY
 GATES, NEW YORK

Lab SDG	Analysis Method	Lab Sample ID	Field Sample ID	Parameter	Lab	Lab	Final	Final	Val Reason Code	Units
					Result	Qualifier	Result	Qualifier		
480-136477-1	537 (modified)	480-136477-1	828072-MW05D010	Perfluorohexane sulfonic acid	0.74	J B	2	U	BL1	ng/l
480-136477-1	537 (modified)	480-136477-2	828072-MW005006	Perfluorobutanesulfonic acid	11	CI	11	J	CI	ng/l
480-136477-1	537 (modified)	480-136477-2	828072-MW005006	Perfluorohexane sulfonic acid	1	J B	2	U	BL1	ng/l
480-136477-1	SW8260C	480-136477-2	828072-MW005006	Acetone	10	J *	10	J	LCS-H	ug/l
480-136477-1	SW8260C	480-136477-5	828072-MW03A008	Acetone	950	*	950	J	LCS-H	ug/l
480-136477-1	SW8260C	480-136477-6	828072-MW01A008	Acetone	460	*	460	J	LCS-H	ug/l
480-136477-1	SW8260C	480-136477-7	828072-MW03D014	Acetone	370	*	370	J	LCS-H	ug/l
480-136477-1	537 (modified)	480-136477-8	828072-MW008023	Perfluorohexane sulfonic acid	0.39	J B	2	U	BL1	ng/l
480-136477-1	537 (modified)	480-136477-9	828072-MW08D033	Perfluorohexane sulfonic acid	0.84	J B	2	U	BL1	ng/l
480-136557-1	SW8260C	480-136557-1	828072-GPZ5S018	Acetone	3.4	J	3.4	J	LCS-H	ug/l
480-136557-1	SW8260C	480-136557-1	828072-GPZ5S018	Dichlorodifluoromethane	1	U	1	UJ	LCS-L	ug/l
480-136557-1	SW8260C	480-136557-2	828072-GPZ5D025	Dichlorodifluoromethane	1	U	1	UJ	LCS-L	ug/l
480-136557-1	SW8260C	480-136557-3	828072-GPZ6D028	Dichlorodifluoromethane	2	U	2	UJ	LCS-L	ug/l
480-136557-1	SW8260C	480-136557-5	828072-MW21D020	Dichlorodifluoromethane	1	U	1	UJ	LCS-L	ug/l
480-136557-1	SW8260C	480-136557-6	828072-MW21D020 DUP	Dichlorodifluoromethane	1	U	1	UJ	LCS-L	ug/l
480-136557-1	SW8260C	480-136557-7	828072-MW021012	Dichlorodifluoromethane	1	U	1	UJ	LCS-L	ug/l

BL1 = method blank contamination
 CI = chromatographic interference
 LCS-H = LCS recovery high
 LCS-L = LCS recovery low

ATTACHMENT A
SUMMARY OF VALIDATION QC LIMITS FOR SURROGATES, SPIKES, AND DUPLICATES
BASED ON THE REGION 2 VALIDATION GUIDELINES

PARAMETER	QC TEST	ANALYTE	Soil	Soil
			(%R)	(RPD)
Volatiles	Surrogate	All Surrogate Compounds	70 - 130	
	LCS	All Target Compounds	70 - 130	
	MS/MSD	All Target Compounds	70 - 130	35
	Field Duplicate	All Target Compounds		100
Per- and Polyfluorinated Alkyl Substances (PFAS)	Surrogate	All Surrogate Compounds	Lab Limits	
	LCS	All Target Compounds	Lab Limits	
	MS/MSD	All Target Compounds	Lab Limits	Lab Limits
	Field Duplicate	All Target Compounds		50
Semivolatiles	Surrogate	All BN Compounds	50 - 140	
		All Acid Compounds	30 - 140	
	LCS	All BN Compounds	50 - 140	
		All Acid Compounds	30 - 140	
	MS/MSD	All BN Compounds	50 - 140	35
		All Acid Compounds	30 - 140	35
	Field Duplicate	All Target Compounds		100

Notes:

LCS - Laboratory Control Sample

MS/MSD - Matrix spike/ Matrix Spike Duplicate

RPD = Relative percent difference

%R = percent recovery

QC Limits are based on USEPA Region II Data Validation Guidelines and Project QA/QC Objectives

**DATA USABILITY SUMMARY REPORT
MAY 2018 GROUNDWATER SAMPLING EVENT
ERDLE PERFORATING COMPANY SITE
GATES, NEW YORK**

ATTACHMENT B

VOCs

NYSDEC DUSR PROJECT CHEMIST REVIEW RECORD

Project: Erdle - CO

Method: 8210C

Laboratory: TAL Buffalo

Date: 6/26/18

Reviewer: Julie Pallozzi

SDG(s): 136477

136557

Review Level NYSDEC DUSR

USEPA Region II Guideline

1. **Case Narrative Review and COC/Data Package Completeness** COMMENTS
Were problems noted? *See attached*
Are Field Sample IDs and Locations assigned correctly? YES NO (circle one)
Were all the samples on the COC analyzed for the requested analyses? YES NO (circle one)
2. **Holding time and Sample Collection**
All samples were analyzed within the 14 day holding time. YES NO (circle one) *for samples w/ pH > 2 a 7 day hold time was implemented.*
3. **QC Blanks**
Are method blanks free of contamination? YES NO (circle one)
Are Trip blanks free of contamination? YES NO (circle one)
Are Rinse blanks free of contamination? YES NO NA (circle one)
4. **Instrument Tuning - Data Package Narrative Review**
Did the laboratory narrative identify any results that were not within method criteria? YES NO (circle one)
If yes, use professional judgment to evaluate data and qualify results if needed
5. **Instrument Calibration - Data Package Narrative Review**
Did the laboratory narrative identify compounds that were not within criteria in the initial and/or continuing calibration standards? YES NO (circle one)

Initial Calibration %RSD = 20% (30% for 1,1-DCE, chloroform, 1,2-DCEP, toluene, ethylbenzene, VC)
Initial Avg RRF and Continuing RRF should be ≥ 0.05 and 0.10 for Chloromethane, 1,1-Dichloroethane, Bromoform and 0.30 for Chlorobenzene and 1,1,2,2-Tetrachloroethane

Continuing Calibration %D = 20%

Did the laboratory qualify results based on initial or continuing calibration exceedances? YES NO (circle one)
If yes to above, use professional judgment to evaluate data and qualify results if needed
6. **Internal Standards - Data Package Narrative Review**
(Area Limits = -50% to +100%, RTs within 30 seconds of daily CCAL standard (or ICAL mid-point if samples follow ICAL))
Did the laboratory narrative identify any sample internal standards that were not within criteria? YES NO (circle one)

Did the laboratory qualify results based on internal standard exceedances? YES NO (circle one)
If yes to above, use professional judgment to evaluate data and qualify results if needed
7. **Surrogate Recovery - Region II limits (water 80-120%, soil 70-130%)**
Were all results within Region II limits? YES NO (circle one)
8. **Matrix Spike - Region II limits (water and soil 70-130%, water RPD 20, soil RPD 35)**
Were MS/MSDs submitted/analyzed? YES NO *MW-2D - high bias for acetone source sample ND : no quals.*
Were all results within the Region II limits? YES NO NA (circle one)

9. **Duplicates - Region II Limits (water RPD 50, soil RPD 100)**
Were Field Duplicates submitted/analyzed? YES NO MW-21D / MW-21D DUP

Were all results within Region II limits? (soil RPD < 100, water RPD < 50) YES NO NA

10. **Laboratory Control Sample Results - Region II (Water and soil 70-130%)**

Were all results were within Region II control limits? YES NO (circle one)

See attached.
J/LCS-H detections of acetone

11. **Raw Data Review and Calculation Checks** attached.

J/LCS-H acetone detects.
UJ/LCS-L dichlorodifluoro-methane results

12. **Electronic Data Review and Edits**
Does the EDD match the Form Is? YES NO (circle one)

13. **Tables and TIC Review**
Table 1 (Samples and Analytical Methods)
Table 2 (Analytical Results)
Table 3 (Qualification Actions)

Were all tables produced and reviewed? YES NO (circle one)

Table 4 (TICs) Did lab report TICs? YES NO (circle one)

MW-3 lab reported 20x run & 40x run. retained 20x run results for all except vinyl chloride, which exceeded calibration range in 20x run. 1 set of results was refused in val files final result/qual removed.

SVOC

NYSDEC DUSR PROJECT CHEMIST REVIEW RECORD

Project: Erdle- CO

Method: 8270 D - SIM

Laboratory: TAL Buffalo

SDG(s): 136477

Date: 6/21/18

Reviewer: Julie Pallozzi

Review Level NYSDEC DUSR

USEPA Region II Guideline

1. **Case Narrative Review and Data Package Completeness** COMMENTS no qual's
- Were problems noted? no
- Were all the samples on the COC analyzed for the requested analyses? YES NO (circle one)
- Are Field Sample IDs and Locations assigned correctly? YES NO (circle one)
2. **Holding time and Sample Collection**
- Soil: 14 days from collection to extraction; 40 days from extraction to analysis
- Water: 7 days from collection to extraction; 40 days from extraction to analysis
- Hold time met for all samples? YES NO (circle one)
3. **QC Blanks**
- Are method blanks free of contamination? YES NO (circle one)
- Are Rinse blanks free of contamination? YES NO NA (circle one)
4. **Instrument Tuning - Data Package Narrative Review**
- Did the laboratory narrative identify any results that were not within method criteria? YES NO (circle one)
- If yes, use professional judgment to evaluate data and qualify results if needed
5. **Internal Standards - Data Package Narrative Review**
- (Area Limits = -50% to +100%, RTs within 30 seconds of daily CCAL standard (or ICAL mid-point if samples follow ICAL))
- Did the laboratory narrative identify any sample internal standards that were not within criteria? YES NO (circle one)
- Did the laboratory qualify results based on internal standard exceedances? YES NO (circle one)
- If yes to above, use professional judgment to evaluate data and qualify results if needed
6. **Instrument Calibration - Data Package Narrative Review**
- Did the laboratory narrative identify compounds that were not within criteria in the initial and/or continuing calibration standards? YES NO (circle one)
- Control Limits (Region II HW-22): Initial Calibration %RSD = 15%, Continuing Calibration %D = 20%
Average RRF should be ≥ 0.05 (or reject NDs, J detects or use professional judgment to J/UJ)
- Did the laboratory qualify results based on initial or continuing calibration exceedances? YES NO (circle one)
- If yes to above, use professional judgment to evaluate data and qualify results if needed
7. **Surrogate Recovery** (water and soil limits: Base/Neutral 50-140%, Acid 30-140%)
- Were all results within limits? YES NO (circle one)
- Were any recoveries < 10%? (Reject fraction compounds if recoveries are < 10%)
8. **Matrix Spike** (water & soil limits: Base/Neutral 50-140%, Acid 30-140%) (RPD soil=35, water=20)
- Were MS/MSDs submitted/analyzed? YES NO (circle one)
- Were all results within limits? YES NO NA (circle one)

9. **Duplicates** (RPD limits = water:50, soil:100)
Were Field Duplicates submitted/analyzed? YES NO
Were RPDs within criteria? YES NO (circle one)
10. **Laboratory Control Sample Results** (water&soil limits: Base/Neutral 50-140%, Acid 30-140%)
Were all results within limits? YES NO (circle one)
11. **Raw Data Review and Calculation Checks** *attached*
12. **Electronic Data Review and Edits**
Does the EDD match the Form Is? YES NO (circle one)
13. **Tables and TIC Review**
Table 1 (Samples and Analytical Methods)
Table 2 (Analytical Results)
Table 3 (Qualification Actions)
Were all tables produced and reviewed? YES NO (circle one)
Table 4 (TICs) Did lab report TICs? YES NO (circle one)

PFAS

NYSDEC DUSR PROJECT CHEMIST REVIEW RECORD

Project: Erdle-CO
Method: PFC-DV-LC-0012 / 537 (modified)
Laboratory: TAL Buffalo SDG(s): 136477
Date: 6/26/18
Reviewer: Julie Palluzzi

Review Level NYSDEC DUSR

USEPA Region II Guideline

- Case Narrative Review and Data Package Completeness** COMMENTS
Were problems noted? *See attached - JICI ① result based on chromatographic interfer.*
Were all the samples on the COC analyzed for the requested analyses? YES NO (circle one)
Are Field Sample IDs and Locations assigned correctly? YES NO (circle one)
- Holding time and Sample Collection**
Water: 14 days from collection to extraction; 28 days from extraction to analysis
Hold time met for all samples? YES NO (circle one)
- QC Blanks**
Are method blanks free of contamination? YES NO (circle one) *see attached*
Are rinse blanks free of contamination? YES NA (circle one)
Are field reagent blanks free of contamination? YES NO NA (circle one)

U/BL1 ⊕ results.
- Instrument Tuning – Data Package Narrative Review**
Did the laboratory narrative identify any results that were not within method criteria? YES NO (circle one)
If yes, use professional judgment to evaluate data and qualify results if needed
- Internal Standards – Data Package Narrative Review**
(Area Limits = -50% to +100%, RTs within 30 seconds of daily CCAL standard (or ICAL mid-point if samples follow ICAL))
Did the laboratory narrative identify any sample internal standards that were not within criteria? YES NO (circle one)

Did the laboratory qualify results based on internal standard exceedances? YES NO (circle one)
If yes to above, use professional judgment to evaluate data and qualify results if needed
- Instrument Calibration – Data Package Narrative Review**
Did the laboratory narrative identify compounds that were not within criteria in the initial and/or continuing calibration standards? YES NO (circle one)

Initial Calibration %RSD = 15%, Continuing Calibration %D = 20%

Did the laboratory qualify results based on initial or continuing calibration exceedances? YES NO (circle one)
If yes to above, use professional judgment to evaluate data and qualify results if needed
- Surrogate Recovery (lab limits)**
Were all results within limits? YES NO (circle one) *attached - no quals*
Were any recoveries < 10%? (use professional judgment)
- Matrix Spike (lab limits)**
Were MS/MSDs submitted/analyzed? YES NO (circle one)

Were all results within limits? YES NO NA (circle one)

9. **Duplicates** (RPD limits = water 50)
Were Field Duplicates submitted/analyzed? YES NO
Were RPDs within criteria? YES NO NA (circle one)
10. **Laboratory Control Sample Results** (lab limits)
Were all results within limits? YES NO (circle one)
11. **Raw Data Review and Calculation Checks** *attached*
12. **Electronic Data Review and Edits**
Does the EDD match the Form Is? YES NO (circle one)
13. **Tables**
Table 1 (Samples and Analytical Methods)
Table 2 (Analytical Results)
Table 3 (Qualification Actions)
Were all tables produced and reviewed? YES NO (circle one)

Sample Summary

Client: New York State D.E.C.
Project/Site: 100 Pixley Industrial Pkwy #828072

TestAmerica Job ID: 480-136477-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-136477-1	828072-MW05D010	Water	05/21/18 18:40	05/24/18 10:00
480-136477-2	828072-MW005006	Water	05/22/18 09:10	05/24/18 10:00
480-136477-3	828072-MW02D020	Water	05/22/18 12:30	05/24/18 10:00
480-136477-4	828072-MW02A008	Water	05/22/18 13:30	05/24/18 10:00
480-136477-5	828072-MW03A008	Water	05/22/18 16:15	05/24/18 10:00
480-136477-6	828072-MW01A008	Water	05/22/18 17:35	05/24/18 10:00
480-136477-7	828072-MW03D014	Water	05/23/18 08:30	05/24/18 10:00
480-136477-8	828072-MW008023	Water	05/23/18 12:00	05/24/18 10:00
480-136477-9	828072-MW08D033	Water	05/23/18 14:25	05/24/18 10:00
480-136477-10	828072-MW009025	Water	05/23/18 15:20	05/24/18 10:00
480-136477-11	828072-MW09D035	Water	05/23/18 16:25	05/24/18 10:00
480-136477-12	828072-TRIP BLANK 01	Water	05/23/18 00:00	05/24/18 10:00

Job Narrative
480-136477-1

Comments

No additional comments.

Receipt

The samples were received on 5/24/2018 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.8° C and 3.6° C.

GC/MS VOA

Method(s) 8260C: The continuing calibration verification (CCV) associated with batch 480-416656 recovered outside acceptance criteria, low biased, for 1,1,2-Trichloroethane, 1,1,2,2-Tetrachloroethane, 4-Methyl-2-pentanone (MIBK) and Chloromethane. A reporting limit (RL) standard was analyzed, and the target analytes were detected. Since the associated samples were non-detect for these analytes, the data have been reported. The following samples are impacted: 828072-MW05D010 (480-136477-1), 828072-MW005006 (480-136477-2), 828072-MW02D020 (480-136477-3), 828072-MW02A008 (480-136477-4), 828072-MW03A008 (480-136477-5), 828072-MW01A008 (480-136477-6), 828072-MW03D014 (480-136477-7), 828072-MW008023 (480-136477-8), 828072-MW08D033 (480-136477-9), 828072-MW009025 (480-136477-10), 828072-MW09D035 (480-136477-11) and 828072-TRIP BLANK 01 (480-136477-12).

OK
no qualifiers applied by lab.

Method(s) 8260C: The continuing calibration verification (CCV) associated with batch 480-416656 recovered outside acceptance criteria low biased, for Vinyl chloride. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported. The following samples are impacted: 828072-MW05D010 (480-136477-1), 828072-MW005006 (480-136477-2), 828072-MW08D033 (480-136477-9) and 828072-TRIP BLANK 01 (480-136477-12).

Method(s) 8260C: The continuing calibration verification (CCV) analyzed in batch 480-416656 was outside the method criteria for the following analyte: Vinyl chloride. A CCV standard at or below the reporting limit (RL) was analyzed with the affected samples and found to be acceptable. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte is considered estimated. The following samples are impacted: 828072-MW02D020 (480-136477-3), 828072-MW02A008 (480-136477-4), 828072-MW03A008 (480-136477-5), 828072-MW01A008 (480-136477-6), 828072-MW03D014 (480-136477-7), 828072-MW008023 (480-136477-8), 828072-MW009025 (480-136477-10) and 828072-MW09D035 (480-136477-11).

Method(s) 8260C: The laboratory control sample (LCS) for analytical batch 480-416656 recovered outside control limits for the following analyte: Acetone. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported. The following samples are affected: 828072-MW05D010 (480-136477-1), 828072-MW005006 (480-136477-2), 828072-MW02D020 (480-136477-3), 828072-MW02A008 (480-136477-4), 828072-MW008023 (480-136477-8), 828072-MW08D033 (480-136477-9), 828072-MW009025 (480-136477-10), 828072-MW09D035 (480-136477-11) and 828072-TRIP BLANK 01 (480-136477-12).

OK
no quals

Method(s) 8260C: The laboratory control sample (LCS) for analytical batch 480-416656 recovered outside control limits for the following analyte: Acetone. This analyte was biased high in the LCS and due to holding time limitations the associated samples were not reanalyzed; therefore, the data have been reported. The following samples are affected: 828072-MW03A008 (480-136477-5), 828072-MW01A008 (480-136477-6) and 828072-MW03D014 (480-136477-7).

see attached

Method(s) 8260C: The following samples were diluted to bring the concentration of target analytes within the calibration range: 828072-MW02A008 (480-136477-4), 828072-MW03A008 (480-136477-5), 828072-MW03D014 (480-136477-7), 828072-MW008023 (480-136477-8), 828072-MW08D033 (480-136477-9) and 828072-MW009025 (480-136477-10). Elevated reporting limits (RLs) are provided.

OK

Method(s) 8260C: The following volatiles samples were diluted due to foaming at the time of purging during the original sample analysis: 828072-MW005006 (480-136477-2) and 828072-MW01A008 (480-136477-6). Elevated reporting limits (RLs) are provided.

OK

Method(s) 8260C: The following samples was collected in properly preserved vials for analysis of volatile organic compounds (VOCs). However, the pH was outside the required criteria when verified by the laboratory, and corrective action was not possible: 828072-MW01A008 (480-136477-6). The sample was analyzed within 7 days per EPA recommendation.

OK
no quals

Method(s) 8260C: The continuing calibration verification (CCV) associated with batch 480-416689 recovered outside acceptance criteria, low biased, for Chloromethane. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported. The following sample is impacted: 828072-MW03A008 (480-136477-5).

OK
no quals

Method(s) 8260C: The laboratory control sample (LCS) for analytical batch 480-416689 recovered outside control limits for the following analytes: Acetone. These analytes were biased high in the LCS. Due to holding time limitations the samples were not reanalyzed. The following sample is impacted: 828072-MW03A008 (480-136477-5).

see attached

Method(s) 8260C: The following sample was diluted to bring the concentration of target analytes within the calibration range: 828072-MW03A008 (480-136477-5). Elevated reporting limits (RLs) are provided.

OK

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA

Method(s) 8270D SIM ID: The following sample was diluted to bring the concentration of target analytes within the calibration range: 828072-MW005006 (480-136477-2). Elevated reporting limits (RLs) are provided. OL

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

LCMS

Method(s) 537 (modified): Isotope Dilution Analyte (IDA) recovery for M2-6:2FTS is above the method recommended limit for the following sample: 828072-MW005006 (480-136477-2). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries. ✓

Method(s) 537 (modified): The peaks identified for Perfluorobutanesulfonic acid (PFBS) by the data system exhibited chromatographic interferences that could not be resolved for the following sample: 828072-MW005006 (480-136477-2). The entire area detected by the data system was used in the quantitation of this analyte, providing a conservative result. J/C1

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

Method(s) 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 480-416383. ✓

Method(s) 3510C: Elevated reporting limits are provided for the following sample due to insufficient sample provided for preparation: 828072-MW005006 (480-136477-2). ✓

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-226170. ✓

Method(s) 3535: The following samples: 828072-MW05D010 (480-136477-1), 828072-MW005006 (480-136477-2), 828072-MW008023 (480-136477-8) and 828072-MW08D033 (480-136477-9) were decanted prior to extraction, due to containing excess sediment that had the potential to clog the solid-phase column. ✓

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

OP 6/26/18

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Buffalo

Job No.: 480-136477-1

SDG No.: _____

Matrix: Water

Level: Low

Lab File ID: N9913.D

Lab ID: LCS 480-416656/5

Client ID: _____

*proj. limits.
70-130*

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
1,1,1-Trichloroethane	25.0	26.4	106	73-126	
1,1,2,2-Tetrachloroethane	25.0	21.4	86	76-120	
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	24.5	98	61-148	
1,1,2-Trichloroethane	25.0	21.9	87	76-122	
1,1-Dichloroethane	25.0	22.9	92	77-120	
1,1-Dichloroethene	25.0	22.9	91	66-127	
1,2,4-Trichlorobenzene	25.0	23.6	94	79-122	
1,2-Dibromo-3-Chloropropane	25.0	21.3	85	56-134	
1,2-Dibromoethane	25.0	23.4	93	77-120	
1,2-Dichlorobenzene	25.0	25.4	102	80-124	
1,2-Dichloroethane	25.0	24.9	100	75-120	
1,2-Dichloropropane	25.0	23.2	93	76-120	
1,3-Dichlorobenzene	25.0	25.7	103	77-120	
1,4-Dichlorobenzene	25.0	24.9	99	80-120	
2-Butanone (MEK)	125	135	108	57-140	
2-Hexanone	125	128	102	65-127	
4-Methyl-2-pentanone (MIBK)	125	110	88	71-125	
Acetone	125	197	158	56-142	*
Benzene	25.0	23.3	93	71-124	
Bromodichloromethane	25.0	23.9	95	80-122	
Bromoform	25.0	25.5	102	61-132	
Bromomethane	25.0	19.0	76	55-144	
Carbon disulfide	25.0	22.2	89	59-134	
Carbon tetrachloride	25.0	26.6	107	72-134	
Chlorobenzene	25.0	24.5	98	80-120	
Chloroethane	25.0	20.3	81	69-136	
Chloroform	25.0	22.9	92	73-127	
Chloromethane	25.0	18.8	75	68-124	
cis-1,2-Dichloroethene	25.0	22.6	91	74-124	
cis-1,3-Dichloropropene	25.0	25.2	101	74-124	
Cyclohexane	25.0	25.2	101	59-135	
Dibromochloromethane	25.0	27.6	110	75-125	
Dichlorodifluoromethane	25.0	22.4	90	59-135	
Ethylbenzene	25.0	24.2	97	77-123	
Isopropylbenzene	25.0	26.6	106	77-122	
Methyl acetate	50.0	43.1	86	74-133	
Methyl tert-butyl ether	25.0	23.1	92	77-120	
Methylcyclohexane	25.0	24.9	100	68-134	
Methylene Chloride	25.0	22.7	91	75-124	
Styrene	25.0	24.6	98	80-120	
Tetrachloroethene	25.0	25.9	104	74-122	

Column to be used to flag recovery and RPD values

FORM III 8260C

JP 6/24/18

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Buffalo

Job No.: 480-136477-1

SDG No.: _____

Matrix: Water

Level: Low

Lab File ID: N9940.D

Lab ID: LCS 480-416689/5

Client ID: _____

*proj. limits.
70-130*

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
1,1,1-Trichloroethane	25.0	25.6	102	73-126	
1,1,2,2-Tetrachloroethane	25.0	22.2	89	76-120	
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	24.3	97	61-148	
1,1,2-Trichloroethane	25.0	22.6	90	76-122	
1,1-Dichloroethane	25.0	24.0	96	77-120	
1,1-Dichloroethene	25.0	22.8	91	66-127	
1,2,4-Trichlorobenzene	25.0	23.1	92	79-122	
1,2-Dibromo-3-Chloropropane	25.0	23.7	95	56-134	
1,2-Dibromoethane	25.0	24.6	98	77-120	
1,2-Dichlorobenzene	25.0	24.6	98	80-124	
1,2-Dichloroethane	25.0	25.6	102	75-120	
1,2-Dichloropropane	25.0	24.1	96	76-120	
1,3-Dichlorobenzene	25.0	25.4	101	77-120	
1,4-Dichlorobenzene	25.0	24.9	100	80-120	
2-Butanone (MEK)	125	152	121	57-140	
2-Hexanone	125	148	119	65-127	
4-Methyl-2-pentanone (MIBK)	125	126	101	71-125	
<u>Acetone</u> <i>J LCS-H detections</i>	125	194	155	56-142	*
Benzene	25.0	23.9	96	71-124	
Bromodichloromethane	25.0	25.3	101	80-122	
Bromoform	25.0	28.1	112	61-132	
Bromomethane	25.0	21.0	84	55-144	
Carbon disulfide	25.0	22.6	90	59-134	
Carbon tetrachloride	25.0	27.1	108	72-134	
Chlorobenzene	25.0	25.1	100	80-120	
Chloroethane	25.0	21.9	88	69-136	
Chloroform	25.0	23.5	94	73-127	
Chloromethane	25.0	19.4	77	68-124	
cis-1,2-Dichloroethene	25.0	23.4	94	74-124	
cis-1,3-Dichloropropene	25.0	26.7	107	74-124	
Cyclohexane	25.0	24.4	98	59-135	
Dibromochloromethane	25.0	28.5	114	75-125	
Dichlorodifluoromethane	25.0	23.8	95	59-135	
Ethylbenzene	25.0	24.9	99	77-123	
Isopropylbenzene	25.0	25.4	102	77-122	
Methyl acetate	50.0	50.5	101	74-133	
Methyl tert-butyl ether	25.0	24.5	98	77-120	
Methylcyclohexane	25.0	25.6	103	68-134	
Methylene Chloride	25.0	22.7	91	75-124	
Styrene	25.0	25.0	100	80-120	
Tetrachloroethene	25.0	26.9	108	74-122	

Column to be used to flag recovery and RPD values

FORM III 8260C

DP 6/26/18

FORM III
GC/MS VOA MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Buffalo

Job No.: 480-136477-1

SDG No.:

Matrix: Water

Level: Low

Lab File ID: N9934.D

Lab ID: 480-136477-3 MS

Client ID: 828072-MW02D020 MS

proj limits: 70-130

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
1,1,1-Trichloroethane	25.0	ND	27.0	108	73-126	
1,1,2,2-Tetrachloroethane	25.0	ND	22.0	88	76-120	
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	ND	23.5	94	61-148	
1,1,2-Trichloroethane	25.0	ND	22.2	89	76-122	
1,1-Dichloroethane	25.0	0.80 J	25.6	99	77-120	
1,1-Dichloroethene	25.0	ND	24.3	97	66-127	
1,2,4-Trichlorobenzene	25.0	ND	21.9	88	79-122	
1,2-Dibromo-3-Chloropropane	25.0	ND	21.7	87	56-134	
1,2-Dibromoethane	25.0	ND	25.5	102	77-120	
1,2-Dichlorobenzene	25.0	ND	24.2	97	80-124	
1,2-Dichloroethane	25.0	ND	25.8	103	75-120	
1,2-Dichloropropane	25.0	ND	23.9	96	76-120	
1,3-Dichlorobenzene	25.0	ND	23.9	95	77-120	
1,4-Dichlorobenzene	25.0	ND	23.2	93	78-124	
2-Butanone (MEK)	125	ND	150	120	57-140	
2-Hexanone	125	ND	147	117	65-127	
4-Methyl-2-pentanone (MIBK)	125	ND	125	100	71-125	
Acetone	125	ND	175	140	56-142	<i>high bias.</i>
Benzene	25.0	ND	24.4	98	71-124	<i>result is ND... no quals</i>
Bromodichloromethane	25.0	ND	24.9	100	80-122	
Bromoform	25.0	ND	24.2	97	61-132	
Bromomethane	25.0	ND	21.1	84	55-144	
Carbon disulfide	25.0	ND	22.2	89	59-134	
Carbon tetrachloride	25.0	ND	27.6	110	72-134	
Chlorobenzene	25.0	ND	24.9	99	80-120	
Chloroethane	25.0	ND	22.5	90	69-136	
Chloroform	25.0	ND	24.1	96	73-127	
Chloromethane	25.0	ND	19.9	79	68-124	
cis-1,2-Dichloroethene	25.0	12	33.9	89	74-124	
cis-1,3-Dichloropropene	25.0	ND	23.6	94	74-124	
Cyclohexane	25.0	ND	23.0	92	59-135	
Dibromochloromethane	25.0	ND	27.1	108	75-125	
Dichlorodifluoromethane	25.0	ND	21.3	85	59-135	
Ethylbenzene	25.0	ND	23.3	93	77-123	
Isopropylbenzene	25.0	ND	23.7	95	77-122	
Methyl acetate	50.0	ND	46.4	93	74-133	
Methyl tert-butyl ether	25.0	ND	24.2	97	77-120	
Methylcyclohexane	25.0	ND	22.6	90	68-134	
Methylene Chloride	25.0	ND	25.0	100	75-124	
Styrene	25.0	ND	22.3	89	80-120	
Tetrachloroethene	25.0	ND	25.9	103	74-122	

Column to be used to flag recovery and RPD values

FORM III 8260C

OP 6/26/18

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 480-136477-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-226170/1-A
 Matrix: Water Lab File ID: 2018.06.03LLB_044.d
 Analysis Method: 537 (modified) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 05/30/2018 10:46
 Sample wt/vol: 250.0(mL) Date Analyzed: 06/04/2018 03:46
 Con. Extract Vol.: 10.0(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 226975 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	0.538	J	sample results 2.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	ND		>5x action level 2.0	0.49
307-24-4	Perfluoroheptanoic acid (PFHxA)	ND		no quals. 2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	ND		2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	ND		2.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	ND		2.0	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	ND		2.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.271	J		0.17
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		5xAL=1.355 2.0	0.19
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.54
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		2.0	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	ND		2.0	0.35
2355-31-9	N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ND		20	3.1
2991-50-6	N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	ND		20	1.9
27619-97-2	6:2FTS	ND		20	2.0
39108-34-4	8:2FTS	ND		20	2.0

④ results < 5xAL and < RL

U qual @ RL BL1

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 480-136477-1

SDG No.: _____

Matrix: Water

Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	M262FTS #	PFOA #
828072-MW05D010	480-136477-1	65	90	88	95	102	97	134	100
828072-MW005006	480-136477-2	25	59	75	73	86	91	183	99
828072-MW008023	480-136477-8	45	79	83	83	95	92	125	101
828072-MW08D033	480-136477-9	62	88	88	94	96	97	130	101
	MB 320-226170/1-A	92	98	92	99	104	95	114	104
	LCS 320-226170/2-A	92	95	90	93	93	88	111	100
	LCSD 320-226170/3-A	85	86	82	88	89	85	104	96

out high
associated result
is ND

no quals.

	QC LIMITS
PFBA = 13C4 PFBA	25-150
PFPeA = 13C5 PFPeA	25-150
PFBS = 13C3-PFBS	25-150
PFHxA = 13C2 PFHxA	25-150
PFHpA = 13C4-PFHpA	25-150
PFHxS = 1802 PFHxS	25-150
M262FTS = M2-6:2FTS	25-150
PFOA = 13C4 PFOA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

JP 6/21/18

Compound	Sig	RT (min.)	Adj RT (min.)	Diff RT (min.)	Q	Response	Cal Amt ug/L	OnCol Amt ug/L	Flags
36 1,1-Dichloroethane	63	3.758	3.758	0.000	95	14856	1.00	0.9206	
39 Vinyl acetate	43	3.806	3.812	-0.006	93	40958	2.00	1.69	M
42 2,2-Dichloropropane	77	4.275	4.281	-0.006	58	9872	1.00	1.07	M
43 cis-1,2-Dichloroethene	96	4.305	4.305	0.000	87	7957	1.00	0.8874	
44 2-Butanone (MEK)	43	4.336	4.330	0.006	97	29816	5.00	4.75	M
47 Chlorobromomethane	128	4.530	4.530	0.000	89	5638	1.00	1.14	M
49 Tetrahydrofuran	42	4.567	4.567	0.000	50	11473	2.00	2.37	
50 Chloroform	83	4.615	4.615	0.000	94	16319	1.00	1.11	
51 1,1,1-Trichloroethane	97	4.737	4.743	-0.006	35	8817	1.00	0.7698	
52 Cyclohexane	56	4.755	4.761	-0.006	16	16376	1.00	0.9599	M
53 Carbon tetrachloride	117	4.889	4.883	0.006	57	10027	1.00	0.9551	M
54 1,1-Dichloropropene	75	4.889	4.895	-0.006	86	9865	1.00	0.9478	
56 Isobutyl alcohol	43	5.090	5.084	0.006	47	12114	25.0	20.1	
55 Benzene	78	5.090	5.090	0.000	90	29549	1.00	0.9589	
57 1,2-Dichloroethane	62	5.132	5.139	-0.007	44	13659	1.00	0.9572	
59 n-Heptane	43	5.309	5.303	0.006	72	12874	1.00	0.7481	
60 Trichloroethene	95	5.698	5.698	0.000	84	6863	1.00	0.8483	
62 Methylcyclohexane	83	5.832	5.838	-0.006	90	11315	1.00	0.8282	
63 1,2-Dichloropropane	63	5.923	5.923	0.000	82	7177	1.00	0.8204	
64 Dibromomethane	93	6.051	6.057	-0.006	92	5105	1.00	0.9110	M
66 1,4-Dioxane	88	6.075	6.063	0.012	0	1605	20.0	22.7	M
67 Dichlorobromomethane	83	6.209	6.209	0.000	94	9265	1.00	0.9009	
69 2-Chloroethyl vinyl ether	63	6.495	6.495	0.000	43	4851	1.00	0.8538	
71 cis-1,3-Dichloropropene	75	6.635	6.629	0.006	86	8367	1.00	0.7758	
72 4-Methyl-2-pentanone (MIBK)	58	6.775	6.775	0.000	97	18650	5.00	4.00	
73 Toluene	92	6.927	6.933	-0.006	95	14986	1.00	0.7885	
75 trans-1,3-Dichloropropene	75	7.189	7.195	-0.006	91	7631	1.00	0.7690	
77 Ethyl methacrylate	69	7.262	7.256	0.006	94	7289	1.00	0.7747	
78 1,1,2-Trichloroethane	83	7.383	7.377	0.006	86	5397	1.00	0.8857	
79 Tetrachloroethene	166	7.469	7.469	0.000	82	7539	1.00	0.9031	
80 1,3-Dichloropropane	76	7.535	7.542	-0.007	88	9420	1.00	0.8125	
82 2-Hexanone	43	7.615	7.615	0.000	96	39228	5.00	4.44	
83 Chlorodibromomethane	129	7.779	7.779	0.000	86	5581	1.00	0.7678	
84 Ethylene Dibromide	107	7.882	7.876	0.006	31	5620	1.00	0.7802	
85 Chlorobenzene	112	8.369	8.369	0.000	91	17986	1.00	0.8126	
89 1,1,1,2-Tetrachloroethane	131	8.466	8.466	0.000	45	7251	1.00	0.9269	
88 Ethylbenzene	91	8.472	8.472	0.000	84	30891	1.00	0.8704	a
90 m-Xylene & p-Xylene	106	8.588	8.594	-0.006	0	9610	1.00	0.7267	
91 o-Xylene	106	9.020	9.020	0.000	90	12262	1.00	0.9022	
92 Styrene	104	9.050	9.044	0.006	0	17516	1.00	0.7681	M
93 Bromoform	173	9.275	9.275	0.000	17	3671	1.00	0.7844	
95 Isopropylbenzene	105	9.403	9.409	-0.006	95	25098	1.00	0.6956	
97 Bromobenzene	156	9.744	9.744	0.000	82	9316	1.00	0.9310	
98 1,1,2,2-Tetrachloroethane	83	9.786	9.780	0.006	87	10326	1.00	0.9378	
99 1,2,3-Trichloropropane	110	9.823	9.817	0.006	34	3110	1.00	0.8866	
100 N-Propylbenzene	91	9.841	9.835	0.006	98	34952	1.00	0.8000	
101 trans-1,4-Dichloro-2-buten	53	9.835	9.835	0.000	41	4465	1.00	0.9568	
102 2-Chlorotoluene	126	9.939	9.933	0.006	94	6840	1.00	0.7384	
104 1,3,5-Trimethylbenzene	105	10.024	10.024	0.000	95	21635	1.00	0.7139	
105 4-Chlorotoluene	91	10.048	10.048	0.000	95	21399	1.00	0.7440	
106 tert-Butylbenzene	134	10.334	10.340	-0.006	93	5605	1.00	0.7744	
108 1,2,4-Trimethylbenzene	105	10.395	10.395	0.000	96	26041	1.00	0.8062	

$$\frac{7957}{143038} \times \frac{25}{1} = 1.3907 \text{ OK}$$

 PKF = 1.3907
 cis-1,2-...

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Buffalo

Job No.: 480-136477-1

Analy Batch No.: 411061

SDG No.:

Instrument ID: HP5973N

GC Column: ZB-624 (20) ID: 0.18(mm)

Heated Purge: (Y/N) N

Calibration Start Date: 04/26/2018 14:11

Calibration End Date: 04/26/2018 17:20

Calibration ID: 33672

ANALYTE	LVL 1		LVL 2		LVL 3		LVL 4		LVL 5		CURVE TYPE	B	COEFFICIENT		#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	LVL 11	LVL 12	M1	M2													
Carbon disulfide	3.3433	3.3825	3.5900	4.0670	3.9270	Ave		3.6697			0.1000	8.0	20.0									
Allyl chloride	4.0264	3.5689	3.4528	3.1092	2.9912	Ave		2.9568			0.1000	6.0	20.0									
Methyl acetate	2.9208	2.7014	3.2047	1.9539	1.9612	Ave		2.0238			0.1000	4.2	20.0									
Methylene Chloride	3.1012	2.8688	2.7575	1.7065	1.6738	Lin1		1.3238			0.1000											0.9950
2-Methyl-2-propanol	2.0856	1.9823	1.9326	0.1619	0.1355	Ave		0.1686					20.0									
Methyl tert-butyl ether	1.4936	1.3571	1.2710	4.4745	4.4548	Ave		4.3188			0.1000	4.9	20.0									
trans-1,2-Dichloroethene	4.4072	4.1417	4.1413	1.4854	1.5174	Ave		1.3584			0.1000	10.5	20.0									
Acrylonitrile	1.4366	1.2872	1.2318	1.0503	1.0685	Ave		1.0114					20.0									
Hexane	0.9968	0.9800	1.0242	2.8766	2.6645	Ave		2.6138					8.5									
1,1-Dichloroethane	1.0209	0.9632	0.9869	3.1732	2.9814	Ave		2.8204			0.2000	7.2	20.0									
Vinyl acetate	2.7459	2.5965	2.7607	4.1783	4.3418	Ave		4.2350					13.7									
2,2-Dichloropropane	3.5294	3.5793	3.7161	1.7271	1.6541	Ave		1.6157					6.1									
cis-1,2-Dichloroethene	1.5950	1.5004	1.4784	1.8259	1.6699	Ave		1.5672			0.1000	9.0	20.0									
2-Butanone (MEK)	1.5314	1.3907	1.5811	1.0418	0.9695	Ave		1.0974			0.1000	10.9	20.0									
Chlorobromomethane	1.6218	1.4904	1.4269	0.9918	0.8713	Ave		0.8681					10.4									
Tetrahydrofuran	1.2128	1.2297	1.2204	0.8552	0.8179	Ave		0.8469					9.0									
Chloroform	0.9231	0.9854	0.8032	2.6781	2.6547	Ave		2.5731			0.2000	7.2	20.0									
1,1,1-Trichloroethane	0.8225	0.7870	0.7602	2.2202	2.1051	Ave		2.0019			0.1000	10.5	20.0									
Cyclohexane	0.8776	0.8336	0.8232	3.1472	3.1892	Ave		2.9818			0.1000	7.4	20.0									
Carbon tetrachloride	2.1264	1.5410	1.9374	1.9309	1.8651	Ave		1.8350			0.1000	4.4	20.0									
	2.1391	1.9779	1.9684	1.7525	1.7574	Ave							20.0									
	3.3237	2.9974	2.8746	1.8173	1.7742	Ave							4.4									
	1.9475	1.8173	1.7742																			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

$\%RSD = \frac{0.14074}{1.5672} \times 100 = 8.98\%$

$RRF = 1.5672$

PP dtd 2/11/18

VOC ICAL

VOC Sample
Calc
Check

TestAmerica Buffalo
Target Compound Quantitation Report

Data File: \\ChromNA\Buffalo\ChromData\HP5973N\20180526-71875.b\N9924.D
 Lims ID: 480-136477-B-4
 Client ID: 828072-MW02A008
 Sample Type: Client
 Inject. Date: 26-May-2018 16:37:30 ALS Bottle#: 16 Worklist Smp#: 17
 Purge Vol: 5.000 mL Dil. Factor: 200.0000
 Sample Info: 480-136477-b-4
 Misc. Info.: 480-0071875-017
 Operator ID: AEM Instrument ID: HP5973N
 Method: \\ChromNA\Buffalo\ChromData\HP5973N\20180526-71875.b\N-8260.m
 Limit Group: MV - 8260C ICAL
 Last Update: 27-May-2018 15:58:59 Calib Date: 26-Apr-2018 22:17:30
 Integrator: RTE ID Type: Deconvolution ID
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Buffalo\ChromData\HP5973N\20180426-71004.b\N8582.D
 Column 1: ZB-624 (0.25 mm) Det: MS SCAN
 Process Host: XAWRK007

First Level Reviewer: milligana Date: 27-May-2018 15:58:59

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/L	Flags
* 147 Fluorobenzene (IS)	70	5.358	5.358	0.000	98	155016	25.0	
* 2 Chlorobenzene-d5	117	8.338	8.339	-0.001	89	588404	25.0	
* 3 1,4-Dichlorobenzene-d4	152	10.741	10.742	-0.001	97	297132	25.0	
\$ 5 1,2-Dichloroethane-d4 (Sur	65	5.066	5.066	0.000	0	276068	25.3	
\$ 6 Toluene-d8 (Surr)	98	6.866	6.866	0.000	94	692700	22.9	
\$ 7 4-Bromofluorobenzene (Surr	174	9.592	9.592	0.000	90	229501	25.4	
11 Dichlorodifluoromethane	85		1.294				ND	
13 Chloromethane	50		1.470				ND	
14 Vinyl chloride	62	1.549	1.549	0.000	98	55474	4.86	
15 Bromomethane	94		1.853				ND	
16 Chloroethane	64		1.945				ND	
18 Trichlorofluoromethane	101		2.170				ND	
22 1,1-Dichloroethene	96		2.632				ND	
21 1,1,2-Trichloro-1,2,2-trif	101		2.656				ND	
23 Acetone	43		2.729				ND	U
25 Carbon disulfide	76		2.821				ND	
28 Methyl acetate	43		3.034				ND	
30 Methylene Chloride	84		3.119				ND	
32 Methyl tert-butyl ether	73		3.350				ND	
33 trans-1,2-Dichloroethene	96	3.356	3.368	0.000	36	2407	0.2858	
36 1,1-Dichloroethane	63		3.758				ND	
43 cis-1,2-Dichloroethene = Target	96	4.305	4.305	0.000	85	292742	30.1	
44 2-Butanone (MEK)	43		4.335				ND	
50 Chloroform	83		4.615				ND	
51 1,1,1-Trichloroethane	97		4.743				ND	
52 Cyclohexane	56		4.767				ND	
53 Carbon tetrachloride	117		4.889				ND	
55 Benzene	78		5.090				ND	
57 1,2-Dichloroethane	62		5.138				ND	
60 Trichloroethene	95	5.698	5.698	0.000	87	28731	3.28	
62 Methylcyclohexane	83		5.838				ND	

target = $\frac{292742}{155016} \times \frac{25}{1.5672}$
 = 30.12 ug
 actual = 30.12×200
 = 6024 ug
 OK
 OK

JP 6/21/18
06/08/2018

1,4-dioxane
ICAL

Report Date: 02-May-2018 10:37:12

Chrom Revision: 2.2 26-Apr-2018 11:26:08

TestAmerica Buffalo
Target Compound Quantitation Report

Data File: \\ChromNA\Buffalo\ChromData\HP5973U\20180501-71142.b\U3307303.D
 Lims ID: IC - SIM 1.0
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 01-May-2018 18:36:30 ALS Bottle#: 7 Worklist Smp#: 7
 Injection Vol: 1.0 ul Dil. Factor: 1.0000
 Sample Info: 480-0071142-007
 Operator ID: DR Instrument ID: HP5973U
 Sublist: chrom-1,4_Dx_SIM_HP5973U*sub1
 Method: \\ChromNA\Buffalo\ChromData\HP5973U\20180501-71142.b\1,4_Dx_SIM_HP5973U.m
 Limit Group: MB - 8270D SIM ID ICAL
 Last Update: 02-May-2018 10:37:12 Calib Date: 01-May-2018 18:59:30
 Integrator: Picker ID Type: RT Order ID
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Buffalo\ChromData\HP5973U\20180501-71142.b\U3307304.D

Column 1: Det: MS SCAN
 Process Host: XAWRK013

First Level Reviewer: richardsd Date: 02-May-2018 10:36:12

Compound	Sig	RT (min.)	Exp RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ng/ul	OnCol Amt ng/ul	Flags
D 1 1,4-Dioxane-d8	96	2.735	2.743	-0.008	98	783806	10.0	10.6	
3 1,4-Dioxane	88	2.776	2.784	-0.008	98	74441	1.00	1.02	
* 2 1,4-Dichlorobenzene-d4	152	5.950	5.950	0.000	98	676652	4.00	4.00	

Reagents:

MB_1,4SIM_WRK_00057 Amount Added: 1.00 Units: mL
 MB_LLIS_WRK_00145 Amount Added: 20.00 Units: uL Run Reagent

$$RRF = \frac{74441}{783806} \times \frac{10}{1} = 0.94974 \quad \underline{OK}$$

JP 6/26/18
06/08/2018

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Buffalo Job No.: 480-136477-1 Analy Batch No.: 411928

SDG No.:

Instrument ID: HP5973U GC Column: RXI-5Sil MS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/01/2018 17:00 Calibration End Date: 05/01/2018 18:59 Calibration ID: 33706

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 480-411928/3	U3307299.D
Level 2	ICIS 480-411928/5	U3307301.D
Level 3	IC 480-411928/6	U3307302.D
Level 4	IC 480-411928/7	U3307303.D
Level 5	IC 480-411928/8	U3307304.D
Level 6	IC 480-411928/4	U3307300.D

ANALYTE	RRF						CURVE TYPE			COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	B	M1	M2	B	M1	M2							
1,4-Dioxane	0.8739 0.9445	0.9551	0.9354	0.9497	0.9425	AveID		0.9335					0.0100	3.2	20.0				
1,4-Dioxane-d8	0.4274 0.4094	0.4475	0.4446	0.4633	0.4406	Ave		0.4388					0.0100	4.2	20.0				

$$\overline{RRF} = 0.9335 \quad \checkmark$$

$$1.RSD = \frac{0.02995}{0.9335} \times 100 = 3.21 \quad \checkmark$$

1,4-dioxane ICAL

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

Handwritten: 05/20/18

Report Date: 16-May-2018 09:19:52

Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2017.05.15LLB_ICAL_002.d
 Lims ID: IC L1 Full
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 15-May-2018 15:13:31 ALS Bottle#: 10 Worklist Smp#: 2
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L1-FULL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-A8_N*sub32
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\A8_N.m
 Limit Group: LC PFC ICAL
 Last Update: 16-May-2018 09:19:50 Calib Date: 15-May-2018 16:39:20
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: $R_{RF} = \frac{73922}{7998943} \times \frac{2.5}{0.025} = 0.9241$ Det: EXP1
 Process Host: XAWRK037

First Level Reviewer: hannigana

Date: 16-May-2018 08:31:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags	
2 Perfluorobutyric acid	212.90	> 169.00	1.461	1.462	-0.001	1.000	73922	0.0248	99.4	28.8	
D 1 13C4 PFBA	217.00	> 172.00	1.461	1.462	-0.001	1.000	7998943	2.40	95.9	49727	
D 3 13C5-PFPeA	267.90	> 223.00	1.743	1.744	-0.001	0.560	5228218	2.44	97.8	84850	
4 Perfluoropentanoic acid	262.90	> 219.00	1.743	1.745	-0.002	1.000	66005	0.0267	107	33.2	
D 47 13C3-PFBS	301.90	> 83.00	1.779	1.780	-0.001	1.000	110547	2.29	98.3	732	
5 Perfluorobutanesulfonic acid	298.90	> 80.00	1.788	1.783	0.005	1.005	77106	0.0208	94.0	369	
	298.90	> 99.00	1.788	1.783	0.005	1.005	35336	2.18(1.25-3.74)	94.0	183	
D 60 M2-4:2FTS	329.00	> 81.00	1.999	1.999	0.0	1.000	858664	2.42	104	9883	
61 Sodium 1H,1H,2H,2H-perfluorohexane	327.00	> 307.00	1.999	2.000	-0.001	1.000	17882	0.0227	97.2	804	
D 7 13C2 PFHxA	315.00	> 270.00	2.045	2.037	0.008	1.000	5626147	2.47	98.7	120947	
6 Perfluorohexanoic acid	313.00	> 269.00	2.045	2.037	0.008	1.000	56711	0.0245	98.0	74.3	M
	313.00	> 119.00	2.045	2.037	0.008	1.000	4387	12.93(5.03-15.10)	98.0	58.7	M
70 Perfluoropentanesulfonic acid	349.00	> 80.00	2.067	2.059	0.008	1.000	78646	0.0238	101	963	
	349.00	> 99.00	2.067	2.059	0.008	1.000	30425	2.58(1.36-4.07)	101	298	
D 64 13C3 HFPO-DA	332.10	> 287.00	2.146	2.134	0.012	1.000	272111	2.41	96.5	4220	

FORM VI
 LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
 CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 480-136477-1 Analy Batch No.: 223412
 SDG No.: _____
 Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
 Calibration Start Date: 05/15/2018 15:13 Calibration End Date: 05/15/2018 16:39 Calibration ID: 39197

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-223412/2	2017.05.15LLB_ICAL_002.d
Level 2	IC 320-223412/3	2017.05.15LLB_ICAL_003.d
Level 3	IC 320-223412/4	2017.05.15LLB_ICAL_004.d
Level 4	IC 320-223412/5	2017.05.15LLB_ICAL_005.d
Level 5	IC 320-223412/11	2018.05.15LLC_ICAL_006.d
Level 6	IC 320-223412/7	2017.05.15LLB_ICAL_007.d
Level 7	IC 320-223412/8	2017.05.15LLB_ICAL_008.d

ANALYTE	RRF						CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 7		B	M1	M2							
Perfluorobutanoic acid (PFBA)	0.924	0.9313	0.9225	0.9212	0.9561	AveID		0.9298			2.3	35.0					
Perfluoropentanoic acid (PFPeA)	1.2625	1.2317	1.1470	1.1005	1.1953	AveID		1.1805			4.6	35.0					
Perfluorobutanesulfonic acid (PFBS)	73.379	78.361	79.854	76.421	80.657	AveID		78.092			4.7	50.0					
4:2 FTS	16.107	17.745	15.595	16.119	16.756	AveID		16.574			5.3	50.0					
Perfluorohexanoic acid (PFHxA)	1.0080	1.1481	0.9804	0.9949	0.9470	AveID		1.0281			6.6	35.0					
Perfluoropentanesulfonic acid (PFPeS)	70.536	69.604	70.709	68.100	69.356	AveID		69.545			4.6	50.0					
HFPO-DA (GenX)	2.4769	3.1177	2.9135	3.1580	3.2449	AveID		3.0568			9.2	35.0					
Perfluoroheptanoic acid (PFHpA)	1.1170	1.0612	1.0572	0.9754	1.0839	AveID		1.0563			4.1	35.0					
Perfluorohexanesulfonic acid (PFHxS)	1.2868	1.1929	1.1199	1.0451	1.0961	AveID		1.1268			7.6	35.0					
Adona	3.2060	3.8072	3.3608	3.8067	3.5300	AveID		3.4271			9.9	50.0					
6:2FTS	2.5480	2.0146	2.1352	1.5658	1.7196	L2ID	0.0180	1.7550				0.9900	0.9900				
Perfluorooctanoic acid (PFOA)	1.2824	1.3066	1.1380	1.1380	1.0898	AveID		1.1770			7.3	35.0					
Perfluoroheptanesulfonic acid (PFHpS)	1.1977	1.4162	1.3092	1.3585	1.3580	AveID		1.3320			5.5	50.0					
Perfluorooctanesulfonic acid (PFOS)	1.3297	1.2627	1.2157	1.0803	1.0707	AveID		1.1758			8.4	35.0					

RRF = 0.92983 ✓
 %RSD = $\frac{0.0216}{0.9298} \times 100 = 2.3\% \checkmark$

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

OP 6/26/18

ICAL PFAS

sample calc
PFAS.

Report Date: 05-Jun-2018 13:47:17

Chrom Revision: 2.2 11-May-2018 08:54:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A8_N\20180604-59130.b\2018.06.03LLB_065.d
 Lims ID: 480-136477-C-1-A
 Client ID: 828072-MW05D010
 Sample Type: Client
 Inject. Date: 04-Jun-2018 06:31:18 ALS Bottle#: 47 Worklist Smp#: 23
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 480-136477-C-1-A
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNA\Sacramento\ChromData\A8_N\20180604-59130.b\A8_N.m
 Limit Group: LC PFC ICAL
 Last Update: 05-Jun-2018 13:47:15 Calib Date: 15-May-2018 16:39:20
 Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180515-58217.b\2018.05.15LLC_ICAL_006.d

Column 1: [PFBA] = $\frac{1269877}{5063649} \times \frac{2.5}{0.9298} = 0.6743 \text{ ng/ml}$ Def: EXP1 * $\frac{10 \text{ ml}}{0.255 \text{ ml}} = 2.6 \text{ ng/l}$ ✓
 Process Host: XAWRK030

First Level Reviewer: mongkols

Date: 05-Jun-2018 13:47:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid	212.90	> 169.00	1.457	1.461	-0.004	1.000	(1269877)	0.6743 ✓	565	
D 1 13C4 PFBA	217.00	> 172.00	1.457	1.461	-0.004	1.000	(5063649)	1.63	65.2	25465
4 Perfluoropentanoic acid	262.90	> 219.00	1.728	1.734	-0.006	1.000	567173	0.2676	90.0	M
D 3 13C5-PFPeA	267.90	> 223.00	1.728	1.734	-0.006	0.563	4487900	2.25	90.1	27413
D 47 13C3-PFBS	301.90	> 83.00	1.764	1.770	-0.006	1.000	92150	2.05	88.0	184
5 Perfluorobutanesulfonic acid	298.90	> 80.00	1.773	1.779	-0.006	1.005	55641	0.0180	20.4	M
	298.90	> 99.00	1.773	1.779	-0.006	1.005	24649	2.26(1.25-3.74)	32.1	M
6 Perfluorohexanoic acid	313.00	> 269.00	2.025	2.022	0.003	1.000	454510	0.2202	170	
	313.00	> 119.00	2.025	2.022	0.003	1.000	42569	10.68(5.03-15.10)	407	
D 7 13C2 PFHxA	315.00	> 270.00	2.025	2.022	0.003	1.000	5019925	2.36	94.5	67407
D 9 13C4-PFHpA	367.00	> 322.00	2.345	2.355	-0.010	1.000	5165356	2.54	102	93579
10 Perfluoroheptanoic acid	363.00	> 319.00	2.345	2.355	-0.010	1.000	162315	0.0744	93.2	
	363.00	> 169.00	2.345	2.355	-0.010	1.000	60463	2.68(1.13-3.40)	321	
8 Perfluorohexanesulfonic acid	399.00	> 80.00	2.371	2.369	0.002	1.000	52509	0.0190	29.1	
	399.00	> 99.00	2.371	2.369	0.002	1.000	18033	2.91(1.50-4.49)	37.1	
D 11 18O2 PFHxS	403.00	> 84.00	2.371	2.381	-0.010	1.000	5790025	2.30	97.3	146983

JP 6/20/18

Sample Summary

Client: New York State D.E.C.
Project/Site: 100 Pixley Industrial Pkwy #828072

TestAmerica Job ID: 480-136557-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-136557-1	828072-GPZ5S018	Water	05/24/18 10:10	05/25/18 09:30
480-136557-2	828072-GPZ5D025	Water	05/24/18 10:55	05/25/18 09:30
480-136557-3	828072-GPZ6D028	Water	05/24/18 11:55	05/25/18 09:30
480-136557-4	828072-MW06D015	Water	05/24/18 15:10	05/25/18 09:30
480-136557-5	828072-MW21D020	Water	05/24/18 15:55	05/25/18 09:30
480-136557-6	828072-MW21D020 DUP	Water	05/24/18 15:55	05/25/18 09:30
480-136557-7	828072-MW021012	Water	05/24/18 16:45	05/25/18 09:30
480-136557-8	828072-Trip Blank 02	Water	05/24/18 00:00	05/25/18 09:30

Job Narrative
480-136557-1

Comments

No additional comments.

Receipt

The samples were received on 5/25/2018 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.6° C. ✓

Receipt Exceptions

The Chain-of-Custody (COC) was incorrect as received. The listed sample collection date is 3/24/18. The login was completed using 5/24/18. ✓

GC/MS VOA

Method(s) 8260C: The continuing calibration verification (CCV) associated with batch 480-417154 recovered outside acceptance criteria, low biased, for Chloromethane. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported. The following samples are impacted: 828072-GPZ5S018 (480-136557-1), 828072-GPZ5D025 (480-136557-2), 828072-GPZ6D028 (480-136557-3), 828072-MW21D020 (480-136557-5), 828072-MW21D020 DUP (480-136557-6) and 828072-MW021012 (480-136557-7). ✓

Method(s) 8260C: The continuing calibration verification (CCV) analyzed in batch 480-417154 was outside the method criteria for the following analyte: Vinyl chloride. A CCV standard at or below the reporting limit (RL) was analyzed with the affected samples and found to be acceptable. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte is considered estimated. The following samples are impacted: 828072-GPZ5S018 (480-136557-1), 828072-GPZ5D025 (480-136557-2), 828072-GPZ6D028 (480-136557-3), 828072-MW21D020 (480-136557-5), 828072-MW21D020 DUP (480-136557-6) and 828072-MW021012 (480-136557-7). ✓

Method(s) 8260C: The following sample was diluted to bring the concentration of target analytes within the calibration range: 828072-GPZ6D028 (480-136557-3). Elevated reporting limits (RLs) are provided. ✓

Method(s) 8260C: The continuing calibration verification (CCV) associated with batch 480-417181 recovered outside acceptance criteria, low biased, for 1,1,2,2-Tetrachloroethane, Chloromethane, and Vinyl Chloride. A reporting limit (RL) standard was analyzed, and the target analytes were detected. Since the associated samples were non-detects for these analytes, the data have been reported. The following sample is impacted: 828072-Trip Blank 02 (480-136557-8). ✓

Method(s) 8260C: The following sample was diluted to bring the concentration of target analytes within the calibration range: 828072-MW06D015 (480-136557-4). Elevated reporting limits (RLs) are provided. ✓

Method(s) 8260C: The continuing calibration verification (CCV) analyzed in batch 480-417181 was outside the method criteria for the following analyte(s): Vinyl chloride. A CCV standard at or below the reporting limit (RL) was analyzed with the affected samples and found to be acceptable. As indicated in the reference method, sample analysis may proceed; however, any detection for the affected analyte(s) is considered estimated. The following sample is impacted: 828072-MW06D015 (480-136557-4). ✓

Method(s) 8260C: The continuing calibration verification (CCV) associated with batch 480-417181 recovered outside acceptance criteria, low biased, for 1,1,2,2-Tetrachloroethane and Chloromethane. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported. The following sample is impacted: 828072-MW06D015 (480-136557-4). ✓

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

laboratory did not apply any quals for CCVs

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Buffalo

Job No.: 480-136557-1

SDG No.:

Matrix: Water

Level: Low

Lab File ID: N0047.D

Lab ID: LCS 480-417154/5

Client ID:

proj. limits: 70-130

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
1,1,1-Trichloroethane	25.0	26.1	104	73-126	
1,1,2,2-Tetrachloroethane	25.0	21.3	85	76-120	
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	21.5	86	61-148	
1,1,2-Trichloroethane	25.0	22.9	92	76-122	
1,1-Dichloroethane	25.0	23.6	94	77-120	
1,1-Dichloroethene	25.0	22.6	90	66-127	
1,2,4-Trichlorobenzene	25.0	25.9	104	79-122	
1,2-Dibromo-3-Chloropropane	25.0	22.5	90	56-134	
1,2-Dibromoethane	25.0	24.4	98	77-120	
1,2-Dichlorobenzene	25.0	24.5	98	80-124	
1,2-Dichloroethane	25.0	24.8	99	75-120	
1,2-Dichloropropane	25.0	24.0	96	76-120	
1,3-Dichlorobenzene	25.0	25.7	103	77-120	
1,4-Dichlorobenzene	25.0	24.1	96	80-120	
2-Butanone (MEK)	125	128	102	57-140	
2-Hexanone	125	121	97	65-127	
4-Methyl-2-pentanone (MIBK)	125	118	94	71-125	
<u>Acetone</u>	125	170	136	56-142	
Benzene	25.0	22.9	92	71-124	
Bromodichloromethane	25.0	25.0	100	80-122	
Bromoform	25.0	27.8	111	61-132	
Bromomethane	25.0	18.2	73	55-144	
Carbon disulfide	25.0	23.5	94	59-134	
Carbon tetrachloride	25.0	25.8	103	72-134	
Chlorobenzene	25.0	24.9	100	80-120	
Chloroethane	25.0	20.1	80	69-136	
Chloroform	25.0	22.7	91	73-127	
Chloromethane	25.0	19.3	77	68-124	
cis-1,2-Dichloroethene	25.0	23.2	93	74-124	
cis-1,3-Dichloropropene	25.0	26.6	106	74-124	
Cyclohexane	25.0	24.0	96	59-135	
Dibromochloromethane	25.0	27.7	111	75-125	
<u>Dichlorodifluoromethane</u>	25.0	17.0	68	59-135	
Ethylbenzene	25.0	24.6	99	77-123	
Isopropylbenzene	25.0	26.8	107	77-122	
Methyl acetate	50.0	44.9	90	74-133	
Methyl tert-butyl ether	25.0	24.3	97	77-120	
Methylcyclohexane	25.0	23.5	94	68-134	
Methylene Chloride	25.0	25.2	101	75-124	
Styrene	25.0	24.8	99	80-120	
Tetrachloroethene	25.0	26.1	105	74-122	

J LCS-H detections

J/UJ LCS-L results in this batch.

Column to be used to flag recovery and RPD values

FORM III 8260C

JP 6/26/18

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Buffalo

Job No.: 480-136557-1

SDG No.: _____

Matrix: Water

Level: Low

Lab File ID: N0071.D

Lab ID: LCS 480-417181/5

Client ID: _____

proj. limits: 70-130

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
1,1,1-Trichloroethane	25.0	24.3	97	73-126	
1,1,2,2-Tetrachloroethane	25.0	19.5	78	76-120	
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	22.2	89	61-148	
1,1,2-Trichloroethane	25.0	21.0	84	76-122	
1,1-Dichloroethane	25.0	22.3	89	77-120	
1,1-Dichloroethene	25.0	21.4	86	66-127	
1,2,4-Trichlorobenzene	25.0	23.5	94	79-122	
1,2-Dibromo-3-Chloropropane	25.0	19.3	77	56-134	
1,2-Dibromoethane	25.0	22.8	91	77-120	
1,2-Dichlorobenzene	25.0	23.6	95	80-124	
1,2-Dichloroethane	25.0	23.5	94	75-120	
1,2-Dichloropropane	25.0	23.1	92	76-120	
1,3-Dichlorobenzene	25.0	24.0	96	77-120	
1,4-Dichlorobenzene	25.0	23.3	93	80-120	
2-Butanone (MEK)	125	121	96	57-140	
2-Hexanone	125	116	93	65-127	
4-Methyl-2-pentanone (MIBK)	125	104	83	71-125	
Acetone	125	169	135	56-142	
Benzene	25.0	21.7	87	71-124	
Bromodichloromethane	25.0	23.7	95	80-122	
Bromoform	25.0	25.3	101	61-132	
Bromomethane	25.0	17.8	71	55-144	
Carbon disulfide	25.0	21.9	88	59-134	
Carbon tetrachloride	25.0	24.9	100	72-134	
Chlorobenzene	25.0	23.4	93	80-120	
Chloroethane	25.0	18.6	74	69-136	
Chloroform	25.0	21.3	85	73-127	
Chloromethane	25.0	17.7	71	68-124	
cis-1,2-Dichloroethene	25.0	22.1	88	74-124	
cis-1,3-Dichloropropene	25.0	24.5	98	74-124	
Cyclohexane	25.0	23.8	95	59-135	
Dibromochloromethane	25.0	26.2	105	75-125	
Dichlorodifluoromethane	25.0	17.5	70	59-135	
Ethylbenzene	25.0	23.3	93	77-123	
Isopropylbenzene	25.0	25.1	100	77-122	
Methyl acetate	50.0	40.7	81	74-133	
Methyl tert-butyl ether	25.0	22.3	89	77-120	
Methylcyclohexane	25.0	23.3	93	68-134	
Methylene Chloride	25.0	22.2	89	75-124	
Styrene	25.0	23.6	94	80-120	
Tetrachloroethene	25.0	25.1	100	74-122	

J LCS-H detections.

Column to be used to flag recovery and RPD values

FORM III 8260C

JP 10/26/18