LCSWMA

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January 8, 2020

Ms. Kelly Kinkaid PG; Licensed Professional Geologist
Pennsylvania Department of Environmental Protection
Bureau of Waste Management
909 Elmerton Avenue
Harrisburg, PA 17110-8200

REF: 3rd Quarter 2019 Form 19, 50 and 52 Submittal
Frey Farm Landfill; BWM Permit #101389

Dear Ms. Kinkaid:

In accordance with the Municipal Waste Management Regulations, the Lancaster County Solid Waste Management Authority (LCSWMA) continues the above-referenced monitoring program.

ARM Group has provided an analysis of this 3rd Quarter 2019 data for groundwater, leachate, and contiguous landowners. ARM Group's report is attached to this submittal.

Groundwater:
In accordance with the Municipal Waste Management Regulations, the Lancaster County Solid Waste Management Authority (LCSWMA) continues the above-referenced monitoring program. Attached are the Forms 19, laboratory reports, and data export excel file for uploading the data into your LandLinks Access database.

Leachate:
In accordance with both the Pennsylvania Municipal Waste Management and the Federal Subtitle D Regulations, the Lancaster County Solid Waste Management Authority (LCSWMA) continues to complete the above referenced monitoring program. Enclosed is the Department's Form 50 - "Municipal Waste Landfill Leachate Analysis" for the quarterly monitoring period.

- LCSWMA continues to monitor the Form 50 parameters from location FFLEINFS. This location is the leachate collection system for the Frey Farm Landfill and represents "raw" leachate characteristics for the facility, as collected from the six (6) landfill cells.

- As indicated on the Form 50, the primary leachate collection and secondary detection systems encompass approximately 93 acres of drainage area.

- At your request, we have included analyses of the four (4) secondary individual detection zone discharges with an individual Form 50 for each.

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- Included on the CD are files which contains the FFLEINFS data in a compatible format for your LandLinks software. The CD also contains a pdf file of the laboratory results and the Form 50.

In accordance with Section 273.255(d)(1)(2) and (3) of the Municipal Waste Management Regulations, the Lancaster County Solid Waste Management Authority (LCSWMA) is providing this secondary flow report.

The 3rd Quarter Frey Farm Landfill (FFLF) secondary flow was noted at 0.94 gallons per day per acre (gpdpa); which is below the regulatory limit of 100 gpdpa. The 2nd Quarter secondary flow was 0.62% of the primary flow, which is below the regulatory 10% (maximum). Table 1 indicates this quarter's weekly flow information for the six (6) operational cells at the FFLF, cells 2 and 4 continue to indicate no secondary flow present.

- Consistent with all previous monitoring events, LCSWMA remains well below the secondary leachate flow threshold (100-gpdpa)

Contiguous Landowners:
Attached are the Forms 52, laboratory reports, and a data export excel file for uploading the data into your LandLinks Access database.

Please do not hesitate in contacting me if you have any questions or concerns at nrogers@lcswma.org.

Respectfully submitted,

Nick Rogers
FFLF Facility Manager

Enclosures

Cc: LCSWMA: Environmental, John Ridinger, Aaron Rice
PA DEP: Ed Rawski, Randy Weiss

ARM Group LLC
Engineers and Scientists

January 7, 2020

Mr. Daniel Brown
Environmental Compliance Manager
Lancaster County Solid Waste
Management Authority
1299 Harrisburg Pike
PO Box 4425
Lancaster, PA 17604

Re: LCSWMA Frey Farm Landfill
Permit No. 101389
Manor Township
Lancaster County, Pennsylvania
Third Quarter 2019 Water Quality Data Review
ARM Project 190783

Dear Mr. Brown:

ARM Group LLC (ARM) has prepared this assessment at the request of the Lancaster County Solid Waste Management Authority (LCSWMA) to provide an evaluation of the Fourth Quarter 2019 water quality monitoring results for Frey Farm Landfill (FFLF). As part of this evaluation, ARM reviewed the historic and Third Quarter 2019 laboratory analytical results for the sampled upgradient and downgradient Form 19 groundwater monitoring wells, Form 50 leachate collection and detection zones, and Form 52 contiguous private wells.

The groundwater and leachate samples collected by LCSWMA during the Third Quarter 2019 were analyzed for quarterly Form 19, Form 50, and Form 52 parameters, as applicable. The following narrative provides a summary of noteworthy observations of the results for the Third Quarter of 2019, as well as a general discussion of recent data trends.

Background/Upgradient Parameter Concentrations

To determine if the concentration of a given parameter at each groundwater monitoring location is elevated compared to the background/upgradient concentration, ARM calculated the 95% upper prediction limits (UPLs) using historical data from the upgradient well, FFMP002W (MP-2), using laboratory analytical results provided by LCSWMA from the First Quarter 2009 through the most recent quarter (Third Quarter 2019).

The UPL approach is used to predict the upper limit of possible future values based on a background data set. A 95% UPL established from background data represents the upper limit which will predict if an independently obtained future sample result exceeds background levels with 95% confidence. If the concentration of a given parameter in a downgradient well exceeds its established UPL, this represents a statistically significant exceedance of background groundwater quality.

To calculate the UPLs, ARM first applied the Dixon's and Rosner's Tests for outliers in ChemStat® statistical analysis software (version 6.3.0.2, Starpoint Software, Inc., ©1996-2013) to identify potential historical anomalous concentrations in MP-2. The Dixon's Test applies to populations of 3-25 values, and the Rosner's Test is valid for populations of more than 25 values. ARM identified 44 statistical outliers at a 95% significance level in the historical dataset which did not appear to be part of a long-term concentration trend. No outliers were identified from the Third Quarter 2019 analytical results.

The most appropriate method of calculating a UPL varies according to the distribution of each dataset. After removing outliers, ARM assessed the remaining historical MP-2 concentration data for each parameter to determine the best fitting statistical distribution (i.e., normal, lognormal, gamma or no distribution) at a 95% significance level using the EPA's ProUCL statistical analysis software (version 5.1.002, EPA, 2015). ARM then used ProUCL to calculate the UPLs for each parameter, which are summarized in the enclosed **Attachment 1**. The exported ProUCL statistical calculation sheets are included in the enclosed **Attachment 2**.

For pH, a one-sided UPL is not appropriate because of the double-sided nature of this parameter. ARM assessed the downgradient pH data by investigating time-series concentration plots for identifiable trends and comparing the Third Quarter 2019 results to the historical range of concentrations in both the sampled well and the upgradient well.

The Interstate Technology and Regulatory Council (ITRC) recommends that a UPL should only be applied for background populations of at least 8-10 observations. Use of smaller populations containing either fewer measurements or multiple non-detections can result in skewed datasets and statistically flawed UPL calculations.

The background population is less than 8 for all volatile organic compounds (VOCs), chemical oxygen demand (COD), and total phenolics because of a historical lack of detections in MP-2. A background level could therefore not be accurately calculated for these parameters, which are labeled with asterisks in the enclosed **Attachment 1**. ARM substituted the laboratory reporting detection limit for the statistical background standard when assessing these parameters in the downgradient wells due to their historical absence in the upgradient groundwater.

The attached **Table 1** summarizes the background exceedances in the downgradient Form 19 wells during the Third Quarter 2019. The attached **Table 2** summarizes the background exceedances in the downgradient Form 52 wells during the Third Quarter 2019. Background exceedances shown in **Tables 1 and 2** denote a statistically significant increase of concentrations relative to those observed historically in the upgradient well MP-2. Close attention should be paid to results from the monitoring locations with noted water quality changes during future

sampling events to evaluate the presence of any positive or negative trends for the parameters of concern.

Individual Form 19 Well Summary

- MP-2 – No parameters are above the statistical background level in this upgradient well for the Third Quarter 2019, indicating that groundwater quality appears relatively stable upgradient of the site. Alkalinity, ammonia-N, calcium, manganese, potassium, sodium, specific conductance (SpC), total dissolved solids (TDS), and total organic carbon (TOC) concentrations increased rapidly in 2012 to historical high levels. All these parameters have returned to apparently stable, long-term trends in line with historical average levels since 2014. pH has fluctuated over a range of approximately 0.5 unit over the past several years but appears to have a steady long-term trend. All other Form 19 analytical parameters appear to be stable and within historical concentration ranges.

- MP-5 – Parameters above background in this well include chloride, magnesium, SpC, TDS, and total organic carbon (TOC). Concentrations of these parameters historically appeared stable until an increase in 2018. These concentrations have decreased over the past five quarters and now generally appear in line with the historical averages. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.5 unit higher, on average, while fluctuating over a slightly wider range.

- MP-15 – No parameters are above background in this well for the Third Quarter 2019. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.7 unit higher, on average, while fluctuating over a slightly wider range.

- MP-16 – Chloride and magnesium levels are above background in this well. Concentrations of these parameters appear to have a stable trend long-term with short-term fluctuations. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.8 unit higher than background.

- MP-17 – Parameters above background in this well include ammonia-N, calcium, chloride, magnesium, manganese, SpC, TDS, TOC, and turbidity. Concentrations of most of these parameters appear to be increasing over time. Two instances of apparent rapid increases in concentration occurred during 2012 and 2016. After both events, these parameter levels have appeared to stabilize. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.8 unit higher than background.

- MP-18 – Parameters above background in this well include chloride, magnesium, manganese, and TDS. Concentrations of these parameters appeared to spike during the First Quarter 2018 sampling event but have since returned to near historical average levels. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.5 unit higher, on average.

- MP-19 – Chloride and TOC levels are above background in this well. Chloride concentrations appear to be slowly increasing over time. TOC levels appear to fluctuate

across a range of approximately 2.5 mg/L but with no apparent long-term trend. pH appears to mimic the trend observed in the upgradient well at levels approximately 1.5 units higher, on average.

- MP-25 – Parameters above background in this well include chloride, magnesium, TDS, and TOC. Concentrations of these parameters appear to be fluctuating rapidly and increasing slowly over time. pH appears to be increasing slowly since 2016 and is currently approximately 1.5 units higher than background.

- MP-28 – Parameters above background in this well include chloride, magnesium, and TDS. Chloride and TDS concentrations appear to be elevated yet stable over time. Magnesium concentrations appear to be decreasing as a long-term trend with occasional fluctuations. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.6 unit higher, on average, while fluctuating over a slightly wider range.

- MP-29 – Chloride levels are above background in this well and appear to fluctuate between 20-160 mg/L in a seasonal pattern. There does not appear to be a long-term increasing or decreasing trend, though. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.5 unit higher, on average.

- MP-2DW – Parameters above background in this well include ammonia-N, calcium, chloride, iron, magnesium, manganese, SpC, TDS, and turbidity. These parameter concentrations appear to have increased between the Third Quarter 2017 and Fourth Quarter 2018 sampling events. They generally appear to be following a decreasing trend during subsequent quarters. pH appears to mimic the trend observed in the upgradient well at levels approximately 2.1 units higher, on average.

- MP-2SW – Parameters above background in this well include chloride, iron, SpC, TOC, and turbidity. Chloride and SpC levels appear to be decreasing over time. Iron, TOC, and turbidity appear to be increasing over time with occasional fluctuations. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.8 unit higher, on average.

- MP-31 – Parameters above background in this well include iron, manganese, and turbidity. These parameter concentrations appear to be increasing slowly since the First Quarter 2018 sampling event. pH appears to mimic the trend observed in the upgradient well at levels approximately 2.0 units higher, on average, while fluctuating over a wider range.

- MP-32 – Parameters above background in this well include ammonia-N, iron, manganese, and turbidity. These parameter concentrations appear to be fluctuating rapidly but do not appear to show a long-term increasing or decreasing trend. pH appears to mimic the trend observed in the upgradient well at levels approximately 1.8 units higher, while fluctuating over a wider range.

- MP-33 – Parameters above background in this well include ammonia-N, chloride, iron, manganese, and turbidity. These parameter concentrations appear to be fluctuating but do

not appear to show a long-term increasing or decreasing trend. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.9 unit higher, on average.

- MP-3A – Magnesium levels are above background in this well but appear to be steady long-term. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.2 unit higher, on average.

- MP-4A – Parameters above background in this well include alkalinity (bicarbonate and total), calcium, chloride, magnesium, SpC, and TDS. All these parameter concentrations appear to be stable or decreasing long-term. Calcium and TDS levels appear to be fluctuating rapidly within their long-term trends. pH appears to mimic the trend observed in the upgradient well at levels approximately 1.9 units higher, on average, while fluctuating over a slightly wider range.

- MP-26R – Parameters above background in this well include chloride, magnesium, manganese, SpC, sulfate, TDS, and TOC. Most of these parameters appear to be increasing slowly since 2014. Sulfate and TOC appear to be fluctuating rapidly but not increasing long-term. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.4 unit higher, on average.

- MP-30R – Parameters above background in this well include chloride, magnesium, manganese, SpC, TDS, and turbidity. These parameter concentrations appear to be fluctuating across a relatively wide range of values with no apparent long-term trends. pH appears to mimic the trend observed in the upgradient well at levels approximately 0.6 unit higher, on average, while fluctuating over a wider range.

Parameters not noted above are either at or below background levels. Overall, the groundwater quality at FFLF appears to be stable. Most parameters noted as being elevated above background levels do not appear to be increasing over time. Several parameters appear to be fluctuating but do not show an apparent long-term increasing or decreasing trend. ARM will continue to closely assess the noted parameters with increasing trends to see if any changes to the trends occur over time.

Form 50 Leachate Zone Summary

ARM reviewed the historic and Third Quarter 2019 laboratory analytical results for sample location FFLEINFS (grab samples collected from the combined flow from FFLF's primary leachate collection lines) and four (4) manholes which represent the secondary leachate detection zones (FFMH01SS, FFMH03SS, FFMH05SS, and FFMH06SS).

Leachate flows in the primary and secondary zones appear to be generally stable over time. Flows from the secondary zones appear to fluctuate seasonally, with the highest flows generally occurring in the first quarter and the lowest flows generally occurring in the third quarter.

VOC Detections and Apparent Trends

2-butanone (MEK), 4-methyl-2-pentanone (MIK), acetone, methylene chloride, and toluene have historically been present in FFLEINFS, but none of these VOC concentrations appear to be increasing over time.

1,1-dichloroethane, 1,4-dichlorobenzene, acetone, benzene, cis-1,2-dichloroethene, and ethylbenzene have historically been present at low levels in FFMH01SS. 1,4-dichlorobenzene levels appear to be very slowly increasing over time, and the other noted VOC concentrations appear to be stable or decreasing.

Other Form 50 Detections and Apparent Trends

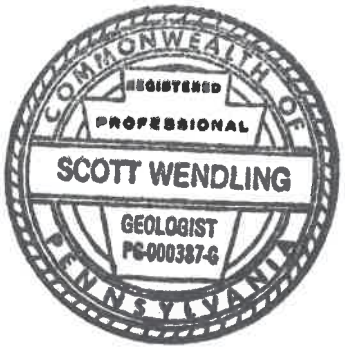
Ammonia-N, barium, chloride, iron, pH, potassium, sodium, and TOC levels appear to be increasing long-term at FFLEINFS and FFMH01SS. COD, nitrate-N, SpC, sulfate, TDS, and TOC appear to be decreasing at FFMH05SS. Alkalinity, calcium, magnesium, and manganese concentrations fluctuate across a wide range of values in the historical leachate results, but no long-term trends are apparent for these parameters. ARM will continue to closely assess the noted parameters with increasing trends to see if any changes to the trends occur over time.

Form 52 Contiguous Private Wells Summary

ARM reviewed the Third Quarter 2019 groundwater monitoring results for ten (10) contiguous privately-owned wells. Samples collected from these wells were analyzed for Form 52 parameters. The attached **Table 2** summarizes the background exceedances in the downgradient Form 52 wells during the Third Quarter 2019. Background exceedances shown in **Table 2** denote a statistically significant increase of concentrations relative to those observed historically in the upgradient well MP-2. Most notably, several wells displayed a background exceedance for chloride, potassium, sodium, and TDS. ARM will continue to assess Form 52 results to see if any apparent concentration trends develop.

Closing

If you have any questions regarding this water quality data evaluation, please contact the undersigned at 717-533-8600. ARM appreciates the opportunity to assist LCSWMA with its assessment of quarterly water quality data collected at FFLF.



Sincerely,
ARM Group LLC

Ryan Brandon
Project Hydrogeologist II

Scott Wendling, P.G.
Vice President, Sr. Project Manager

Enclosed: Tables 1-2
Attachments 1-2

TABLES

Table 1. LCSWMA Frey Farm Landfill Form 19 Groundwater Monitoring Well Background Standard Comparisons - 3rd Quarter 2019

Parameter	Background Standard	Units	FFMP002W	FFMP005W	FFMP015W	FFMP016W	FFMP017W	FFMP018W	FFMP019W	FFMP025W	FFMP028W	FFMP029W	FFMP02DW	FFMP02SW	FFMP031W	FFMP032W	FFMP033W	FFMP03AW	FFMP04AW	FFMP26RW	FFMP30RW
1,1,1-TRICHLOROETHANE	**1***	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-DICHLOROETHANE	**1***	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-DICHLOROETHENE	**1***	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-DIBROMOETHANE (EDB) (ETHYLENE DIBROMIDE)	**1***	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-DICHLOROETHANE	**1***	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ALKALINITY	**147.9**	mg/L	< 5	52	21	42	46	18	69	40	33	13	125	14	68	67	43	21	221	46	34
AMMONIA-NITROGEN	**0.313**	mg/L	0.10	0.13	< 0.10	< 0.10	0.60	0.16	0.14	0.13	< 0.10	0.17	0.62	0.13	0.27	0.57	0.69	< 0.10	< 0.10	< 0.10	0.13
BENZENE	**1***	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
BICARBONATE	**143.2**	mg/L	< 5	52	21	42	46	18	69	40	33	13	125	14	68	67	43	21	221	46	34
CALCIUM, TOTAL	**73.74**	mg/L	20.2	72.2	9.3	29.9	99.1	30.5	56.6	27.4	41.1	11.2	104	22.9	40.6	15.4	26.6	17.0	152	67.8	37.6
CHLORIDE	**30.97**	mg/L	22.1	188	12.0	83.1	405	106	75.9	56.8	88.8	50.7	275	130	24.6	21.9	41.0	27.5	317	191	219
cis 1,2-DICHLOROETHENE	**1***	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
COD (CHEMICAL OXYGEN DEMAND)	**15***	mg/L	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15	< 15
ETHYLBENZENE	**1***	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
FLUORIDE	**0.5**	mg/L	< 0.2	< 0.5	< 0.2	< 0.2	< 0.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
IRON, TOTAL	**0.185**	mg/L	< 0.06	< 0.06	< 0.06	< 0.06	0.09	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	0.52	9.6	3.8	5.8	4.5	< 0.06	< 0.06	< 0.06	0.07
MAGNESIUM, TOTAL	**10.17**	mg/L	7.7	16.6	9.8	14.2	41.2	15.7	5.4	13.0	17.4	8.6	16.1	9.6	3.9	4.9	8.9	11.0	23.5	19.1	14.9
MANGANESE, TOTAL	**0.329**	mg/L	0.26	0.080	0.040	0.020	0.49	0.36	< 0.0056	0.0063	0.0088	0.020	0.43	0.11	0.36	0.63	0.48	0.26	0.31	0.51	2.6
METHYLENE CHLORIDE	**1***	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
NITRATE-NITROGEN	**28.82**	mg/L	22.5	2.2	10.1	11.5	2.0	5.7	0.22	11.5	17.7	3.6	8.9	14.4	< 0.2	< 0.2	12.0	20.0	0.2	2.3	5.8
POTASSIUM, TOTAL	**10.69**	mg/L	5.57	6.07	6.46	6.22	6.34	5.93	7.03	7.07	6.85	5.89	7.85	6.72	7.66	7.33	6.41	6.08	7.70	6.00	6.36
SODIUM, TOTAL	**22.3**	mg/L	1.0	2.8	2.2	2.2	6.2	5.0	0.93	2.2	2.2	1.8	1.7	5.3	1.4	1.2	1.5	1.4	2.3	8.0	5.3
SPEC. COND., LAB	**582.1**	µmho/cm	257	888	234	479	1,520	528	421	402	572	221	1,250	644	274	172	298	254	1,430	912	915
SULFATE	**59.97**	mg/L	12.8	59.2	45.9	27.8	56.8	39.4	14.0	23.1	24.5	4.1	29.1	31.7	42.9	< 2.0	8.1	2.8	46.9	74.5	26.9
TDS (TOTAL DISSOLVED SOLIDS)	**338.6**	mg/L	189	592	172	322	1,140	363	308	528	386	193	805	207	142	76	213	209	1,030	622	542
TETRACHLOROETHENE	**1***	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TOC (TOTAL ORGANIC CARBON)	**1.06**	mg/L	0.66	1.3	0.93	0.97	2.5	0.92	1.1	1.1	0.98	< 0.5	0.65	1.6	0.57	0.85	0.60	0.56	0.89	1.6	0.89
TOLUENE	**1***	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TOTAL PHENOLICS	**0.005***	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
trans 1,2-DICHLOROETHENE	**1***	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TRICHLOROETHENE	**1***	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TURBIDITY	**1.792**	NTU	0.27	0.12	0.15	0.26	4.64	0.15	0.29	0.50	0.17	0.14	5.15	126	24.8	95.5	3.13	0.16	1.40	0.44	1.98
VINYL CHLORIDE	**1***	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
XYLENES (TOTAL)	**3***	µg/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

Notes:

Gray text indicates a parameter non-detection.

Shaded text indicates a background standard exceedance.

* Reporting limit substituted for background standard due to lack of historical detections in the upgradient well.

Table 2. LCSWMA Frey Farm Landfill Form 52 Groundwater Monitoring Well Background Standard Comparisons - 3rd Quarter 2019

Parameter	FFLF Background Standard	Units	3044 RIVER RD	3052 RIVER RD	3056 RIVER RD	3060 RIVER RD	3076 RIVER RD	3079 RIVER RD	3088 RIVER RD	3100 RIVER RD	3106 RIVER RD	3125 RIVER RD
ALKALINITY	**147.9**	mg/L	6	6			7	23	150	7	11	224
AMMONIA-NITROGEN	**0.313**	mg/L	0.24	0.19	0.17		0.18	0.25	0.22	0.29		
BICARBONATE ALKALINITY	**143.2**	mg/L	6	6			7	23	150	7	11	224
CALCIUM, DISSOLVED	**28.22**	mg/L	14.1	16.8	10.6	8.6	16.7	9.9		13.0	22.9	0.77
CALCIUM, TOTAL	**73.74**	mg/L	13.2	16.5	10.2	8.9	15.7	10.0	0.10	12.5	21.3	0.86
CHLORIDE	**30.97**	mg/L	22.7	22.3	26.3	20.3	57.1	35.9	235	42.7	137	95.9
IRON, TOTAL	**0.185**	mg/L				0.030	0.030				0.140	
MAGNESIUM, DISSOLVED	**10.84**	mg/L	10.5	8.8	13.7	10.3	8.6	5.5		6.2	15.9	0.12
MAGNESIUM, TOTAL	**10.17**	mg/L	10.1	8.6	13.5	10.5	8.2	5.4		6.1	14.7	0.12
MANGANESE, DISSOLVED	**0.531**	mg/L	0.030	0.030	0.130	0.100	0.200	0.410		0.010	0.090	
MANGANESE, TOTAL	**0.329**	mg/L	0.020	0.030	0.130	0.110	0.190	0.410		0.010	0.090	
NITRATE-NITROGEN	**28.82**	mg/L	19.4	18.7	20.0	14.5	10.4		6.6	4.9	13.2	5.7
pH-LAB	**NA**	S.U.	6.20	6.13	5.18	5.39	6.16	6.67	7.24	6.18	5.96	7.40
POTASSIUM, DISSOLVED	**1.685**	mg/L	1.6	1.8	2.1	1.9	3.5	2.1	1.9	1.5	2.0	3.1
POTASSIUM, TOTAL	**10.69**	mg/L	1.6	1.7	2.1	2.0	3.4	2.0	2.0	1.5	2.0	3.2
SODIUM, DISSOLVED	**21.81**	mg/L	8.5	8.0	8.7	8.1	25.9	14.5	216	18.4	56.5	161
SODIUM, TOTAL	**22.3**	mg/L	8.2	7.8	8.4	9.0	24.6	14.3	198	17.1	54.5	158
SPEC. COND., LAB	**582.1**	µmhos/cm	213	211	237	187	291	181	1,090	212	546	723
SULFATE	**59.97**	mg/L		2.1		9.3	12.7	15.4		14.5	8.5	13.7
TDS (TOT. DISSOLVED SOLIDS)	**338.6**	mg/L	164	153	186	152	188	111	602	133	347	411
TOC (TOTAL ORGANIC CARBON)	**1.06**	mg/L					0.75				0.68	1.10
TURBIDITY	**1.792**	NTU	0.17	0.20	0.17	0.57	0.21	0.18	0.12	0.11	0.18	0.15

Notes:
Blank cells indicate parameter not detected by laboratory.
Shaded text indicates exceedance of a FFLF statistical background standard.

ATTACHMENT 1

BACKGROUND UPPER PREDICTION LIMITS

LCSWMA Frey Farm Landfill 3rd Quarter 2019 - Background Upper Prediction Limits (MP-2)			
Parameter	**Distribution**	**Upper Prediction Limit**	**Unit**
1,1,1-Trichloroethane	NA	1*	µg/L
1,1-Dichloroethane	NA	1*	µg/L
1,1-Dichloroethene	NA	1*	µg/L
1,2-Dibromoethane	NA	1*	µg/L
1,2-Dichloroethane	NA	1*	µg/L
Alkalinity	No Distribution	147.9	mg/L
Ammonia-Nitrogen	Normal	0.313	mg/L
Benzene	NA	1*	µg/L
Bicarbonate Alkalinity	No Distribution	143.2	mg/L
Calcium, Dissolved	Normal	28.22	mg/L
Calcium, Total	No Distribution	73.74	mg/L
Chloride	Normal	30.97	mg/L
Cis 1,2-Dichloroethene	NA	1*	µg/L
Chemical Oxygen Demand	NA	15*	mg/L
Ethylbenzene	NA	1*	µg/L
Fluoride	No Distribution	0.5	mg/L
Iron, Dissolved	NA	0.066*	mg/L
Iron, Total	Lognormal	0.185	mg/L
Magnesium, Dissolved	Normal	10.84	mg/L
Magnesium, Total	Normal	10.17	mg/L
Manganese, Dissolved	Gamma	0.531	mg/L
Manganese, Total	Normal	0.329	mg/L
Methylene Chloride	NA	1*	µg/L
Nitrate-Nitrogen	No Distribution	28.82	mg/L
pH-Lab	NA	None**	S.U.
Potassium, Dissolved	Normal	1.685	mg/L
Potassium, Total	No Distribution	10.69	mg/L
Sodium, Dissolved	Normal	21.81	mg/L
Sodium, Total	Normal	22.3	mg/L
Spec. Cond., Lab	No Distribution	582.1	µmhos/cm
Sulfate	No Distribution	59.97	mg/L
Total Dissolved Solids	Normal	338.6	mg/L
Tetrachloroethene	NA	1*	µg/L
Total Organic Carbon	Normal	1.06	mg/L
Toluene	NA	1*	µg/L
Total Phenolics	NA	0.005*	mg/L
Trans 1,2-Dichloroethene	NA	1*	µg/L
Trichloroethene	NA	1*	µg/L
Turbidity	Lognormal	1.792	NTU
Vinyl Chloride	NA	1*	µg/L
Total Xylenes	NA	3*	µg/L

Notes:

"NA" denotes parameter not detected or not enough detections in MP-2 over course of historical data to develop tolerance limits.

* Reporting limit substituted for background standard due to lack of historical detections.

** One-sided background standards are not appropriate for pH. Other analysis used in report.

ATTACHMENT 2

STATISTICAL CALCULATION SHEETS

1				Background Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3		Date/Time of Computation		ProUCL 5.11/2/2020 10:48:13 AM								
4		From File		MP-2 ProUCL Entry.xls								
5		Full Precision		OFF								
6		Confidence Coefficient		95%								
7		Coverage		95%								
8		Different or Future K Observations		1								
9		Number of Bootstrap Operations		2000								
10												
11	1,1,1-TRICHLOROETHANE (ug/L)											
12												
13					General Statistics							
14				Total Number of Observations	43			Number of Missing Observations	0			
15				Number of Distinct Observations	1							
16				Number of Detects	0			Number of Non-Detects	43			
17				Number of Distinct Detects	0			Number of Distinct Non-Detects	1			
18				Minimum Detect	N/A			Minimum Non-Detect	1			
19				Maximum Detect	N/A			Maximum Non-Detect	1			
20				Variance Detected	N/A			Percent Non-Detects	100%			
21				Mean Detected	N/A			SD Detected	N/A			
22				Mean of Detected Logged Data	N/A			SD of Detected Logged Data	N/A			
23												
24				Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!								
25				Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!								
26				The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).								
27												
28				The data set for variable 1,1,1-TRICHLOROETHANE (ug/L) was not processed!								
29												
30												
31	1,1-DICHLOROETHANE (ug/L)											
32												
33					General Statistics							
34				Total Number of Observations	43			Number of Missing Observations	0			
35				Number of Distinct Observations	1							
36				Number of Detects	0			Number of Non-Detects	43			
37				Number of Distinct Detects	0			Number of Distinct Non-Detects	1			
38				Minimum Detect	N/A			Minimum Non-Detect	1			
39				Maximum Detect	N/A			Maximum Non-Detect	1			
40				Variance Detected	N/A			Percent Non-Detects	100%			
41				Mean Detected	N/A			SD Detected	N/A			
42				Mean of Detected Logged Data	N/A			SD of Detected Logged Data	N/A			
43												
44				Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!								
45				Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!								
46				The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).								
47												
48				The data set for variable 1,1-DICHLOROETHANE (ug/L) was not processed!								
49												
50												

	A	B	C	D	E	F	G	H	I	J	K	L
51	**1,1-DICHLOROETHENE (ug/L)**											
52												
53	**General Statistics**											
54	Total Number of Observations					43	Number of Missing Observations					0
55	Number of Distinct Observations					1						
56	Number of Detects					0	Number of Non-Detects					43
57	Number of Distinct Detects					0	Number of Distinct Non-Detects					1
58	Minimum Detect					N/A	Minimum Non-Detect					1
59	Maximum Detect					N/A	Maximum Non-Detect					1
60	Variance Detected					N/A	Percent Non-Detects					100%
61	Mean Detected					N/A	SD Detected					N/A
62	Mean of Detected Logged Data					N/A	SD of Detected Logged Data					N/A
63												
64	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
65	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
66	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
67												
68	**The data set for variable 1,1-DICHLOROETHENE (ug/L) was not processed!**											
69												
70												
71	**1,2-DIBROMOETHANE (ug/L)**											
72												
73	**General Statistics**											
74	Total Number of Observations					43	Number of Missing Observations					0
75	Number of Distinct Observations					1						
76	Number of Detects					0	Number of Non-Detects					43
77	Number of Distinct Detects					0	Number of Distinct Non-Detects					1
78	Minimum Detect					N/A	Minimum Non-Detect					1
79	Maximum Detect					N/A	Maximum Non-Detect					1
80	Variance Detected					N/A	Percent Non-Detects					100%
81	Mean Detected					N/A	SD Detected					N/A
82	Mean of Detected Logged Data					N/A	SD of Detected Logged Data					N/A
83												
84	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
85	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
86	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
87												
88	**The data set for variable 1,2-DIBROMOETHANE (ug/L) was not processed!**											
89												
90												
91	**1,2-DICHLOROETHANE**											
92												
93	**General Statistics**											
94	Total Number of Observations					43	Number of Missing Observations					0
95	Number of Distinct Observations					1						
96	Number of Detects					0	Number of Non-Detects					43
97	Number of Distinct Detects					0	Number of Distinct Non-Detects					1
98	Minimum Detect					N/A	Minimum Non-Detect					1
99	Maximum Detect					N/A	Maximum Non-Detect					1
100	Variance Detected					N/A	Percent Non-Detects					100%

101					Mean Detected	N/A					SD Detected	N/A
102					Mean of Detected Logged Data	N/A					SD of Detected Logged Data	N/A
103												
104	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
105	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
106	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
107												
108	**The data set for variable 1,2-DICHLOROETHANE was not processed!**											
109												
110												
111	**ALKALINITY (mg/L)**											
112												
113	**General Statistics**											
114					Total Number of Observations	42					Number of Missing Observations	0
115					Number of Distinct Observations	14						
116					Number of Detects	20					Number of Non-Detects	22
117					Number of Distinct Detects	14					Number of Distinct Non-Detects	1
118					Minimum Detect	5					Minimum Non-Detect	5
119					Maximum Detect	182					Maximum Non-Detect	5
120					Variance Detected	3029					Percent Non-Detects	52.38%
121					Mean Detected	42.2					SD Detected	55.03
122					Mean of Detected Logged Data	2.904					SD of Detected Logged Data	1.329
123												
124	**Critical Values for Background Threshold Values (BTVs)**											
125					Tolerance Factor K (For UTL)	2.104					d2max (for USL)	2.887
126												
127	**Normal GOF Test on Detects Only**											
128					Shapiro Wilk Test Statistic	0.725	**Shapiro Wilk GOF Test**					
129					5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level					
130					Lilliefors Test Statistic	0.283	**Lilliefors GOF Test**					
131					5% Lilliefors Critical Value	0.192	Data Not Normal at 5% Significance Level					
132	**Data Not Normal at 5% Significance Level**											
133												
134	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
135					KM Mean	22.71					KM SD	41.42
136					95% UTL95% Coverage	109.8					95% KM UPL (t)	93.24
137					90% KM Percentile (z)	75.79					95% KM Percentile (z)	90.84
138					99% KM Percentile (z)	119.1					95% KM USL	142.3
139												
140	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
141					Mean	21.4					SD	42.5
142					95% UTL95% Coverage	110.8					95% UPL (t)	93.77
143					90% Percentile (z)	75.87					95% Percentile (z)	91.31
144					99% Percentile (z)	120.3					95% USL	144.1
145	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
146												
147	**Gamma GOF Tests on Detected Observations Only**											
148					A-D Test Statistic	1.479	**Anderson-Darling GOF Test**					
149					5% A-D Critical Value	0.782	Data Not Gamma Distributed at 5% Significance Level					
150					K-S Test Statistic	0.263	**Kolmogorov-Smirnov GOF**					

151				5% K-S Critical Value	0.202	Data Not Gamma Distributed at 5% Significance Level						
152	**Data Not Gamma Distributed at 5% Significance Level**											
153												
154	**Gamma Statistics on Detected Data Only**											
155				k hat (MLE)	0.718				k star (bias corrected MLE)	0.644		
156				Theta hat (MLE)	58.77				Theta star (bias corrected MLE)	65.56		
157				nu hat (MLE)	28.72				nu star (bias corrected)	25.75		
158				MLE Mean (bias corrected)	42.2							
159				MLE Sd (bias corrected)	52.6				95% Percentile of Chisquare (2kstar)	4.516		
160												
161	**Gamma ROS Statistics using Imputed Non-Detects**											
162	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
163	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
164	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
165	This is especially true when the sample size is small.											
166	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
167				Minimum	0.01				Mean	20.1		
168				Maximum	182				Median	0.01		
169				SD	43.11				CV	2.145		
170				k hat (MLE)	0.185				k star (bias corrected MLE)	0.188		
171				Theta hat (MLE)	108.7				Theta star (bias corrected MLE)	107.2		
172				nu hat (MLE)	15.53				nu star (bias corrected)	15.75		
173				MLE Mean (bias corrected)	20.1				MLE Sd (bias corrected)	46.42		
174				95% Percentile of Chisquare (2kstar)	1.964				90% Percentile	60.72		
175				95% Percentile	105.3				99% Percentile	229.3		
176	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
177	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
178					WH	HW				WH	HW	
179				95% Approx. Gamma UTL with 95% Coverage	122.8	146			95% Approx. Gamma UPL	79.98	85.81	
180				95% Gamma USL	246	349.2						
181												
182	**Estimates of Gamma Parameters using KM Estimates**											
183				Mean (KM)	22.71				SD (KM)	41.42		
184				Variance (KM)	1715				SE of Mean (KM)	6.557		
185				k hat (KM)	0.301				k star (KM)	0.295		
186				nu hat (KM)	25.27				nu star (KM)	24.8		
187				theta hat (KM)	75.51				theta star (KM)	76.95		
188				80% gamma percentile (KM)	34.69				90% gamma percentile (KM)	67.12		
189				95% gamma percentile (KM)	104.4				99% gamma percentile (KM)	201.6		
190												
191	**The following statistics are computed using gamma distribution and KM estimates**											
192	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
193					WH	HW				WH	HW	
194				95% Approx. Gamma UTL with 95% Coverage	97.28	96.11			95% Approx. Gamma UPL	71.83	68.97	
195				95% KM Gamma Percentile	68.57	65.59			95% Gamma USL	163.1	171.5	
196												
197	**Lognormal GOF Test on Detected Observations Only**											
198				Shapiro Wilk Test Statistic	0.844	**Shapiro Wilk GOF Test**						
199				5% Shapiro Wilk Critical Value	0.905	Data Not Lognormal at 5% Significance Level						
200				Lilliefors Test Statistic	0.225	**Lilliefors GOF Test**						

201	5% Lilliefors Critical Value					0.192	Data Not Lognormal at 5% Significance Level					
202	**Data Not Lognormal at 5% Significance Level**											
203												
204	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
205	Mean in Original Scale					20.51	Mean in Log Scale					0.936
206	SD in Original Scale					42.92	SD in Log Scale					2.314
207	95% UTL95% Coverage					331.6	95% BCA UTL95% Coverage					178.6
208	95% Bootstrap (%) UTL95% Coverage					178.6	95% UPL (t)					131.2
209	90% Percentile (z)					49.49	95% Percentile (z)					114.7
210	99% Percentile (z)					555.3	95% USL					2035
211												
212	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
213	KM Mean of Logged Data					2.226	95% KM UTL (Lognormal)95% Coverage					94.26
214	KM SD of Logged Data					1.103	95% KM UPL (Lognormal)					60.58
215	95% KM Percentile Lognormal (z)					56.83	95% KM USL (Lognormal)					223.8
216												
217	**Background DL/2 Statistics Assuming Lognormal Distribution**											
218	Mean in Original Scale					21.4	Mean in Log Scale					1.863
219	SD in Original Scale					42.5	SD in Log Scale					1.352
220	95% UTL95% Coverage					110.7	95% UPL (t)					64.37
221	90% Percentile (z)					36.42	95% Percentile (z)					59.52
222	99% Percentile (z)					149.6	95% USL					319.3
223	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
224												
225	**Nonparametric Distribution Free Background Statistics**											
226	**Data do not follow a Discernible Distribution (0.05)**											
227												
228	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
229	Order of Statistic, r					42	95% UTL with95% Coverage					182
230	Approx, f used to compute achieved CC					2.211	Approximate Actual Confidence Coefficient achieved by UTL					0.884
231	Approximate Sample Size needed to achieve specified CC					59	95% UPL					147.9
232	95% USL					182	95% KM Chebyshev UPL					205.4
233												
234	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
235	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
236	and consists of observations collected from clean unimpacted locations.											
237	The use of USL tends to provide a balance between false positives and false negatives provided the data											
238	represents a background data set and when many onsite observations need to be compared with the BTV.											
239												
240	**AMMONIA-NITROGEN (mg/L)**											
241												
242	**General Statistics**											
243	Total Number of Observations					43	Number of Missing Observations					0
244	Number of Distinct Observations					7						
245	Number of Detects					7	Number of Non-Detects					36
246	Number of Distinct Detects					7	Number of Distinct Non-Detects					1
247	Minimum Detect					0.1	Minimum Non-Detect					0.1
248	Maximum Detect					0.63	Maximum Non-Detect					0.1
249	Variance Detected					0.0395	Percent Non-Detects					83.72%
250	Mean Detected					0.304	SD Detected					0.199

	A	B	C	D	E	F	G	H	I	J	K	L
251	Mean of Detected Logged Data					-1.389	SD of Detected Logged Data					0.699
252												
253	**Critical Values for Background Threshold Values (BTVs)**											
254	Tolerance Factor K (For UTL)					2.097	d2max (for USL)					2.897
255												
256	**Normal GOF Test on Detects Only**											
257	Shapiro Wilk Test Statistic					0.904	**Shapiro Wilk GOF Test**					
258	5% Shapiro Wilk Critical Value					0.803	Detected Data appear Normal at 5% Significance Level					
259	Lilliefors Test Statistic					0.254	**Lilliefors GOF Test**					
260	5% Lilliefors Critical Value					0.304	Detected Data appear Normal at 5% Significance Level					
261	**Detected Data appear Normal at 5% Significance Level**											
262												
263	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
264	KM Mean					0.133	KM SD					0.106
265	95% UTL95% Coverage					0.355	95% KM UPL (t)					0.313
266	90% KM Percentile (z)					0.269	95% KM Percentile (z)					0.307
267	99% KM Percentile (z)					0.379	95% KM USL					0.44
268												
269	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
270	Mean					0.0914	SD					0.121
271	95% UTL95% Coverage					0.345	95% UPL (t)					0.297
272	90% Percentile (z)					0.247	95% Percentile (z)					0.291
273	99% Percentile (z)					0.373	95% USL					0.442
274	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
275												
276	**Gamma GOF Tests on Detected Observations Only**											
277	A-D Test Statistic					0.319	**Anderson-Darling GOF Test**					
278	5% A-D Critical Value					0.713	Detected data appear Gamma Distributed at 5% Significance Level					
279	K-S Test Statistic					0.212	**Kolmogorov-Smirnov GOF**					
280	5% K-S Critical Value					0.314	Detected data appear Gamma Distributed at 5% Significance Level					
281	**Detected data appear Gamma Distributed at 5% Significance Level**											
282												
283	**Gamma Statistics on Detected Data Only**											
284	k hat (MLE)					2.665	k star (bias corrected MLE)					1.618
285	Theta hat (MLE)					0.114	Theta star (bias corrected MLE)					0.188
286	nu hat (MLE)					37.3	nu star (bias corrected)					22.65
287	MLE Mean (bias corrected)					0.304						
288	MLE Sd (bias corrected)					0.239	95% Percentile of Chisquare (2kstar)					8.22
289												
290	**Gamma ROS Statistics using Imputed Non-Detects**											
291	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
292	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
293	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
294	This is especially true when the sample size is small.											
295	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
296	Minimum					0.01	Mean					0.0579
297	Maximum					0.63	Median					0.01
298	SD					0.133	CV					2.299
299	k hat (MLE)					0.513	k star (bias corrected MLE)					0.493
300	Theta hat (MLE)					0.113	Theta star (bias corrected MLE)					0.117

	A	B	C	D	E	F	G	H	I	J	K	L
301					nu hat (MLE)	44.14				nu star (bias corrected)		42.39
302					MLE Mean (bias corrected)	0.0579				MLE Sd (bias corrected)		0.0825
303					95% Percentile of Chisquare (2kstar)	3.806				90% Percentile		0.157
304					95% Percentile	0.224				99% Percentile		0.387
305	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
306	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
307					WH	HW					WH	HW
308	95% Approx. Gamma UTL with 95% Coverage				0.264	0.253	95% Approx. Gamma UPL				0.189	0.176
309	95% Gamma USL				0.469	0.486						
310												
311	**Estimates of Gamma Parameters using KM Estimates**											
312					Mean (KM)	0.133				SD (KM)		0.106
313					Variance (KM)	0.0112				SE of Mean (KM)		0.0174
314					k hat (KM)	1.586				k star (KM)		1.491
315					nu hat (KM)	136.4				nu star (KM)		128.2
316					theta hat (KM)	0.084				theta star (KM)		0.0894
317					80% gamma percentile (KM)	0.206				90% gamma percentile (KM)		0.278
318					95% gamma percentile (KM)	0.348				99% gamma percentile (KM)		0.505
319												
320	**The following statistics are computed using gamma distribution and KM estimates**											
321	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
322					WH	HW					WH	HW
323	95% Approx. Gamma UTL with 95% Coverage				0.308	0.302	95% Approx. Gamma UPL				0.263	0.257
324	95% KM Gamma Percentile				0.257	0.251	95% Gamma USL				0.412	0.409
325												
326	**Lognormal GOF Test on Detected Observations Only**											
327					Shapiro Wilk Test Statistic	0.935	**Shapiro Wilk GOF Test**					
328					5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level					
329					Lilliefors Test Statistic	0.19	**Lilliefors GOF Test**					
330					5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level					
331	**Detected Data appear Lognormal at 5% Significance Level**											
332												
333	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
334					Mean in Original Scale	0.065				Mean in Log Scale		-4.229
335					SD in Original Scale	0.132				SD in Log Scale		1.853
336					95% UTL95% Coverage	0.709				95% BCA UTL95% Coverage		0.588
337					95% Bootstrap (%) UTL95% Coverage	0.613				95% UPL (t)		0.341
338					90% Percentile (z)	0.157				95% Percentile (z)		0.307
339					99% Percentile (z)	1.085				95% USL		3.122
340												
341	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
342					KM Mean of Logged Data	-2.154				95% KM UTL (Lognormal)95% Coverage		0.284
343					KM SD of Logged Data	0.426				95% KM UPL (Lognormal)		0.24
344					95% KM Percentile Lognormal (z)	0.234				95% KM USL (Lognormal)		0.399
345												
346	**Background DL/2 Statistics Assuming Lognormal Distribution**											
347					Mean in Original Scale	0.0914				Mean in Log Scale		-2.734
348					SD in Original Scale	0.121				SD in Log Scale		0.656
349					95% UTL95% Coverage	0.257				95% UPL (t)		0.198
350					90% Percentile (z)	0.15				95% Percentile (z)		0.191

351					99% Percentile (z)	0.299					95% USL	0.434
352	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
353												
354	**Nonparametric Distribution Free Background Statistics**											
355	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
356												
357	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
358					Order of Statistic, r	43					95% UTL with95% Coverage	0.63
359					Approx, f used to compute achieved CC	2.263					Approximate Actual Confidence Coefficient achieved by UTL	0.89
360					Approximate Sample Size needed to achieve specified CC	59					95% UPL	0.45
361					95% USL	0.63					95% KM Chebyshev UPL	0.6
362												
363	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
364	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
365	and consists of observations collected from clean unimpacted locations.											
366	The use of USL tends to provide a balance between false positives and false negatives provided the data											
367	represents a background data set and when many onsite observations need to be compared with the BTV.											
368												
369	**BENZENE (ug/L)**											
370												
371	**General Statistics**											
372					Total Number of Observations	43					Number of Missing Observations	0
373					Number of Distinct Observations	1						
374					Number of Detects	0					Number of Non-Detects	43
375					Number of Distinct Detects	0					Number of Distinct Non-Detects	1
376					Minimum Detect	N/A					Minimum Non-Detect	1
377					Maximum Detect	N/A					Maximum Non-Detect	1
378					Variance Detected	N/A					Percent Non-Detects	100%
379					Mean Detected	N/A					SD Detected	N/A
380					Mean of Detected Logged Data	N/A					SD of Detected Logged Data	N/A
381												
382	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
383	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
384	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
385												
386	**The data set for variable BENZENE (ug/L) was not processed!**											
387												
388												
389	**BICARBONATE ALKALINITY (mg/L)**											
390												
391	**General Statistics**											
392					Total Number of Observations	43					Number of Missing Observations	0
393					Number of Distinct Observations	14						
394					Number of Detects	20					Number of Non-Detects	23
395					Number of Distinct Detects	14					Number of Distinct Non-Detects	1
396					Minimum Detect	5					Minimum Non-Detect	5
397					Maximum Detect	182					Maximum Non-Detect	5
398					Variance Detected	2624					Percent Non-Detects	53.49%
399					Mean Detected	36.65					SD Detected	51.23
400					Mean of Detected Logged Data	2.823					SD of Detected Logged Data	1.241

401												
402	**Critical Values for Background Threshold Values (BTVs)**											
403					Tolerance Factor K (For UTL)	2.097			d2max (for USL)	2.897		
404												
405	**Normal GOF Test on Detects Only**											
406					Shapiro Wilk Test Statistic	0.673	**Shapiro Wilk GOF Test**					
407					5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level					
408					Lilliefors Test Statistic	0.268	**Lilliefors GOF Test**					
409					5% Lilliefors Critical Value	0.192	Data Not Normal at 5% Significance Level					
410	**Data Not Normal at 5% Significance Level**											
411												
412	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
413					KM Mean	19.72			KM SD	37.53		
414					95% UTL95% Coverage	98.43			95% KM UPL (t)	83.58		
415					90% KM Percentile (z)	67.82			95% KM Percentile (z)	81.46		
416					99% KM Percentile (z)	107			95% KM USL	128.5		
417												
418	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
419					Mean	18.38			SD	38.52		
420					95% UTL95% Coverage	99.18			95% UPL (t)	83.93		
421					90% Percentile (z)	67.76			95% Percentile (z)	81.75		
422					99% Percentile (z)	108			95% USL	130		
423	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
424												
425	**Gamma GOF Tests on Detected Observations Only**											
426					A-D Test Statistic	1.343	**Anderson-Darling GOF Test**					
427					5% A-D Critical Value	0.779	Data Not Gamma Distributed at 5% Significance Level					
428					K-S Test Statistic	0.251	**Kolmogorov-Smirnov GOF**					
429					5% K-S Critical Value	0.201	Data Not Gamma Distributed at 5% Significance Level					
430	**Data Not Gamma Distributed at 5% Significance Level**											
431												
432	**Gamma Statistics on Detected Data Only**											
433					k hat (MLE)	0.767			k star (bias corrected MLE)	0.685		
434					Theta hat (MLE)	47.81			Theta star (bias corrected MLE)	53.51		
435					nu hat (MLE)	30.66			nu star (bias corrected)	27.4		
436					MLE Mean (bias corrected)	36.65						
437					MLE Sd (bias corrected)	44.28			95% Percentile of Chisquare (2kstar)	4.699		
438												
439	**Gamma ROS Statistics using Imputed Non-Detects**											
440	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
441	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
442	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
443	This is especially true when the sample size is small.											
444	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
445					Minimum	0.01			Mean	17.05		
446					Maximum	182			Median	0.01		
447					SD	39.1			CV	2.293		
448					k hat (MLE)	0.187			k star (bias corrected MLE)	0.189		
449					Theta hat (MLE)	91.38			Theta star (bias corrected MLE)	90.18		
450					nu hat (MLE)	16.05			nu star (bias corrected)	16.26		

	A	B	C	D	E	F	G	H	I	J	K	L
451				MLE Mean (bias corrected)		17.05				MLE Sd (bias corrected)		39.21
452				95% Percentile of Chisquare (2kstar)		1.977				90% Percentile		51.52
453				95% Percentile		89.13				99% Percentile		193.6
454	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
455	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
456					WH	HW					WH	HW
457			95% Approx. Gamma UTL with 95% Coverage		102.6	121.4			95% Approx. Gamma UPL		67.15	71.87
458				95% Gamma USL	208.2	295						
459												
460	**Estimates of Gamma Parameters using KM Estimates**											
461				Mean (KM)		19.72				SD (KM)		37.53
462				Variance (KM)		1409				SE of Mean (KM)		5.872
463				k hat (KM)		0.276				k star (KM)		0.272
464				nu hat (KM)		23.74				nu star (KM)		23.42
465				theta hat (KM)		71.43				theta star (KM)		72.42
466				80% gamma percentile (KM)		29.45				90% gamma percentile (KM)		58.77
467				95% gamma percentile (KM)		93.01				99% gamma percentile (KM)		183.1
468												
469	**The following statistics are computed using gamma distribution and KM estimates**											
470	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
471					WH	HW					WH	HW
472			95% Approx. Gamma UTL with 95% Coverage		80.58	78.84			95% Approx. Gamma UPL		60.33	57.61
473				95% KM Gamma Percentile	57.75	54.96				95% Gamma USL	134.4	139.1
474												
475	**Lognormal GOF Test on Detected Observations Only**											
476				Shapiro Wilk Test Statistic		0.864	**Shapiro Wilk GOF Test**					
477				5% Shapiro Wilk Critical Value		0.905	Data Not Lognormal at 5% Significance Level					
478				Lilliefors Test Statistic		0.212	**Lilliefors GOF Test**					
479				5% Lilliefors Critical Value		0.192	Data Not Lognormal at 5% Significance Level					
480	**Data Not Lognormal at 5% Significance Level**											
481												
482	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
483				Mean in Original Scale		17.5				Mean in Log Scale		0.904
484				SD in Original Scale		38.91				SD in Log Scale		2.205
485				95% UTL95% Coverage		251.7				95% BCA UTL95% Coverage		154
486				95% Bootstrap (%) UTL95% Coverage		173.8				95% UPL (t)		105.2
487				90% Percentile (z)		41.68				95% Percentile (z)		92.84
488				99% Percentile (z)		417.1				95% USL		1468
489												
490	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
491				KM Mean of Logged Data		2.174				95% KM UTL (Lognormal)95% Coverage		75.16
492				KM SD of Logged Data		1.023				95% KM UPL (Lognormal)		50.13
493				95% KM Percentile Lognormal (z)		47.31				95% KM USL (Lognormal)		170.4
494												
495	**Background DL/2 Statistics Assuming Lognormal Distribution**											
496				Mean in Original Scale		18.38				Mean in Log Scale		1.803
497				SD in Original Scale		38.52				SD in Log Scale		1.274
498				95% UTL95% Coverage		87.75				95% UPL (t)		53
499				90% Percentile (z)		31.05				95% Percentile (z)		49.32
500				99% Percentile (z)		117.5				95% USL		243.1

501	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
502												
503	**Nonparametric Distribution Free Background Statistics**											
504	**Data do not follow a Discernible Distribution (0.05)**											
505												
506	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
507						Order of Statistic, r	43				95% UTL with95% Coverage	182
508						Approx, f used to compute achieved CC	2.263				Approximate Actual Confidence Coefficient achieved by UTL	0.89
509						Approximate Sample Size needed to achieve specified CC	59				95% UPL	143.2
510						95% USL	182				95% KM Chebyshev UPL	185.2
511												
512	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
513	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
514	and consists of observations collected from clean unimpacted locations.											
515	The use of USL tends to provide a balance between false positives and false negatives provided the data											
516	represents a background data set and when many onsite observations need to be compared with the BTV.											
517												
518	**CALCIUM, DISSOLVED (mg/L)**											
519												
520	**General Statistics**											
521						Total Number of Observations	10				Number of Distinct Observations	9
522						Minimum	18.3				First Quartile	21.3
523						Second Largest	26.1				Median	23.4
524						Maximum	26.6				Third Quartile	24.48
525						Mean	22.83				SD	2.803
526						Coefficient of Variation	0.123				Skewness	-0.371
527						Mean of logged Data	3.121				SD of logged Data	0.126
528												
529	**Critical Values for Background Threshold Values (BTVs)**											
530						Tolerance Factor K (For UTL)	2.911				d2max (for USL)	2.176
531												
532	**Normal GOF Test**											
533						Shapiro Wilk Test Statistic	0.945				**Shapiro Wilk GOF Test**	
534						5% Shapiro Wilk Critical Value	0.842				Data appear Normal at 5% Significance Level	
535						Lilliefors Test Statistic	0.167				**Lilliefors GOF Test**	
536						5% Lilliefors Critical Value	0.262				Data appear Normal at 5% Significance Level	
537	**Data appear Normal at 5% Significance Level**											
538												
539	**Background Statistics Assuming Normal Distribution**											
540						95% UTL with 95% Coverage	30.99				90% Percentile (z)	26.42
541						95% UPL (t)	28.22				95% Percentile (z)	27.44
542						95% USL	28.93				99% Percentile (z)	29.35
543												
544	**Gamma GOF Test**											
545						A-D Test Statistic	0.323				**Anderson-Darling Gamma GOF Test**	
546						5% A-D Critical Value	0.724				Detected data appear Gamma Distributed at 5% Significance Level	
547						K-S Test Statistic	0.184				**Kolmogorov-Smirnov Gamma GOF Test**	
548						5% K-S Critical Value	0.266				Detected data appear Gamma Distributed at 5% Significance Level	
549	**Detected data appear Gamma Distributed at 5% Significance Level**											
550												

551	**Gamma Statistics**											
552					k hat (MLE)	71.14			k star (bias corrected MLE)	49.87		
553					Theta hat (MLE)	0.321			Theta star (bias corrected MLE)	0.458		
554					nu hat (MLE)	1423			nu star (bias corrected)	997.4		
555					MLE Mean (bias corrected)	22.83			MLE Sd (bias corrected)	3.233		
556												
557	**Background Statistics Assuming Gamma Distribution**											
558				95% Wilson Hilferty (WH) Approx. Gamma UPL		28.64			90% Percentile	27.06		
559				95% Hawkins Wixley (HW) Approx. Gamma UPL		28.7			95% Percentile	28.39		
560				95% WH Approx. Gamma UTL with 95% Coverage		32.05			99% Percentile	31.02		
561				95% HW Approx. Gamma UTL with 95% Coverage		32.21						
562					95% WH USL	29.49			95% HW USL	29.58		
563												
564	**Lognormal GOF Test**											
565					Shapiro Wilk Test Statistic	0.933			**Shapiro Wilk Lognormal GOF Test**			
566					5% Shapiro Wilk Critical Value	0.842			Data appear Lognormal at 5% Significance Level			
567					Lilliefors Test Statistic	0.186			**Lilliefors Lognormal GOF Test**			
568					5% Lilliefors Critical Value	0.262			Data appear Lognormal at 5% Significance Level			
569	**Data appear Lognormal at 5% Significance Level**											
570												
571	**Background Statistics assuming Lognormal Distribution**											
572					95% UTL with 95% Coverage	32.75			90% Percentile (z)	26.65		
573					95% UPL (t)	28.9			95% Percentile (z)	27.91		
574					95% USL	29.84			99% Percentile (z)	30.42		
575												
576	**Nonparametric Distribution Free Background Statistics**											
577	**Data appear Normal at 5% Significance Level**											
578												
579	**Nonparametric Upper Limits for Background Threshold Values**											
580					Order of Statistic, r	10			95% UTL with 95% Coverage	26.6		
581					Approx, f used to compute achieved CC	0.526			Approximate Actual Confidence Coefficient achieved by UTL	0.401		
582									Approximate Sample Size needed to achieve specified CC	59		
583				95% Percentile Bootstrap UTL with 95% Coverage		26.6			95% BCA Bootstrap UTL with 95% Coverage	26.6		
584					95% UPL	26.6			90% Percentile	26.15		
585					90% Chebyshev UPL	31.65			95% Percentile	26.38		
586					95% Chebyshev UPL	35.64			99% Percentile	26.56		
587					95% USL	26.6						
588												
589	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
590	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
591	and consists of observations collected from clean unimpacted locations.											
592	The use of USL tends to provide a balance between false positives and false negatives provided the data											
593	represents a background data set and when many onsite observations need to be compared with the BTV.											
594												
595	**CALCIUM, TOTAL (mg/L)**											
596												
597	**General Statistics**											
598					Total Number of Observations	42			Number of Distinct Observations	37		
599					Minimum	18.9			First Quartile	21.45		
600					Second Largest	74.7			Median	23.15		

601					Maximum	93					Third Quartile	25.43
602					Mean	28.22					SD	15.53
603					Coefficient of Variation	0.55					Skewness	3.034
604					Mean of logged Data	3.256					SD of logged Data	0.362
605												
606	**Critical Values for Background Threshold Values (BTVs)**											
607					Tolerance Factor K (For UTL)	2.104					d2max (for USL)	2.887
608												
609	**Normal GOF Test**											
610					Shapiro Wilk Test Statistic	0.534	**Shapiro Wilk GOF Test**					
611					5% Shapiro Wilk Critical Value	0.942	Data Not Normal at 5% Significance Level					
612					Lilliefors Test Statistic	0.354	**Lilliefors GOF Test**					
613					5% Lilliefors Critical Value	0.135	Data Not Normal at 5% Significance Level					
614	**Data Not Normal at 5% Significance Level**											
615												
616	**Background Statistics Assuming Normal Distribution**											
617				95% UTL with	95% Coverage	60.88					90% Percentile (z)	48.12
618					95% UPL (t)	54.66					95% Percentile (z)	53.76
619					95% USL	73.05					99% Percentile (z)	64.34
620												
621	**Gamma GOF Test**											
622					A-D Test Statistic	6.01	**Anderson-Darling Gamma GOF Test**					
623					5% A-D Critical Value	0.751	Data Not Gamma Distributed at 5% Significance Level					
624					K-S Test Statistic	0.317	**Kolmogorov-Smirnov Gamma GOF Test**					
625					5% K-S Critical Value	0.137	Data Not Gamma Distributed at 5% Significance Level					
626	**Data Not Gamma Distributed at 5% Significance Level**											
627												
628	**Gamma Statistics**											
629					k hat (MLE)	6.101					k star (bias corrected MLE)	5.681
630					Theta hat (MLE)	4.625					Theta star (bias corrected MLE)	4.967
631					nu hat (MLE)	512.5					nu star (bias corrected)	477.2
632					MLE Mean (bias corrected)	28.22					MLE Sd (bias corrected)	11.84
633												
634	**Background Statistics Assuming Gamma Distribution**											
635				95% Wilson Hilferty (WH) Approx. Gamma UPL		50.15					90% Percentile	44.05
636				95% Hawkins Wixley (HW) Approx. Gamma UPL		49.61					95% Percentile	50.08
637				95% WH Approx. Gamma UTL with	95% Coverage	57.22					99% Percentile	62.75
638				95% HW Approx. Gamma UTL with	95% Coverage	56.79						
639					95% WH USL	72.91					95% HW USL	73.05
640												
641	**Lognormal GOF Test**											
642					Shapiro Wilk Test Statistic	0.666	**Shapiro Wilk Lognormal GOF Test**					
643					5% Shapiro Wilk Critical Value	0.942	Data Not Lognormal at 5% Significance Level					
644					Lilliefors Test Statistic	0.286	**Lilliefors Lognormal GOF Test**					
645					5% Lilliefors Critical Value	0.135	Data Not Lognormal at 5% Significance Level					
646	**Data Not Lognormal at 5% Significance Level**											
647												
648	**Background Statistics assuming Lognormal Distribution**											
649				95% UTL with	95% Coverage	55.58					90% Percentile (z)	41.26
650					95% UPL (t)	48.07					95% Percentile (z)	47.07

651					95% USL	73.83				99% Percentile (z)		60.25
652												
653	**Nonparametric Distribution Free Background Statistics**											
654	**Data do not follow a Discernible Distribution (0.05)**											
655												
656	**Nonparametric Upper Limits for Background Threshold Values**											
657					Order of Statistic, r	42				95% UTL with 95% Coverage		93
658					Approx, f used to compute achieved CC	2.211				Approximate Actual Confidence Coefficient achieved by UTL		0.884
659										Approximate Sample Size needed to achieve specified CC		59
660					95% Percentile Bootstrap UTL with 95% Coverage	92.08				95% BCA Bootstrap UTL with 95% Coverage		92.08
661					95% UPL	73.74				90% Percentile		34.81
662					90% Chebyshev UPL	75.35				95% Percentile		67.52
663					95% Chebyshev UPL	96.7				99% Percentile		85.5
664					95% USL	93						
665												
666	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
667	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
668	and consists of observations collected from clean unimpacted locations.											
669	The use of USL tends to provide a balance between false positives and false negatives provided the data											
670	represents a background data set and when many onsite observations need to be compared with the BTV.											
671												
672	**CHLORIDE (mg/L)**											
673												
674	**General Statistics**											
675					Total Number of Observations	43				Number of Distinct Observations		38
676					Minimum	19.6				First Quartile		22.5
677					Second Largest	34.3				Median		25.2
678					Maximum	34.5				Third Quartile		26.55
679					Mean	25.16				SD		3.416
680					Coefficient of Variation	0.136				Skewness		0.934
681					Mean of logged Data	3.217				SD of logged Data		0.131
682												
683	**Critical Values for Background Threshold Values (BTVs)**											
684					Tolerance Factor K (For UTL)	2.097				d2max (for USL)		2.897
685												
686	**Normal GOF Test**											
687					Shapiro Wilk Test Statistic	0.93				**Shapiro Wilk GOF Test**		
688					5% Shapiro Wilk Critical Value	0.943				Data Not Normal at 5% Significance Level		
689					Lilliefors Test Statistic	0.119				**Lilliefors GOF Test**		
690					5% Lilliefors Critical Value	0.134				Data appear Normal at 5% Significance Level		
691	**Data appear Approximate Normal at 5% Significance Level**											
692												
693	**Background Statistics Assuming Normal Distribution**											
694					95% UTL with 95% Coverage	32.32				90% Percentile (z)		29.54
695					95% UPL (t)	30.97				95% Percentile (z)		30.78
696					95% USL	35.05				99% Percentile (z)		33.11
697												
698	**Gamma GOF Test**											
699					A-D Test Statistic	0.508				**Anderson-Darling Gamma GOF Test**		
700					5% A-D Critical Value	0.747				Detected data appear Gamma Distributed at 5% Significance Level		

701					K-S Test Statistic	0.101	**Kolmogorov-Smirnov Gamma GOF Test**					
702					5% K-S Critical Value	0.134	Detected data appear Gamma Distributed at 5% Significance Level					
703	**Detected data appear Gamma Distributed at 5% Significance Level**											
704												
705	**Gamma Statistics**											
706					k hat (MLE)	58.69				k star (bias corrected MLE)	54.61	
707					Theta hat (MLE)	0.429				Theta star (bias corrected MLE)	0.461	
708					nu hat (MLE)	5047				nu star (bias corrected)	4697	
709					MLE Mean (bias corrected)	25.16				MLE Sd (bias corrected)	3.404	
710												
711	**Background Statistics Assuming Gamma Distribution**											
712					95% Wilson Hilferty (WH) Approx. Gamma UPL	31.08				90% Percentile	29.61	
713					95% Hawkins Wixley (HW) Approx. Gamma UPL	31.1				95% Percentile	31.01	
714					95% WH Approx. Gamma UTL with 95% Coverage	32.62				99% Percentile	33.75	
715					95% HW Approx. Gamma UTL with 95% Coverage	32.66						
716					95% WH USL	35.88				95% HW USL	36.01	
717												
718	**Lognormal GOF Test**											
719					Shapiro Wilk Test Statistic	0.96	**Shapiro Wilk Lognormal GOF Test**					
720					5% Shapiro Wilk Critical Value	0.943	Data appear Lognormal at 5% Significance Level					
721					Lilliefors Test Statistic	0.0959	**Lilliefors Lognormal GOF Test**					
722					5% Lilliefors Critical Value	0.134	Data appear Lognormal at 5% Significance Level					
723	**Data appear Lognormal at 5% Significance Level**											
724												
725	**Background Statistics assuming Lognormal Distribution**											
726					95% UTL with 95% Coverage	32.82				90% Percentile (z)	29.5	
727					95% UPL (t)	31.16				95% Percentile (z)	30.93	
728					95% USL	36.44				99% Percentile (z)	33.82	
729												
730	**Nonparametric Distribution Free Background Statistics**											
731	**Data appear Approximate Normal at 5% Significance Level**											
732												
733	**Nonparametric Upper Limits for Background Threshold Values**											
734					Order of Statistic, r	43				95% UTL with 95% Coverage	34.5	
735					Approx, f used to compute achieved CC	2.263				Approximate Actual Confidence Coefficient achieved by UTL	0.89	
736										Approximate Sample Size needed to achieve specified CC	59	
737					95% Percentile Bootstrap UTL with 95% Coverage	34.48				95% BCA Bootstrap UTL with 95% Coverage	34.31	
738					95% UPL	33.96				90% Percentile	28.54	
739					90% Chebyshev UPL	35.52				95% Percentile	32.35	
740					95% Chebyshev UPL	40.22				99% Percentile	34.42	
741					95% USL	34.5						
742												
743	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
744	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
745	and consists of observations collected from clean unimpacted locations.											
746	The use of USL tends to provide a balance between false positives and false negatives provided the data											
747	represents a background data set and when many onsite observations need to be compared with the BTV.											
748												
749	**CIS 1,2-DICHLOROETHENE (ug/L)**											
750												

	A	B	C	D	E	F	G	H	I	J	K	L
751	**General Statistics**											
752					Total Number of Observations	43				Number of Missing Observations		0
753					Number of Distinct Observations	1						
754					Number of Detects	0				Number of Non-Detects		43
755					Number of Distinct Detects	0				Number of Distinct Non-Detects		1
756					Minimum Detect	N/A				Minimum Non-Detect		1
757					Maximum Detect	N/A				Maximum Non-Detect		1
758					Variance Detected	N/A				Percent Non-Detects		100%
759					Mean Detected	N/A				SD Detected		N/A
760					Mean of Detected Logged Data	N/A				SD of Detected Logged Data		N/A
761												
762	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
763	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
764	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
765												
766	**The data set for variable CIS 1,2-DICHLOROETHENE (ug/L) was not processed!**											
767												
768												
769	**Chemical Oxygen Demand (mg/L)**											
770												
771	**General Statistics**											
772					Total Number of Observations	42				Number of Missing Observations		0
773					Number of Distinct Observations	3						
774					Number of Detects	0				Number of Non-Detects		42
775					Number of Distinct Detects	0				Number of Distinct Non-Detects		3
776					Minimum Detect	N/A				Minimum Non-Detect		5
777					Maximum Detect	N/A				Maximum Non-Detect		15
778					Variance Detected	N/A				Percent Non-Detects		100%
779					Mean Detected	N/A				SD Detected		N/A
780					Mean of Detected Logged Data	N/A				SD of Detected Logged Data		N/A
781												
782	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
783	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
784	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
785												
786	**The data set for variable Chemical Oxygen Demand (mg/L) was not processed!**											
787												
788												
789	**ETHYLBENZENE (mg/L)**											
790												
791	**General Statistics**											
792					Total Number of Observations	43				Number of Missing Observations		0
793					Number of Distinct Observations	1						
794					Number of Detects	0				Number of Non-Detects		43
795					Number of Distinct Detects	0				Number of Distinct Non-Detects		1
796					Minimum Detect	N/A				Minimum Non-Detect		1
797					Maximum Detect	N/A				Maximum Non-Detect		1
798					Variance Detected	N/A				Percent Non-Detects		100%
799					Mean Detected	N/A				SD Detected		N/A
800					Mean of Detected Logged Data	N/A				SD of Detected Logged Data		N/A

801											
802	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**										
803	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**										
804	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**										
805											
806	**The data set for variable ETHYLBENZENE (mg/L) was not processed!**										
807											
808											
809	**FLUORIDE (mg/L)**										
810											
811	**General Statistics**										
812	Total Number of Observations	42					Number of Missing Observations	0			
813	Number of Distinct Observations	7									
814	Number of Detects	15					Number of Non-Detects	27			
815	Number of Distinct Detects	6					Number of Distinct Non-Detects	2			
816	Minimum Detect	0.12					Minimum Non-Detect	0.2			
817	Maximum Detect	0.24					Maximum Non-Detect	0.5			
818	Variance Detected	0.00157					Percent Non-Detects	64.29%			
819	Mean Detected	0.157					SD Detected	0.0396			
820	Mean of Detected Logged Data	-1.881					SD of Detected Logged Data	0.237			
821											
822	**Critical Values for Background Threshold Values (BTVs)**										
823	Tolerance Factor K (For UTL)	2.104					d2max (for USL)	2.887			
824											
825	**Normal GOF Test on Detects Only**										
826	Shapiro Wilk Test Statistic	0.807					**Shapiro Wilk GOF Test**				
827	5% Shapiro Wilk Critical Value	0.881					Data Not Normal at 5% Significance Level				
828	Lilliefors Test Statistic	0.263					**Lilliefors GOF Test**				
829	5% Lilliefors Critical Value	0.22					Data Not Normal at 5% Significance Level				
830	**Data Not Normal at 5% Significance Level**										
831											
832	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**										
833	KM Mean	0.144					KM SD	0.0307			
834	95% UTL95% Coverage	0.208					95% KM UPL (t)	0.196			
835	90% KM Percentile (z)	0.183					95% KM Percentile (z)	0.194			
836	99% KM Percentile (z)	0.215					95% KM USL	0.232			
837											
838	**DL/2 Substitution Background Statistics Assuming Normal Distribution**										
839	Mean	0.163					SD	0.0649			
840	95% UTL95% Coverage	0.3					95% UPL (t)	0.274			
841	90% Percentile (z)	0.246					95% Percentile (z)	0.27			
842	99% Percentile (z)	0.314					95% USL	0.351			
843	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**										
844											
845	**Gamma GOF Tests on Detected Observations Only**										
846	A-D Test Statistic	1.282					**Anderson-Darling GOF Test**				
847	5% A-D Critical Value	0.735					Data Not Gamma Distributed at 5% Significance Level				
848	K-S Test Statistic	0.254					**Kolmogorov-Smirnov GOF**				
849	5% K-S Critical Value	0.221					Data Not Gamma Distributed at 5% Significance Level				
850	**Data Not Gamma Distributed at 5% Significance Level**										

	A	B	C	D	E	F	G	H	I	J	K	L
851												
852	**Gamma Statistics on Detected Data Only**											
853					k hat (MLE)	18.4			k star (bias corrected MLE)			14.76
854					Theta hat (MLE)	0.00852			Theta star (bias corrected MLE)			0.0106
855					nu hat (MLE)	551.9			nu star (bias corrected)			442.9
856					MLE Mean (bias corrected)	0.157						
857					MLE Sd (bias corrected)	0.0408			95% Percentile of Chisquare (2kstar)			43.19
858												
859	**Gamma ROS Statistics using Imputed Non-Detects**											
860	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
861	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
862	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
863	This is especially true when the sample size is small.											
864	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
865					Minimum	0.0931			Mean			0.146
866					Maximum	0.24			Median			0.14
867					SD	0.0324			CV			0.222
868					k hat (MLE)	22.23			k star (bias corrected MLE)			20.66
869					Theta hat (MLE)	0.00655			Theta star (bias corrected MLE)			0.00705
870					nu hat (MLE)	1868			nu star (bias corrected)			1736
871					MLE Mean (bias corrected)	0.146			MLE Sd (bias corrected)			0.032
872					95% Percentile of Chisquare (2kstar)	57.33			90% Percentile			0.188
873					95% Percentile	0.202			99% Percentile			0.23
874	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
875	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
876					WH	HW				WH	HW	
877				95% Approx. Gamma UTL with 95% Coverage	0.219	0.22			95% Approx. Gamma UPL	0.203	0.203	
878				95% Gamma USL	0.253	0.255						
879												
880	**Estimates of Gamma Parameters using KM Estimates**											
881					Mean (KM)	0.144			SD (KM)			0.0307
882					Variance (KM)	9.4031E-4			SE of Mean (KM)			0.00613
883					k hat (KM)	22			k star (KM)			20.45
884					nu hat (KM)	1848			nu star (KM)			1717
885					theta hat (KM)	0.00654			theta star (KM)			0.00703
886					80% gamma percentile (KM)	0.17			90% gamma percentile (KM)			0.186
887					95% gamma percentile (KM)	0.2			99% gamma percentile (KM)			0.228
888												
889	**The following statistics are computed using gamma distribution and KM estimates**											
890	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
891					WH	HW				WH	HW	
892				95% Approx. Gamma UTL with 95% Coverage	0.209	0.209			95% Approx. Gamma UPL	0.195	0.194	
893				95% KM Gamma Percentile	0.193	0.192			95% Gamma USL	0.238	0.239	
894												
895	**Lognormal GOF Test on Detected Observations Only**											
896					Shapiro Wilk Test Statistic	0.828			**Shapiro Wilk GOF Test**			
897					5% Shapiro Wilk Critical Value	0.881			Data Not Lognormal at 5% Significance Level			
898					Lilliefors Test Statistic	0.24			**Lilliefors GOF Test**			
899					5% Lilliefors Critical Value	0.22			Data Not Lognormal at 5% Significance Level			
900	**Data Not Lognormal at 5% Significance Level**											

901												
902	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
903					Mean in Original Scale	0.146				Mean in Log Scale	-1.945	
904					SD in Original Scale	0.0309				SD in Log Scale	0.199	
905					95% UTL95% Coverage	0.217				95% BCA UTL95% Coverage	0.2	
906					95% Bootstrap (%) UTL95% Coverage	0.238				95% UPL (t)	0.201	
907					90% Percentile (z)	0.185				95% Percentile (z)	0.198	
908					99% Percentile (z)	0.227				95% USL	0.254	
909												
910	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
911					KM Mean of Logged Data	-1.958				95% KM UTL (Lognormal)95% Coverage	0.209	
912					KM SD of Logged Data	0.186				95% KM UPL (Lognormal)	0.194	
913					95% KM Percentile Lognormal (z)	0.192				95% KM USL (Lognormal)	0.242	
914												
915	**Background DL/2 Statistics Assuming Lognormal Distribution**											
916					Mean in Original Scale	0.163				Mean in Log Scale	-1.89	
917					SD in Original Scale	0.0649				SD in Log Scale	0.395	
918					95% UTL95% Coverage	0.346				95% UPL (t)	0.296	
919					90% Percentile (z)	0.25				95% Percentile (z)	0.289	
920					99% Percentile (z)	0.378				95% USL	0.472	
921	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
922												
923	**Nonparametric Distribution Free Background Statistics**											
924	**Data do not follow a Discernible Distribution (0.05)**											
925												
926	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
927					Order of Statistic, r	42				95% UTL with95% Coverage	0.5	
928					Approx, f used to compute achieved CC	2.211				Approximate Actual Confidence Coefficient achieved by UTL	0.884	
929					Approximate Sample Size needed to achieve specified CC	59				95% UPL	0.5	
930					95% USL	0.5				95% KM Chebyshev UPL	0.279	
931												
932	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
933	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
934	and consists of observations collected from clean unimpacted locations.											
935	The use of USL tends to provide a balance between false positives and false negatives provided the data											
936	represents a background data set and when many onsite observations need to be compared with the BTV.											
937												
938	**IRON, DISSOLVED (mg/L)**											
939												
940	**General Statistics**											
941					Total Number of Observations	11				Number of Missing Observations	0	
942					Number of Distinct Observations	2						
943					Number of Detects	0				Number of Non-Detects	11	
944					Number of Distinct Detects	0				Number of Distinct Non-Detects	2	
945					Minimum Detect	N/A				Minimum Non-Detect	0.05	
946					Maximum Detect	N/A				Maximum Non-Detect	0.06	
947					Variance Detected	N/A				Percent Non-Detects	100%	
948					Mean Detected	N/A				SD Detected	N/A	
949					Mean of Detected Logged Data	N/A				SD of Detected Logged Data	N/A	
950												

951	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
952	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
953	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
954												
955	**The data set for variable IRON, DISSOLVED (mg/L) was not processed!**											
956												
957												
958	**IRON, TOTAL (mg/L)**											
959												
960	**General Statistics**											
961						Total Number of Observations	41			Number of Missing Observations	0	
962						Number of Distinct Observations	11					
963						Number of Detects	13			Number of Non-Detects	28	
964						Number of Distinct Detects	10			Number of Distinct Non-Detects	1	
965						Minimum Detect	0.07			Minimum Non-Detect	0.06	
966						Maximum Detect	0.37			Maximum Non-Detect	0.06	
967						Variance Detected	0.00866			Percent Non-Detects	68.29%	
968						Mean Detected	0.166			SD Detected	0.0931	
969						Mean of Detected Logged Data	-1.912			SD of Detected Logged Data	0.482	
970												
971	**Critical Values for Background Threshold Values (BTVs)**											
972						Tolerance Factor K (For UTL)	2.11			d2max (for USL)	2.878	
973												
974	**Normal GOF Test on Detects Only**											
975						Shapiro Wilk Test Statistic	0.783			**Shapiro Wilk GOF Test**		
976						5% Shapiro Wilk Critical Value	0.866			Data Not Normal at 5% Significance Level		
977						Lilliefors Test Statistic	0.303			**Lilliefors GOF Test**		
978						5% Lilliefors Critical Value	0.234			Data Not Normal at 5% Significance Level		
979	**Data Not Normal at 5% Significance Level**											
980												
981	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
982						KM Mean	0.0937			KM SD	0.0705	
983						95% UTL95% Coverage	0.242			95% KM UPL (t)	0.214	
984						90% KM Percentile (z)	0.184			95% KM Percentile (z)	0.21	
985						99% KM Percentile (z)	0.258			95% KM USL	0.297	
986												
987	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
988						Mean	0.0732			SD	0.0819	
989						95% UTL95% Coverage	0.246			95% UPL (t)	0.213	
990						90% Percentile (z)	0.178			95% Percentile (z)	0.208	
991						99% Percentile (z)	0.264			95% USL	0.309	
992	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
993												
994	**Gamma GOF Tests on Detected Observations Only**											
995						A-D Test Statistic	0.726			**Anderson-Darling GOF Test**		
996						5% A-D Critical Value	0.737			Detected data appear Gamma Distributed at 5% Significance Level		
997						K-S Test Statistic	0.267			**Kolmogorov-Smirnov GOF**		
998						5% K-S Critical Value	0.238			Data Not Gamma Distributed at 5% Significance Level		
999	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
1000												

1001	**Gamma Statistics on Detected Data Only**											
1002					k hat (MLE)	4.431			k star (bias corrected MLE)	3.46		
1003					Theta hat (MLE)	0.0375			Theta star (bias corrected MLE)	0.048		
1004					nu hat (MLE)	115.2			nu star (bias corrected)	89.95		
1005					MLE Mean (bias corrected)	0.166						
1006					MLE Sd (bias corrected)	0.0893			95% Percentile of Chisquare (2kstar)	13.95		
1007												
1008	**Gamma ROS Statistics using Imputed Non-Detects**											
1009	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1010	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
1011	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
1012	This is especially true when the sample size is small.											
1013	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1014					Minimum	0.01			Mean	0.0613		
1015					Maximum	0.37			Median	0.01		
1016					SD	0.0887			CV	1.446		
1017					k hat (MLE)	0.699			k star (bias corrected MLE)	0.664		
1018					Theta hat (MLE)	0.0877			Theta star (bias corrected MLE)	0.0923		
1019					nu hat (MLE)	57.31			nu star (bias corrected)	54.45		
1020					MLE Mean (bias corrected)	0.0613			MLE Sd (bias corrected)	0.0753		
1021					95% Percentile of Chisquare (2kstar)	4.607			90% Percentile	0.156		
1022					95% Percentile	0.213			99% Percentile	0.349		
1023	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
1024	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
1025						WH	HW			WH	HW	
1026					95% Approx. Gamma UTL with 95% Coverage	0.279	0.293		95% Approx. Gamma UPL	0.206	0.208	
1027					95% Gamma USL	0.462	0.522					
1028												
1029	**Estimates of Gamma Parameters using KM Estimates**											
1030					Mean (KM)	0.0937			SD (KM)	0.0705		
1031					Variance (KM)	0.00497			SE of Mean (KM)	0.0115		
1032					k hat (KM)	1.763			k star (KM)	1.651		
1033					nu hat (KM)	144.6			nu star (KM)	135.4		
1034					theta hat (KM)	0.0531			theta star (KM)	0.0567		
1035					80% gamma percentile (KM)	0.143			90% gamma percentile (KM)	0.191		
1036					95% gamma percentile (KM)	0.236			99% gamma percentile (KM)	0.339		
1037												
1038	**The following statistics are computed using gamma distribution and KM estimates**											
1039	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
1040						WH	HW			WH	HW	
1041					95% Approx. Gamma UTL with 95% Coverage	0.229	0.228		95% Approx. Gamma UPL	0.194	0.191	
1042					95% KM Gamma Percentile	0.189	0.186		95% Gamma USL	0.309	0.313	
1043												
1044	**Lognormal GOF Test on Detected Observations Only**											
1045					Shapiro Wilk Test Statistic	0.921			**Shapiro Wilk GOF Test**			
1046					5% Shapiro Wilk Critical Value	0.866			Detected Data appear Lognormal at 5% Significance Level			
1047					Lilliefors Test Statistic	0.237			**Lilliefors GOF Test**			
1048					5% Lilliefors Critical Value	0.234			Data Not Lognormal at 5% Significance Level			
1049	**Detected Data appear Approximate Lognormal at 5% Significance Level**											
1050												

1051	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
1052					Mean in Original Scale	0.0756				Mean in Log Scale		-3.056
1053					SD in Original Scale	0.0822				SD in Log Scale		1
1054					95% UTL95% Coverage	0.389				95% BCA UTL95% Coverage		0.35
1055					95% Bootstrap (%) UTL95% Coverage	0.37				95% UPL (t)		0.259
1056					90% Percentile (z)	0.17				95% Percentile (z)		0.244
1057					99% Percentile (z)	0.482				95% USL		0.837
1058												
1059	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
1060					KM Mean of Logged Data	-2.528				95% KM UTL (Lognormal)95% Coverage		0.226
1061					KM SD of Logged Data	0.494				95% KM UPL (Lognormal)		0.185
1062					95% KM Percentile Lognormal (z)	0.18				95% KM USL (Lognormal)		0.331
1063												
1064	**Background DL/2 Statistics Assuming Lognormal Distribution**											
1065					Mean in Original Scale	0.0732				Mean in Log Scale		-3.001
1066					SD in Original Scale	0.0819				SD in Log Scale		0.796
1067					95% UTL95% Coverage	0.267				95% UPL (t)		0.193
1068					90% Percentile (z)	0.138				95% Percentile (z)		0.184
1069					99% Percentile (z)	0.317				95% USL		0.492
1070	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
1071												
1072	**Nonparametric Distribution Free Background Statistics**											
1073	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1074												
1075	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
1076					Order of Statistic, r	41				95% UTL with95% Coverage		0.37
1077					Approx, f used to compute achieved CC	2.158				Approximate Actual Confidence Coefficient achieved by UTL		0.878
1078					Approximate Sample Size needed to achieve specified CC	59				95% UPL		0.335
1079					95% USL	0.37				95% KM Chebyshev UPL		0.405
1080												
1081	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1082	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1083	and consists of observations collected from clean unimpacted locations.											
1084	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1085	represents a background data set and when many onsite observations need to be compared with the BTV.											
1086												
1087	**MAGNESIUM, DISSOLVED (mg/L)**											
1088												
1089	**General Statistics**											
1090					Total Number of Observations	11				Number of Distinct Observations		9
1091					Minimum	7.4				First Quartile		8.8
1092					Second Largest	9.8				Median		9.3
1093					Maximum	10.7				Third Quartile		9.6
1094					Mean	9.191				SD		0.869
1095					Coefficient of Variation	0.0945				Skewness		-0.521
1096					Mean of logged Data	2.214				SD of logged Data		0.0975
1097												
1098	**Critical Values for Background Threshold Values (BTVs)**											
1099					Tolerance Factor K (For UTL)	2.815				d2max (for USL)		2.234
1100												

	A	B	C	D	E	F	G	H	I	J	K	L
1101	**Normal GOF Test**											
1102					Shapiro Wilk Test Statistic	0.955	**Shapiro Wilk GOF Test**					
1103					5% Shapiro Wilk Critical Value	0.85	Data appear Normal at 5% Significance Level					
1104					Lilliefors Test Statistic	0.151	**Lilliefors GOF Test**					
1105					5% Lilliefors Critical Value	0.251	Data appear Normal at 5% Significance Level					
1106	**Data appear Normal at 5% Significance Level**											
1107												
1108	**Background Statistics Assuming Normal Distribution**											
1109				95% UTL with	95% Coverage	11.64				90% Percentile (z)	10.3	
1110					95% UPL (t)	10.84				95% Percentile (z)	10.62	
1111					95% USL	11.13				99% Percentile (z)	11.21	
1112												
1113	**Gamma GOF Test**											
1114					A-D Test Statistic	0.371	**Anderson-Darling Gamma GOF Test**					
1115					5% A-D Critical Value	0.726	Detected data appear Gamma Distributed at 5% Significance Level					
1116					K-S Test Statistic	0.153	**Kolmogorov-Smirnov Gamma GOF Test**					
1117					5% K-S Critical Value	0.254	Detected data appear Gamma Distributed at 5% Significance Level					
1118	**Detected data appear Gamma Distributed at 5% Significance Level**											
1119												
1120	**Gamma Statistics**											
1121					k hat (MLE)	118.4				k star (bias corrected MLE)	86.19	
1122					Theta hat (MLE)	0.0776				Theta star (bias corrected MLE)	0.107	
1123					nu hat (MLE)	2605				nu star (bias corrected)	1896	
1124					MLE Mean (bias corrected)	9.191				MLE Sd (bias corrected)	0.99	
1125												
1126	**Background Statistics Assuming Gamma Distribution**											
1127					95% Wilson Hilferty (WH) Approx. Gamma UPL	10.94				90% Percentile	10.48	
1128					95% Hawkins Wixley (HW) Approx. Gamma UPL	10.96				95% Percentile	10.88	
1129				95% WH Approx. Gamma UTL with	95% Coverage	11.89				99% Percentile	11.65	
1130				95% HW Approx. Gamma UTL with	95% Coverage	11.92						
1131					95% WH USL	11.29				95% HW USL	11.31	
1132												
1133	**Lognormal GOF Test**											
1134					Shapiro Wilk Test Statistic	0.938	**Shapiro Wilk Lognormal GOF Test**					
1135					5% Shapiro Wilk Critical Value	0.85	Data appear Lognormal at 5% Significance Level					
1136					Lilliefors Test Statistic	0.159	**Lilliefors Lognormal GOF Test**					
1137					5% Lilliefors Critical Value	0.251	Data appear Lognormal at 5% Significance Level					
1138	**Data appear Lognormal at 5% Significance Level**											
1139												
1140	**Background Statistics assuming Lognormal Distribution**											
1141				95% UTL with	95% Coverage	12.04				90% Percentile (z)	10.37	
1142					95% UPL (t)	11.01				95% Percentile (z)	10.74	
1143					95% USL	11.38				99% Percentile (z)	11.48	
1144												
1145	**Nonparametric Distribution Free Background Statistics**											
1146	**Data appear Normal at 5% Significance Level**											
1147												
1148	**Nonparametric Upper Limits for Background Threshold Values**											
1149					Order of Statistic, r	11				95% UTL with 95% Coverage	10.7	
1150					Approx, f used to compute achieved CC	0.579	Approximate Actual Confidence Coefficient achieved by UTL				0.431	

1151							Approximate Sample Size needed to achieve specified CC					59
1152	95% Percentile Bootstrap UTL with 95% Coverage					10.7	95% BCA Bootstrap UTL with 95% Coverage					10.7
1153	95% UPL					10.7	90% Percentile					9.8
1154	90% Chebyshev UPL					11.91	95% Percentile					10.25
1155	95% Chebyshev UPL					13.15	99% Percentile					10.61
1156	95% USL					10.7						
1157												
1158	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1159	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1160	and consists of observations collected from clean unimpacted locations.											
1161	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1162	represents a background data set and when many onsite observations need to be compared with the BTV.											
1163												
1164	**MAGNESIUM, TOTAL (mg/L)**											
1165												
1166	**General Statistics**											
1167	Total Number of Observations					40	Number of Distinct Observations					21
1168	Minimum					7.6	First Quartile					8.5
1169	Second Largest					10.4	Median					9
1170	Maximum					10.6	Third Quartile					9.525
1171	Mean					9.018	SD					0.675
1172	Coefficient of Variation					0.0748	Skewness					0.122
1173	Mean of logged Data					2.196	SD of logged Data					0.075
1174												
1175	**Critical Values for Background Threshold Values (BTVs)**											
1176	Tolerance Factor K (For UTL)					2.117	d2max (for USL)					2.868
1177												
1178	**Normal GOF Test**											
1179	Shapiro Wilk Test Statistic					0.982	**Shapiro Wilk GOF Test**					
1180	5% Shapiro Wilk Critical Value					0.94	Data appear Normal at 5% Significance Level					
1181	Lilliefors Test Statistic					0.0853	**Lilliefors GOF Test**					
1182	5% Lilliefors Critical Value					0.139	Data appear Normal at 5% Significance Level					
1183	**Data appear Normal at 5% Significance Level**											
1184												
1185	**Background Statistics Assuming Normal Distribution**											
1186	95% UTL with 95% Coverage					10.45	90% Percentile (z)					9.882
1187	95% UPL (t)					10.17	95% Percentile (z)					10.13
1188	95% USL					10.95	99% Percentile (z)					10.59
1189												
1190	**Gamma GOF Test**											
1191	A-D Test Statistic					0.242	**Anderson-Darling Gamma GOF Test**					
1192	5% A-D Critical Value					0.747	Detected data appear Gamma Distributed at 5% Significance Level					
1193	K-S Test Statistic					0.0784	**Kolmogorov-Smirnov Gamma GOF Test**					
1194	5% K-S Critical Value					0.139	Detected data appear Gamma Distributed at 5% Significance Level					
1195	**Detected data appear Gamma Distributed at 5% Significance Level**											
1196												
1197	**Gamma Statistics**											
1198	k hat (MLE)					183	k star (bias corrected MLE)					169.3
1199	Theta hat (MLE)					0.0493	Theta star (bias corrected MLE)					0.0533
1200	nu hat (MLE)					14639	nu star (bias corrected)					13543

1201	MLE Mean (bias corrected)					9.018	MLE Sd (bias corrected)					0.693
1202												
1203	**Background Statistics Assuming Gamma Distribution**											
1204	95% Wilson Hilferty (WH) Approx. Gamma UPL					10.2	90% Percentile					9.916
1205	95% Hawkins Wixley (HW) Approx. Gamma UPL					10.21	95% Percentile					10.19
1206	95% WH Approx. Gamma UTL with 95% Coverage					10.51	99% Percentile					10.71
1207	95% HW Approx. Gamma UTL with 95% Coverage					10.51						
1208	95% WH USL					11.08	95% HW USL					11.09
1209												
1210	**Lognormal GOF Test**											
1211	Shapiro Wilk Test Statistic					0.983	**Shapiro Wilk Lognormal GOF Test**					
1212	5% Shapiro Wilk Critical Value					0.94	Data appear Lognormal at 5% Significance Level					
1213	Lilliefors Test Statistic					0.0739	**Lilliefors Lognormal GOF Test**					
1214	5% Lilliefors Critical Value					0.139	Data appear Lognormal at 5% Significance Level					
1215	**Data appear Lognormal at 5% Significance Level**											
1216												
1217	**Background Statistics assuming Lognormal Distribution**											
1218	95% UTL with 95% Coverage					10.54	90% Percentile (z)					9.9
1219	95% UPL (t)					10.22	95% Percentile (z)					10.17
1220	95% USL					11.15	99% Percentile (z)					10.71
1221												
1222	**Nonparametric Distribution Free Background Statistics**											
1223	**Data appear Normal at 5% Significance Level**											
1224												
1225	**Nonparametric Upper Limits for Background Threshold Values**											
1226	Order of Statistic, r					40	95% UTL with 95% Coverage					10.6
1227	Approx, f used to compute achieved CC					2.105	Approximate Actual Confidence Coefficient achieved by UTL					0.871
1228							Approximate Sample Size needed to achieve specified CC					59
1229	95% Percentile Bootstrap UTL with 95% Coverage					10.6	95% BCA Bootstrap UTL with 95% Coverage					10.6
1230	95% UPL					10.38	90% Percentile					9.71
1231	90% Chebyshev UPL					11.07	95% Percentile					10.02
1232	95% Chebyshev UPL					12	99% Percentile					10.52
1233	95% USL					10.6						
1234												
1235	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1236	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1237	and consists of observations collected from clean unimpacted locations.											
1238	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1239	represents a background data set and when many onsite observations need to be compared with the BTV.											
1240												
1241	**MANGANESE, DISSOLVED (mg/L)**											
1242												
1243	**General Statistics**											
1244	Total Number of Observations					11	Number of Distinct Observations					8
1245	Minimum					0.11	First Quartile					0.245
1246	Second Largest					0.32	Median					0.26
1247	Maximum					0.57	Third Quartile					0.31
1248	Mean					0.287	SD					0.111
1249	Coefficient of Variation					0.386	Skewness					1.494
1250	Mean of logged Data					-1.313	SD of logged Data					0.388

	A	B	C	D	E	F	G	H	I	J	K	L
1251												
1252	**Critical Values for Background Threshold Values (BTVs)**											
1253					Tolerance Factor K (For UTL)	2.815				d2max (for USL)		2.234
1254												
1255	**Normal GOF Test**											
1256					Shapiro Wilk Test Statistic	0.812	**Shapiro Wilk GOF Test**					
1257					5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level					
1258					Lilliefors Test Statistic	0.293	**Lilliefors GOF Test**					
1259					5% Lilliefors Critical Value	0.251	Data Not Normal at 5% Significance Level					
1260	**Data Not Normal at 5% Significance Level**											
1261												
1262	**Background Statistics Assuming Normal Distribution**											
1263				95% UTL with	95% Coverage	0.599				90% Percentile (z)		0.429
1264					95% UPL (t)	0.497				95% Percentile (z)		0.47
1265					95% USL	0.535				99% Percentile (z)		0.545
1266												
1267	**Gamma GOF Test**											
1268					A-D Test Statistic	0.786	**Anderson-Darling Gamma GOF Test**					
1269					5% A-D Critical Value	0.73	Data Not Gamma Distributed at 5% Significance Level					
1270					K-S Test Statistic	0.244	**Kolmogorov-Smirnov Gamma GOF Test**					
1271					5% K-S Critical Value	0.256	Detected data appear Gamma Distributed at 5% Significance Level					
1272	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
1273												
1274	**Gamma Statistics**											
1275					k hat (MLE)	7.82				k star (bias corrected MLE)		5.748
1276					Theta hat (MLE)	0.0367				Theta star (bias corrected MLE)		0.05
1277					nu hat (MLE)	172				nu star (bias corrected)		126.5
1278					MLE Mean (bias corrected)	0.287				MLE Sd (bias corrected)		0.12
1279												
1280	**Background Statistics Assuming Gamma Distribution**											
1281				95% Wilson Hilferty (WH) Approx. Gamma UPL		0.524				90% Percentile		0.448
1282				95% Hawkins Wixley (HW) Approx. Gamma UPL		0.531				95% Percentile		0.508
1283				95% WH Approx. Gamma UTL with	95% Coverage	0.686				99% Percentile		0.636
1284				95% HW Approx. Gamma UTL with	95% Coverage	0.708						
1285					95% WH USL	0.581				95% HW USL		0.592
1286												
1287	**Lognormal GOF Test**											
1288					Shapiro Wilk Test Statistic	0.856	**Shapiro Wilk Lognormal GOF Test**					
1289					5% Shapiro Wilk Critical Value	0.85	Data appear Lognormal at 5% Significance Level					
1290					Lilliefors Test Statistic	0.252	**Lilliefors Lognormal GOF Test**					
1291					5% Lilliefors Critical Value	0.251	Data Not Lognormal at 5% Significance Level					
1292	**Data appear Approximate Lognormal at 5% Significance Level**											
1293												
1294	**Background Statistics assuming Lognormal Distribution**											
1295				95% UTL with	95% Coverage	0.802				90% Percentile (z)		0.442
1296					95% UPL (t)	0.561				95% Percentile (z)		0.509
1297					95% USL	0.64				99% Percentile (z)		0.663
1298												
1299	**Nonparametric Distribution Free Background Statistics**											
1300	**Data appear Approximate Gamma Distribution at 5% Significance Level**											

	A	B	C	D	E	F	G	H	I	J	K	L
1301												
1302	**Nonparametric Upper Limits for Background Threshold Values**											
1303					Order of Statistic, r	11			95% UTL with 95% Coverage			0.57
1304					Approx, f used to compute achieved CC	0.579			Approximate Actual Confidence Coefficient achieved by UTL			0.431
1305									Approximate Sample Size needed to achieve specified CC			59
1306					95% Percentile Bootstrap UTL with 95% Coverage	0.57			95% BCA Bootstrap UTL with 95% Coverage			0.57
1307					95% UPL	0.57			90% Percentile			0.32
1308					90% Chebyshev UPL	0.635			95% Percentile			0.445
1309					95% Chebyshev UPL	0.792			99% Percentile			0.545
1310					95% USL	0.57						
1311												
1312	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1313	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1314	and consists of observations collected from clean unimpacted locations.											
1315	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1316	represents a background data set and when many onsite observations need to be compared with the BTV.											
1317												
1318	**MANGANESE, TOTAL (mg/L)**											
1319												
1320	**General Statistics**											
1321					Total Number of Observations	34			Number of Distinct Observations			11
1322					Minimum	0.23			First Quartile			0.26
1323					Second Largest	0.33			Median			0.27
1324					Maximum	0.34			Third Quartile			0.29
1325					Mean	0.279			SD			0.0297
1326					Coefficient of Variation	0.106			Skewness			0.552
1327					Mean of logged Data	-1.284			SD of logged Data			0.105
1328												
1329	**Critical Values for Background Threshold Values (BTVs)**											
1330					Tolerance Factor K (For UTL)	2.166			d2max (for USL)			2.799
1331												
1332	**Normal GOF Test**											
1333					Shapiro Wilk Test Statistic	0.928			**Shapiro Wilk GOF Test**			
1334					5% Shapiro Wilk Critical Value	0.933			Data Not Normal at 5% Significance Level			
1335					Lilliefors Test Statistic	0.146			**Lilliefors GOF Test**			
1336					5% Lilliefors Critical Value	0.15			Data appear Normal at 5% Significance Level			
1337	**Data appear Approximate Normal at 5% Significance Level**											
1338												
1339	**Background Statistics Assuming Normal Distribution**											
1340					95% UTL with 95% Coverage	0.343			90% Percentile (z)			0.317
1341					95% UPL (t)	0.329			95% Percentile (z)			0.327
1342					95% USL	0.362			99% Percentile (z)			0.348
1343												
1344	**Gamma GOF Test**											
1345					A-D Test Statistic	0.76			**Anderson-Darling Gamma GOF Test**			
1346					5% A-D Critical Value	0.746			Data Not Gamma Distributed at 5% Significance Level			
1347					K-S Test Statistic	0.145			**Kolmogorov-Smirnov Gamma GOF Test**			
1348					5% K-S Critical Value	0.15			Detected data appear Gamma Distributed at 5% Significance Level			
1349	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
1350												

1351	**Gamma Statistics**											
1352					k hat (MLE)	93.29			k star (bias corrected MLE)			85.08
1353					Theta hat (MLE)	0.00299			Theta star (bias corrected MLE)			0.00327
1354					nu hat (MLE)	6344			nu star (bias corrected)			5785
1355					MLE Mean (bias corrected)	0.279			MLE Sd (bias corrected)			0.0302
1356												
1357	**Background Statistics Assuming Gamma Distribution**											
1358				95% Wilson Hilferty (WH) Approx. Gamma UPL		0.331			90% Percentile			0.318
1359				95% Hawkins Wixley (HW) Approx. Gamma UPL		0.331			95% Percentile			0.33
1360				95% WH Approx. Gamma UTL with 95% Coverage		0.346			99% Percentile			0.354
1361				95% HW Approx. Gamma UTL with 95% Coverage		0.346						
1362					95% WH USL	0.368			95% HW USL			0.368
1363												
1364	**Lognormal GOF Test**											
1365					Shapiro Wilk Test Statistic	0.942			**Shapiro Wilk Lognormal GOF Test**			
1366					5% Shapiro Wilk Critical Value	0.933			Data appear Lognormal at 5% Significance Level			
1367					Lilliefors Test Statistic	0.14			**Lilliefors Lognormal GOF Test**			
1368					5% Lilliefors Critical Value	0.15			Data appear Lognormal at 5% Significance Level			
1369	**Data appear Lognormal at 5% Significance Level**											
1370												
1371	**Background Statistics assuming Lognormal Distribution**											
1372					95% UTL with 95% Coverage	0.348			90% Percentile (z)			0.317
1373					95% UPL (t)	0.332			95% Percentile (z)			0.329
1374					95% USL	0.371			99% Percentile (z)			0.353
1375												
1376	**Nonparametric Distribution Free Background Statistics**											
1377	**Data appear Approximate Normal at 5% Significance Level**											
1378												
1379	**Nonparametric Upper Limits for Background Threshold Values**											
1380					Order of Statistic, r	34			95% UTL with 95% Coverage			0.34
1381					Approx, f used to compute achieved CC	1.789			Approximate Actual Confidence Coefficient achieved by UTL			0.825
1382									Approximate Sample Size needed to achieve specified CC			59
1383				95% Percentile Bootstrap UTL with 95% Coverage		0.34			95% BCA Bootstrap UTL with 95% Coverage			0.33
1384					95% UPL	0.333			90% Percentile			0.33
1385					90% Chebyshev UPL	0.369			95% Percentile			0.33
1386					95% Chebyshev UPL	0.41			99% Percentile			0.337
1387					95% USL	0.34						
1388												
1389	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1390	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1391	and consists of observations collected from clean unimpacted locations.											
1392	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1393	represents a background data set and when many onsite observations need to be compared with the BTV.											
1394												
1395	**METHYLENE CHLORIDE (ug/L)**											
1396												
1397	**General Statistics**											
1398					Total Number of Observations	43			Number of Missing Observations			0
1399					Number of Distinct Observations	1						
1400					Number of Detects	0			Number of Non-Detects			43

1401					Number of Distinct Detects	0					Number of Distinct Non-Detects	1
1402					Minimum Detect	N/A					Minimum Non-Detect	1
1403					Maximum Detect	N/A					Maximum Non-Detect	1
1404					Variance Detected	N/A					Percent Non-Detects	100%
1405					Mean Detected	N/A					SD Detected	N/A
1406					Mean of Detected Logged Data	N/A					SD of Detected Logged Data	N/A
1407												
1408					**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**							
1409					**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**							
1410					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
1411												
1412					**The data set for variable METHYLENE CHLORIDE (ug/L) was not processed!**							
1413												
1414												
1415	**NITRATE-NITROGEN (mg/L)**											
1416												
1417	**General Statistics**											
1418					Total Number of Observations	42					Number of Distinct Observations	35
1419					Minimum	4.9					First Quartile	19.4
1420					Second Largest	29					Median	22.6
1421					Maximum	31.7					Third Quartile	25.9
1422					Mean	21.12					SD	6.554
1423					Coefficient of Variation	0.31					Skewness	-0.996
1424					Mean of logged Data	2.98					SD of logged Data	0.425
1425												
1426					**Critical Values for Background Threshold Values (BTVs)**							
1427					Tolerance Factor K (For UTL)	2.104					d2max (for USL)	2.887
1428												
1429					**Normal GOF Test**							
1430					Shapiro Wilk Test Statistic	0.85					**Shapiro Wilk GOF Test**	
1431					5% Shapiro Wilk Critical Value	0.942					Data Not Normal at 5% Significance Level	
1432					Lilliefors Test Statistic	0.191					**Lilliefors GOF Test**	
1433					5% Lilliefors Critical Value	0.135					Data Not Normal at 5% Significance Level	
1434					**Data Not Normal at 5% Significance Level**							
1435												
1436					**Background Statistics Assuming Normal Distribution**							
1437					95% UTL with 95% Coverage	34.91					90% Percentile (z)	29.52
1438					95% UPL (t)	32.28					95% Percentile (z)	31.9
1439					95% USL	40.04					99% Percentile (z)	36.37
1440												
1441					**Gamma GOF Test**							
1442					A-D Test Statistic	2.985					**Anderson-Darling Gamma GOF Test**	
1443					5% A-D Critical Value	0.75					Data Not Gamma Distributed at 5% Significance Level	
1444					K-S Test Statistic	0.231					**Kolmogorov-Smirnov Gamma GOF Test**	
1445					5% K-S Critical Value	0.137					Data Not Gamma Distributed at 5% Significance Level	
1446					**Data Not Gamma Distributed at 5% Significance Level**							
1447												
1448					**Gamma Statistics**							
1449					k hat (MLE)	7.267					k star (bias corrected MLE)	6.764
1450					Theta hat (MLE)	2.906					Theta star (bias corrected MLE)	3.122

1451					nu hat (MLE)	610.4				nu star (bias corrected)		568.2
1452					MLE Mean (bias corrected)	21.12				MLE Sd (bias corrected)		8.12
1453												
1454	**Background Statistics Assuming Gamma Distribution**											
1455				95% Wilson Hilferty (WH) Approx. Gamma UPL		36.31				90% Percentile		31.96
1456				95% Hawkins Wixley (HW) Approx. Gamma UPL		37.16				95% Percentile		36
1457				95% WH Approx. Gamma UTL with 95% Coverage		41.05				99% Percentile		44.43
1458				95% HW Approx. Gamma UTL with 95% Coverage		42.4						
1459					95% WH USL	51.47				95% HW USL		54.23
1460												
1461	**Lognormal GOF Test**											
1462				Shapiro Wilk Test Statistic		0.756	**Shapiro Wilk Lognormal GOF Test**					
1463				5% Shapiro Wilk Critical Value		0.942	Data Not Lognormal at 5% Significance Level					
1464				Lilliefors Test Statistic		0.253	**Lilliefors Lognormal GOF Test**					
1465				5% Lilliefors Critical Value		0.135	Data Not Lognormal at 5% Significance Level					
1466	**Data Not Lognormal at 5% Significance Level**											
1467												
1468	**Background Statistics assuming Lognormal Distribution**											
1469				95% UTL with 95% Coverage		48.16				90% Percentile (z)		33.95
1470					95% UPL (t)	40.61				95% Percentile (z)		39.62
1471					95% USL	67.22				99% Percentile (z)		52.95
1472												
1473	**Nonparametric Distribution Free Background Statistics**											
1474	**Data do not follow a Discernible Distribution (0.05)**											
1475												
1476	**Nonparametric Upper Limits for Background Threshold Values**											
1477				Order of Statistic, r		42				95% UTL with 95% Coverage		31.7
1478				Approx, f used to compute achieved CC		2.211	Approximate Actual Confidence Coefficient achieved by UTL					0.884
1479							Approximate Sample Size needed to achieve specified CC					59
1480				95% Percentile Bootstrap UTL with 95% Coverage		31.51	95% BCA Bootstrap UTL with 95% Coverage					31.51
1481					95% UPL	28.82				90% Percentile		26.7
1482					90% Chebyshev UPL	41.01				95% Percentile		27.77
1483					95% Chebyshev UPL	50.03				99% Percentile		30.59
1484					95% USL	31.7						
1485												
1486	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1487	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1488	and consists of observations collected from clean unimpacted locations.											
1489	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1490	represents a background data set and when many onsite observations need to be compared with the BTV.											
1491												
1492	**pH-FIELD (SU)**											
1493												
1494	**General Statistics**											
1495				Total Number of Observations		41				Number of Distinct Observations		36
1496					Minimum	3.91				First Quartile		4.55
1497					Second Largest	6.38				Median		4.74
1498					Maximum	6.55				Third Quartile		5.15
1499					Mean	4.946				SD		0.573
1500					Coefficient of Variation	0.116				Skewness		1.102

	A	B	C	D	E	F	G	H	I	J	K	L
1501					Mean of logged Data	1.592				SD of logged Data		0.111
1502												
1503					**Critical Values for Background Threshold Values (BTVs)**							
1504					Tolerance Factor K (For UTL)	2.11				d2max (for USL)		2.878
1505												
1506					**Normal GOF Test**							
1507					Shapiro Wilk Test Statistic	0.889	**Shapiro Wilk GOF Test**					
1508					5% Shapiro Wilk Critical Value	0.941	Data Not Normal at 5% Significance Level					
1509					Lilliefors Test Statistic	0.179	**Lilliefors GOF Test**					
1510					5% Lilliefors Critical Value	0.137	Data Not Normal at 5% Significance Level					
1511					**Data Not Normal at 5% Significance Level**							
1512												
1513					**Background Statistics Assuming Normal Distribution**							
1514				95% UTL with	95% Coverage	6.155				90% Percentile (z)		5.68
1515					95% UPL (t)	5.923				95% Percentile (z)		5.889
1516					95% USL	6.595				99% Percentile (z)		6.279
1517												
1518					**Gamma GOF Test**							
1519					A-D Test Statistic	1.6	**Anderson-Darling Gamma GOF Test**					
1520					5% A-D Critical Value	0.747	Data Not Gamma Distributed at 5% Significance Level					
1521					K-S Test Statistic	0.178	**Kolmogorov-Smirnov Gamma GOF Test**					
1522					5% K-S Critical Value	0.137	Data Not Gamma Distributed at 5% Significance Level					
1523					**Data Not Gamma Distributed at 5% Significance Level**							
1524												
1525					**Gamma Statistics**							
1526					k hat (MLE)	81.46				k star (bias corrected MLE)		75.51
1527					Theta hat (MLE)	0.0607				Theta star (bias corrected MLE)		0.0655
1528					nu hat (MLE)	6679				nu star (bias corrected)		6192
1529					MLE Mean (bias corrected)	4.946				MLE Sd (bias corrected)		0.569
1530												
1531					**Background Statistics Assuming Gamma Distribution**							
1532				95% Wilson Hilferty (WH) Approx. Gamma UPL		5.93				90% Percentile		5.688
1533				95% Hawkins Wixley (HW) Approx. Gamma UPL		5.931				95% Percentile		5.918
1534				95% WH Approx. Gamma UTL with	95% Coverage	6.188				99% Percentile		6.366
1535				95% HW Approx. Gamma UTL with	95% Coverage	6.193						
1536					95% WH USL	6.696				95% HW USL		6.711
1537												
1538					**Lognormal GOF Test**							
1539					Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk Lognormal GOF Test**					
1540					5% Shapiro Wilk Critical Value	0.941	Data Not Lognormal at 5% Significance Level					
1541					Lilliefors Test Statistic	0.173	**Lilliefors Lognormal GOF Test**					
1542					5% Lilliefors Critical Value	0.137	Data Not Lognormal at 5% Significance Level					
1543					**Data Not Lognormal at 5% Significance Level**							
1544												
1545					**Background Statistics assuming Lognormal Distribution**							
1546				95% UTL with	95% Coverage	6.209				90% Percentile (z)		5.665
1547					95% UPL (t)	5.936				95% Percentile (z)		5.897
1548					95% USL	6.759				99% Percentile (z)		6.359
1549												
1550					**Nonparametric Distribution Free Background Statistics**							

1551	**Data do not follow a Discernible Distribution (0.05)**											
1552												
1553	**Nonparametric Upper Limits for Background Threshold Values**											
1554					Order of Statistic, r	41				95% UTL with 95% Coverage	6.55	
1555					Approx, f used to compute achieved CC	2.158				Approximate Actual Confidence Coefficient achieved by UTL	0.878	
1556										Approximate Sample Size needed to achieve specified CC	59	
1557					95% Percentile Bootstrap UTL with 95% Coverage	6.55				95% BCA Bootstrap UTL with 95% Coverage	6.38	
1558					95% UPL	6.337				90% Percentile	5.79	
1559					90% Chebyshev UPL	6.686				95% Percentile	5.95	
1560					95% Chebyshev UPL	7.474				99% Percentile	6.482	
1561					95% USL	6.55						
1562												
1563	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1564	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1565	and consists of observations collected from clean unimpacted locations.											
1566	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1567	represents a background data set and when many onsite observations need to be compared with the BTV.											
1568												
1569	**pH-LAB (SU)**											
1570												
1571	**General Statistics**											
1572					Total Number of Observations	40				Number of Distinct Observations	35	
1573					Minimum	4.84				First Quartile	5.41	
1574					Second Largest	7.24				Median	5.585	
1575					Maximum	7.81				Third Quartile	5.748	
1576					Mean	5.706				SD	0.608	
1577					Coefficient of Variation	0.107				Skewness	1.768	
1578					Mean of logged Data	1.736				SD of logged Data	0.0993	
1579												
1580	**Critical Values for Background Threshold Values (BTVs)**											
1581					Tolerance Factor K (For UTL)	2.117				d2max (for USL)	2.868	
1582												
1583	**Normal GOF Test**											
1584					Shapiro Wilk Test Statistic	0.814				**Shapiro Wilk GOF Test**		
1585					5% Shapiro Wilk Critical Value	0.94				Data Not Normal at 5% Significance Level		
1586					Lilliefors Test Statistic	0.233				**Lilliefors GOF Test**		
1587					5% Lilliefors Critical Value	0.139				Data Not Normal at 5% Significance Level		
1588	**Data Not Normal at 5% Significance Level**											
1589												
1590	**Background Statistics Assuming Normal Distribution**											
1591					95% UTL with 95% Coverage	6.993				90% Percentile (z)	6.485	
1592					95% UPL (t)	6.743				95% Percentile (z)	6.706	
1593					95% USL	7.45				99% Percentile (z)	7.121	
1594												
1595	**Gamma GOF Test**											
1596					A-D Test Statistic	2.442				**Anderson-Darling Gamma GOF Test**		
1597					5% A-D Critical Value	0.747				Data Not Gamma Distributed at 5% Significance Level		
1598					K-S Test Statistic	0.218				**Kolmogorov-Smirnov Gamma GOF Test**		
1599					5% K-S Critical Value	0.139				Data Not Gamma Distributed at 5% Significance Level		
1600	**Data Not Gamma Distributed at 5% Significance Level**											

1601												
1602	**Gamma Statistics**											
1603					k hat (MLE)	99.5			k star (bias corrected MLE)	92.05		
1604					Theta hat (MLE)	0.0573			Theta star (bias corrected MLE)	0.062		
1605					nu hat (MLE)	7960			nu star (bias corrected)	7364		
1606					MLE Mean (bias corrected)	5.706			MLE Sd (bias corrected)	0.595		
1607												
1608	**Background Statistics Assuming Gamma Distribution**											
1609				95% Wilson Hilferty (WH) Approx. Gamma UPL		6.73			90% Percentile	6.48		
1610				95% Hawkins Wixley (HW) Approx. Gamma UPL		6.729			95% Percentile	6.718		
1611				95% WH Approx. Gamma UTL with 95% Coverage		6.999			99% Percentile	7.179		
1612				95% HW Approx. Gamma UTL with 95% Coverage		7.001						
1613				95% WH USL		7.509			95% HW USL	7.518		
1614												
1615	**Lognormal GOF Test**											
1616				Shapiro Wilk Test Statistic		0.856			**Shapiro Wilk Lognormal GOF Test**			
1617				5% Shapiro Wilk Critical Value		0.94			Data Not Lognormal at 5% Significance Level			
1618				Lilliefors Test Statistic		0.212			**Lilliefors Lognormal GOF Test**			
1619				5% Lilliefors Critical Value		0.139			Data Not Lognormal at 5% Significance Level			
1620	**Data Not Lognormal at 5% Significance Level**											
1621												
1622	**Background Statistics assuming Lognormal Distribution**											
1623				95% UTL with 95% Coverage		7.006			90% Percentile (z)	6.448		
1624				95% UPL (t)		6.725			95% Percentile (z)	6.685		
1625				95% USL		7.548			99% Percentile (z)	7.153		
1626												
1627	**Nonparametric Distribution Free Background Statistics**											
1628	**Data do not follow a Discernible Distribution (0.05)**											
1629												
1630	**Nonparametric Upper Limits for Background Threshold Values**											
1631					Order of Statistic, r	40			95% UTL with 95% Coverage	7.81		
1632					Approx, f used to compute achieved CC	2.105			Approximate Actual Confidence Coefficient achieved by UTL	0.871		
1633									Approximate Sample Size needed to achieve specified CC	59		
1634				95% Percentile Bootstrap UTL with 95% Coverage		7.81			95% BCA Bootstrap UTL with 95% Coverage	7.81		
1635					95% UPL	7.236			90% Percentile	6.45		
1636					90% Chebyshev UPL	7.553			95% Percentile	7.155		
1637					95% Chebyshev UPL	8.39			99% Percentile	7.588		
1638					95% USL	7.81						
1639												
1640	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1641	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1642	and consists of observations collected from clean unimpacted locations.											
1643	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1644	represents a background data set and when many onsite observations need to be compared with the BTV.											
1645												
1646	**POTASSIUM, DISSOLVED (mg/L)**											
1647												
1648	**General Statistics**											
1649					Total Number of Observations	10			Number of Distinct Observations	7		
1650					Minimum	0.95			First Quartile	1.1		

	A	B	C	D	E	F	G	H	I	J	K	L
1651					Second Largest	1.6					Median	1.2
1652					Maximum	1.6					Third Quartile	1.375
1653					Mean	1.245					SD	0.229
1654					Coefficient of Variation	0.184					Skewness	0.54
1655					Mean of logged Data	0.204					SD of logged Data	0.181
1656												
1657	**Critical Values for Background Threshold Values (BTVs)**											
1658					Tolerance Factor K (For UTL)	2.911					d2max (for USL)	2.176
1659												
1660	**Normal GOF Test**											
1661					Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk GOF Test**					
1662					5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level					
1663					Lilliefors Test Statistic	0.178	**Lilliefors GOF Test**					
1664					5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level					
1665	**Data appear Normal at 5% Significance Level**											
1666												
1667	**Background Statistics Assuming Normal Distribution**											
1668				95% UTL with	95% Coverage	1.912					90% Percentile (z)	1.539
1669					95% UPL (t)	1.685					95% Percentile (z)	1.622
1670					95% USL	1.743					99% Percentile (z)	1.778
1671												
1672	**Gamma GOF Test**											
1673					A-D Test Statistic	0.306	**Anderson-Darling Gamma GOF Test**					
1674					5% A-D Critical Value	0.724	Detected data appear Gamma Distributed at 5% Significance Level					
1675					K-S Test Statistic	0.162	**Kolmogorov-Smirnov Gamma GOF Test**					
1676					5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level					
1677	**Detected data appear Gamma Distributed at 5% Significance Level**											
1678												
1679	**Gamma Statistics**											
1680					k hat (MLE)	33.83					k star (bias corrected MLE)	23.75
1681					Theta hat (MLE)	0.0368					Theta star (bias corrected MLE)	0.0524
1682					nu hat (MLE)	676.5					nu star (bias corrected)	474.9
1683					MLE Mean (bias corrected)	1.245					MLE Sd (bias corrected)	0.255
1684												
1685	**Background Statistics Assuming Gamma Distribution**											
1686					95% Wilson Hilferty (WH) Approx. Gamma UPL	1.716					90% Percentile	1.582
1687					95% Hawkins Wixley (HW) Approx. Gamma UPL	1.721					95% Percentile	1.693
1688					95% WH Approx. Gamma UTL with 95% Coverage	2.007					99% Percentile	1.915
1689					95% HW Approx. Gamma UTL with 95% Coverage	2.023						
1690					95% WH USL	1.788					95% HW USL	1.795
1691												
1692	**Lognormal GOF Test**											
1693					Shapiro Wilk Test Statistic	0.941	**Shapiro Wilk Lognormal GOF Test**					
1694					5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level					
1695					Lilliefors Test Statistic	0.148	**Lilliefors Lognormal GOF Test**					
1696					5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level					
1697	**Data appear Lognormal at 5% Significance Level**											
1698												
1699	**Background Statistics assuming Lognormal Distribution**											
1700				95% UTL with	95% Coverage	2.076					90% Percentile (z)	1.546

1701					95% UPL (t)	1.736				95% Percentile (z)		1.651
1702					95% USL	1.818				99% Percentile (z)		1.868
1703												
1704	**Nonparametric Distribution Free Background Statistics**											
1705	**Data appear Normal at 5% Significance Level**											
1706												
1707	**Nonparametric Upper Limits for Background Threshold Values**											
1708					Order of Statistic, r	10				95% UTL with 95% Coverage		1.6
1709					Approx, f used to compute achieved CC	0.526				Approximate Actual Confidence Coefficient achieved by UTL		0.401
1710										Approximate Sample Size needed to achieve specified CC		59
1711					95% Percentile Bootstrap UTL with 95% Coverage	1.6				95% BCA Bootstrap UTL with 95% Coverage		1.6
1712					95% UPL	1.6				90% Percentile		1.6
1713					90% Chebyshev UPL	1.966				95% Percentile		1.6
1714					95% Chebyshev UPL	2.292				99% Percentile		1.6
1715					95% USL	1.6						
1716												
1717	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1718	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1719	and consists of observations collected from clean unimpacted locations.											
1720	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1721	represents a background data set and when many onsite observations need to be compared with the BTV.											
1722												
1723	**POTASSIUM, TOTAL (mg/L)**											
1724												
1725	**General Statistics**											
1726					Total Number of Observations	41				Number of Distinct Observations		17
1727					Minimum	0				First Quartile		1.2
1728					Second Largest	11.1				Median		1.2
1729					Maximum	14.4				Third Quartile		1.9
1730					Mean	2.209				SD		2.749
1731					Coefficient of Variation	1.245				Skewness		3.356
1732												
1733	**Critical Values for Background Threshold Values (BTVs)**											
1734					Tolerance Factor K (For UTL)	2.11				d2max (for USL)		2.878
1735												
1736	**Normal GOF Test**											
1737					Shapiro Wilk Test Statistic	0.505				**Shapiro Wilk GOF Test**		
1738					5% Shapiro Wilk Critical Value	0.941				Data Not Normal at 5% Significance Level		
1739					Lilliefors Test Statistic	0.35				**Lilliefors GOF Test**		
1740					5% Lilliefors Critical Value	0.137				Data Not Normal at 5% Significance Level		
1741	**Data Not Normal at 5% Significance Level**											
1742												
1743	**Background Statistics Assuming Normal Distribution**											
1744					95% UTL with 95% Coverage	8.01				90% Percentile (z)		5.732
1745					95% UPL (t)	6.894				95% Percentile (z)		6.731
1746					95% USL	10.12				99% Percentile (z)		8.604
1747												
1748	**Gamma Statistics**											
1749	**Gamma Statistics Not Available**											
1750												

	A	B	C	D	E	F	G	H	I	J	K	L
1751	**Cannot Compute Gamma Statistics!**											
1752												
1753	**Cannot Compute Log Statistics**											
1754												
1755	**Nonparametric Distribution Free Background Statistics**											
1756	**Data do not follow a Discernible Distribution (0.05)**											
1757												
1758	**Nonparametric Upper Limits for Background Threshold Values**											
1759					Order of Statistic, r	41			95% UTL with 95% Coverage			14.4
1760					Approx, f used to compute achieved CC	2.158			Approximate Actual Confidence Coefficient achieved by UTL			0.878
1761									Approximate Sample Size needed to achieve specified CC			59
1762					95% Percentile Bootstrap UTL with 95% Coverage	14.4			95% BCA Bootstrap UTL with 95% Coverage			11.1
1763					95% UPL	10.69			90% Percentile			3.1
1764					90% Chebyshev UPL	10.56			95% Percentile			7
1765					95% Chebyshev UPL	14.34			99% Percentile			13.08
1766					95% USL	14.4						
1767												
1768	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1769	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1770	and consists of observations collected from clean unimpacted locations.											
1771	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1772	represents a background data set and when many onsite observations need to be compared with the BTV.											
1773												
1774	**SODIUM, DISSOLVED (mg/L)**											
1775												
1776	**General Statistics**											
1777					Total Number of Observations	11			Number of Distinct Observations			9
1778					Minimum	13.7			First Quartile			14.2
1779					Second Largest	20.6			Median			16.2
1780					Maximum	20.9			Third Quartile			18.75
1781					Mean	16.76			SD			2.667
1782					Coefficient of Variation	0.159			Skewness			0.437
1783					Mean of logged Data	2.808			SD of logged Data			0.157
1784												
1785	**Critical Values for Background Threshold Values (BTVs)**											
1786					Tolerance Factor K (For UTL)	2.815			d2max (for USL)			2.234
1787												
1788	**Normal GOF Test**											
1789					Shapiro Wilk Test Statistic	0.895			**Shapiro Wilk GOF Test**			
1790					5% Shapiro Wilk Critical Value	0.85			Data appear Normal at 5% Significance Level			
1791					Lilliefors Test Statistic	0.186			**Lilliefors GOF Test**			
1792					5% Lilliefors Critical Value	0.251			Data appear Normal at 5% Significance Level			
1793	**Data appear Normal at 5% Significance Level**											
1794												
1795	**Background Statistics Assuming Normal Distribution**											
1796					95% UTL with 95% Coverage	24.27			90% Percentile (z)			20.18
1797					95% UPL (t)	21.81			95% Percentile (z)			21.15
1798					95% USL	22.72			99% Percentile (z)			22.97
1799												
1800	**Gamma GOF Test**											

	A	B	C	D	E	F	G	H	I	J	K	L
1801					A-D Test Statistic	0.469	**Anderson-Darling Gamma GOF Test**					
1802					5% A-D Critical Value	0.728	Detected data appear Gamma Distributed at 5% Significance Level					
1803					K-S Test Statistic	0.201	**Kolmogorov-Smirnov Gamma GOF Test**					
1804					5% K-S Critical Value	0.255	Detected data appear Gamma Distributed at 5% Significance Level					
1805	**Detected data appear Gamma Distributed at 5% Significance Level**											
1806												
1807	**Gamma Statistics**											
1808					k hat (MLE)	44.49				k star (bias corrected MLE)		32.41
1809					Theta hat (MLE)	0.377				Theta star (bias corrected MLE)		0.517
1810					nu hat (MLE)	978.7				nu star (bias corrected)		713.1
1811					MLE Mean (bias corrected)	16.76				MLE Sd (bias corrected)		2.944
1812												
1813	**Background Statistics Assuming Gamma Distribution**											
1814				95% Wilson Hilferty (WH) Approx. Gamma UPL		22.11				90% Percentile		20.63
1815				95% Hawkins Wixley (HW) Approx. Gamma UPL		22.16				95% Percentile		21.88
1816				95% WH Approx. Gamma UTL with	95% Coverage	25.17				99% Percentile		24.36
1817				95% HW Approx. Gamma UTL with	95% Coverage	25.31						
1818					95% WH USL	23.21				95% HW USL		23.29
1819												
1820	**Lognormal GOF Test**											
1821					Shapiro Wilk Test Statistic	0.902	**Shapiro Wilk Lognormal GOF Test**					
1822					5% Shapiro Wilk Critical Value	0.85	Data appear Lognormal at 5% Significance Level					
1823					Lilliefors Test Statistic	0.19	**Lilliefors Lognormal GOF Test**					
1824					5% Lilliefors Critical Value	0.251	Data appear Lognormal at 5% Significance Level					
1825	**Data appear Lognormal at 5% Significance Level**											
1826												
1827	**Background Statistics assuming Lognormal Distribution**											
1828					95% UTL with	95% Coverage	25.77			90% Percentile (z)		20.26
1829					95% UPL (t)	22.3				95% Percentile (z)		21.45
1830					95% USL	23.53				99% Percentile (z)		23.87
1831												
1832	**Nonparametric Distribution Free Background Statistics**											
1833	**Data appear Normal at 5% Significance Level**											
1834												
1835	**Nonparametric Upper Limits for Background Threshold Values**											
1836					Order of Statistic, r	11				95% UTL with	95% Coverage	20.9
1837					Approx, f used to compute achieved CC	0.579				Approximate Actual Confidence Coefficient achieved by UTL		0.431
1838										Approximate Sample Size needed to achieve specified CC		59
1839				95% Percentile Bootstrap UTL with	95% Coverage	20.9				95% BCA Bootstrap UTL with	95% Coverage	20.9
1840					95% UPL	20.9				90% Percentile		20.6
1841					90% Chebyshev UPL	25.12				95% Percentile		20.75
1842					95% Chebyshev UPL	28.91				99% Percentile		20.87
1843					95% USL	20.9						
1844												
1845	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1846	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1847	and consists of observations collected from clean unimpacted locations.											
1848	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1849	represents a background data set and when many onsite observations need to be compared with the BTV.											
1850												

	A	B	C	D	E	F	G	H	I	J	K	L
1851	**SODIUM, TOTAL (mg/L)**											
1852												
1853	**General Statistics**											
1854					Total Number of Observations	39				Number of Distinct Observations		29
1855					Minimum	13.7				First Quartile		14.45
1856					Second Largest	22.3				Median		15.9
1857					Maximum	24				Third Quartile		18.4
1858					Mean	16.64				SD		2.526
1859					Coefficient of Variation	0.152				Skewness		1.041
1860					Mean of logged Data	2.801				SD of logged Data		0.144
1861												
1862					**Critical Values for Background Threshold Values (BTVs)**							
1863					Tolerance Factor K (For UTL)	2.124				d2max (for USL)		2.857
1864												
1865					**Normal GOF Test**							
1866					Shapiro Wilk Test Statistic	0.881				**Shapiro Wilk GOF Test**		
1867					5% Shapiro Wilk Critical Value	0.939				Data Not Normal at 5% Significance Level		
1868					Lilliefors Test Statistic	0.161				**Lilliefors GOF Test**		
1869					5% Lilliefors Critical Value	0.14				Data Not Normal at 5% Significance Level		
1870					**Data Not Normal at 5% Significance Level**							
1871												
1872					**Background Statistics Assuming Normal Distribution**							
1873					95% UTL with 95% Coverage	22				90% Percentile (z)		19.87
1874					95% UPL (t)	20.95				95% Percentile (z)		20.79
1875					95% USL	23.85				99% Percentile (z)		22.51
1876												
1877					**Gamma GOF Test**							
1878					A-D Test Statistic	1.373				**Anderson-Darling Gamma GOF Test**		
1879					5% A-D Critical Value	0.746				Data Not Gamma Distributed at 5% Significance Level		
1880					K-S Test Statistic	0.157				**Kolmogorov-Smirnov Gamma GOF Test**		
1881					5% K-S Critical Value	0.141				Data Not Gamma Distributed at 5% Significance Level		
1882					**Data Not Gamma Distributed at 5% Significance Level**							
1883												
1884					**Gamma Statistics**							
1885					k hat (MLE)	48.02				k star (bias corrected MLE)		44.34
1886					Theta hat (MLE)	0.346				Theta star (bias corrected MLE)		0.375
1887					nu hat (MLE)	3746				nu star (bias corrected)		3459
1888					MLE Mean (bias corrected)	16.64				MLE Sd (bias corrected)		2.498
1889												
1890					**Background Statistics Assuming Gamma Distribution**							
1891					95% Wilson Hilferty (WH) Approx. Gamma UPL	21.01				90% Percentile		19.91
1892					95% Hawkins Wixley (HW) Approx. Gamma UPL	21.02				95% Percentile		20.95
1893					95% WH Approx. Gamma UTL with 95% Coverage	22.21				99% Percentile		22.99
1894					95% HW Approx. Gamma UTL with 95% Coverage	22.25						
1895					95% WH USL	24.45				95% HW USL		24.54
1896												
1897					**Lognormal GOF Test**							
1898					Shapiro Wilk Test Statistic	0.902				**Shapiro Wilk Lognormal GOF Test**		
1899					5% Shapiro Wilk Critical Value	0.939				Data Not Lognormal at 5% Significance Level		
1900					Lilliefors Test Statistic	0.155				**Lilliefors Lognormal GOF Test**		

1901				5% Lilliefors Critical Value		0.14		Data Not Lognormal at 5% Significance Level				
1902	**Data Not Lognormal at 5% Significance Level**											
1903												
1904	**Background Statistics assuming Lognormal Distribution**											
1905				95% UTL with 95% Coverage		22.35				90% Percentile (z)		19.8
1906				95% UPL (t)		21.05				95% Percentile (z)		20.86
1907				95% USL		24.84				99% Percentile (z)		23.01
1908												
1909	**Nonparametric Distribution Free Background Statistics**											
1910	**Data do not follow a Discernible Distribution (0.05)**											
1911												
1912	**Nonparametric Upper Limits for Background Threshold Values**											
1913				Order of Statistic, r		39				95% UTL with 95% Coverage		24
1914				Approx, f used to compute achieved CC		2.053				Approximate Actual Confidence Coefficient achieved by UTL		0.865
1915										Approximate Sample Size needed to achieve specified CC		59
1916				95% Percentile Bootstrap UTL with 95% Coverage		24				95% BCA Bootstrap UTL with 95% Coverage		24
1917				95% UPL		22.3				90% Percentile		20
1918				90% Chebyshev UPL		24.31				95% Percentile		20.5
1919				95% Chebyshev UPL		27.79				99% Percentile		23.35
1920				95% USL		24						
1921												
1922	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1923	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1924	and consists of observations collected from clean unimpacted locations.											
1925	The use of USL tends to provide a balance between false positives and false negatives provided the data											
1926	represents a background data set and when many onsite observations need to be compared with the BTV.											
1927												
1928	**SPEC. COND., FIELD (umhos/cm)**											
1929												
1930	**General Statistics**											
1931				Total Number of Observations		40				Number of Distinct Observations		31
1932				Minimum		215				First Quartile		310.5
1933				Second Largest		590				Median		331
1934				Maximum		661				Third Quartile		350.5
1935				Mean		339.1				SD		81.01
1936				Coefficient of Variation		0.239				Skewness		2.268
1937				Mean of logged Data		5.803				SD of logged Data		0.209
1938												
1939	**Critical Values for Background Threshold Values (BTVs)**											
1940				Tolerance Factor K (For UTL)		2.117				d2max (for USL)		2.868
1941												
1942	**Normal GOF Test**											
1943				Shapiro Wilk Test Statistic		0.751		**Shapiro Wilk GOF Test**				
1944				5% Shapiro Wilk Critical Value		0.94		Data Not Normal at 5% Significance Level				
1945				Lilliefors Test Statistic		0.273		**Lilliefors GOF Test**				
1946				5% Lilliefors Critical Value		0.139		Data Not Normal at 5% Significance Level				
1947	**Data Not Normal at 5% Significance Level**											
1948												
1949	**Background Statistics Assuming Normal Distribution**											
1950				95% UTL with 95% Coverage		510.6				90% Percentile (z)		442.9

1951					95% UPL (t)	477.3					95% Percentile (z)	472.3
1952					95% USL	571.4					99% Percentile (z)	527.6
1953												
1954	**Gamma GOF Test**											
1955					A-D Test Statistic	2.536	**Anderson-Darling Gamma GOF Test**					
1956					5% A-D Critical Value	0.747	Data Not Gamma Distributed at 5% Significance Level					
1957					K-S Test Statistic	0.237	**Kolmogorov-Smirnov Gamma GOF Test**					
1958					5% K-S Critical Value	0.139	Data Not Gamma Distributed at 5% Significance Level					
1959	**Data Not Gamma Distributed at 5% Significance Level**											
1960												
1961	**Gamma Statistics**											
1962					k hat (MLE)	21.98					k star (bias corrected MLE)	20.35
1963					Theta hat (MLE)	15.43					Theta star (bias corrected MLE)	16.67
1964					nu hat (MLE)	1758					nu star (bias corrected)	1628
1965					MLE Mean (bias corrected)	339.1					MLE Sd (bias corrected)	75.18
1966												
1967	**Background Statistics Assuming Gamma Distribution**											
1968				95% Wilson Hilferty (WH) Approx. Gamma UPL		473.2					90% Percentile	438.3
1969				95% Hawkins Wixley (HW) Approx. Gamma UPL		473.1					95% Percentile	471.5
1970				95% WH Approx. Gamma UTL with 95% Coverage		511.8					99% Percentile	538
1971				95% HW Approx. Gamma UTL with 95% Coverage		512.6						
1972					95% WH USL	587.4					95% HW USL	590.8
1973												
1974	**Lognormal GOF Test**											
1975					Shapiro Wilk Test Statistic	0.858	**Shapiro Wilk Lognormal GOF Test**					
1976					5% Shapiro Wilk Critical Value	0.94	Data Not Lognormal at 5% Significance Level					
1977					Lilliefors Test Statistic	0.221	**Lilliefors Lognormal GOF Test**					
1978					5% Lilliefors Critical Value	0.139	Data Not Lognormal at 5% Significance Level					
1979	**Data Not Lognormal at 5% Significance Level**											
1980												
1981	**Background Statistics assuming Lognormal Distribution**											
1982				95% UTL with 95% Coverage		516.1					90% Percentile (z)	433.3
1983					95% UPL (t)	473.5					95% Percentile (z)	467.5
1984					95% USL	603.8					99% Percentile (z)	539.2
1985												
1986	**Nonparametric Distribution Free Background Statistics**											
1987	**Data do not follow a Discernible Distribution (0.05)**											
1988												
1989	**Nonparametric Upper Limits for Background Threshold Values**											
1990					Order of Statistic, r	40					95% UTL with 95% Coverage	661
1991					Approx, f used to compute achieved CC	2.105	Approximate Actual Confidence Coefficient achieved by UTL					0.871
1992							Approximate Sample Size needed to achieve specified CC					59
1993				95% Percentile Bootstrap UTL with 95% Coverage		661					95% BCA Bootstrap UTL with 95% Coverage	661
1994					95% UPL	583.8					90% Percentile	372
1995					90% Chebyshev UPL	585.1					95% Percentile	472.2
1996					95% Chebyshev UPL	696.6					99% Percentile	633.3
1997					95% USL	661						
1998												
1999	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
2000	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											

and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

SPEC. COND., LAB (umhos/cm)

General Statistics

Total Number of Observations	40	Number of Distinct Observations	33
Minimum	242	First Quartile	284.3
Second Largest	589	Median	302
Maximum	656	Third Quartile	336.5
Mean	325.1	SD	81.84
Coefficient of Variation	0.252	Skewness	2.68
Mean of logged Data	5.761	SD of logged Data	0.205

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.117	d2max (for USL)	2.868

Normal GOF Test

Shapiro Wilk Test Statistic	0.715	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.94	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.212	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.139	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	498.3	90% Percentile (z)	430
95% UPL (t)	464.7	95% Percentile (z)	459.7
95% USL	559.7	99% Percentile (z)	515.5

Gamma GOF Test

A-D Test Statistic	2.214	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.747	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.175	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.139	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	21.58	k star (bias corrected MLE)	19.98
Theta hat (MLE)	15.06	Theta star (bias corrected MLE)	16.27
nu hat (MLE)	1727	nu star (bias corrected)	1598
MLE Mean (bias corrected)	325.1	MLE Sd (bias corrected)	72.73

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	454.7	90% Percentile	421.1
95% Hawkins Wixley (HW) Approx. Gamma UPL	453.7	95% Percentile	453.2
95% WH Approx. Gamma UTL with 95% Coverage	492.1	99% Percentile	517.7
95% HW Approx. Gamma UTL with 95% Coverage	491.6		
95% WH USL	565.5	95% HW USL	566.9

2051	**Lognormal GOF Test**											
2052					Shapiro Wilk Test Statistic	0.837	**Shapiro Wilk Lognormal GOF Test**					
2053					5% Shapiro Wilk Critical Value	0.94	Data Not Lognormal at 5% Significance Level					
2054					Lilliefors Test Statistic	0.156	**Lilliefors Lognormal GOF Test**					
2055					5% Lilliefors Critical Value	0.139	Data Not Lognormal at 5% Significance Level					
2056	**Data Not Lognormal at 5% Significance Level**											
2057												
2058	**Background Statistics assuming Lognormal Distribution**											
2059					95% UTL with 95% Coverage	490.5				90% Percentile (z)	413.2	
2060					95% UPL (t)	450.8				95% Percentile (z)	445.2	
2061					95% USL	572.2				99% Percentile (z)	512	
2062												
2063	**Nonparametric Distribution Free Background Statistics**											
2064	**Data do not follow a Discernible Distribution (0.05)**											
2065												
2066	**Nonparametric Upper Limits for Background Threshold Values**											
2067					Order of Statistic, r	40				95% UTL with 95% Coverage	656	
2068					Approx, f used to compute achieved CC	2.105				Approximate Actual Confidence Coefficient achieved by UTL	0.871	
2069										Approximate Sample Size needed to achieve specified CC	59	
2070					95% Percentile Bootstrap UTL with 95% Coverage	656				95% BCA Bootstrap UTL with 95% Coverage	656	
2071					95% UPL	582.1				90% Percentile	382.7	
2072					90% Chebyshev UPL	573.6				95% Percentile	458.9	
2073					95% Chebyshev UPL	686.2				99% Percentile	629.9	
2074					95% USL	656						
2075												
2076	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
2077	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
2078	and consists of observations collected from clean unimpacted locations.											
2079	The use of USL tends to provide a balance between false positives and false negatives provided the data											
2080	represents a background data set and when many onsite observations need to be compared with the BTV.											
2081												
2082	**SULFATE (mg/L)**											
2083												
2084	**General Statistics**											
2085					Total Number of Observations	40				Number of Distinct Observations	37	
2086					Minimum	6.9				First Quartile	9.775	
2087					Second Largest	60.4				Median	12.3	
2088					Maximum	74				Third Quartile	23.08	
2089					Mean	20.21				SD	16.16	
2090					Coefficient of Variation	0.8				Skewness	1.747	
2091					Mean of logged Data	2.771				SD of logged Data	0.653	
2092												
2093	**Critical Values for Background Threshold Values (BTVs)**											
2094					Tolerance Factor K (For UTL)	2.117				d2max (for USL)	2.868	
2095												
2096	**Normal GOF Test**											
2097					Shapiro Wilk Test Statistic	0.758	**Shapiro Wilk GOF Test**					
2098					5% Shapiro Wilk Critical Value	0.94	Data Not Normal at 5% Significance Level					
2099					Lilliefors Test Statistic	0.252	**Lilliefors GOF Test**					
2100					5% Lilliefors Critical Value	0.139	Data Not Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
2101	**Data Not Normal at 5% Significance Level**											
2102												
2103	**Background Statistics Assuming Normal Distribution**											
2104					95% UTL with 95% Coverage	54.43				90% Percentile (z)		40.92
2105					95% UPL (t)	47.78				95% Percentile (z)		46.8
2106					95% USL	66.56				99% Percentile (z)		57.81
2107												
2108	**Gamma GOF Test**											
2109					A-D Test Statistic	2.141	**Anderson-Darling Gamma GOF Test**					
2110					5% A-D Critical Value	0.758	Data Not Gamma Distributed at 5% Significance Level					
2111					K-S Test Statistic	0.234	**Kolmogorov-Smirnov Gamma GOF Test**					
2112					5% K-S Critical Value	0.141	Data Not Gamma Distributed at 5% Significance Level					
2113	**Data Not Gamma Distributed at 5% Significance Level**											
2114												
2115	**Gamma Statistics**											
2116					k hat (MLE)	2.277				k star (bias corrected MLE)		2.123
2117					Theta hat (MLE)	8.873				Theta star (bias corrected MLE)		9.518
2118					nu hat (MLE)	182.2				nu star (bias corrected)		169.9
2119					MLE Mean (bias corrected)	20.21				MLE Sd (bias corrected)		13.87
2120												
2121	**Background Statistics Assuming Gamma Distribution**											
2122					95% Wilson Hilferty (WH) Approx. Gamma UPL	47.39				90% Percentile		38.75
2123					95% Hawkins Wixley (HW) Approx. Gamma UPL	47.57				95% Percentile		47.04
2124					95% WH Approx. Gamma UTL with 95% Coverage	57.92				99% Percentile		65.35
2125					95% HW Approx. Gamma UTL with 95% Coverage	58.95						
2126					95% WH USL	80.95				95% HW USL		84.82
2127												
2128	**Lognormal GOF Test**											
2129					Shapiro Wilk Test Statistic	0.896	**Shapiro Wilk Lognormal GOF Test**					
2130					5% Shapiro Wilk Critical Value	0.94	Data Not Lognormal at 5% Significance Level					
2131					Lilliefors Test Statistic	0.208	**Lilliefors Lognormal GOF Test**					
2132					5% Lilliefors Critical Value	0.139	Data Not Lognormal at 5% Significance Level					
2133	**Data Not Lognormal at 5% Significance Level**											
2134												
2135	**Background Statistics assuming Lognormal Distribution**											
2136					95% UTL with 95% Coverage	63.64				90% Percentile (z)		36.88
2137					95% UPL (t)	48.65				95% Percentile (z)		46.75
2138					95% USL	103.9				99% Percentile (z)		72.96
2139												
2140	**Nonparametric Distribution Free Background Statistics**											
2141	**Data do not follow a Discernible Distribution (0.05)**											
2142												
2143	**Nonparametric Upper Limits for Background Threshold Values**											
2144					Order of Statistic, r	40				95% UTL with 95% Coverage		74
2145					Approx, f used to compute achieved CC	2.105				Approximate Actual Confidence Coefficient achieved by UTL		0.871
2146										Approximate Sample Size needed to achieve specified CC		59
2147					95% Percentile Bootstrap UTL with 95% Coverage	74				95% BCA Bootstrap UTL with 95% Coverage		74
2148					95% UPL	59.97				90% Percentile		42.7
2149					90% Chebyshev UPL	69.3				95% Percentile		52.14
2150					95% Chebyshev UPL	91.54				99% Percentile		68.7

2151					95% USL	74						
2152												
2153	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
2154	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
2155	and consists of observations collected from clean unimpacted locations.											
2156	The use of USL tends to provide a balance between false positives and false negatives provided the data											
2157	represents a background data set and when many onsite observations need to be compared with the BTV.											
2158												
2159	**Total Dissolved Solids (mg/L)**											
2160												
2161	**General Statistics**											
2162					Total Number of Observations	40				Number of Distinct Observations	38	
2163					Minimum	135				First Quartile	196.5	
2164					Second Largest	381				Median	238.5	
2165					Maximum	433				Third Quartile	262.8	
2166					Mean	236.9				SD	59.67	
2167					Coefficient of Variation	0.252				Skewness	1.056	
2168					Mean of logged Data	5.438				SD of logged Data	0.243	
2169												
2170	**Critical Values for Background Threshold Values (BTVs)**											
2171					Tolerance Factor K (For UTL)	2.117				d2max (for USL)	2.868	
2172												
2173	**Normal GOF Test**											
2174					Shapiro Wilk Test Statistic	0.928				**Shapiro Wilk GOF Test**		
2175					5% Shapiro Wilk Critical Value	0.94				Data Not Normal at 5% Significance Level		
2176					Lilliefors Test Statistic	0.119				**Lilliefors GOF Test**		
2177					5% Lilliefors Critical Value	0.139				Data appear Normal at 5% Significance Level		
2178	**Data appear Approximate Normal at 5% Significance Level**											
2179												
2180	**Background Statistics Assuming Normal Distribution**											
2181					95% UTL with 95% Coverage	363.2				90% Percentile (z)	313.3	
2182					95% UPL (t)	338.6				95% Percentile (z)	335	
2183					95% USL	408				99% Percentile (z)	375.7	
2184												
2185	**Gamma GOF Test**											
2186					A-D Test Statistic	0.57				**Anderson-Darling Gamma GOF Test**		
2187					5% A-D Critical Value	0.747				Detected data appear Gamma Distributed at 5% Significance Level		
2188					K-S Test Statistic	0.094				**Kolmogorov-Smirnov Gamma GOF Test**		
2189					5% K-S Critical Value	0.139				Detected data appear Gamma Distributed at 5% Significance Level		
2190	**Detected data appear Gamma Distributed at 5% Significance Level**											
2191												
2192	**Gamma Statistics**											
2193					k hat (MLE)	17.33				k star (bias corrected MLE)	16.05	
2194					Theta hat (MLE)	13.67				Theta star (bias corrected MLE)	14.76	
2195					nu hat (MLE)	1386				nu star (bias corrected)	1284	
2196					MLE Mean (bias corrected)	236.9				MLE Sd (bias corrected)	59.13	
2197												
2198	**Background Statistics Assuming Gamma Distribution**											
2199					95% Wilson Hilferty (WH) Approx. Gamma UPL	343.4				90% Percentile	315.1	
2200					95% Hawkins Wixley (HW) Approx. Gamma UPL	344.4				95% Percentile	341.7	

2201	95% WH Approx. Gamma UTL with 95% Coverage					374.7	99% Percentile					395.6
2202	95% HW Approx. Gamma UTL with 95% Coverage					376.8						
2203	95% WH USL					436.5	95% HW USL					441.8
2204												
2205	**Lognormal GOF Test**											
2206	Shapiro Wilk Test Statistic					0.97	**Shapiro Wilk Lognormal GOF Test**					
2207	5% Shapiro Wilk Critical Value					0.94	Data appear Lognormal at 5% Significance Level					
2208	Lilliefors Test Statistic					0.109	**Lilliefors Lognormal GOF Test**					
2209	5% Lilliefors Critical Value					0.139	Data appear Lognormal at 5% Significance Level					
2210	**Data appear Lognormal at 5% Significance Level**											
2211												
2212	**Background Statistics assuming Lognormal Distribution**											
2213	95% UTL with 95% Coverage					384.7	90% Percentile (z)					314.1
2214	95% UPL (t)					348.2	95% Percentile (z)					343
2215	95% USL					461.7	99% Percentile (z)					404.8
2216												
2217	**Nonparametric Distribution Free Background Statistics**											
2218	**Data appear Approximate Normal at 5% Significance Level**											
2219												
2220	**Nonparametric Upper Limits for Background Threshold Values**											
2221	Order of Statistic, r					40	95% UTL with 95% Coverage					433
2222	Approx, f used to compute achieved CC					2.105	Approximate Actual Confidence Coefficient achieved by UTL					0.871
2223							Approximate Sample Size needed to achieve specified CC					59
2224	95% Percentile Bootstrap UTL with 95% Coverage					433	95% BCA Bootstrap UTL with 95% Coverage					433
2225	95% UPL					378.5	90% Percentile					294.7
2226	90% Chebyshev UPL					418.1	95% Percentile					333.5
2227	95% Chebyshev UPL					500.2	99% Percentile					412.7
2228	95% USL					433						
2229												
2230	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
2231	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
2232	and consists of observations collected from clean unimpacted locations.											
2233	The use of USL tends to provide a balance between false positives and false negatives provided the data											
2234	represents a background data set and when many onsite observations need to be compared with the BTV.											
2235												
2236	**TETRACHLOROETHENE (ug/L)**											
2237												
2238	**General Statistics**											
2239	Total Number of Observations					43	Number of Missing Observations					0
2240	Number of Distinct Observations					1						
2241	Number of Detects					0	Number of Non-Detects					43
2242	Number of Distinct Detects					0	Number of Distinct Non-Detects					1
2243	Minimum Detect					N/A	Minimum Non-Detect					1
2244	Maximum Detect					N/A	Maximum Non-Detect					1
2245	Variance Detected					N/A	Percent Non-Detects					100%
2246	Mean Detected					N/A	SD Detected					N/A
2247	Mean of Detected Logged Data					N/A	SD of Detected Logged Data					N/A
2248												
2249	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
2250	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											

2251	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
2252												
2253	The data set for variable TETRACHLOROETHENE (ug/L) was not processed!											
2254												
2255												
2256	TOTAL ORGANIC CARBON (mg/L)											
2257												
2258	General Statistics											
2259						Total Number of Observations	40			Number of Missing Observations	0	
2260						Number of Distinct Observations	12					
2261						Number of Detects	11			Number of Non-Detects	29	
2262						Number of Distinct Detects	10			Number of Distinct Non-Detects	2	
2263						Minimum Detect	0.6			Minimum Non-Detect	0.5	
2264						Maximum Detect	1.4			Maximum Non-Detect	1	
2265						Variance Detected	0.0717			Percent Non-Detects	72.5%	
2266						Mean Detected	0.895			SD Detected	0.268	
2267						Mean of Detected Logged Data	-0.151			SD of Detected Logged Data	0.291	
2268												
2269	Critical Values for Background Threshold Values (BTVs)											
2270						Tolerance Factor K (For UTL)	2.117			d2max (for USL)	2.868	
2271												
2272	Normal GOF Test on Detects Only											
2273						Shapiro Wilk Test Statistic	0.912			Shapiro Wilk GOF Test		
2274						5% Shapiro Wilk Critical Value	0.85			Detected Data appear Normal at 5% Significance Level		
2275						Lilliefors Test Statistic	0.173			Lilliefors GOF Test		
2276						5% Lilliefors Critical Value	0.251			Detected Data appear Normal at 5% Significance Level		
2277	Detected Data appear Normal at 5% Significance Level											
2278												
2279	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution											
2280						KM Mean	0.696			KM SD	0.213	
2281						95% UTL95% Coverage	1.148			95% KM UPL (t)	1.06	
2282						90% KM Percentile (z)	0.97			95% KM Percentile (z)	1.047	
2283						99% KM Percentile (z)	1.193			95% KM USL	1.308	
2284												
2285	DL/2 Substitution Background Statistics Assuming Normal Distribution											
2286						Mean	0.584			SD	0.248	
2287						95% UTL95% Coverage	1.109			95% UPL (t)	1.007	
2288						90% Percentile (z)	0.901			95% Percentile (z)	0.992	
2289						99% Percentile (z)	1.161			95% USL	1.295	
2290	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons											
2291												
2292	Gamma GOF Tests on Detected Observations Only											
2293						A-D Test Statistic	0.379			Anderson-Darling GOF Test		
2294						5% A-D Critical Value	0.729			Detected data appear Gamma Distributed at 5% Significance Level		
2295						K-S Test Statistic	0.169			Kolmogorov-Smirnov GOF		
2296						5% K-S Critical Value	0.255			Detected data appear Gamma Distributed at 5% Significance Level		
2297	Detected data appear Gamma Distributed at 5% Significance Level											
2298												
2299	Gamma Statistics on Detected Data Only											
2300						k hat (MLE)	12.92			k star (bias corrected MLE)	9.457	

	A	B	C	D	E	F	G	H	I	J	K	L
2301					Theta hat (MLE)	0.0692				Theta star (bias corrected MLE)		0.0946
2302					nu hat (MLE)	284.2				nu star (bias corrected)		208.1
2303					MLE Mean (bias corrected)	0.895						
2304					MLE Sd (bias corrected)	0.291				95% Percentile of Chisquare (2kstar)		30.03
2305												
2306	**Gamma ROS Statistics using Imputed Non-Detects**											
2307	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2308	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
2309	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
2310	This is especially true when the sample size is small.											
2311	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2312					Minimum	0.188				Mean		0.651
2313					Maximum	1.4				Median		0.627
2314					SD	0.274				CV		0.421
2315					k hat (MLE)	5.527				k star (bias corrected MLE)		5.129
2316					Theta hat (MLE)	0.118				Theta star (bias corrected MLE)		0.127
2317					nu hat (MLE)	442.1				nu star (bias corrected)		410.3
2318					MLE Mean (bias corrected)	0.651				MLE Sd (bias corrected)		0.288
2319					95% Percentile of Chisquare (2kstar)	18.66				90% Percentile		1.037
2320					95% Percentile	1.185				99% Percentile		1.499
2321	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
2322	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
2323					WH	HW					WH	HW
2324	95% Approx. Gamma UTL with 95% Coverage				1.379	1.412	95% Approx. Gamma UPL				1.197	1.215
2325	95% Gamma USL				1.756	1.832						
2326												
2327	**Estimates of Gamma Parameters using KM Estimates**											
2328					Mean (KM)	0.696				SD (KM)		0.213
2329					Variance (KM)	0.0456				SE of Mean (KM)		0.0474
2330					k hat (KM)	10.63				k star (KM)		9.847
2331					nu hat (KM)	850.2				nu star (KM)		787.8
2332					theta hat (KM)	0.0655				theta star (KM)		0.0707
2333					80% gamma percentile (KM)	0.873				90% gamma percentile (KM)		0.991
2334					95% gamma percentile (KM)	1.096				99% gamma percentile (KM)		1.313
2335												
2336	**The following statistics are computed using gamma distribution and KM estimates**											
2337	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
2338					WH	HW					WH	HW
2339	95% Approx. Gamma UTL with 95% Coverage				1.173	1.178	95% Approx. Gamma UPL				1.062	1.063
2340	95% KM Gamma Percentile				1.046	1.047	95% Gamma USL				1.394	1.41
2341												
2342	**Lognormal GOF Test on Detected Observations Only**											
2343					Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk GOF Test**					
2344					5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level					
2345					Lilliefors Test Statistic	0.165	**Lilliefors GOF Test**					
2346					5% Lilliefors Critical Value	0.251	Detected Data appear Lognormal at 5% Significance Level					
2347	**Detected Data appear Lognormal at 5% Significance Level**											
2348												
2349	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
2350					Mean in Original Scale	0.677				Mean in Log Scale		-0.448

2351					SD in Original Scale	0.241				SD in Log Scale		0.343
2352					95% UTL95% Coverage	1.322				95% BCA UTL95% Coverage		1.21
2353					95% Bootstrap (%) UTL95% Coverage	1.4				95% UPL (t)		1.148
2354					90% Percentile (z)	0.992				95% Percentile (z)		1.124
2355					99% Percentile (z)	1.42				95% USL		1.71
2356												
2357	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
2358					KM Mean of Logged Data	-0.403				95% KM UTL (Lognormal)95% Coverage		1.196
2359					KM SD of Logged Data	0.275				95% KM UPL (Lognormal)		1.068
2360					95% KM Percentile Lognormal (z)	1.05				95% KM USL (Lognormal)		1.47
2361												
2362	**Background DL/2 Statistics Assuming Lognormal Distribution**											
2363					Mean in Original Scale	0.584				Mean in Log Scale		-0.613
2364					SD in Original Scale	0.248				SD in Log Scale		0.384
2365					95% UTL95% Coverage	1.221				95% UPL (t)		1.043
2366					90% Percentile (z)	0.886				95% Percentile (z)		1.019
2367					99% Percentile (z)	1.323				95% USL		1.629
2368	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
2369												
2370	**Nonparametric Distribution Free Background Statistics**											
2371	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
2372												
2373	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
2374					Order of Statistic, r	40				95% UTL with95% Coverage		1.4
2375					Approx, f used to compute achieved CC	2.105				Approximate Actual Confidence Coefficient achieved by UTL		0.871
2376					Approximate Sample Size needed to achieve specified CC	59				95% UPL		1.195
2377					95% USL	1.4				95% KM Chebyshev UPL		1.638
2378												
2379	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
2380	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
2381	and consists of observations collected from clean unimpacted locations.											
2382	The use of USL tends to provide a balance between false positives and false negatives provided the data											
2383	represents a background data set and when many onsite observations need to be compared with the BTV.											
2384												
2385	**TOLUENE (mg/)**											
2386												
2387	**General Statistics**											
2388					Total Number of Observations	42				Number of Missing Observations		0
2389					Number of Distinct Observations	1						
2390					Number of Detects	0				Number of Non-Detects		42
2391					Number of Distinct Detects	0				Number of Distinct Non-Detects		1
2392					Minimum Detect	N/A				Minimum Non-Detect		1
2393					Maximum Detect	N/A				Maximum Non-Detect		1
2394					Variance Detected	N/A				Percent Non-Detects		100%
2395					Mean Detected	N/A				SD Detected		N/A
2396					Mean of Detected Logged Data	N/A				SD of Detected Logged Data		N/A
2397												
2398	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
2399	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
2400	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											

	A	B	C	D	E	F	G	H	I	J	K	L
2401												
2402	**The data set for variable TOLUENE (mg/) was not processed!**											
2403												
2404												
2405	**TOTAL PHENOLICS (mg/L)**											
2406												
2407	**General Statistics**											
2408	Total Number of Observations					43	Number of Missing Observations					0
2409	Number of Distinct Observations					2						
2410	Number of Detects					2	Number of Non-Detects					41
2411	Number of Distinct Detects					1	Number of Distinct Non-Detects					2
2412	Minimum Detect					0.01	Minimum Non-Detect					0.005
2413	Maximum Detect					0.01	Maximum Non-Detect					0.01
2414	Variance Detected					0	Percent Non-Detects					95.35%
2415	Mean Detected					0.01	SD Detected					0
2416	Mean of Detected Logged Data					-4.605	SD of Detected Logged Data					0
2417												
2418	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
2419	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
2420												
2421	**The data set for variable TOTAL PHENOLICS (mg/L) was not processed!**											
2422												
2423												
2424	**TRANS 1,2-DICHLOROETHENE (ug/L)**											
2425												
2426	**General Statistics**											
2427	Total Number of Observations					43	Number of Missing Observations					0
2428	Number of Distinct Observations					1						
2429	Number of Detects					0	Number of Non-Detects					43
2430	Number of Distinct Detects					0	Number of Distinct Non-Detects					1
2431	Minimum Detect					N/A	Minimum Non-Detect					1
2432	Maximum Detect					N/A	Maximum Non-Detect					1
2433	Variance Detected					N/A	Percent Non-Detects					100%
2434	Mean Detected					N/A	SD Detected					N/A
2435	Mean of Detected Logged Data					N/A	SD of Detected Logged Data					N/A
2436												
2437	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
2438	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
2439	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2440												
2441	**The data set for variable TRANS 1,2-DICHLOROETHENE (ug/L) was not processed!**											
2442												
2443												
2444	**TRICHLOROETHENE (ug/L)**											
2445												
2446	**General Statistics**											
2447	Total Number of Observations					43	Number of Missing Observations					0
2448	Number of Distinct Observations					1						
2449	Number of Detects					0	Number of Non-Detects					43
2450	Number of Distinct Detects					0	Number of Distinct Non-Detects					1

2451					Minimum Detect	N/A				Minimum Non-Detect		1
2452					Maximum Detect	N/A				Maximum Non-Detect		1
2453					Variance Detected	N/A				Percent Non-Detects		100%
2454					Mean Detected	N/A				SD Detected		N/A
2455					Mean of Detected Logged Data	N/A				SD of Detected Logged Data		N/A
2456												
2457	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
2458	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
2459	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2460												
2461	**The data set for variable TRICHLOROETHENE (ug/L) was not processed!**											
2462												
2463												
2464	**TURBIDITY (NTU)**											
2465												
2466	**General Statistics**											
2467					Total Number of Observations	43				Number of Missing Observations		0
2468					Number of Distinct Observations	29						
2469					Number of Detects	37				Number of Non-Detects		6
2470					Number of Distinct Detects	28				Number of Distinct Non-Detects		1
2471					Minimum Detect	0.11				Minimum Non-Detect		0.1
2472					Maximum Detect	10.1				Maximum Non-Detect		0.1
2473					Variance Detected	3.434				Percent Non-Detects		13.95%
2474					Mean Detected	0.826				SD Detected		1.853
2475					Mean of Detected Logged Data	-1.038				SD of Detected Logged Data		1.05
2476												
2477	**Critical Values for Background Threshold Values (BTVs)**											
2478					Tolerance Factor K (For UTL)	2.097				d2max (for USL)		2.897
2479												
2480	**Normal GOF Test on Detects Only**											
2481					Shapiro Wilk Test Statistic	0.405	**Shapiro Wilk GOF Test**					
2482					5% Shapiro Wilk Critical Value	0.936	Data Not Normal at 5% Significance Level					
2483					Lilliefors Test Statistic	0.401	**Lilliefors GOF Test**					
2484					5% Lilliefors Critical Value	0.144	Data Not Normal at 5% Significance Level					
2485	**Data Not Normal at 5% Significance Level**											
2486												
2487	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
2488					KM Mean	0.725				KM SD		1.714
2489					95% UTL95% Coverage	4.32				95% KM UPL (t)		3.641
2490					90% KM Percentile (z)	2.922				95% KM Percentile (z)		3.544
2491					99% KM Percentile (z)	4.713				95% KM USL		5.691
2492												
2493	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
2494					Mean	0.718				SD		1.737
2495					95% UTL95% Coverage	4.361				95% UPL (t)		3.673
2496					90% Percentile (z)	2.944				95% Percentile (z)		3.575
2497					99% Percentile (z)	4.759				95% USL		5.75
2498	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
2499												
2500	**Gamma GOF Tests on Detected Observations Only**											

2501					A-D Test Statistic	4.196	**Anderson-Darling GOF Test**					
2502					5% A-D Critical Value	0.792	Data Not Gamma Distributed at 5% Significance Level					
2503					K-S Test Statistic	0.277	**Kolmogorov-Smirnov GOF**					
2504					5% K-S Critical Value	0.151	Data Not Gamma Distributed at 5% Significance Level					
2505	**Data Not Gamma Distributed at 5% Significance Level**											
2506												
2507	**Gamma Statistics on Detected Data Only**											
2508					k hat (MLE)	0.712	k star (bias corrected MLE)					0.673
2509					Theta hat (MLE)	1.16	Theta star (bias corrected MLE)					1.228
2510					nu hat (MLE)	52.71	nu star (bias corrected)					49.77
2511					MLE Mean (bias corrected)	0.826						
2512					MLE Sd (bias corrected)	1.007	95% Percentile of Chisquare (2kstar)					4.645
2513												
2514	**Gamma ROS Statistics using Imputed Non-Detects**											
2515	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2516	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
2517	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
2518	This is especially true when the sample size is small.											
2519	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2520					Minimum	0.01	Mean					0.712
2521					Maximum	10.1	Median					0.24
2522					SD	1.739	CV					2.443
2523					k hat (MLE)	0.527	k star (bias corrected MLE)					0.506
2524					Theta hat (MLE)	1.352	Theta star (bias corrected MLE)					1.408
2525					nu hat (MLE)	45.31	nu star (bias corrected)					43.48
2526					MLE Mean (bias corrected)	0.712	MLE Sd (bias corrected)					1.001
2527					95% Percentile of Chisquare (2kstar)	3.869	90% Percentile					1.922
2528					95% Percentile	2.725	99% Percentile					4.696
2529	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
2530	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
2531						WH	HW				WH	HW
2532					95% Approx. Gamma UTL with 95% Coverage	3.247	3.347	95% Approx. Gamma UPL			2.354	2.333
2533					95% Gamma USL	5.685	6.369					
2534												
2535	**Estimates of Gamma Parameters using KM Estimates**											
2536					Mean (KM)	0.725	SD (KM)					1.714
2537					Variance (KM)	2.939	SE of Mean (KM)					0.265
2538					k hat (KM)	0.179	k star (KM)					0.182
2539					nu hat (KM)	15.37	nu star (KM)					15.63
2540					theta hat (KM)	4.055	theta star (KM)					3.987
2541					80% gamma percentile (KM)	0.904	90% gamma percentile (KM)					2.186
2542					95% gamma percentile (KM)	3.825	99% gamma percentile (KM)					8.409
2543												
2544	**The following statistics are computed using gamma distribution and KM estimates**											
2545	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
2546						WH	HW				WH	HW
2547					95% Approx. Gamma UTL with 95% Coverage	2.941	2.831	95% Approx. Gamma UPL			2.186	2.055
2548					95% KM Gamma Percentile	2.091	1.959	95% Gamma USL			4.957	5.047
2549												
2550	**Lognormal GOF Test on Detected Observations Only**											

2551					Shapiro Wilk Test Statistic	0.855	**Shapiro Wilk GOF Test**					
2552					5% Shapiro Wilk Critical Value	0.936	Data Not Lognormal at 5% Significance Level					
2553					Lilliefors Test Statistic	0.143	**Lilliefors GOF Test**					
2554					5% Lilliefors Critical Value	0.144	Detected Data appear Lognormal at 5% Significance Level					
2555	**Detected Data appear Approximate Lognormal at 5% Significance Level**											
2556												
2557	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
2558					Mean in Original Scale	0.716	Mean in Log Scale	-1.362				
2559					SD in Original Scale	1.738	SD in Log Scale	1.278				
2560					95% UTL95% Coverage	3.735	95% BCA UTL95% Coverage	9.417				
2561					95% Bootstrap (%) UTL95% Coverage	9.638	95% UPL (t)	2.252				
2562					90% Percentile (z)	1.317	95% Percentile (z)	2.095				
2563					99% Percentile (z)	5.005	95% USL	10.38				
2564												
2565	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
2566					KM Mean of Logged Data	-1.214	95% KM UTL (Lognormal)95% Coverage	2.722				
2567					KM SD of Logged Data	1.056	95% KM UPL (Lognormal)	1.792				
2568					95% KM Percentile Lognormal (z)	1.688	95% KM USL (Lognormal)	6.336				
2569												
2570	**Background DL/2 Statistics Assuming Lognormal Distribution**											
2571					Mean in Original Scale	0.718	Mean in Log Scale	-1.311				
2572					SD in Original Scale	1.737	SD in Log Scale	1.19				
2573					95% UTL95% Coverage	3.273	95% UPL (t)	2.043				
2574					90% Percentile (z)	1.24	95% Percentile (z)	1.91				
2575					99% Percentile (z)	4.3	95% USL	8.482				
2576	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
2577												
2578	**Nonparametric Distribution Free Background Statistics**											
2579	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
2580												
2581	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
2582					Order of Statistic, r	43	95% UTL with95% Coverage	10.1				
2583					Approx, f used to compute achieved CC	2.263	Approximate Actual Confidence Coefficient achieved by UTL	0.89				
2584					Approximate Sample Size needed to achieve specified CC	59	95% UPL	5.038				
2585					95% USL	10.1	95% KM Chebyshev UPL	8.283				
2586												
2587	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
2588	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
2589	and consists of observations collected from clean unimpacted locations.											
2590	The use of USL tends to provide a balance between false positives and false negatives provided the data											
2591	represents a background data set and when many onsite observations need to be compared with the BTV.											
2592												
2593	**VINYL CHLORIDE (ug/L)**											
2594												
2595	**General Statistics**											
2596					Total Number of Observations	43	Number of Missing Observations	0				
2597					Number of Distinct Observations	1						
2598					Number of Detects	0	Number of Non-Detects	43				
2599					Number of Distinct Detects	0	Number of Distinct Non-Detects	1				
2600					Minimum Detect	N/A	Minimum Non-Detect	1				

2601					Maximum Detect	N/A				Maximum Non-Detect		1
2602					Variance Detected	N/A				Percent Non-Detects		100%
2603					Mean Detected	N/A				SD Detected		N/A
2604					Mean of Detected Logged Data	N/A				SD of Detected Logged Data		N/A
2605												
2606					**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**							
2607					**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**							
2608					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
2609												
2610					**The data set for variable VINYL CHLORIDE (ug/L) was not processed!**							
2611												
2612												
2613	**TOTAL XYLENES (ug/L)**											
2614												
2615					**General Statistics**							
2616					Total Number of Observations	43				Number of Missing Observations		0
2617					Number of Distinct Observations	1						
2618					Number of Detects	0				Number of Non-Detects		43
2619					Number of Distinct Detects	0				Number of Distinct Non-Detects		1
2620					Minimum Detect	N/A				Minimum Non-Detect		3
2621					Maximum Detect	N/A				Maximum Non-Detect		3
2622					Variance Detected	N/A				Percent Non-Detects		100%
2623					Mean Detected	N/A				SD Detected		N/A
2624					Mean of Detected Logged Data	N/A				SD of Detected Logged Data		N/A
2625												
2626					**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**							
2627					**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**							
2628					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
2629												
2630					**The data set for variable TOTAL XYLENES (ug/L) was not processed!**							
2631												
2632												

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/11/2019
DEP USE ONLY
Date Received

FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP015W — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 36.43 " — Longitude: 76 ° 27 ' 10.82 "

Depth to Water Level: 56.93 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 1.90 ft — Elevation of Water Level: 519.47 ft./MSL

Sampling Depth: 135 ft — Volume of Water Column: 135.07 gal

Total Well Depth: 148.9 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 1.0

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/19/2019 — Sample Collection Time: 10:58

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3052609001 — Final Lab Analysis CompletionDate: 8/28/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP015W
Sample Date	8/19/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	21	SM20-2320B
CALCIUM, TOTAL	9.3	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	12	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	9.8	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	41	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	10.1	EPA 300
pH-FIELD (SU)	5.04	FIELD
pH-LAB (SU)	6.46	SM20-4500HB
POTASSIUM, TOTAL	2.2	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	22.6	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	269	FIELD
SPEC. COND., LAB (umhos/cm)	234	SW846 9050A
SULFATE	45.9	EPA 300
ALKALINITY	21	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	172	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.93	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.15	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP015W
Sample Date	8/19/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/11/2019
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FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP03AW — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 24.05 " — Longitude: 76 ° 27 ' 30.58 "

Depth to Water Level: 50.14 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 1.20 ft — Elevation of Water Level: 540.76 ft./MSL

Sampling Depth: 130 ft — Volume of Water Column: 142.55 gal

Total Well Depth: 147.2 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 0.9

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/19/2019 — Sample Collection Time: 12:11

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3052609002 — Final Lab Analysis CompletionDate: 8/28/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP03AW
Sample Date	8/19/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	21	SM20-2320B
CALCIUM, TOTAL	17	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	27.5	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	11	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	260	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	20	EPA 300
pH-FIELD (SU)	3.92	FIELD
pH-LAB (SU)	6.08	SM20-4500HB
POTASSIUM, TOTAL	1.4	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	12.4	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	287	FIELD
SPEC. COND., LAB (umhos/cm)	254	SW846 9050A
SULFATE	2.8	EPA 300
ALKALINITY	21	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	209	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.56	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.16	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP03AW
Sample Date	8/19/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

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FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP30RW — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 15.52 " — Longitude: 76 ° 27 ' 26.8 "

Depth to Water Level: 36.31 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 2.20 ft — Elevation of Water Level: 525.99 ft./MSL

Sampling Depth: 85 ft — Volume of Water Column: 78.85 gal

Total Well Depth: 90 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 1.4

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/19/2019 — Sample Collection Time: 13:41

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3052609003 — Final Lab Analysis CompletionDate: 8/28/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP30RW
Sample Date	8/19/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.135	D6919-09
BICARBONATE ALKALINITY	34	SM20-2320B
CALCIUM, TOTAL	37.6	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	219	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	77	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	14.9	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	2600	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	5.8	EPA 300
pH-FIELD (SU)	4.69	FIELD
pH-LAB (SU)	6.36	SM20-4500HB
POTASSIUM, TOTAL	5.3	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	110	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	899	FIELD
SPEC. COND., LAB (umhos/cm)	915	SW846 9050A
SULFATE	26.9	EPA 300
ALKALINITY	34	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	542	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.89	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	1.98	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP30RW
Sample Date	8/19/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/11/2019
DEP USE ONLY
Date Received

FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP04AW — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 15.4 " — Longitude: 76 ° 27 ' 26.58 "

Depth to Water Level: 35.66 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 2.52 ft — Elevation of Water Level: 525.06 ft./MSL

Sampling Depth: 146 ft — Volume of Water Column: 390.46 gal

Total Well Depth: 301.52 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 0.8

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/19/2019 — Sample Collection Time: 14:49

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3052609004 — Final Lab Analysis CompletionDate: 8/28/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP04AW
Sample Date	8/19/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	221	SM20-2320B
CALCIUM, TOTAL	152	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	317	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	23.5	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	310	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	0.24	EPA 300
pH-FIELD (SU)	6.33	FIELD
pH-LAB (SU)	7.7	SM20-4500HB
POTASSIUM, TOTAL	2.3	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	90.8	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	1451	FIELD
SPEC. COND., LAB (umhos/cm)	1430	SW846 9050A
SULFATE	46.9	EPA 300
ALKALINITY	221	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	1030	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.89	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	1.4	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP04AW
Sample Date	8/19/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/11/2019
DEP USE ONLY
Date Received

FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP017W — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 8.5 " — Longitude: 76 ° 27 ' 6.17 "

Depth to Water Level: 41.04 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 2.00 ft — Elevation of Water Level: 439.66 ft./MSL

Sampling Depth: 135 ft — Volume of Water Column: 160.76 gal

Total Well Depth: 150.5 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 1.0

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/20/2019 — Sample Collection Time: 9:41

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3052795001 — Final Lab Analysis CompletionDate: 8/28/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP017W
Sample Date	8/20/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.609	D6919-09
BICARBONATE ALKALINITY	46	SM20-2320B
CALCIUM, TOTAL	99.1	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15	EPA 410.4
CHLORIDE	405	EPA 300
FLUORIDE	0.5 ND	EPA 300
IRON, TOTAL (ug/l)	99	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	41.2	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	490	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	2	EPA 300
pH-FIELD (SU)	5.81	FIELD
pH-LAB (SU)	6.34	SM20-4500HB
POTASSIUM, TOTAL	6.2	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	86.4	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	1567	FIELD
SPEC. COND., LAB (umhos/cm)	1520	SW846 9050A
SULFATE	56.8	EPA 300
ALKALINITY	46	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	1140	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	2.5	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	4.64	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).
Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP017W
Sample Date	8/20/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/11/2019
DEP USE ONLY
Date Received

FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP018W — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 11.62 " — Longitude: 76 ° 27 ' 5.68 "

Depth to Water Level: 26.73 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 2.46 ft — Elevation of Water Level: 445.47 ft./MSL

Sampling Depth: 40 ft — Volume of Water Column: 16.12 gal

Total Well Depth: 51.43 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 0.9

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/20/2019 — Sample Collection Time: 10:26

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3052795002 — Final Lab Analysis CompletionDate: 8/28/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP018W
Sample Date	8/20/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.161	D6919-09
BICARBONATE ALKALINITY	18	SM20-2320B
CALCIUM, TOTAL	30.5	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	106	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	15.7	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	360	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	5.7	EPA 300
pH-FIELD (SU)	5.14	FIELD
pH-LAB (SU)	5.93	SM20-4500HB
POTASSIUM, TOTAL	5	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	35.5	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	554	FIELD
SPEC. COND., LAB (umhos/cm)	528	SW846 9050A
SULFATE	39.4	EPA 300
ALKALINITY	18	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	363	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.92	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.15	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP018W
Sample Date	8/20/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/11/2019
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Date Received

FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP019W — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 11.58 " — Longitude: 76 ° 27 ' 5.75 "

Depth to Water Level: 27.48 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 1.79 ft — Elevation of Water Level: 444.47 ft./MSL

Sampling Depth: 49 ft — Volume of Water Column: 68.74 gal

Total Well Depth: 132.79 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 1.0

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/20/2019 — Sample Collection Time: 11:11

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3052795003 — Final Lab Analysis CompletionDate: 8/28/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP019W
Sample Date	8/20/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.141	D6919-09
BICARBONATE ALKALINITY	69	SM20-2320B
CALCIUM, TOTAL	56.6	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	75.9	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	5.4	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	5.6 ND	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	0.22	EPA 300
pH-FIELD (SU)	5.73	FIELD
pH-LAB (SU)	7.03	SM20-4500HB
POTASSIUM, TOTAL	0.93	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	10.1	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	447	FIELD
SPEC. COND., LAB (umhos/cm)	421	SW846 9050A
SULFATE	14	EPA 300
ALKALINITY	69	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	308	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	1.1	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.29	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP019W
Sample Date	8/20/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
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FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP029W — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 12.93 " — Longitude: 76 ° 27 ' 0.67 "

Depth to Water Level: 38.41 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 2.00 ft — Elevation of Water Level: 438.89 ft./MSL

Sampling Depth: 55 ft — Volume of Water Column: 29.51 gal

Total Well Depth: 58.5 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 3.1

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/20/2019 — Sample Collection Time: 12:34

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3052795004 — Final Lab Analysis CompletionDate: 8/28/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP029W
Sample Date	8/20/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.171	D6919-09
BICARBONATE ALKALINITY	13	SM20-2320B
CALCIUM, TOTAL	11.2	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	50.7	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	8.6	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	25	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	3.6	EPA 300
pH-FIELD (SU)	3.94	FIELD
pH-LAB (SU)	5.89	SM20-4500HB
POTASSIUM, TOTAL	1.8	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	17	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	261	FIELD
SPEC. COND., LAB (umhos/cm)	221	SW846 9050A
SULFATE	4.1	EPA 300
ALKALINITY	13	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	193	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.14	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP029W
Sample Date	8/20/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/11/2019
DEP USE ONLY
Date Received

FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP005W — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 10.67 " — Longitude: 76 ° 27 ' 21.3 "

Depth to Water Level: 68.45 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 1.70 ft — Elevation of Water Level: 468.95 ft./MSL

Sampling Depth: 135 ft — Volume of Water Column: 119.77 gal

Total Well Depth: 150 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 1.4

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/20/2019 — Sample Collection Time: 14:25

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3052795005 — Final Lab Analysis CompletionDate: 8/29/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP005W
Sample Date	8/20/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.133	D6919-09
BICARBONATE ALKALINITY	52	SM20-2320B
CALCIUM, TOTAL	72.2	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	188	EPA 300
FLUORIDE	0.5 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	16.6	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	80	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	2.2	EPA 300
pH-FIELD (SU)	5.14	FIELD
pH-LAB (SU)	6.07	SM20-4500HB
POTASSIUM, TOTAL	2.8	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	42.1	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	914	FIELD
SPEC. COND., LAB (umhos/cm)	888	SW846 9050A
SULFATE	59.2	EPA 300
ALKALINITY	52	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	592	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	1.3	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.12	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP005W
Sample Date	8/20/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/11/2019
DEP USE ONLY
Date Received

FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP028W — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: Manor Township

Sampling Point: Latitude: 37 ° 57 ' 21.62 " — Longitude: 76 ° 27 ' 0.1 "

Depth to Water Level: 16.01 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 2.50 ft — Elevation of Water Level: 448.99 ft./MSL

Sampling Depth: 50 ft — Volume of Water Column: ___ gal

Total Well Depth: 60 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 2.5

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/21/2019 — Sample Collection Time: 9:57

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3053286001 — Final Lab Analysis CompletionDate: 8/30/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP028W
Sample Date	8/21/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	33	SM20-2320B
CALCIUM, TOTAL	41.1	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	88.8	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	17.4	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	8.8	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	17.7	EPA 300
pH-FIELD (SU)	5.53	FIELD
pH-LAB (SU)	6.85	SM20-4500HB
POTASSIUM, TOTAL	2.2	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	26.4	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	566	FIELD
SPEC. COND., LAB (umhos/cm)	572	SW846 9050A
SULFATE	24.5	EPA 300
ALKALINITY	33	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	386	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.98	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.17	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP028W
Sample Date	8/21/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/11/2019
DEP USE ONLY
Date Received

FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP025W — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 19.07 " — Longitude: 76 ° 27 ' 1.12 "

Depth to Water Level: 26.83 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 1.50 ft — Elevation of Water Level: 449.97 ft./MSL

Sampling Depth: 39 ft — Volume of Water Column: 19.34 gal

Total Well Depth: 40 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 1.0

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/21/2019 — Sample Collection Time: 10:36

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3053286002 — Final Lab Analysis CompletionDate: 8/29/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP025W
Sample Date	8/21/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.137	D6919-09
BICARBONATE ALKALINITY	40	SM20-2320B
CALCIUM, TOTAL	27.4	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	56.8	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	13	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	6.3	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	11.5	EPA 300
pH-FIELD (SU)	5.22	FIELD
pH-LAB (SU)	7.07	SM20-4500HB
POTASSIUM, TOTAL	2.2	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	21.7	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	416	FIELD
SPEC. COND., LAB (umhos/cm)	402	SW846 9050A
SULFATE	23.1	EPA 300
ALKALINITY	40	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	528	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	1.1	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.5	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP025W
Sample Date	8/21/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
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Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP02SW — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: MANOR TOWNSHIP

Sampling Point: Latitude: 39 ° 57 ' 27.9 " — Longitude: 76 ° 27 ' 1.58 "

Depth to Water Level: 15.39 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: ___ ft — Elevation of Water Level: 494.51 ft./MSL

Sampling Depth: 18 ft — Volume of Water Column: ___ gal

Total Well Depth: 25 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 1.2

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/21/2019 — Sample Collection Time: 13:14

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3053286004 — Final Lab Analysis CompletionDate: 8/29/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP02SW
Sample Date	8/21/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.139	D6919-09
BICARBONATE ALKALINITY	14	SM20-2320B
CALCIUM, TOTAL	22.9	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	130	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	9600	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	9.6	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	110	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	14.4	EPA 300
pH-FIELD (SU)	5.23	FIELD
pH-LAB (SU)	6.72	SM20-4500HB
POTASSIUM, TOTAL	5.3	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	79.6	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	702	FIELD
SPEC. COND., LAB (umhos/cm)	644	SW846 9050A
SULFATE	31.7	EPA 300
ALKALINITY	14	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	207	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	1.6	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	126	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP02SW
Sample Date	8/21/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/11/2019
DEP USE ONLY
Date Received

FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP02DW — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: MANOR TOWNSHIP

Sampling Point: Latitude: 39 ° 57 ' 27.74 " — Longitude: 76 ° 27 ' 1.49 "

Depth to Water Level: 19.57 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: ___ ft — Elevation of Water Level: 490.03 ft./MSL

Sampling Depth: 120 ft — Volume of Water Column: ___ gal

Total Well Depth: 152 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 0.3

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/21/2019 — Sample Collection Time: 14:28

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3053286005 — Final Lab Analysis CompletionDate: 8/29/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP02DW
Sample Date	8/21/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.627	D6919-09
BICARBONATE ALKALINITY	125	SM20-2320B
CALCIUM, TOTAL	104	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	275	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	520	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	16.1	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	430	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	8.9	EPA 300
pH-FIELD (SU)	7.03	FIELD
pH-LAB (SU)	7.85	SM20-4500HB
POTASSIUM, TOTAL	1.7	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	99.1	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	1250	FIELD
SPEC. COND., LAB (umhos/cm)	1250	SW846 9050A
SULFATE	29.1	EPA 300
ALKALINITY	125	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	805	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.65	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	5.15	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP02DW
Sample Date	8/21/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/11/2019
DEP USE ONLY
Date Received

FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP031W — X Well ___ Spring ___ Stream ___ Other

X Upgradient/Upstream ___ Downgradient/Downstream

Location (County): Lancaster County — Municipality: MANOR TOWNSHIP

Sampling Point: Latitude: 39 ° 57 ' 31.2 " — Longitude: 76 ° 27 ' 23.53 "

Depth to Water Level: 64.82 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 2.38 ft — Elevation of Water Level: 547.84 ft./MSL

Sampling Depth: 130 ft — Volume of Water Column: 110.41 gal

Total Well Depth: 140 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 1.0

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/22/2019 — Sample Collection Time: 12:20

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3053612001 — Final Lab Analysis CompletionDate: 8/30/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP031W
Sample Date	8/22/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.272	D6919-09
BICARBONATE ALKALINITY	68	SM20-2320B
CALCIUM, TOTAL	40.6	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	24.6	EPA 300
FLUORIDE	0.2	EPA 300
IRON, TOTAL (ug/l)	3800	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	3.9	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	360	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	8	FIELD
pH-LAB (SU)	7.66	SM20-4500HB
POTASSIUM, TOTAL	1.4	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	10.7	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	322	FIELD
SPEC. COND., LAB (umhos/cm)	274	SW846 9050A
SULFATE	42.9	EPA 300
ALKALINITY	68	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	142	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.57	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	24.8	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP031W
Sample Date	8/22/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/11/2019
DEP USE ONLY
Date Received

FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP002W — X Well ___ Spring ___ Stream ___ Other

X Upgradient/Upstream ___ Downgradient/Downstream

Location (County): Lancaster County — Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 32.25 " — Longitude: 76 ° 27 ' 24.03 "

Depth to Water Level: 65.51 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 1.60 ft — Elevation of Water Level: 547.69 ft./MSL

Sampling Depth: 85 ft — Volume of Water Column: 152.87 gal

Total Well Depth: 169.6 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 1.1

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/22/2019 — Sample Collection Time: 13:07

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3053612002 — Final Lab Analysis CompletionDate: 8/30/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP002W
Sample Date	8/22/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1	D6919-09
BICARBONATE ALKALINITY	5 ND	SM20-2320B
CALCIUM, TOTAL	20.2	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	22.1	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	7.7	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	260	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	22.5	EPA 300
pH-FIELD (SU)	4.82	FIELD
pH-LAB (SU)	5.57	SM20-4500HB
POTASSIUM, TOTAL	1	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	13.7	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	5	FIELD
SPEC. COND., LAB (umhos/cm)	257	SW846 9050A
SULFATE	12.8	EPA 300
ALKALINITY	5 ND	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	189	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.66	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.27	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP002W
Sample Date	8/22/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/11/2019
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FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP032W — X Well ___ Spring ___ Stream ___ Other

X Upgradient/Upstream ___ Downgradient/Downstream

Location (County): Lancaster County — Municipality: MANOR TOWNSHIP

Sampling Point: Latitude: 39 ° 57 ' 33.45 " — Longitude: 76 ° 27 ' 17.71 "

Depth to Water Level: 47.27 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 2.06 ft — Elevation of Water Level: 546.82 ft./MSL

Sampling Depth: 62 ft — Volume of Water Column: 40.73 gal

Total Well Depth: 75 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 1.0

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/22/2019 — Sample Collection Time: 13:47

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3053612003 — Final Lab Analysis CompletionDate: 8/30/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP032W
Sample Date	8/22/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.572	D6919-09
BICARBONATE ALKALINITY	67	SM20-2320B
CALCIUM, TOTAL	15.4	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	21.9	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	5800	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	4.9	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	630	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	6.6	FIELD
pH-LAB (SU)	7.33	SM20-4500HB
POTASSIUM, TOTAL	1.2	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	13.2	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	213	FIELD
SPEC. COND., LAB (umhos/cm)	172	SW846 9050A
SULFATE	2 ND	EPA 300
ALKALINITY	67	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	76	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.85	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	95.5	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP032W
Sample Date	8/22/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
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FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP033W — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: MANOR TOWNSHIP

Sampling Point: Latitude: 39 ° 57 ' 31.09 " — Longitude: 76 ° 27 ' 4.98 "

Depth to Water Level: 17 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 0.49 ft — Elevation of Water Level: 499.52 ft./MSL

Sampling Depth: ___ ft — Volume of Water Column: 116.02 gal

Total Well Depth: 96 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 1.0

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/22/2019 — Sample Collection Time: 15:02

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3053612004 — Final Lab Analysis CompletionDate: 8/30/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP033W
Sample Date	8/22/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.694	D6919-09
BICARBONATE ALKALINITY	43	SM20-2320B
CALCIUM, TOTAL	26.6	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	41	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	4500	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	8.9	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	480	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	12	EPA 300
pH-FIELD (SU)	4.28	FIELD
pH-LAB (SU)	6.41	SM20-4500HB
POTASSIUM, TOTAL	1.5	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	13.6	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	349	FIELD
SPEC. COND., LAB (umhos/cm)	298	SW846 9050A
SULFATE	8.1	EPA 300
ALKALINITY	43	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	213	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.6	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	3.13	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP033W
Sample Date	8/22/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/11/2019
DEP USE ONLY
Date Received

FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP26RW — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 11.03 " — Longitude: 76 ° 27 ' 20.3 "

Depth to Water Level: 78.81 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 3.30 ft — Elevation of Water Level: 468.59 ft./MSL

Sampling Depth: 105 ft — Volume of Water Column: 51.68 gal

Total Well Depth: 114 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: 2.6

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/23/2019 — Sample Collection Time: 9:21

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3053834001 — Final Lab Analysis CompletionDate: 8/31/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP26RW
Sample Date	8/23/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	46	SM20-2320B
CALCIUM, TOTAL	67.8	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	191	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	19.1	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	510	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	2.3	EPA 300
pH-FIELD (SU)	5.61	FIELD
pH-LAB (SU)	6	SM20-4500HB
POTASSIUM, TOTAL	8	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	60	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	945	FIELD
SPEC. COND., LAB (umhos/cm)	912	SW846 9050A
SULFATE	74.5	EPA 300
ALKALINITY	46	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	622	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	1.6	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.44	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP26RW
Sample Date	8/23/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0041 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/11/2019
DEP USE ONLY
Date Received

FORM 19

MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 19, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (D° MM' SS.S")

Monitoring Point Number: FFMP016W — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 19.15 " — Longitude: 76 ° 27 ' 0.88 "

Depth to Water Level: 13.81 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: 1.97 ft — Elevation of Water Level: 460.79 ft./MSL

Sampling Depth: 135 ft — Volume of Water Column: 199.72 gal

Total Well Depth: 149.8 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: ___

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: ___ gpm

Sample Date (mm/dd/yy): 8/23/2019 — Sample Collection Time: 10:05

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 3053834002 — Final Lab Analysis CompletionDate: 8/31/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP016W
Sample Date	8/23/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

ANALYTES

1-Q. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	D6919-09
BICARBONATE ALKALINITY	42	SM20-2320B
CALCIUM, TOTAL	29.9	SW846 6010C
CALCIUM, DISSOLVED		SW846 6010C
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	83.1	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	67 ND	SW846 6010C
IRON, DISSOLVED (ug/l)		SW846 6010C
MAGNESIUM, TOTAL	14.2	SW846 6010C
MAGNESIUM, DISSOLVED		SW846 6010C
MANGANESE, TOTAL (ug/l)	26	SW846 6010C
MANGANESE, DISSOLVED (ug/l)		SW846 6010C
NITRATE-NITROGEN	11.5	EPA 300
pH-FIELD (SU)	6.27	FIELD
pH-LAB (SU)	6.22	SM20-4500HB
POTASSIUM, TOTAL	2.2	SW846 6010C
POTASSIUM, DISSOLVED		SW846 6010C
SODIUM, TOTAL	26.7	SW846 6010C
SODIUM, DISSOLVED		SW846 6010C
SPEC. COND., FIELD (umhos/cm)	7	FIELD
SPEC. COND., LAB (umhos/cm)	479	SW846 9050A
SULFATE	27.8	EPA 300
ALKALINITY	42	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	322	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.97	SW846 9060A
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.26	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.
T Please indicate detection limit if analyte is not detected.
** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4). Remaining quarterly samples only require total metals analysis.

I.D. No	101389
Monitoring Point No.	FFMP016W
Sample Date	8/23/2019

FORM 19

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

2-Q. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1 ND	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
CIS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
TRANS 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF LAND RECYCLING AND WASTE MANAGEMENT

Date Prepared/Revised
01/08/2020
DEP USE ONLY
Date Received

FORM 8

MUNICIPAL WASTE LANDFILLS
BASELINE GROUND WATER ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 8, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.284
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

An application for a municipal waste landfill shall contain a description of the chemical characteristics of each aqyufer in the proposed permit area and adjacent area, based on at least two quarters of monitoring data, one of which shall include the season of the highest local groundwater levels. Submit separate forms for each sample analysis.

SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Management Authority

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Monitoring Wells must be designed and constructed in accordance with Department Standards. INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")

Monitoring Point Number: FFMP034W — X Well ___ Spring ___ Stream ___ Other

___ Upgradient/Upstream X Downgradient/Downstream

Location (County): Lancaster County — Municipality: ___

Sampling Point: Latitude: ___ o ___ ' ___ " — Longitude: ___ o ___ ' ___ "

Depth to Water Level: 18.25 ft — Measured from: ___ Land Surface X TOC

Casing Stickup: ___ ft — Elevation of Water Level: 454.63 ft./MSL

Sampling Depth: ___ ft — Volume of Water Column: ___ gal

Total Well Depth: 121 ft — Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes ___ No — Well Volumes Purged: ___

Sample Field Filtered (must be 0.45 micron)?: ___ Yes X No

Spring Flow Rate: __gpm

Sample Date (mm/dd/yy): 8/21/2019 — Sample Collection Time: 12:43

Sample Collector's Name: Mr. Brian G Sh

Sample Collector's Affiliation: ALS

Laboratory(ies) Performing Analysis: ALS Environmental

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Lab Certification Number(s): 22-293

Lab Sample Number(s): 3053286003 — Final Lab Analysis CompletionDate: 9/11/2019

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

I.D. No	101389
Monitoring Point No.	FFMP034W
Sample Date	8/21/2019

FORM 8

1. Inorganics (Enter all data in mg/l except as noted)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.223	ASTM D6919-03
BICARBONATE ALKALINITY	34	SM20 2321
CALCIUM, TOTAL	44.7	EPA 200.7
CALCIUM, DISSOLVED	41.5	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	120	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL	490	EPA 200.7
IRON, DISSOLVED	60 ND	EPA 200.7
MAGNESIUM, TOTAL	17.3	EPA 200.7
MAGNESIUM, DISSOLVED	16	EPA 200.7
MANGANESE, TOTAL	66	EPA 200.7
MANGANESE, DISSOLVED	71	EPA 200.7
NITRATE-NITROGEN	9.2	EPA 300
pH-FIELD	4.62	FIELD
pH-LAB	7.03	EPA 150.1
POTASSIUM, TOTAL	2.3	EPA 200.7
POTASSIUM, DISSOLVED	2.4	EPA 200.7
SODIUM, TOTAL	31.6	EPA 200.7
SODIUM, DISSOLVED	31.6	EPA 200.7
SPEC. COND., FIELD	622	FIELD
SPEC. COND., LAB	610	EPA 120.1
SULFATE	29.9	EPA 300
ALKALINITY	34	SM20 2320B
TDS (TOT. DISSOLVED SOLIDS)	423	SM20 2540C
TOC (TOTAL ORGANIC CARBON)	0.81	SM20 5310B
TOTAL PHENOLICS	5 ND	SW846 9066
TURBIDITY	7.83	SM 2130B

T Please indicate detection limit if analyte is not detected.

I.D. No	101389
Monitoring Point No.	FFMP034W
Sample Date	8/21/2019

FORM 8

2. Metals (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
ARSENIC, TOTAL	9 ND	EPA 200.8
ARSENIC, DISSOLVED	8 ND	EPA 200.8
BARIUM, TOTAL	37	EPA 200.8
BARIUM, DISSOLVED	38	EPA 200.8
CADMIUM, TOTAL	2.2 ND	EPA 200.8
CADMIUM, DISSOLVED	2 ND	EPA 200.8
CHROMIUM, TOTAL	5.6 ND	EPA 200.8
CHROMIUM, DISSOLVED	5 ND	EPA 200.8
COPPER, TOTAL	11 ND	EPA 200.8
COPPER, DISSOLVED	10 ND	EPA 200.8
LEAD-FLAMELESS, TOTAL	6.7 ND	EPA 200.8
LEAD, DISSOLVED	6 ND	EPA 200.8
MERCURY, TOTAL	0.5 ND	EPA 200.8
MERCURY, DISSOLVED	0.5 ND	EPA 200.8
SELENIUM, TOTAL	22 ND	EPA 200.8
SELENIUM, DISSOLVED	20 ND	EPA 200.8
SILVER, TOTAL	4.4 ND	EPA 200.8
SILVER, DISSOLVED	4 ND	EPA 200.8
ZINC, TOTAL	22 ND	EPA 200.8
ZINC, DISSOLVED	20 ND	EPA 200.8

T Please indicate detection limit if analyte is not detected.

I.D. No	101389
Monitoring Point No.	FFMP034W
Sample Date	8/21/2019

FORM 8

3. Organics (Enter all data in ug/l)

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
BROMOFORM	1 ND	EPA 524.2
CARBON TETRACHLORIDE	1 ND	EPA 524.2
CHLOROBENZENE	1 ND	EPA 524.2
CHLOROETHANE	1 ND	EPA 524.2
3-CHLORO-1-PROPENE	1 ND	EPA 524.2
DIBROMOCHLOROMETHANE	1 ND	EPA 524.2
1,2-DIBROMOETHANE	1 ND	EPA 524.2
1,2-DICHLOROBENZENE	1 ND	EPA 524.2
1,3-DICHLOROBENZENE	1 ND	EPA 524.2
1,4-DICHLOROBENZENE	1 ND	EPA 524.2
DICHLORODIFLUOROMETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROPROPANE	1 ND	EPA 524.2
CIS 1,3-DICHLOROPROPENE	1 ND	EPA 524.2
TRANS 1,3-DICHLOROPROPENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
BROMOMETHANE	1 ND	EPA 524.2
CHLOROMETHANE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
2-BUTANONE (MEK)	10 ND	EPA 524.2
1,1,1,2-TETRACHLOROETHANE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
1,1,2,2-TETRACHLOROETHANE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
1,1,2-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
1,2,3-TRICHLOROPROPANE	2 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2
4-METHYL-2-PENTANONE	5 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

I.D. No	101389
Monitoring Point No.	FFMP034W
Sample Date	8/21/2019

FORM 8

QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

SUBTITLE D - Add-On List - For Detection Zone Analytes (mg/l). When the MCLs (where established) of any analyte is exceeded in the detection zone (e.g. established cells) Form 50 monitoring, the following analytes must be monitored during the baseline groundwater analyses .

ORGANICS AND METALS

ANALYTE	VALUE[T]	ANALYSIS METHOD NUMBER
ACETONE		EPA 524.2
ACRYLONITRILE		EPA 524.2
BROMOCHLOROMETHANE (CHLOROBRO		EPA 524.2
BROMODICHLOROMETHANE		EPA 524.2
CARBON DISULFIDE		EPA 524.2
CHLOROFORM		EPA 524.2
1,2-DIBROMO-3-CHLOROPROPANE		EPA 524.2
TRANS 1,4-DICHLORO-2-BUTENE		EPA 524.2
2-HEXANONE		EPA 524.2
DIBROMOMETHANE		EPA 524.2
IODOMETHANE		EPA 524.2
STYRENE		EPA 524.2
VINYL ACETATE		EPA 524.2
ANTIMONY		EPA 200.8
BERYLLIUM		EPA 200.8
COBALT		SW846 6010B
NICKEL		SW846 6010B
THALLIUM		EPA 200.8
VANADIUM		SW846 6010B

T Please indicate detection limit if analyte is not detected.

I.D. No	101389
Monitoring Point No.	FFMP034W
Sample Date	8/21/2019

FORM 8

Qualitatively Identified Organic Compounds

List at least ten volatile organic compounds not otherwise identified in this section. Their identification should be based upon those compounds showing the greatest apparent concentration from the peaks of a mass spectrum of each sample. These ten compounds shall be identified but the concentration of each is not required.

Constituent	CAS Number

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September 1, 2019

Mr. Daniel Brown
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**FREY FARM**	Workorder:	**3053612**
Purchase Order:	**PO1000126**	Workorder ID:	**3rd QTR 2019 GWMP-FORM 19Q**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Thursday, August 22, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Ms. Jordan Gallagher , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3053612 3rd QTR 2019 GWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3053612001	FFMP031W	Ground Water	8/22/2019 12:20	8/22/2019 16:51	Mr. Brian G Shade
3053612002	FFMP002W	Ground Water	8/22/2019 13:07	8/22/2019 16:51	Mr. Brian G Shade
3053612003	FFMP032W	Ground Water	8/22/2019 13:47	8/22/2019 16:51	Mr. Brian G Shade
3053612004	FFMP033W	Ground Water	8/22/2019 15:02	8/22/2019 16:51	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3053612 3rd QTR 2019 GWMP-FORM 19Q

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3053612 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053612001** Date Collected: 8/22/2019 12:20 Matrix: Ground Water
Sample ID: **FFMP031W** Date Received: 8/22/2019 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/29/19 03:37	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/29/19 03:37	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 03:37	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 03:37	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 03:37	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 03:37	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 03:37	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/29/19 03:37	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 03:37	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 03:37	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/29/19 03:37	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/29/19 03:37	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 03:37	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 03:37	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 03:37	PDK	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	126		%	62 - 133	SW846 8260B			8/29/19 03:37	PDK	G
4-Bromofluorobenzene (S)	101		%	79 - 114	SW846 8260B			8/29/19 03:37	PDK	G
Dibromofluoromethane (S)	106		%	78 - 116	SW846 8260B			8/29/19 03:37	PDK	G
Toluene-d8 (S)	110		%	76 - 127	SW846 8260B			8/29/19 03:37	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	68		mg/L	5	SM2320B-2011			8/28/19 07:58	MBW	B
Alkalinity, Total	68	2	mg/L	5	SM2320B-2011			8/28/19 07:58	MBW	B
Ammonia-N	0.272		mg/L	0.100	D6919-09			8/30/19 06:50	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/28/19 13:26	AK	A
Chloride	24.6		mg/L	2.0	EPA 300.0			8/23/19 06:02	CHW	B
Fluoride	0.20		mg/L	0.20	EPA 300.0			8/23/19 06:02	CHW	B
Nitrate-N	ND		mg/L	0.20	EPA 300.0			8/23/19 06:02	CHW	B
pH	7.66	1	pH_Units		S4500HB-11			8/28/19 07:58	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/27/19 13:01	C_D	8/28/19 08:23	C_D	F
Specific Conductance	274		umhos/cm	1	SW846 9050A			8/28/19 07:58	MBW	B
Sulfate	42.9		mg/L	2.0	EPA 300.0			8/23/19 06:02	CHW	B
Total Dissolved Solids	142		mg/L	5	S2540C-11			8/28/19 16:41	D1C	B
Total Organic Carbon (TOC)	0.57		mg/L	0.50	SW846 9060A			8/30/19 10:49	PAG	D
Turbidity	24.8		NTU	0.10	SM2130B-2011			8/23/19 07:16	R2B	B

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ANALYTICAL RESULTS

Workorder: 3053612 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053612001** Date Collected: 8/22/2019 12:20 Matrix: Ground Water
Sample ID: **FFMP031W** Date Received: 8/22/2019 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	40.6		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:41	SRT	J1
Iron, Total	3.8		mg/L	0.067	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:41	SRT	J1
Magnesium, Total	3.9		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:41	SRT	J1
Manganese, Total	0.36		mg/L	0.0056	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:41	SRT	J1
Potassium, Total	1.4		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:41	SRT	J1
Sodium, Total	10.7		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:41	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	64.82		Feet		Field			8/22/19 12:20	BGS	C
Elev Top MW Casing above MSL	612.66		Feet		Field			8/22/19 12:20	BGS	C
Flow Rate	1.32		gal/min		Field			8/22/19 12:20	BGS	C
Ground Water Elevation	547.84		ft/MSL		Field			8/22/19 12:20	BGS	C
pH, Field (SM4500B)	8.00		pH_Units		Field			8/22/19 12:20	BGS	C
Sample Depth	130.00		Feet		Field			8/22/19 12:20	BGS	C
Specific Conductance, Field	322		umhos/cm	1	Field			8/22/19 12:20	BGS	C
Temperature	14.43		Deg. C		Field			8/22/19 12:20	BGS	C
Total Well Depth	142.70		Feet		Field			8/22/19 12:20	BGS	C
Volume in Water Column	114.48		Gallons		Field			8/22/19 12:20	BGS	C
Water Level After Purge	113.14		Feet		Field			8/22/19 12:20	BGS	C
Well Volumes Purged	0.99		Vol		Field			8/22/19 12:20	BGS	C

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3053612 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053612002** Date Collected: 8/22/2019 13:07 Matrix: Ground Water
Sample ID: **FFMP002W** Date Received: 8/22/2019 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:00	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/29/19 04:00	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 04:00	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 04:00	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:00	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:00	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:00	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:00	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 04:00	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:00	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:00	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/29/19 04:00	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 04:00	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:00	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 04:00	PDK	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	128		%	62 - 133	SW846 8260B			8/29/19 04:00	PDK	G
4-Bromofluorobenzene (S)	102		%	79 - 114	SW846 8260B			8/29/19 04:00	PDK	G
Dibromofluoromethane (S)	104		%	78 - 116	SW846 8260B			8/29/19 04:00	PDK	G
Toluene-d8 (S)	109		%	76 - 127	SW846 8260B			8/29/19 04:00	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	ND		mg/L	5	SM2320B-2011			8/28/19 08:06	MBW	B
Alkalinity, Total	ND	2	mg/L	5	SM2320B-2011			8/28/19 08:06	MBW	B
Ammonia-N	0.100		mg/L	0.100	D6919-09			8/30/19 07:03	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/28/19 13:26	AK	A
Chloride	22.1		mg/L	2.0	EPA 300.0			8/23/19 06:17	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/23/19 06:17	CHW	B
Nitrate-N	22.5	3	mg/L	0.50	EPA 300.0			8/24/19 18:51	CHW	B
pH	5.57	1	pH_Units		S4500HB-11			8/28/19 08:06	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/27/19 13:01	C_D	8/28/19 08:23	C_D	F
Specific Conductance	257		umhos/cm	1	SW846 9050A			8/28/19 08:06	MBW	B
Sulfate	12.8		mg/L	2.0	EPA 300.0			8/23/19 06:17	CHW	B
Total Dissolved Solids	189		mg/L	5	S2540C-11			8/28/19 16:41	D1C	B
Total Organic Carbon (TOC)	0.66		mg/L	0.50	SW846 9060A			8/30/19 10:49	PAG	D
Turbidity	0.27		NTU	0.10	SM2130B-2011			8/23/19 07:16	R2B	B

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ANALYTICAL RESULTS

Workorder: 3053612 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053612002** Date Collected: 8/22/2019 13:07 Matrix: Ground Water
Sample ID: **FFMP002W** Date Received: 8/22/2019 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	20.2		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:45	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:45	SRT	J1
Magnesium, Total	7.7		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:45	SRT	J1
Manganese, Total	0.26		mg/L	0.0056	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:45	SRT	J1
Potassium, Total	1.0		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:45	SRT	J1
Sodium, Total	13.7		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:45	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	65.51		Feet		Field			8/22/19 13:07	BGS	C
Elev Top MW Casing above MSL	613.20		Feet		Field			8/22/19 13:07	BGS	C
Flow Rate	1.29		gal/min		Field			8/22/19 13:07	BGS	C
Ground Water Elevation	547.69		ft/MSL		Field			8/22/19 13:07	BGS	C
pH, Field (SM4500B)	4.82		pH_Units		Field			8/22/19 13:07	BGS	C
Sample Depth	85.00		Feet		Field			8/22/19 13:07	BGS	C
Specific Conductance, Field	5		umhos/cm	1	Field			8/22/19 13:07	BGS	C
Temperature	22.94		Deg. C		Field			8/22/19 13:07	BGS	C
Total Well Depth	90.02		Feet		Field			8/22/19 13:07	BGS	C
Volume in Water Column	36.03		Gallons		Field			8/22/19 13:07	BGS	C
Water Level After Purge	79.00		Feet		Field			8/22/19 13:07	BGS	C
Well Volumes Purged	1.07		Vol		Field			8/22/19 13:07	BGS	C

Susan J. Scherer
Ms. Susan J Scherer
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3053612 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053612003** Date Collected: 8/22/2019 13:47 Matrix: Ground Water
Sample ID: **FFMP032W** Date Received: 8/22/2019 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:22	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/29/19 04:22	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 04:22	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 04:22	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:22	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:22	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:22	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:22	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 04:22	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:22	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:22	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/29/19 04:22	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 04:22	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:22	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 04:22	PDK	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	128		%	62 - 133	SW846 8260B			8/29/19 04:22	PDK	G
4-Bromofluorobenzene (S)	102		%	79 - 114	SW846 8260B			8/29/19 04:22	PDK	G
Dibromofluoromethane (S)	104		%	78 - 116	SW846 8260B			8/29/19 04:22	PDK	G
Toluene-d8 (S)	110		%	76 - 127	SW846 8260B			8/29/19 04:22	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	67		mg/L	5	SM2320B-2011			8/28/19 08:15	MBW	B
Alkalinity, Total	67	3	mg/L	5	SM2320B-2011			8/28/19 08:15	MBW	B
Ammonia-N	0.572		mg/L	0.100	D6919-09			8/30/19 07:16	AK	A
Chemical Oxygen Demand (COD)	ND	1	mg/L	15	EPA 410.4			8/28/19 13:26	AK	A
Chloride	21.9		mg/L	2.0	EPA 300.0			8/23/19 06:33	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/23/19 06:33	CHW	B
Nitrate-N	ND		mg/L	0.20	EPA 300.0			8/23/19 06:33	CHW	B
pH	7.33	2	pH_Units		S4500HB-11			8/28/19 08:15	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/27/19 13:01	C_D	8/28/19 08:23	C_D	F
Specific Conductance	172		umhos/cm	1	SW846 9050A			8/28/19 08:15	MBW	B
Sulfate	ND		mg/L	2.0	EPA 300.0			8/23/19 06:33	CHW	B
Total Dissolved Solids	76		mg/L	5	S2540C-11			8/28/19 16:41	D1C	B
Total Organic Carbon (TOC)	0.85		mg/L	0.50	SW846 9060A			8/30/19 16:03	PAG	D
Turbidity	95.5		NTU	0.10	SM2130B-2011			8/23/19 07:16	R2B	B

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ANALYTICAL RESULTS

Workorder: 3053612 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053612003** Date Collected: 8/22/2019 13:47 Matrix: Ground Water

Sample ID: **FFMP032W** Date Received: 8/22/2019 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	15.4		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:49	SRT	J1
Iron, Total	5.8		mg/L	0.067	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:49	SRT	J1
Magnesium, Total	4.9		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:49	SRT	J1
Manganese, Total	0.63		mg/L	0.0056	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:49	SRT	J1
Potassium, Total	1.2		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:49	SRT	J1
Sodium, Total	13.2		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:49	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	47.27		Feet		Field			8/22/19 13:47	BGS	C
Elev Top MW Casing above MSL	594.09		Feet		Field			8/22/19 13:47	BGS	C
Flow Rate	0.92		gal/min		Field			8/22/19 13:47	BGS	C
Ground Water Elevation	546.82		ft/MSL		Field			8/22/19 13:47	BGS	C
pH, Field (SM4500B)	6.60		pH_Units		Field			8/22/19 13:47	BGS	C
Sample Depth	62.00		Feet		Field			8/22/19 13:47	BGS	C
Specific Conductance, Field	213		umhos/cm	1	Field			8/22/19 13:47	BGS	C
Temperature	15.15		Deg. C		Field			8/22/19 13:47	BGS	C
Total Well Depth	77.60		Feet		Field			8/22/19 13:47	BGS	C
Volume in Water Column	44.59		Gallons		Field			8/22/19 13:47	BGS	C
Water Level After Purge	66.95		Feet		Field			8/22/19 13:47	BGS	C
Well Volumes Purged	1.00		Vol		Field			8/22/19 13:47	BGS	C

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3053612 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053612004** Date Collected: 8/22/2019 15:02 Matrix: Ground Water
Sample ID: **FFMP033W** Date Received: 8/22/2019 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:45	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/29/19 04:45	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 04:45	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 04:45	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:45	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:45	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:45	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:45	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 04:45	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:45	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:45	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/29/19 04:45	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 04:45	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 04:45	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 04:45	PDK	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	130		%	62 - 133	SW846 8260B			8/29/19 04:45	PDK	G
4-Bromofluorobenzene (S)	101		%	79 - 114	SW846 8260B			8/29/19 04:45	PDK	G
Dibromofluoromethane (S)	107		%	78 - 116	SW846 8260B			8/29/19 04:45	PDK	G
Toluene-d8 (S)	109		%	76 - 127	SW846 8260B			8/29/19 04:45	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	43		mg/L	5	SM2320B-2011			8/28/19 08:23	MBW	B
Alkalinity, Total	43	2	mg/L	5	SM2320B-2011			8/28/19 08:23	MBW	B
Ammonia-N	0.694		mg/L	0.100	D6919-09			8/30/19 07:28	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/28/19 13:26	AK	A
Chloride	41.0		mg/L	2.0	EPA 300.0			8/23/19 06:49	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/23/19 06:49	CHW	B
Nitrate-N	12.0		mg/L	0.20	EPA 300.0			8/23/19 06:49	CHW	B
pH	6.41	1	pH_Units		S4500HB-11			8/28/19 08:23	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/27/19 13:01	C_D	8/28/19 08:23	C_D	F
Specific Conductance	298		umhos/cm	1	SW846 9050A			8/28/19 08:23	MBW	B
Sulfate	8.1		mg/L	2.0	EPA 300.0			8/23/19 06:49	CHW	B
Total Dissolved Solids	213		mg/L	5	S2540C-11			8/28/19 16:41	D1C	B
Total Organic Carbon (TOC)	0.60		mg/L	0.50	SW846 9060A			8/30/19 16:03	PAG	D
Turbidity	3.13		NTU	0.10	SM2130B-2011			8/23/19 07:16	R2B	B

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ANALYTICAL RESULTS

Workorder: 3053612 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053612004** Date Collected: 8/22/2019 15:02 Matrix: Ground Water

Sample ID: **FFMP033W** Date Received: 8/22/2019 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	26.6		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:53	SRT	J1
Iron, Total	4.5		mg/L	0.067	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:53	SRT	J1
Magnesium, Total	8.9		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:53	SRT	J1
Manganese, Total	0.48		mg/L	0.0056	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:53	SRT	J1
Potassium, Total	1.5		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:53	SRT	J1
Sodium, Total	13.6		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:53	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	17.00		Feet		Field			8/22/19 15:02	BGS	C
Elev Top MW Casing above MSL	516.52		Feet		Field			8/22/19 15:02	BGS	C
Flow Rate	1.97		gal/min		Field			8/22/19 15:02	BGS	C
Ground Water Elevation	499.52		ft/MSL		Field			8/22/19 15:02	BGS	C
pH, Field (SM4500B)	4.28		pH_Units		Field			8/22/19 15:02	BGS	C
Sample Depth	79.00		Feet		Field			8/22/19 15:02	BGS	C
Specific Conductance, Field	349		umhos/cm	1	Field			8/22/19 15:02	BGS	C
Temperature	12.58		Deg. C		Field			8/22/19 15:02	BGS	C
Total Well Depth	100.00		Feet		Field			8/22/19 15:02	BGS	C
Volume in Water Column	122.01		Gallons		Field			8/22/19 15:02	BGS	C
Water Level After Purge	28.25		Feet		Field			8/22/19 15:02	BGS	C
Well Volumes Purged	0.97		Vol		Field			8/22/19 15:02	BGS	C

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3053612 3rd QTR 2019 GWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3053612001	1	FFMP031W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3053612001	2	FFMP031W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053612002	1	FFMP002W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3053612002	2	FFMP002W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053612002	3	FFMP002W	EPA 300.0	Nitrate-N
The sample was originally run within hold time, but required further analysis that exceeded hold time.				
3053612003	1	FFMP032W	EPA 410.4	Chemical Oxygen Demand (COD)
The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits.				
3053612003	2	FFMP032W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3053612003	3	FFMP032W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053612004	1	FFMP033W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3053612004	2	FFMP033W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3053612 3rd QTR 2019 GWMP-FORM 19Q

Lab ID	Sample ID	Analysis Method	Prep Method
3053612001	FFMP031W	D6919-09	
3053612001	FFMP031W	EPA 300.0	
3053612001	FFMP031W	EPA 410.4	
3053612001	FFMP031W	Field	
3053612001	FFMP031W	S2540C-11	
3053612001	FFMP031W	S4500HB-11	
3053612001	FFMP031W	SM2130B-2011	
3053612001	FFMP031W	SM2320B-2011	
3053612001	FFMP031W	SW846 6010C	SW846 3015
3053612001	FFMP031W	SW846 8260B	
3053612001	FFMP031W	SW846 9050A	
3053612001	FFMP031W	SW846 9060A	
3053612001	FFMP031W	SW846 9066	420.4/9066
3053612002	FFMP002W	D6919-09	
3053612002	FFMP002W	EPA 300.0	
3053612002	FFMP002W	EPA 410.4	
3053612002	FFMP002W	Field	
3053612002	FFMP002W	S2540C-11	
3053612002	FFMP002W	S4500HB-11	
3053612002	FFMP002W	SM2130B-2011	
3053612002	FFMP002W	SM2320B-2011	
3053612002	FFMP002W	SW846 6010C	SW846 3015
3053612002	FFMP002W	SW846 8260B	
3053612002	FFMP002W	SW846 9050A	
3053612002	FFMP002W	SW846 9060A	
3053612002	FFMP002W	SW846 9066	420.4/9066
3053612003	FFMP032W	D6919-09	
3053612003	FFMP032W	EPA 300.0	
3053612003	FFMP032W	EPA 410.4	
3053612003	FFMP032W	Field	
3053612003	FFMP032W	S2540C-11	
3053612003	FFMP032W	S4500HB-11	
3053612003	FFMP032W	SM2130B-2011	
3053612003	FFMP032W	SM2320B-2011	
3053612003	FFMP032W	SW846 6010C	SW846 3015
3053612003	FFMP032W	SW846 8260B	
3053612003	FFMP032W	SW846 9050A	
3053612003	FFMP032W	SW846 9060A	
3053612003	FFMP032W	SW846 9066	420.4/9066
3053612004	FFMP033W	D6919-09	
3053612004	FFMP033W	EPA 300.0	
3053612004	FFMP033W	EPA 410.4	
3053612004	FFMP033W	Field	
3053612004	FFMP033W	S2540C-11	
3053612004	FFMP033W	S4500HB-11	
3053612004	FFMP033W	SM2130B-2011	

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3053612 3rd QTR 2019 GWMP-FORM 19Q

Lab ID	Sample ID	Analysis Method	Prep Method
3053612004	FFMP033W	SM2320B-2011	
3053612004	FFMP033W	SW846 6010C	SW846 3015
3053612004	FFMP033W	SW846 8260B	
3053612004	FFMP033W	SW846 9050A	
3053612004	FFMP033W	SW846 9060A	
3053612004	FFMP033W	SW846 9066	420.4/9066

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CHAIN OF CUSTODY / REQUEST FOR ANALYSIS

Generated by ALS

COC #: 3

ALS Quote

30536123

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Client Name: Lancaster County Solid Waste MA

Address: 1299 Harrisburg Pike, P.O. Box 4424
Lancaster, PA 17604

Contact: Mark Reider

Phone#: (717) 735-0193

Project Name/#: Frey Farm Quarterly (GWMP)

Bill To: Lancaster County Solid Waste MA

TAT [X] Normal-Standard TAT is 10-12 business days.
[ ] Rush-Subject to ALS approval and surcharges.

Date Required: _____ Approved By: _____

Email? [X] -Y mreider@LCSWMA.com

Fax? [X] -Y No.: (717) 397-9973

Container Type	AG	AN	CG	---	---	PL	PL	PL	PL	
Container Size	40 ml	120 ml	40 ml	---	---	250 ml	120 ml	500 ml	500 ml	
Preservative	HCl	H2SO4	HCl	—	—	H2SO4	HNO3	None	None	

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	VOC - Form 19Q	Field Measurements	Sample Depth for AUX Data	NH3-N, COD	Metals: Fe, Mn, Na, Ca, K, Mg	pH, Cl, SpC, F, SO4, TDS, NO3, Turb.	Alkalinity Bicarbonate	
					Enter Number of Containers Per Sample or Field Results Below.									
1. FFMP031W	08/22/19	1220	G	GW	2	1	2	X	X	1	1	1	1	
2. FFMP002W	08/22/19	1307	G	GW	2	1	2	X	X	1	1	1	1	
3. FFMP032W	08/22/19	1347	G	GW	2	1	2	X	X	1	1	1	1	
4. FFMP033W	08/22/19	1502	G	GW	2	1	2	X	X	1	1	1	1	
5														
6														
7														
8														
9														
10														

Receipt Information (completed by Receiving Lab)

Cooler Temp: 0.1 Therm ID: 403

No. of Coolers: _____

	Y	N	Initial
Custody Seals Present?			
(If present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. In Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

Sample/COC Comments

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: _____

Project Comments:

LOGGED BY(signature): DATE TIME

REVIEWED BY(signature): DATE TIME

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] @ ALS	8/22/19	1657	2 [signature]	8/22/19	1651
3			4		
5			6		
7			8		
9			10		

Data Deliverables: ☐Standard ☐CLP-like ☐USACE ☐

Special Processing: USACE ☐ Navy ☐

State Samples Collected In: ☐NY ☐NJ [X] PA ☐NC ☐

Reportable to PADEP? Yes ☐ PWSID # _____

Sample Disposal: Lab [X] Special ☐

EDDS: Format Type: _____

* G=Grab; C=Composite **Matrix - Al=Air; DW=Drinking Water; GW=Groundwater; Oil=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

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Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSWA | Work Order #: 30536612 | Initials: LW | Date: 8.23.19

1. Were airbills / tracking numbers present and recorded?	NONE	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		YES	NO
5g. Does the COC note the matrix of the sample(s)?		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		YES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #: 1

Temperature (°C): 0.1

Thermometer ID: 403

Radiological (µCi): _____

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

September 11, 2019

Mr. Daniel Brown
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Revised Report - 9/11/2019 5:02:12 PM - See workorder comment section for explanation

Project Name:	**FREY FARM**	Workorder:	**3053286**
Purchase Order:	**PO1000126**	Workorder ID:	**3rd QTR 2019 GWMP-FORM 19Q**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory between Wednesday, August 21, 2019 and Friday, August 30, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Ms. Jordan Gallagher , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3053286001	FFMP028W	Ground Water	8/21/2019 09:57	8/21/2019 15:49	Mr. Brian G Shade
3053286002	FFMP025W	Ground Water	8/21/2019 10:36	8/21/2019 15:49	Mr. Brian G Shade
3053286003	FFMP034W	Ground Water	8/21/2019 12:43	8/30/2019 15:34	Mr. Brian G Shade
3053286004	FFMP02SW	Ground Water	8/21/2019 13:14	8/21/2019 15:49	Mr. Brian G Shade
3053286005	FFMP02DW	Ground Water	8/21/2019 14:28	8/21/2019 15:49	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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PROJECT SUMMARY

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Workorder Comments

This work order was modified to report Form 8 VOC, Total Metals and Dissolved metals per email from Dan Brown. SB 09/03/19

Sample Comments

Lab ID: 3053286003 **Sample ID:** FFMP034W **Sample Type:** SAMPLE

Original samples recieved on 08/21/19 at 15:49. Additional parameters added via email from Dan Brown on 8/30/19 @ 15:34. SB 09/03/19

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ANALYTICAL RESULTS

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053286001** Date Collected: 8/21/2019 09:57 Matrix: Ground Water
Sample ID: **FFMP028W** Date Received: 8/21/2019 15:49

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/28/19 16:23	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/28/19 16:23	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 16:23	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 16:23	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 16:23	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 16:23	TMP	G
trans-1,2-Dichloroethene	ND	2	ug/L	1.0	SW846 8260B			8/28/19 16:23	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/28/19 16:23	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/28/19 16:23	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 16:23	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/28/19 16:23	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/28/19 16:23	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 16:23	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 16:23	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/28/19 16:23	TMP	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	125		%	62 - 133	SW846 8260B			8/28/19 16:23	TMP	G
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			8/28/19 16:23	TMP	G
Dibromofluoromethane (S)	105		%	78 - 116	SW846 8260B			8/28/19 16:23	TMP	G
Toluene-d8 (S)	111		%	76 - 127	SW846 8260B			8/28/19 16:23	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	33		mg/L	5	SM2320B-2011			8/28/19 04:02	MBW	B
Alkalinity, Total	33	3	mg/L	5	SM2320B-2011			8/28/19 04:02	MBW	B
Ammonia-N	ND		mg/L	0.100	D6919-09			8/30/19 08:41	NJA	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/27/19 14:27	AK	A
Chloride	88.8		mg/L	2.0	EPA 300.0			8/22/19 10:09	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/22/19 10:09	CHW	B
Nitrate-N	17.7		mg/L	0.20	EPA 300.0			8/22/19 10:09	CHW	B
pH	6.85	1	pH_Units		S4500HB-11			8/28/19 04:02	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/23/19 14:19	C_D	8/26/19 05:46	C_D	F
Specific Conductance	572		umhos/cm	1	SW846 9050A			8/28/19 04:02	MBW	B
Sulfate	24.5		mg/L	2.0	EPA 300.0			8/22/19 10:09	CHW	B
Total Dissolved Solids	386		mg/L	5	S2540C-11			8/27/19 17:26	D1C	B
Total Organic Carbon (TOC)	0.98		mg/L	0.50	SW846 9060A			8/29/19 23:49	PAG	D
Turbidity	0.17		NTU	0.10	SM2130B-2011			8/22/19 07:12	R2B	B

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ANALYTICAL RESULTS

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053286001** Date Collected: 8/21/2019 09:57 Matrix: Ground Water
Sample ID: **FFMP028W** Date Received: 8/21/2019 15:49

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	41.1		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:15	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:15	SRT	J1
Magnesium, Total	17.4		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:15	SRT	J1
Manganese, Total	0.0088		mg/L	0.0056	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:15	SRT	J1
Potassium, Total	2.2		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:15	SRT	J1
Sodium, Total	26.4		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:15	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	16.01		Feet		Field			8/21/19 09:57	BGS	C
Elev Top MW Casing above MSL	465.00		Feet		Field			8/21/19 09:57	BGS	C
Flow Rate	2.68		gal/min		Field			8/21/19 09:57	BGS	C
Ground Water Elevation	448.99		ft/MSL		Field			8/21/19 09:57	BGS	C
pH, Field (SM4500B)	5.53		pH_Units		Field			8/21/19 09:57	BGS	C
Sample Depth	50.00		Feet		Field			8/21/19 09:57	BGS	C
Specific Conductance, Field	566		umhos/cm	1	Field			8/21/19 09:57	BGS	C
Temperature	10.55		Deg. C		Field			8/21/19 09:57	BGS	C
Total Well Depth	60.00		Feet		Field			8/21/19 09:57	BGS	C
Volume in Water Column	64.67		Gallons		Field			8/21/19 09:57	BGS	C
Water Level After Purge	37.73		Feet		Field			8/21/19 09:57	BGS	C
Well Volumes Purged	2.49		Vol		Field			8/21/19 09:57	BGS	C

Susan J. Scherer
Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053286002** Date Collected: 8/21/2019 10:36 Matrix: Ground Water
Sample ID: **FFMP025W** Date Received: 8/21/2019 15:49

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/28/19 16:45	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/28/19 16:45	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 16:45	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 16:45	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 16:45	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 16:45	TMP	G
trans-1,2-Dichloroethene	ND	2	ug/L	1.0	SW846 8260B			8/28/19 16:45	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/28/19 16:45	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/28/19 16:45	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 16:45	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/28/19 16:45	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/28/19 16:45	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 16:45	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 16:45	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/28/19 16:45	TMP	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	124		%	62 - 133	SW846 8260B			8/28/19 16:45	TMP	G
4-Bromofluorobenzene (S)	101		%	79 - 114	SW846 8260B			8/28/19 16:45	TMP	G
Dibromofluoromethane (S)	105		%	78 - 116	SW846 8260B			8/28/19 16:45	TMP	G
Toluene-d8 (S)	109		%	76 - 127	SW846 8260B			8/28/19 16:45	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	40		mg/L	5	SM2320B-2011			8/28/19 04:11	MBW	B
Alkalinity, Total	40	3	mg/L	5	SM2320B-2011			8/28/19 04:11	MBW	B
Ammonia-N	0.137		mg/L	0.100	D6919-09			8/28/19 21:19	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/27/19 14:27	AK	A
Chloride	56.8		mg/L	2.0	EPA 300.0			8/22/19 10:25	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/22/19 10:25	CHW	B
Nitrate-N	11.5		mg/L	0.20	EPA 300.0			8/22/19 10:25	CHW	B
pH	7.07	1	pH_Units		S4500HB-11			8/28/19 04:11	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/27/19 13:01	C_D	8/28/19 08:23	C_D	F
Specific Conductance	402		umhos/cm	1	SW846 9050A			8/28/19 04:11	MBW	B
Sulfate	23.1		mg/L	2.0	EPA 300.0			8/22/19 10:25	CHW	B
Total Dissolved Solids	528		mg/L	5	S2540C-11			8/27/19 17:26	D1C	B
Total Organic Carbon (TOC)	1.1		mg/L	0.50	SW846 9060A			8/29/19 23:49	PAG	D
Turbidity	0.50		NTU	0.10	SM2130B-2011			8/22/19 07:12	R2B	B

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ANALYTICAL RESULTS

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053286002** Date Collected: 8/21/2019 10:36 Matrix: Ground Water

Sample ID: **FFMP025W** Date Received: 8/21/2019 15:49

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	27.4		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:19	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:19	SRT	J1
Magnesium, Total	13.0		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:19	SRT	J1
Manganese, Total	0.0063		mg/L	0.0056	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:19	SRT	J1
Potassium, Total	2.2		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:19	SRT	J1
Sodium, Total	21.7		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:19	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	26.83		Feet		Field			8/21/19 10:36	BGS	C
Elev Top MW Casing above MSL	476.80		Feet		Field			8/21/19 10:36	BGS	C
Flow Rate	3.70		gal/min		Field			8/21/19 10:36	BGS	C
Ground Water Elevation	449.97		ft/MSL		Field			8/21/19 10:36	BGS	C
pH, Field (SM4500B)	5.22		pH_Units		Field			8/21/19 10:36	BGS	C
Sample Depth	39.00		Feet		Field			8/21/19 10:36	BGS	C
Specific Conductance, Field	416		umhos/cm	1	Field			8/21/19 10:36	BGS	C
Temperature	9.93		Deg. C		Field			8/21/19 10:36	BGS	C
Total Well Depth	41.50		Feet		Field			8/21/19 10:36	BGS	C
Volume in Water Column	21.56		Gallons		Field			8/21/19 10:36	BGS	C
Water Level After Purge	27.35		Feet		Field			8/21/19 10:36	BGS	C
Well Volumes Purged	1.03		Vol		Field			8/21/19 10:36	BGS	C

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053286003** Date Collected: 8/21/2019 12:43 Matrix: Ground Water
Sample ID: **FFMP034W** Date Received: 8/30/2019 15:34

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
Bromoform	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
Bromomethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
2-Butanone	ND		ug/L	10.0	SW846 8260B			8/28/19 17:08	TMP	G
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
Chloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
Chloromethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
3-Chloro-1-propene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
Dichlorodifluoromethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
1,1-Dichloroethane	ND	7	ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
1,1-Dichloroethene	ND	4	ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
trans-1,2-Dichloroethene	ND	5,6	ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
cis-1,3-Dichloropropene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
trans-1,3-Dichloropropene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
4-Methyl-2-Pentanone(MIBK)	ND		ug/L	5.0	SW846 8260B			8/28/19 17:08	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
1,1,1,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/28/19 17:08	TMP	G
1,1,1-Trichloroethane	ND	8	ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
Trichlorofluoromethane	ND	2,3	ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			8/28/19 17:08	TMP	G

ANALYTICAL RESULTS

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053286003** Date Collected: 8/21/2019 12:43 Matrix: Ground Water
Sample ID: **FFMP034W** Date Received: 8/30/2019 15:34

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/28/19 17:08	TMP	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	127		%	62 - 133	SW846 8260B			8/28/19 17:08	TMP	G
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			8/28/19 17:08	TMP	G
Dibromofluoromethane (S)	106		%	78 - 116	SW846 8260B			8/28/19 17:08	TMP	G
Toluene-d8 (S)	111		%	76 - 127	SW846 8260B			8/28/19 17:08	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	34		mg/L	5	SM2320B-2011			8/28/19 04:19	MBW	B
Alkalinity, Total	34	9	mg/L	5	SM2320B-2011			8/28/19 04:19	MBW	B
Ammonia-N	0.223		mg/L	0.100	D6919-09			8/28/19 21:32	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/27/19 14:27	AK	A
Chloride	120		mg/L	2.0	EPA 300.0			8/22/19 10:40	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/22/19 10:40	CHW	B
Nitrate-N	9.2		mg/L	0.20	EPA 300.0			8/22/19 10:40	CHW	B
pH	7.03	1	pH_Units		S4500HB-11			8/28/19 04:19	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/27/19 13:01	C_D	8/28/19 08:23	C_D	F
Specific Conductance	610		umhos/cm	1	SW846 9050A			8/28/19 04:19	MBW	B
Sulfate	29.9		mg/L	2.0	EPA 300.0			8/22/19 10:40	CHW	B
Total Dissolved Solids	423		mg/L	5	S2540C-11			8/27/19 17:26	D1C	B
Total Organic Carbon (TOC)	0.81		mg/L	0.50	SW846 9060A			8/29/19 23:49	PAG	D
Turbidity	7.83		NTU	0.10	SM2130B-2011			8/22/19 07:12	R2B	B
METALS										
Arsenic, Total	ND		mg/L	0.0090	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:23	SRT	J
Arsenic, Dissolved	ND		mg/L	0.0080	SW846 6010C	9/5/19 10:17	SRT	9/11/19 12:30	SRT	B
Barium, Total	0.037		mg/L	0.011	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:23	SRT	J
Barium, Dissolved	0.038		mg/L	0.010	SW846 6010C	9/5/19 10:17	SRT	9/11/19 12:30	SRT	B
Cadmium, Total	ND		mg/L	0.0022	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:23	SRT	J
Cadmium, Dissolved	ND		mg/L	0.0020	SW846 6010C	9/5/19 10:17	SRT	9/11/19 12:30	SRT	B
Calcium, Total	44.7		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:23	SRT	J1
Calcium, Dissolved	41.5		mg/L	0.10	SW846 6010C	9/5/19 10:17	SRT	9/11/19 12:30	SRT	B
Chromium, Total	ND		mg/L	0.0056	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:23	SRT	J
Chromium, Dissolved	ND		mg/L	0.0050	SW846 6010C	9/5/19 10:17	SRT	9/11/19 12:30	SRT	B
Copper, Total	ND		mg/L	0.011	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:23	SRT	J
Copper, Dissolved	ND		mg/L	0.010	SW846 6010C	9/5/19 10:17	SRT	9/11/19 12:30	SRT	B
Iron, Total	0.49		mg/L	0.067	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:23	SRT	J1

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ANALYTICAL RESULTS

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053286003** Date Collected: 8/21/2019 12:43 Matrix: Ground Water
Sample ID: **FFMP034W** Date Received: 8/30/2019 15:34

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Iron, Dissolved	ND		mg/L	0.060	SW846 6010C	9/5/19 10:17	SRT	9/11/19 12:30	SRT	B
Lead, Total	ND		mg/L	0.0067	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:23	SRT	J
Lead, Dissolved	ND		mg/L	0.0060	SW846 6010C	9/5/19 10:17	SRT	9/11/19 12:30	SRT	B
Magnesium, Total	17.3		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:23	SRT	J1
Magnesium, Dissolved	16.0		mg/L	0.10	SW846 6010C	9/5/19 10:17	SRT	9/11/19 12:30	SRT	B
Manganese, Total	0.066		mg/L	0.0056	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:23	SRT	J1
Manganese, Dissolved	0.071		mg/L	0.0050	SW846 6010C	9/5/19 10:17	SRT	9/11/19 12:30	SRT	B
Mercury, Total	ND		mg/L	0.00050	SW846 7470A	9/5/19 12:20	AHI	9/5/19 15:54	AHI	J
Mercury, Dissolved	ND		mg/L	0.00050	SW846 7470A	9/9/19 00:10	MSA	9/9/19 04:28	MSA	B
Potassium, Total	2.3		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:23	SRT	J1
Potassium, Dissolved	2.4		mg/L	0.50	SW846 6010C	9/5/19 10:17	SRT	9/11/19 12:30	SRT	B
Selenium, Total	ND		mg/L	0.022	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:23	SRT	J
Selenium, Dissolved	ND		mg/L	0.020	SW846 6010C	9/5/19 10:17	SRT	9/11/19 12:30	SRT	B
Silver, Total	ND		mg/L	0.0044	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:23	SRT	J
Silver, Dissolved	ND		mg/L	0.0040	SW846 6010C	9/5/19 10:17	SRT	9/11/19 12:30	SRT	B
Sodium, Total	31.6		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:23	SRT	J1
Sodium, Dissolved	31.6		mg/L	0.50	SW846 6010C	9/5/19 10:17	SRT	9/11/19 12:30	SRT	B
Zinc, Total	ND		mg/L	0.022	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:23	SRT	J
Zinc, Dissolved	ND		mg/L	0.020	SW846 6010C	9/5/19 10:17	SRT	9/11/19 12:30	SRT	B
FIELD PARAMETERS										
Depth to Water Level	18.25		Feet		Field			8/21/19 12:43	BGS	C
Flow Rate	1.96		gal/min		Field			8/21/19 12:43	BGS	C
pH, Field (SM4500B)	4.62		pH_Units		Field			8/21/19 12:43	BGS	C
Sample Depth	28.85		Feet		Field			8/21/19 12:43	BGS	C
Specific Conductance, Field	622		umhos/cm	1	Field			8/21/19 12:43	BGS	C
Temperature	10.83		Deg. C		Field			8/21/19 12:43	BGS	C
Total Well Depth	121.00		Feet		Field			8/21/19 12:43	BGS	C
Volume in Water Column	151.04		Gallons		Field			8/21/19 12:43	BGS	C
Water Level After Purge	19.14		Feet		Field			8/21/19 12:43	BGS	C
Well Volumes Purged	1.17		Vol		Field			8/21/19 12:43	BGS	C

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ANALYTICAL RESULTS

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053286004** Date Collected: 8/21/2019 13:14 Matrix: Ground Water
Sample ID: **FFMP02SW** Date Received: 8/21/2019 15:49

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:30	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:30	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:30	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:30	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:30	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:30	TMP	G
trans-1,2-Dichloroethene	ND	2	ug/L	1.0	SW846 8260B			8/28/19 17:30	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:30	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/28/19 17:30	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:30	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:30	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/28/19 17:30	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:30	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:30	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/28/19 17:30	TMP	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	129		%	62 - 133	SW846 8260B			8/28/19 17:30	TMP	G
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			8/28/19 17:30	TMP	G
Dibromofluoromethane (S)	108		%	78 - 116	SW846 8260B			8/28/19 17:30	TMP	G
Toluene-d8 (S)	112		%	76 - 127	SW846 8260B			8/28/19 17:30	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	14		mg/L	5	SM2320B-2011			8/28/19 05:02	MBW	B
Alkalinity, Total	14	3	mg/L	5	SM2320B-2011			8/28/19 05:02	MBW	B
Ammonia-N	0.139		mg/L	0.100	D6919-09			8/28/19 21:45	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/27/19 14:27	AK	A
Chloride	130		mg/L	2.0	EPA 300.0			8/22/19 10:56	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/22/19 10:56	CHW	B
Nitrate-N	14.4		mg/L	0.20	EPA 300.0			8/22/19 10:56	CHW	B
pH	6.72	1	pH_Units		S4500HB-11			8/28/19 05:02	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/27/19 13:01	C_D	8/28/19 08:23	C_D	F
Specific Conductance	644		umhos/cm	1	SW846 9050A			8/28/19 05:02	MBW	B
Sulfate	31.7		mg/L	2.0	EPA 300.0			8/22/19 10:56	CHW	B
Total Dissolved Solids	207		mg/L	5	S2540C-11			8/27/19 17:26	D1C	B
Total Organic Carbon (TOC)	1.6		mg/L	0.50	SW846 9060A			8/29/19 23:49	PAG	D
Turbidity	126		NTU	0.10	SM2130B-2011			8/22/19 07:12	R2B	B

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ANALYTICAL RESULTS

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053286004** Date Collected: 8/21/2019 13:14 Matrix: Ground Water

Sample ID: **FFMP02SW** Date Received: 8/21/2019 15:49

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	22.9		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:27	SRT	J1
Iron, Total	9.6		mg/L	0.067	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:27	SRT	J1
Magnesium, Total	9.6		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:27	SRT	J1
Manganese, Total	0.11		mg/L	0.0056	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:27	SRT	J1
Potassium, Total	5.3		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:27	SRT	J1
Sodium, Total	79.6		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:27	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	15.39		Feet		Field			8/21/19 13:15	BGS	C
Elev Top MW Casing above MSL	509.90		Feet		Field			8/21/19 13:15	BGS	C
Flow Rate	0.49		gal/min		Field			8/21/19 13:15	BGS	C
Ground Water Elevation	494.51		ft/MSL		Field			8/21/19 13:15	BGS	C
pH, Field (SM4500B)	5.23		pH_Units		Field			8/21/19 13:15	BGS	C
Sample Depth	18.00		Feet		Field			8/21/19 13:15	BGS	C
Specific Conductance, Field	702		umhos/cm	1	Field			8/21/19 13:15	BGS	C
Temperature	13.23		Deg. C		Field			8/21/19 13:15	BGS	C
Total Well Depth	22.70		Feet		Field			8/21/19 13:15	BGS	C
Volume in Water Column	4.75		Gallons		Field			8/21/19 13:15	BGS	C
Water Level After Purge	17.24		Feet		Field			8/21/19 13:15	BGS	C
Well Volumes Purged	1.24		Vol		Field			8/21/19 13:15	BGS	C

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ANALYTICAL RESULTS

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053286005** Date Collected: 8/21/2019 14:28 Matrix: Ground Water
Sample ID: **FFMP02DW** Date Received: 8/21/2019 15:49

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:53	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:53	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:53	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:53	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:53	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:53	TMP	G
trans-1,2-Dichloroethene	ND	2	ug/L	1.0	SW846 8260B			8/28/19 17:53	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:53	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/28/19 17:53	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:53	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:53	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/28/19 17:53	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/28/19 17:53	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/28/19 17:53	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/28/19 17:53	TMP	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	128		%	62 - 133	SW846 8260B			8/28/19 17:53	TMP	G
4-Bromofluorobenzene (S)	102		%	79 - 114	SW846 8260B			8/28/19 17:53	TMP	G
Dibromofluoromethane (S)	106		%	78 - 116	SW846 8260B			8/28/19 17:53	TMP	G
Toluene-d8 (S)	110		%	76 - 127	SW846 8260B			8/28/19 17:53	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	125		mg/L	5	SM2320B-2011			8/28/19 05:12	MBW	B
Alkalinity, Total	125	3	mg/L	5	SM2320B-2011			8/28/19 05:12	MBW	B
Ammonia-N	0.627		mg/L	0.100	D6919-09			8/28/19 21:58	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/27/19 14:27	AK	A
Chloride	275		mg/L	5.0	EPA 300.0			8/24/19 20:04	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/22/19 11:11	CHW	B
Nitrate-N	8.9		mg/L	0.20	EPA 300.0			8/22/19 11:11	CHW	B
pH	7.85	1	pH_Units		S4500HB-11			8/28/19 05:12	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/27/19 13:01	C_D	8/28/19 08:23	C_D	F
Specific Conductance	1250		umhos/cm	1	SW846 9050A			8/28/19 05:12	MBW	B
Sulfate	29.1		mg/L	2.0	EPA 300.0			8/22/19 11:11	CHW	B
Total Dissolved Solids	805		mg/L	5	S2540C-11			8/27/19 17:26	D1C	B
Total Organic Carbon (TOC)	0.65		mg/L	0.50	SW846 9060A			8/29/19 23:49	PAG	D
Turbidity	5.15		NTU	0.10	SM2130B-2011			8/22/19 07:12	R2B	B

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053286005** Date Collected: 8/21/2019 14:28 Matrix: Ground Water

Sample ID: **FFMP02DW** Date Received: 8/21/2019 15:49

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	104		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:38	SRT	J1
Iron, Total	0.52		mg/L	0.067	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:38	SRT	J1
Magnesium, Total	16.1		mg/L	0.11	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:38	SRT	J1
Manganese, Total	0.43		mg/L	0.0056	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:38	SRT	J1
Potassium, Total	1.7		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:38	SRT	J1
Sodium, Total	99.1		mg/L	0.56	SW846 6010C	8/26/19 18:30	SXC	8/27/19 18:38	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	19.57		Feet		Field			8/21/19 14:28	BGS	C
Elev Top MW Casing above MSL	509.60		Feet		Field			8/21/19 14:28	BGS	C
Flow Rate	1.06		gal/min		Field			8/21/19 14:28	BGS	C
Ground Water Elevation	490.03		ft/MSL		Field			8/21/19 14:28	BGS	C
pH, Field (SM4500B)	7.03		pH_Units		Field			8/21/19 14:28	BGS	C
Sample Depth	120.00		Feet		Field			8/21/19 14:28	BGS	C
Specific Conductance, Field	1250		umhos/cm	1	Field			8/21/19 14:28	BGS	C
Temperature	12.36		Deg. C		Field			8/21/19 14:28	BGS	C
Total Well Depth	153.00		Feet		Field			8/21/19 14:28	BGS	C
Volume in Water Column	196.14		Gallons		Field			8/21/19 14:28	BGS	C
Water Level After Purge	53.09		Feet		Field			8/21/19 14:28	BGS	C
Well Volumes Purged	0.32		Vol		Field			8/21/19 14:28	BGS	C

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3053286001	1	FFMP028W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3053286001	2	FFMP028W	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 123 and the control limits were 71 to 122.				
3053286001	3	FFMP028W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053286002	1	FFMP025W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3053286002	2	FFMP025W	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 123 and the control limits were 71 to 122.				
3053286002	3	FFMP025W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053286003	1	FFMP034W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3053286003	2	FFMP034W	SW846 8260B	Trichlorofluoromethane
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte Trichlorofluoromethane. The % Recovery was reported as 146 and the control limits were 38 to 123.				
3053286003	3	FFMP034W	SW846 8260B	Trichlorofluoromethane
The QC sample type MSD for method SW846 8260B was outside the control limits for the analyte Trichlorofluoromethane. The % Recovery was reported as 125 and the control limits were 38 to 123.				
3053286003	4	FFMP034W	SW846 8260B	1,1-Dichloroethene
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 138 and the control limits were 63 to 128.				
3053286003	5	FFMP034W	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 135 and the control limits were 71 to 122.				
3053286003	6	FFMP034W	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 123 and the control limits were 71 to 122.				
3053286003	7	FFMP034W	SW846 8260B	1,1-Dichloroethane
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte 1,1-Dichloroethane. The % Recovery was reported as 128 and the control limits were 78 to 124.				
3053286003	8	FFMP034W	SW846 8260B	1,1,1-Trichloroethane
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte 1,1,1-Trichloroethane. The % Recovery was reported as 131 and the control limits were 66 to 130.				
3053286003	9	FFMP034W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

ANALYTICAL RESULTS

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

3053286004	1	FFMP02SW	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3053286004	2	FFMP02SW	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 123 and the control limits were 71 to 122.				
3053286004	3	FFMP02SW	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053286005	1	FFMP02DW	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3053286005	2	FFMP02DW	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type LCS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 123 and the control limits were 71 to 122.				
3053286005	3	FFMP02DW	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Lab ID	Sample ID	Analysis Method	Prep Method
3053286001	FFMP028W	D6919-09	
3053286001	FFMP028W	EPA 300.0	
3053286001	FFMP028W	EPA 410.4	
3053286001	FFMP028W	Field	
3053286001	FFMP028W	S2540C-11	
3053286001	FFMP028W	S4500HB-11	
3053286001	FFMP028W	SM2130B-2011	
3053286001	FFMP028W	SM2320B-2011	
3053286001	FFMP028W	SW846 6010C	SW846 3015
3053286001	FFMP028W	SW846 8260B	
3053286001	FFMP028W	SW846 9050A	
3053286001	FFMP028W	SW846 9060A	
3053286001	FFMP028W	SW846 9066	420.4/9066
3053286002	FFMP025W	D6919-09	
3053286002	FFMP025W	EPA 300.0	
3053286002	FFMP025W	EPA 410.4	
3053286002	FFMP025W	Field	
3053286002	FFMP025W	S2540C-11	
3053286002	FFMP025W	S4500HB-11	
3053286002	FFMP025W	SM2130B-2011	
3053286002	FFMP025W	SM2320B-2011	
3053286002	FFMP025W	SW846 6010C	SW846 3015
3053286002	FFMP025W	SW846 8260B	
3053286002	FFMP025W	SW846 9050A	
3053286002	FFMP025W	SW846 9060A	
3053286002	FFMP025W	SW846 9066	420.4/9066
3053286003	FFMP034W	D6919-09	
3053286003	FFMP034W	EPA 300.0	
3053286003	FFMP034W	EPA 410.4	
3053286003	FFMP034W	Field	
3053286003	FFMP034W	In-House	
3053286003	FFMP034W	S2540C-11	
3053286003	FFMP034W	S4500HB-11	
3053286003	FFMP034W	SM2130B-2011	
3053286003	FFMP034W	SM2320B-2011	
3053286003	FFMP034W	SW846 6010C	SW846 3015
3053286003	FFMP034W	SW846 6010C	SW846 6010C
3053286003	FFMP034W	SW846 7470A	SW846 7470A
3053286003	FFMP034W	SW846 8260B	
3053286003	FFMP034W	SW846 9050A	
3053286003	FFMP034W	SW846 9060A	
3053286003	FFMP034W	SW846 9066	420.4/9066
3053286004	FFMP02SW	D6919-09	
3053286004	FFMP02SW	EPA 300.0	
3053286004	FFMP02SW	EPA 410.4	
3053286004	FFMP02SW	Field	

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3053286 3rd QTR 2019 GWMP-FORM 19Q

Lab ID	Sample ID	Analysis Method	Prep Method
3053286004	FFMP02SW	S2540C-11	
3053286004	FFMP02SW	S4500HB-11	
3053286004	FFMP02SW	SM2130B-2011	
3053286004	FFMP02SW	SM2320B-2011	
3053286004	FFMP02SW	SW846 6010C	SW846 3015
3053286004	FFMP02SW	SW846 8260B	
3053286004	FFMP02SW	SW846 9050A	
3053286004	FFMP02SW	SW846 9060A	
3053286004	FFMP02SW	SW846 9066	420.4/9066
3053286005	FFMP02DW	D6919-09	
3053286005	FFMP02DW	EPA 300.0	
3053286005	FFMP02DW	EPA 410.4	
3053286005	FFMP02DW	Field	
3053286005	FFMP02DW	S2540C-11	
3053286005	FFMP02DW	S4500HB-11	
3053286005	FFMP02DW	SM2130B-2011	
3053286005	FFMP02DW	SM2320B-2011	
3053286005	FFMP02DW	SW846 6010C	SW846 3015
3053286005	FFMP02DW	SW846 8260B	
3053286005	FFMP02DW	SW846 9050A	
3053286005	FFMP02DW	SW846 9060A	
3053286005	FFMP02DW	SW846 9066	420.4/9066

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CHAIN OF CUSTODY / REQUEST FOR ANALYSIS

Generated by ALS

COC #:

ALS Quo

30532864

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Client Name: Lancaster County Solid Waste MA

Address: 1299 Harrisburg Pike, P.O. Box 4424
Lancaster, PA 17604

Contact: Mark Reider

Phone#: (717) 735-0193

Project Name/#: Frey Farm Quarterly (GWMP)

Bill To: Lancaster County Solid Waste MA

TAT [X] Normal-Standard TAT is 10-12 business days.
[ ] Rush-Subject to ALS approval and surcharges.

Date Required: _____ Approved By: _____

Email? [X] -Y mreider@LCSWMA.com

Fax? [X] -Y No.: (717) 397-9973

Container Type	AG	AN	CG	—	—	PL	PL	PL	PL	
Container Size	40 ml	120 ml	40 ml	—	—	250 ml	120 ml	500 ml	500 ml	
Preservative	HCl	H2SO4	HCl	—	—	H2SO4	HNO3	None	None	

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	VOC - Form 19Q	Field Measurements	Sample Depth for AUX Data	NH3-N, COD	Metals: Fe, Mn, Na, Ca, K, Mg	pH, Cl, SpC, F, SO4, TDS, NO3, Turb.	Alkalinity Bicarbonate	
					Enter Number of Containers Per Sample or Field Results Below.									
1. FFMP028W	08/21/19	0957	G	GW	2	1	2	x	x	1	1	1	1	
2. FFMP025W	08/21/19	1036	G	GW	2	1	2	x	x	1	1	1	1	
3. FFMP034W	08/21/19	1243	G	GW	2	1	2	x	x	1	1	1	1	
4. FFMP02SW	08/21/19	1314	G	GW	2	1	2	x	x	1	1	1	1	
5. FFMP02DW	08/21/19	1428	G	GW	2	1	2	x	x	1	1	1	1	
6														
7														
8														
9														
10														

Receipt Information (completed by Receiving Lab)

Cooler Temp: 7C Therm ID: 348

No. of Coolers: 1

	Y	N	Initial
Custody Seals Present?			
(if present) Seals Intact?			
Received on Ice?	X		
COC/Labels Complete/Accurate?			
Cont. in Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

Sample/COC Comments

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other:

Project Comments:

LOGGED BY(signature): DATE TIME

REVIEWED BY(signature): DATE TIME

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [illegible] ALS	8/21/19	1540	2	8/21/19	1545
3			4		
5			6		
7			8		
9			10		

Data Deliverables: ☐ Standard ☐ CLP-like ☐ USACE

Special Processing: USACE ☐ Navy ☐

State Samples Collected In: ☐ NY ☐ NJ ☒ PA ☐ NC ☐

Reportable to PADEP? Yes ☐ PWSID # _____

Sample Disposal: Lab ☒ Special ☐

*EDDS: Format Typo-

* G=Grab; C=Composite **Matrix - Al=Air; DW=Drinking Water; GW=Groundwater; Oi=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

Rev 8/04

ALS

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSWMA | Work Order #: 30533286 | Initials: LW | Date: 8-22-19

1. Were airbills / tracking numbers present and recorded?	~~NONE~~	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	~~NONE~~	YES	NO
3. Are Custody Seals on sample containers intact?	~~NONE~~	YES	NO
4. Is there a COC (Chain-of-Custody) present?		~~YES~~	NO
5. Are the COC and bottle labels complete, legible and in agreement?		~~YES~~	NO
5a. Does the COC contain sample locations?		~~YES~~	NO
5b. Does the COC contain date and time of sample collection for all samples?		~~YES~~	NO
5c. Does the COC contain sample collectors name?		~~YES~~	NO
5d. Does the COC note the type(s) of preservation for all bottles?		~~YES~~	NO
5e. Does the COC note the number of bottles submitted for each sample?		~~YES~~	NO
5f. Does the COC note the type of sample, composite or grab?		~~YES~~	NO
5g. Does the COC note the matrix of the sample(s)?		~~YES~~	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	~~YES~~	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		~~YES~~	NO
8. Are all samples within holding times for the requested analyses?		~~YES~~	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		~~YES~~	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	~~N/A~~	YES	NO
11. Were the samples received on ice?		~~YES~~	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	~~NO~~
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	~~NO~~
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #:	1							
Temperature (°C):	7							
Thermometer ID:	38							
Radiological (µCi):								

COMMENTS (Required for all NO responses above and any sample non-conformance):

7°C - same day.

Rev. 4/29/2019

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August 30, 2019

Mr. Daniel Brown
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**FREY FARM**	Workorder:	**3052609**
Purchase Order:	**PO1000126**	Workorder ID:	**3rd QTR 2019 GWMP-FORM 19Q**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Monday, August 19, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Ms. Jordan Gallagher , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3052609 3rd QTR 2019 GWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3052609001	FFMP015W	Ground Water	8/19/2019 10:58	8/19/2019 16:02	Mr. Brian G Shade
3052609002	FFMP03AW	Ground Water	8/19/2019 12:11	8/19/2019 16:02	Mr. Brian G Shade
3052609003	FFMP30RW	Ground Water	8/19/2019 13:41	8/19/2019 16:02	Mr. Brian G Shade
3052609004	FFMP04AW	Ground Water	8/19/2019 14:49	8/19/2019 16:02	Mr. Brian G Shade
3052609005	FIELD BLANK	Water	8/19/2019 15:01	8/19/2019 16:02	Mr. Brian G Shade
3052609006	TRIP BLANK	Water	8/19/2019 16:02	8/19/2019 16:02	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3052609 3rd QTR 2019 GWMP-FORM 19Q

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3052609 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052609001** Date Collected: 8/19/2019 10:58 Matrix: Ground Water
Sample ID: **FFMP015W** Date Received: 8/19/2019 16:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/24/19 02:44	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/24/19 02:44	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 02:44	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 02:44	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 02:44	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 02:44	PDK	G
trans-1,2-Dichloroethene	ND	2	ug/L	1.0	SW846 8260B			8/24/19 02:44	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/24/19 02:44	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/24/19 02:44	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 02:44	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/24/19 02:44	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/24/19 02:44	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 02:44	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 02:44	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/24/19 02:44	PDK	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	103		%	62 - 133	SW846 8260B			8/24/19 02:44	PDK	G
4-Bromofluorobenzene (S)	108		%	79 - 114	SW846 8260B			8/24/19 02:44	PDK	G
Dibromofluoromethane (S)	99.8		%	78 - 116	SW846 8260B			8/24/19 02:44	PDK	G
Toluene-d8 (S)	102		%	76 - 127	SW846 8260B			8/24/19 02:44	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	21		mg/L	5	SM2320B-2011			8/23/19 01:15	MBW	B
Alkalinity, Total	21	3	mg/L	5	SM2320B-2011			8/23/19 01:15	MBW	B
Ammonia-N	ND		mg/L	0.100	D6919-09			8/23/19 21:21	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/26/19 14:55	AK	A
Chloride	12.0		mg/L	2.0	EPA 300.0			8/20/19 08:15	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/20/19 08:15	CHW	B
Nitrate-N	10.1		mg/L	0.20	EPA 300.0			8/20/19 08:15	CHW	B
pH	6.46	1	pH_Units		S4500HB-11			8/23/19 01:15	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/23/19 14:18	C_D	8/26/19 05:46	C_D	F
Specific Conductance	234		umhos/cm	1	SW846 9050A			8/23/19 01:15	MBW	B
Sulfate	45.9		mg/L	2.0	EPA 300.0			8/20/19 08:15	CHW	B
Total Dissolved Solids	172		mg/L	5	S2540C-11			8/23/19 15:20	D1C	B
Total Organic Carbon (TOC)	0.93		mg/L	0.50	SW846 9060A			8/28/19 12:39	PAG	D
Turbidity	0.15		NTU	0.10	SM2130B-2011			8/20/19 06:53	R2B	B

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ANALYTICAL RESULTS

Workorder: 3052609 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052609001** Date Collected: 8/19/2019 10:58 Matrix: Ground Water
Sample ID: **FFMP015W** Date Received: 8/19/2019 16:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	9.3		mg/L	0.11	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:05	SRT	J
Iron, Total	ND		mg/L	0.067	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:05	SRT	J
Magnesium, Total	9.8		mg/L	0.11	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:05	SRT	J
Manganese, Total	0.041		mg/L	0.0056	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:05	SRT	J
Potassium, Total	2.2		mg/L	0.56	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:05	SRT	J
Sodium, Total	22.6		mg/L	0.56	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:05	SRT	J
FIELD PARAMETERS										
Depth to Water Level	56.93		Feet		Field			8/19/19 10:58	BGS	C
Elev Top MW Casing above MSL	576.40		Feet		Field			8/19/19 10:58	BGS	C
Flow Rate	2.15		gal/min		Field			8/19/19 10:58	BGS	C
Ground Water Elevation	519.47		ft/MSL		Field			8/19/19 10:58	BGS	C
pH, Field (SM4500B)	5.04		pH_Units		Field			8/19/19 10:58	BGS	C
Sample Depth	135.00		Feet		Field			8/19/19 10:58	BGS	C
Specific Conductance, Field	269		umhos/cm	1	Field			8/19/19 10:58	BGS	C
Temperature	11.41		Deg. C		Field			8/19/19 10:58	BGS	C
Total Well Depth	149.90		Feet		Field			8/19/19 10:58	BGS	C
Volume in Water Column	136.67		Gallons		Field			8/19/19 10:58	BGS	C
Water Level After Purge	94.00		Feet		Field			8/19/19 10:58	BGS	C
Well Volumes Purged	1.01		Vol		Field			8/19/19 10:58	BGS	C

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ANALYTICAL RESULTS

Workorder: 3052609 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052609002** Date Collected: 8/19/2019 12:11 Matrix: Ground Water
Sample ID: **FFMP03AW** Date Received: 8/19/2019 16:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:07	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/24/19 03:07	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 03:07	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 03:07	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:07	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:07	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:07	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:07	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/24/19 03:07	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:07	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:07	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/24/19 03:07	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 03:07	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:07	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/24/19 03:07	PDK	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	62 - 133	SW846 8260B			8/24/19 03:07	PDK	G
4-Bromofluorobenzene (S)	110		%	79 - 114	SW846 8260B			8/24/19 03:07	PDK	G
Dibromofluoromethane (S)	96.7		%	78 - 116	SW846 8260B			8/24/19 03:07	PDK	G
Toluene-d8 (S)	105		%	76 - 127	SW846 8260B			8/24/19 03:07	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	21		mg/L	5	SM2320B-2011			8/23/19 01:56	MBW	B
Alkalinity, Total	21	2	mg/L	5	SM2320B-2011			8/23/19 01:56	MBW	B
Ammonia-N	ND		mg/L	0.100	D6919-09			8/23/19 07:50	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/26/19 14:55	AK	A
Chloride	27.5		mg/L	2.0	EPA 300.0			8/20/19 08:32	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/20/19 08:32	CHW	B
Nitrate-N	20.0		mg/L	0.20	EPA 300.0			8/20/19 08:32	CHW	B
pH	6.08	1	pH_Units		S4500HB-11			8/23/19 01:56	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/23/19 14:18	C_D	8/26/19 05:46	C_D	F
Specific Conductance	254		umhos/cm	1	SW846 9050A			8/23/19 01:56	MBW	B
Sulfate	2.8		mg/L	2.0	EPA 300.0			8/20/19 08:32	CHW	B
Total Dissolved Solids	209		mg/L	5	S2540C-11			8/23/19 15:20	D1C	B
Total Organic Carbon (TOC)	0.56		mg/L	0.50	SW846 9060A			8/28/19 12:39	PAG	D
Turbidity	0.16		NTU	0.10	SM2130B-2011			8/20/19 06:53	R2B	B

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ANALYTICAL RESULTS

Workorder: 3052609 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052609002** Date Collected: 8/19/2019 12:11 Matrix: Ground Water

Sample ID: **FFMP03AW** Date Received: 8/19/2019 16:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	17.0		mg/L	0.11	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:17	SRT	J
Iron, Total	ND		mg/L	0.067	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:17	SRT	J
Magnesium, Total	11.0		mg/L	0.11	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:17	SRT	J
Manganese, Total	0.26		mg/L	0.0056	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:17	SRT	J
Potassium, Total	1.4		mg/L	0.56	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:17	SRT	J
Sodium, Total	12.4		mg/L	0.56	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:17	SRT	J
FIELD PARAMETERS										
Depth to Water Level	50.14		Feet		Field			8/19/19 12:11	BGS	C
Elev Top MW Casing above MSL	590.90		Feet		Field			8/19/19 12:11	BGS	C
Flow Rate	2.04		gal/min		Field			8/19/19 12:11	BGS	C
Ground Water Elevation	540.76		ft/MSL		Field			8/19/19 12:11	BGS	C
pH, Field (SM4500B)	3.92		pH_Units		Field			8/19/19 12:11	BGS	C
Sample Depth	130.00		Feet		Field			8/19/19 12:11	BGS	C
Specific Conductance, Field	287		umhos/cm	1	Field			8/19/19 12:11	BGS	C
Temperature	11.70		Deg. C		Field			8/19/19 12:11	BGS	C
Total Well Depth	148.40		Feet		Field			8/19/19 12:11	BGS	C
Volume in Water Column	144.44		Gallons		Field			8/19/19 12:11	BGS	C
Water Level After Purge	87.44		Feet		Field			8/19/19 12:11	BGS	C
Well Volumes Purged	0.85		Vol		Field			8/19/19 12:11	BGS	C

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ANALYTICAL RESULTS

Workorder: 3052609 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052609003** Date Collected: 8/19/2019 13:41 Matrix: Ground Water
Sample ID: **FFMP30RW** Date Received: 8/19/2019 16:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:30	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/24/19 03:30	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 03:30	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 03:30	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:30	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:30	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:30	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:30	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/24/19 03:30	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:30	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:30	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/24/19 03:30	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 03:30	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:30	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/24/19 03:30	PDK	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	62 - 133	SW846 8260B			8/24/19 03:30	PDK	G
4-Bromofluorobenzene (S)	108		%	79 - 114	SW846 8260B			8/24/19 03:30	PDK	G
Dibromofluoromethane (S)	99		%	78 - 116	SW846 8260B			8/24/19 03:30	PDK	G
Toluene-d8 (S)	101		%	76 - 127	SW846 8260B			8/24/19 03:30	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	34		mg/L	5	SM2320B-2011			8/23/19 02:04	MBW	B
Alkalinity, Total	34	2	mg/L	5	SM2320B-2011			8/23/19 02:04	MBW	B
Ammonia-N	0.135		mg/L	0.100	D6919-09			8/23/19 13:58	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/26/19 14:55	AK	A
Chloride	219		mg/L	5.0	EPA 300.0			8/22/19 06:33	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/20/19 10:12	CHW	B
Nitrate-N	5.8		mg/L	0.20	EPA 300.0			8/20/19 10:12	CHW	B
pH	6.36	1	pH_Units		S4500HB-11			8/23/19 02:04	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/23/19 14:18	C_D	8/26/19 05:46	C_D	F
Specific Conductance	915		umhos/cm	1	SW846 9050A			8/23/19 02:04	MBW	B
Sulfate	26.9		mg/L	2.0	EPA 300.0			8/20/19 10:12	CHW	B
Total Dissolved Solids	542		mg/L	5	S2540C-11			8/23/19 15:20	D1C	B
Total Organic Carbon (TOC)	0.89		mg/L	0.50	SW846 9060A			8/28/19 12:39	PAG	D
Turbidity	1.98		NTU	0.10	SM2130B-2011			8/20/19 06:53	R2B	B

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ANALYTICAL RESULTS

Workorder: 3052609 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052609003** Date Collected: 8/19/2019 13:41 Matrix: Ground Water
Sample ID: **FFMP30RW** Date Received: 8/19/2019 16:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	37.6		mg/L	0.11	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:21	SRT	J
Iron, Total	0.077		mg/L	0.067	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:21	SRT	J
Magnesium, Total	14.9		mg/L	0.11	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:21	SRT	J
Manganese, Total	2.6		mg/L	0.0056	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:21	SRT	J
Potassium, Total	5.3		mg/L	0.56	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:21	SRT	J
Sodium, Total	110		mg/L	0.56	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:21	SRT	J
FIELD PARAMETERS										
Depth to Water Level	36.31		Feet		Field			8/19/19 13:41	BGS	C
Elev Top MW Casing above MSL	562.30		Feet		Field			8/19/19 13:41	BGS	C
Flow Rate	2.04		gal/min		Field			8/19/19 13:41	BGS	C
Ground Water Elevation	525.99		ft/MSL		Field			8/19/19 13:41	BGS	C
pH, Field (SM4500B)	4.69		pH_Units		Field			8/19/19 13:41	BGS	C
Sample Depth	85.00		Feet		Field			8/19/19 13:41	BGS	C
Specific Conductance, Field	899		umhos/cm	1	Field			8/19/19 13:41	BGS	C
Temperature	11.24		Deg. C		Field			8/19/19 13:41	BGS	C
Total Well Depth	94.20		Feet		Field			8/19/19 13:41	BGS	C
Volume in Water Column	85.10		Gallons		Field			8/19/19 13:41	BGS	C
Water Level After Purge	61.89		Feet		Field			8/19/19 13:41	BGS	C
Well Volumes Purged	1.44		Vol		Field			8/19/19 13:41	BGS	C

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ANALYTICAL RESULTS

Workorder: 3052609 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052609004** Date Collected: 8/19/2019 14:49 Matrix: Ground Water
Sample ID: **FFMP04AW** Date Received: 8/19/2019 16:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:53	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/24/19 03:53	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 03:53	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 03:53	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:53	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:53	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:53	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:53	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/24/19 03:53	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:53	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:53	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/24/19 03:53	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 03:53	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 03:53	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/24/19 03:53	PDK	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	62 - 133	SW846 8260B			8/24/19 03:53	PDK	G
4-Bromofluorobenzene (S)	107		%	79 - 114	SW846 8260B			8/24/19 03:53	PDK	G
Dibromofluoromethane (S)	100		%	78 - 116	SW846 8260B			8/24/19 03:53	PDK	G
Toluene-d8 (S)	101		%	76 - 127	SW846 8260B			8/24/19 03:53	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	221		mg/L	5	SM2320B-2011			8/23/19 02:14	MBW	B
Alkalinity, Total	221	2	mg/L	5	SM2320B-2011			8/23/19 02:14	MBW	B
Ammonia-N	ND		mg/L	0.100	D6919-09			8/23/19 12:00	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/26/19 14:55	AK	A
Chloride	317		mg/L	5.0	EPA 300.0			8/22/19 06:49	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/20/19 10:28	CHW	B
Nitrate-N	0.24		mg/L	0.20	EPA 300.0			8/20/19 10:28	CHW	B
pH	7.70	1	pH_Units		S4500HB-11			8/23/19 02:14	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/23/19 14:18	C_D	8/26/19 05:46	C_D	F
Specific Conductance	1430		umhos/cm	1	SW846 9050A			8/23/19 02:14	MBW	B
Sulfate	46.9		mg/L	2.0	EPA 300.0			8/20/19 10:28	CHW	B
Total Dissolved Solids	1030		mg/L	5	S2540C-11			8/23/19 15:20	D1C	B
Total Organic Carbon (TOC)	0.89		mg/L	0.50	SW846 9060A			8/28/19 12:39	PAG	D
Turbidity	1.40		NTU	0.10	SM2130B-2011			8/20/19 06:53	R2B	B

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ANALYTICAL RESULTS

Workorder: 3052609 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052609004** Date Collected: 8/19/2019 14:49 Matrix: Ground Water

Sample ID: **FFMP04AW** Date Received: 8/19/2019 16:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	152		mg/L	0.11	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:24	SRT	J
Iron, Total	ND		mg/L	0.067	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:24	SRT	J
Magnesium, Total	23.5		mg/L	0.11	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:24	SRT	J
Manganese, Total	0.31		mg/L	0.0056	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:24	SRT	J
Potassium, Total	2.3		mg/L	0.56	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:24	SRT	J
Sodium, Total	90.8		mg/L	0.56	SW846 6010C	8/23/19 15:45	SXC	8/26/19 13:24	SRT	J
FIELD PARAMETERS										
Depth to Water Level	35.66		Feet		Field			8/19/19 14:49	BGS	C
Elev Top MW Casing above MSL	560.72		Feet		Field			8/19/19 14:49	BGS	C
Flow Rate	2.12		gal/min		Field			8/19/19 14:49	BGS	C
Ground Water Elevation	525.06		ft/MSL		Field			8/19/19 14:49	BGS	C
pH, Field (SM4500B)	6.33		pH_Units		Field			8/19/19 14:49	BGS	C
Sample Depth	146.00		Feet		Field			8/19/19 14:49	BGS	C
Specific Conductance, Field	1451		umhos/cm	1	Field			8/19/19 14:49	BGS	C
Temperature	12.22		Deg. C		Field			8/19/19 14:49	BGS	C
Total Well Depth	148.50		Feet		Field			8/19/19 14:49	BGS	C
Volume in Water Column	165.87		Gallons		Field			8/19/19 14:49	BGS	C
Water Level After Purge	78.60		Feet		Field			8/19/19 14:49	BGS	C
Well Volumes Purged	0.77		Vol		Field			8/19/19 14:49	BGS	C

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3052609 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052609005** Date Collected: 8/19/2019 15:01 Matrix: Water

Sample ID: **FIELD BLANK** Date Received: 8/19/2019 16:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:01	PDK	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/24/19 00:01	PDK	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 00:01	PDK	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 00:01	PDK	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:01	PDK	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:01	PDK	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:01	PDK	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:01	PDK	A
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/24/19 00:01	PDK	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:01	PDK	A
Toluene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:01	PDK	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/24/19 00:01	PDK	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 00:01	PDK	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:01	PDK	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/24/19 00:01	PDK	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	100		%	62 - 133	SW846 8260B			8/24/19 00:01	PDK	A
4-Bromofluorobenzene (S)	105		%	79 - 114	SW846 8260B			8/24/19 00:01	PDK	A
Dibromofluoromethane (S)	97.6		%	78 - 116	SW846 8260B			8/24/19 00:01	PDK	A
Toluene-d8 (S)	101		%	76 - 127	SW846 8260B			8/24/19 00:01	PDK	A

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ANALYTICAL RESULTS

Workorder: 3052609 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052609006** Date Collected: 8/19/2019 16:02 Matrix: Water

Sample ID: **TRIP BLANK** Date Received: 8/19/2019 16:02

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:47	PDK	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/24/19 00:47	PDK	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 00:47	PDK	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 00:47	PDK	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:47	PDK	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:47	PDK	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:47	PDK	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:47	PDK	A
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/24/19 00:47	PDK	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:47	PDK	A
Toluene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:47	PDK	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/24/19 00:47	PDK	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/24/19 00:47	PDK	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/24/19 00:47	PDK	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/24/19 00:47	PDK	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	103		%	62 - 133	SW846 8260B			8/24/19 00:47	PDK	A
4-Bromofluorobenzene (S)	111		%	79 - 114	SW846 8260B			8/24/19 00:47	PDK	A
Dibromofluoromethane (S)	100		%	78 - 116	SW846 8260B			8/24/19 00:47	PDK	A
Toluene-d8 (S)	101		%	76 - 127	SW846 8260B			8/24/19 00:47	PDK	A

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3052609 3rd QTR 2019 GWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3052609001	1	FFMP015W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3052609001	2	FFMP015W	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 123 and the control limits were 71 to 122.				
3052609001	3	FFMP015W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3052609002	1	FFMP03AW	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3052609002	2	FFMP03AW	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3052609003	1	FFMP30RW	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3052609003	2	FFMP30RW	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3052609004	1	FFMP04AW	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3052609004	2	FFMP04AW	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3052609 3rd QTR 2019 GWMP-FORM 19Q

Lab ID	Sample ID	Analysis Method	Prep Method
3052609001	FFMP015W	D6919-09	
3052609001	FFMP015W	EPA 300.0	
3052609001	FFMP015W	EPA 410.4	
3052609001	FFMP015W	Field	
3052609001	FFMP015W	S2540C-11	
3052609001	FFMP015W	S4500HB-11	
3052609001	FFMP015W	SM2130B-2011	
3052609001	FFMP015W	SM2320B-2011	
3052609001	FFMP015W	SW846 6010C	SW846 3015
3052609001	FFMP015W	SW846 8260B	
3052609001	FFMP015W	SW846 9050A	
3052609001	FFMP015W	SW846 9060A	
3052609001	FFMP015W	SW846 9066	420.4/9066
3052609002	FFMP03AW	D6919-09	
3052609002	FFMP03AW	EPA 300.0	
3052609002	FFMP03AW	EPA 410.4	
3052609002	FFMP03AW	Field	
3052609002	FFMP03AW	S2540C-11	
3052609002	FFMP03AW	S4500HB-11	
3052609002	FFMP03AW	SM2130B-2011	
3052609002	FFMP03AW	SM2320B-2011	
3052609002	FFMP03AW	SW846 6010C	SW846 3015
3052609002	FFMP03AW	SW846 8260B	
3052609002	FFMP03AW	SW846 9050A	
3052609002	FFMP03AW	SW846 9060A	
3052609002	FFMP03AW	SW846 9066	420.4/9066
3052609003	FFMP30RW	D6919-09	
3052609003	FFMP30RW	EPA 300.0	
3052609003	FFMP30RW	EPA 410.4	
3052609003	FFMP30RW	Field	
3052609003	FFMP30RW	S2540C-11	
3052609003	FFMP30RW	S4500HB-11	
3052609003	FFMP30RW	SM2130B-2011	
3052609003	FFMP30RW	SM2320B-2011	
3052609003	FFMP30RW	SW846 6010C	SW846 3015
3052609003	FFMP30RW	SW846 8260B	
3052609003	FFMP30RW	SW846 9050A	
3052609003	FFMP30RW	SW846 9060A	
3052609003	FFMP30RW	SW846 9066	420.4/9066
3052609004	FFMP04AW	D6919-09	
3052609004	FFMP04AW	EPA 300.0	
3052609004	FFMP04AW	EPA 410.4	
3052609004	FFMP04AW	Field	
3052609004	FFMP04AW	S2540C-11	
3052609004	FFMP04AW	S4500HB-11	
3052609004	FFMP04AW	SM2130B-2011	

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3052609 3rd QTR 2019 GWMP-FORM 19Q

Lab ID	Sample ID	Analysis Method	Prep Method
3052609004	FFMP04AW	SM2320B-2011	
3052609004	FFMP04AW	SW846 6010C	SW846 3015
3052609004	FFMP04AW	SW846 8260B	
3052609004	FFMP04AW	SW846 9050A	
3052609004	FFMP04AW	SW846 9060A	
3052609004	FFMP04AW	SW846 9066	420.4/9066
3052609005	FIELD BLANK	SW846 8260B	
3052609006	TRIP BLANK	SW846 8260B	

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

* 3052609 *

1 of 1

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Client Name: Lancaster County Solid Waste MA

Address: 1299 Harrisburg Pike, P.O. Box 4424
Lancaster, PA 17604

Contact: Mark Reider

Phone#: (717) 735-0193

Project Name/#: Frey Farm Quarterly (GWMP)

Bill To: Lancaster County Solid Waste MA

TAT [X] Normal-Standard TAT is 10-12 business days.
[ ] Rush-Subject to ALS approval and surcharges.

Date Required: _____ Approved By: _____

Email? [X]-Y mreider@LCSWMA.com

Fax? [X]-Y No.: (717) 397-9973

Container Type	AG	AN	CG	—	—	PL	PL	PL	PL	
Container Size	40 ml	120 ml	40 ml	—	—	250 ml	120 ml	500 ml	500 ml	
Preservative	HCl	H2SO4	HCl	—	—	H2SO4	HNO3	None	None	

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	VOC - Form 19Q	Field Measurements	Sample Depth for AUX Data	NH3-N, COD	Metals: Fe, Mn, Na, Ca, K, Mg	pH, Cl, SpC, F, SO4, TDS, NO3, Turb.	Alkalinity Bicarbonate	
					Enter Number of Containers Per Sample or Field Results Below.									
1. FFMP015W	08/19/19	1058	G	GW	2	1	2	X	X	1	1	1	1	
2. FFMP03AW	08/19/19	1211	G	GW	2	1	2	X	X	1	1	1	1	
3. FFMP30RW	08/19/19	1341	G	GW	2	1	2	X	X	1	1	1	1	
4. FFMP04AW	08/19/19	1449	G	GW	2	1	2	X	X	1	1	1	1	
5. Field Blank	08/19/19	1501	G	GW			2							
6. Trip Blank	08/19/19	1602	G	GW			2							
7														
8														
9														
10														

(ed by Receiving Lab)

Cooler Temp: 4°C Therm ID: 318

No. of Coolers: _____

	Y	N	Initial
Custody Seals Present?			
(if present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. in Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

Sample/COC Comments

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: _____

Project Comments:

LOGGED BY(signature): DATE TIME

REVIEWED BY(signature): DATE TIME

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] ALS	8/19/19	1602	2 [signature]	8/19/19	1602
3			4		
5			6		
7			8		
9			10		

Data Deliverables: ☐Standard ☐CLP-like ☐USACE ☐

Special Processing: USACE ☐ Navy ☐ ☐

State Samples Collected In: ☐NY ☐NJ [X]PA ☐NC ☐

Reportable to PADEP? Yes ☐ PWSID # _____

Sample Disposal: Lab [X] Special ☐

EDDS: Format Type _____

* G=Grab; C=Composite

**Matrix - AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

Rev 8/04

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSWMA | Work Order #: 3052609 | Initials: CD | Date: 8/19/19

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number: _____			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	(NO)
13a. Are the samples required for SDWA compliance reporting?	(N/A)	YES	NO
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #: _____

Temperature (°C): 4

Thermometer ID: 315

Radiological (µCi): _____

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

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August 30, 2019

Mr. Daniel Brown
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**FREY FARM**	Workorder:	**3052795**
Purchase Order:	**PO1000126**	Workorder ID:	**3rd QTR 2019 GWMP-FORM 19Q**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, August 20, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Ms. Jordan Gallagher , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3052795 3rd QTR 2019 GWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3052795001	FFMP017W	Ground Water	8/20/2019 09:41	8/20/2019 15:36	Mr. Brian G Shade
3052795002	FFMP018W	Ground Water	8/20/2019 10:26	8/20/2019 15:36	Mr. Brian G Shade
3052795003	FFMP019W	Ground Water	8/20/2019 11:11	8/20/2019 15:36	Mr. Brian G Shade
3052795004	FFMP029W	Ground Water	8/20/2019 12:34	8/20/2019 15:36	Mr. Brian G Shade
3052795005	FFMP005W	Ground Water	8/20/2019 14:25	8/20/2019 15:36	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3052795 3rd QTR 2019 GWMP-FORM 19Q

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3052795 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052795001** Date Collected: 8/20/2019 09:41 Matrix: Ground Water
Sample ID: **FFMP017W** Date Received: 8/20/2019 15:36

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:02	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/27/19 18:02	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/19 18:02	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/19 18:02	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:02	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:02	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:02	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:02	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/27/19 18:02	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:02	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:02	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/27/19 18:02	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/19 18:02	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:02	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/27/19 18:02	TMP	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	107		%	62 - 133	SW846 8260B			8/27/19 18:02	TMP	G
4-Bromofluorobenzene (S)	106		%	79 - 114	SW846 8260B			8/27/19 18:02	TMP	G
Dibromofluoromethane (S)	98.7		%	78 - 116	SW846 8260B			8/27/19 18:02	TMP	G
Toluene-d8 (S)	99.1		%	76 - 127	SW846 8260B			8/27/19 18:02	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	46		mg/L	5	SM2320B-2011			8/23/19 08:12	MBW	B
Alkalinity, Total	46	2	mg/L	5	SM2320B-2011			8/23/19 08:12	MBW	B
Ammonia-N	0.609		mg/L	0.100	D6919-09			8/28/19 11:33	AK	A
Chemical Oxygen Demand (COD)	15		mg/L	15	EPA 410.4			8/26/19 14:55	AK	A
Chloride	405		mg/L	5.0	EPA 300.0			8/21/19 11:15	CHW	B
Fluoride	ND		mg/L	0.50	EPA 300.0			8/21/19 11:15	CHW	B
Nitrate-N	2.0		mg/L	0.50	EPA 300.0			8/21/19 11:15	CHW	B
pH	6.34	1	pH_Units		S4500HB-11			8/23/19 08:12	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/23/19 14:18	C_D	8/26/19 05:46	C_D	F
Specific Conductance	1520		umhos/cm	1	SW846 9050A			8/23/19 08:12	MBW	B
Sulfate	56.8		mg/L	5.0	EPA 300.0			8/21/19 11:15	CHW	B
Total Dissolved Solids	1140		mg/L	5	S2540C-11			8/26/19 11:36	D1C	B
Total Organic Carbon (TOC)	2.5		mg/L	0.50	SW846 9060A			8/28/19 18:18	PAG	D
Turbidity	4.64		NTU	0.10	SM2130B-2011			8/21/19 07:13	R2B	B

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ANALYTICAL RESULTS

Workorder: 3052795 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052795001** Date Collected: 8/20/2019 09:41 Matrix: Ground Water
Sample ID: **FFMP017W** Date Received: 8/20/2019 15:36

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	99.1		mg/L	0.11	SW846 6010C	8/23/19 17:30	AHI	8/26/19 14:31	SRT	J1
Iron, Total	0.099		mg/L	0.067	SW846 6010C	8/23/19 17:30	AHI	8/26/19 14:31	SRT	J1
Magnesium, Total	41.2		mg/L	0.11	SW846 6010C	8/23/19 17:30	AHI	8/26/19 14:31	SRT	J1
Manganese, Total	0.49		mg/L	0.0056	SW846 6010C	8/23/19 17:30	AHI	8/26/19 14:31	SRT	J1
Potassium, Total	6.2		mg/L	0.56	SW846 6010C	8/23/19 17:30	AHI	8/26/19 14:31	SRT	J1
Sodium, Total	86.4		mg/L	0.56	SW846 6010C	8/23/19 17:30	AHI	8/26/19 14:31	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	41.04		Feet		Field			8/20/19 09:41	BGS	C
Elev Top MW Casing above MSL	480.70		Feet		Field			8/20/19 09:41	BGS	C
Flow Rate	2.14		gal/min		Field			8/20/19 09:41	BGS	C
Ground Water Elevation	439.66		ft/MSL		Field			8/20/19 09:41	BGS	C
pH, Field (SM4500B)	5.81		pH_Units		Field			8/20/19 09:41	BGS	C
Sample Depth	135.00		Feet		Field			8/20/19 09:41	BGS	C
Specific Conductance, Field	1567		umhos/cm	1	Field			8/20/19 09:41	BGS	C
Temperature	10.30		Deg. C		Field			8/20/19 09:41	BGS	C
Total Well Depth	150.50		Feet		Field			8/20/19 09:41	BGS	C
Volume in Water Column	160.91		Gallons		Field			8/20/19 09:41	BGS	C
Water Level After Purge	47.25		Feet		Field			8/20/19 09:41	BGS	C
Well Volumes Purged	1.00		Vol		Field			8/20/19 09:41	BGS	C

Susan J. Scherer
Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3052795 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052795002** Date Collected: 8/20/2019 10:26 Matrix: Ground Water
Sample ID: **FFMP018W** Date Received: 8/20/2019 15:36

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:25	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/27/19 18:25	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/19 18:25	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/19 18:25	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:25	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:25	TMP	G
trans-1,2-Dichloroethene	ND	2	ug/L	1.0	SW846 8260B			8/27/19 18:25	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:25	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/27/19 18:25	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:25	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:25	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/27/19 18:25	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/19 18:25	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:25	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/27/19 18:25	TMP	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	107		%	62 - 133	SW846 8260B			8/27/19 18:25	TMP	G
4-Bromofluorobenzene (S)	107		%	79 - 114	SW846 8260B			8/27/19 18:25	TMP	G
Dibromofluoromethane (S)	99.7		%	78 - 116	SW846 8260B			8/27/19 18:25	TMP	G
Toluene-d8 (S)	98.9		%	76 - 127	SW846 8260B			8/27/19 18:25	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	18		mg/L	5	SM2320B-2011			8/23/19 08:20	MBW	B
Alkalinity, Total	18	3	mg/L	5	SM2320B-2011			8/23/19 08:20	MBW	B
Ammonia-N	0.161		mg/L	0.100	D6919-09			8/28/19 14:44	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/26/19 14:55	AK	A
Chloride	106		mg/L	2.0	EPA 300.0			8/21/19 11:32	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/21/19 11:32	CHW	B
Nitrate-N	5.7		mg/L	0.20	EPA 300.0			8/21/19 11:32	CHW	B
pH	5.93	1	pH_Units		S4500HB-11			8/23/19 08:20	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/23/19 14:19	C_D	8/26/19 05:46	C_D	F
Specific Conductance	528		umhos/cm	1	SW846 9050A			8/23/19 08:20	MBW	B
Sulfate	39.4		mg/L	2.0	EPA 300.0			8/21/19 11:32	CHW	B
Total Dissolved Solids	363		mg/L	5	S2540C-11			8/26/19 11:36	D1C	B
Total Organic Carbon (TOC)	0.92		mg/L	0.50	SW846 9060A			8/28/19 18:18	PAG	D
Turbidity	0.15		NTU	0.10	SM2130B-2011			8/21/19 07:13	R2B	B

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ANALYTICAL RESULTS

Workorder: 3052795 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052795002** Date Collected: 8/20/2019 10:26 Matrix: Ground Water

Sample ID: **FFMP018W** Date Received: 8/20/2019 15:36

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	30.5		mg/L	0.11	SW846 6010C	8/22/19 19:30	SXC	8/23/19 14:57	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	8/22/19 19:30	SXC	8/23/19 14:57	SRT	J1
Magnesium, Total	15.7		mg/L	0.11	SW846 6010C	8/22/19 19:30	SXC	8/23/19 14:57	SRT	J1
Manganese, Total	0.36		mg/L	0.0056	SW846 6010C	8/22/19 19:30	SXC	8/23/19 14:57	SRT	J1
Potassium, Total	5.0		mg/L	0.56	SW846 6010C	8/22/19 19:30	SXC	8/23/19 14:57	SRT	J1
Sodium, Total	35.5		mg/L	0.56	SW846 6010C	8/22/19 19:30	SXC	8/23/19 14:57	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	26.73		Feet		Field			8/20/19 10:26	BGS	C
Elev Top MW Casing above MSL	472.20		Feet		Field			8/20/19 10:26	BGS	C
Flow Rate	4.78		gal/min		Field			8/20/19 10:26	BGS	C
Ground Water Elevation	445.47		ft/MSL		Field			8/20/19 10:26	BGS	C
pH, Field (SM4500B)	5.14		pH_Units		Field			8/20/19 10:26	BGS	C
Sample Depth	40.00		Feet		Field			8/20/19 10:26	BGS	C
Specific Conductance, Field	554		umhos/cm	1	Field			8/20/19 10:26	BGS	C
Temperature	13.92		Deg. C		Field			8/20/19 10:26	BGS	C
Total Well Depth	51.46		Feet		Field			8/20/19 10:26	BGS	C
Volume in Water Column	16.07		Gallons		Field			8/20/19 10:26	BGS	C
Water Level After Purge	29.97		Feet		Field			8/20/19 10:26	BGS	C
Well Volumes Purged	0.89		Vol		Field			8/20/19 10:26	BGS	C

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3052795 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052795003** Date Collected: 8/20/2019 11:11 Matrix: Ground Water
Sample ID: **FFMP019W** Date Received: 8/20/2019 15:36

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:47	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/27/19 18:47	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/19 18:47	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/19 18:47	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:47	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:47	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:47	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:47	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/27/19 18:47	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:47	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:47	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/27/19 18:47	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/19 18:47	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 18:47	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/27/19 18:47	TMP	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	107		%	62 - 133	SW846 8260B			8/27/19 18:47	TMP	G
4-Bromofluorobenzene (S)	106		%	79 - 114	SW846 8260B			8/27/19 18:47	TMP	G
Dibromofluoromethane (S)	98.6		%	78 - 116	SW846 8260B			8/27/19 18:47	TMP	G
Toluene-d8 (S)	98.3		%	76 - 127	SW846 8260B			8/27/19 18:47	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	69		mg/L	5	SM2320B-2011			8/23/19 08:28	MBW	B
Alkalinity, Total	69	2	mg/L	5	SM2320B-2011			8/23/19 08:28	MBW	B
Ammonia-N	0.141		mg/L	0.100	D6919-09			8/28/19 14:57	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/26/19 14:55	AK	A
Chloride	75.9		mg/L	2.0	EPA 300.0			8/21/19 11:48	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/21/19 11:48	CHW	B
Nitrate-N	0.22		mg/L	0.20	EPA 300.0			8/21/19 11:48	CHW	B
pH	7.03	1	pH_Units		S4500HB-11			8/23/19 08:28	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/23/19 14:19	C_D	8/26/19 05:46	C_D	F
Specific Conductance	421		umhos/cm	1	SW846 9050A			8/23/19 08:28	MBW	B
Sulfate	14.0		mg/L	2.0	EPA 300.0			8/21/19 11:48	CHW	B
Total Dissolved Solids	308		mg/L	5	S2540C-11			8/26/19 11:36	D1C	B
Total Organic Carbon (TOC)	1.1		mg/L	0.50	SW846 9060A			8/28/19 18:18	PAG	D
Turbidity	0.29		NTU	0.10	SM2130B-2011			8/21/19 07:13	R2B	B

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ANALYTICAL RESULTS

Workorder: 3052795 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052795003** Date Collected: 8/20/2019 11:11 Matrix: Ground Water

Sample ID: **FFMP019W** Date Received: 8/20/2019 15:36

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	56.6		mg/L	0.11	SW846 6010C	8/22/19 19:30	SXC	8/23/19 15:01	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	8/22/19 19:30	SXC	8/23/19 15:01	SRT	J1
Magnesium, Total	5.4		mg/L	0.11	SW846 6010C	8/22/19 19:30	SXC	8/23/19 15:01	SRT	J1
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	8/22/19 19:30	SXC	8/23/19 15:01	SRT	J1
Potassium, Total	0.93		mg/L	0.56	SW846 6010C	8/22/19 19:30	SXC	8/23/19 15:01	SRT	J1
Sodium, Total	10.1		mg/L	0.56	SW846 6010C	8/22/19 19:30	SXC	8/23/19 15:01	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	27.48		Feet		Field			8/20/19 11:11	BGS	C
Elev Top MW Casing above MSL	471.95		Feet		Field			8/20/19 11:11	BGS	C
Flow Rate	4.50		gal/min		Field			8/20/19 11:11	BGS	C
Ground Water Elevation	444.47		ft/MSL		Field			8/20/19 11:11	BGS	C
pH, Field (SM4500B)	5.73		pH_Units		Field			8/20/19 11:11	BGS	C
Sample Depth	49.00		Feet		Field			8/20/19 11:11	BGS	C
Specific Conductance, Field	447		umhos/cm	1	Field			8/20/19 11:11	BGS	C
Temperature	11.36		Deg. C		Field			8/20/19 11:11	BGS	C
Total Well Depth	132.79		Feet		Field			8/20/19 11:11	BGS	C
Volume in Water Column	68.45		Gallons		Field			8/20/19 11:11	BGS	C
Water Level After Purge	36.39		Feet		Field			8/20/19 11:11	BGS	C
Well Volumes Purged	0.99		Vol		Field			8/20/19 11:11	BGS	C

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ANALYTICAL RESULTS

Workorder: 3052795 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052795004** Date Collected: 8/20/2019 12:34 Matrix: Ground Water
Sample ID: **FFMP029W** Date Received: 8/20/2019 15:36

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:10	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/27/19 19:10	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/19 19:10	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/19 19:10	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:10	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:10	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:10	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:10	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/27/19 19:10	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:10	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:10	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/27/19 19:10	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/19 19:10	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:10	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/27/19 19:10	TMP	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	106		%	62 - 133	SW846 8260B			8/27/19 19:10	TMP	G
4-Bromofluorobenzene (S)	106		%	79 - 114	SW846 8260B			8/27/19 19:10	TMP	G
Dibromofluoromethane (S)	99.5		%	78 - 116	SW846 8260B			8/27/19 19:10	TMP	G
Toluene-d8 (S)	98.5		%	76 - 127	SW846 8260B			8/27/19 19:10	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	13		mg/L	5	SM2320B-2011			8/23/19 08:37	MBW	I
Alkalinity, Total	13	2	mg/L	5	SM2320B-2011			8/23/19 08:37	MBW	I
Ammonia-N	0.171		mg/L	0.100	D6919-09			8/28/19 15:10	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/26/19 14:55	AK	A
Chloride	50.7		mg/L	2.0	EPA 300.0			8/21/19 12:05	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/21/19 12:05	CHW	B
Nitrate-N	3.6		mg/L	0.20	EPA 300.0			8/21/19 12:05	CHW	B
pH	5.89	1	pH_Units		S4500HB-11			8/23/19 08:37	MBW	I
Phenolics	ND		mg/L	0.005	SW846 9066	8/23/19 14:19	C_D	8/26/19 05:46	C_D	F
Specific Conductance	221		umhos/cm	1	SW846 9050A			8/23/19 08:37	MBW	I
Sulfate	4.1		mg/L	2.0	EPA 300.0			8/21/19 12:05	CHW	B
Total Dissolved Solids	193		mg/L	5	S2540C-11			8/26/19 11:36	D1C	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	SW846 9060A			8/28/19 18:18	PAG	D
Turbidity	0.14		NTU	0.10	SM2130B-2011			8/21/19 07:13	R2B	B

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ANALYTICAL RESULTS

Workorder: 3052795 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052795004** Date Collected: 8/20/2019 12:34 Matrix: Ground Water
Sample ID: **FFMP029W** Date Received: 8/20/2019 15:36

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	11.2		mg/L	0.11	SW846 6010C	8/22/19 19:30	SXC	8/23/19 15:05	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	8/22/19 19:30	SXC	8/23/19 15:05	SRT	J1
Magnesium, Total	8.6		mg/L	0.11	SW846 6010C	8/22/19 19:30	SXC	8/23/19 15:05	SRT	J1
Manganese, Total	0.025		mg/L	0.0056	SW846 6010C	8/22/19 19:30	SXC	8/23/19 15:05	SRT	J1
Potassium, Total	1.8		mg/L	0.56	SW846 6010C	8/22/19 19:30	SXC	8/23/19 15:05	SRT	J1
Sodium, Total	17.0		mg/L	0.56	SW846 6010C	8/22/19 19:30	SXC	8/23/19 15:05	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	38.41		Feet		Field			8/20/19 12:34	BGS	C
Elev Top MW Casing above MSL	477.30		Feet		Field			8/20/19 12:34	BGS	C
Flow Rate	2.50		gal/min		Field			8/20/19 12:34	BGS	C
Ground Water Elevation	438.89		ft/MSL		Field			8/20/19 12:34	BGS	C
pH, Field (SM4500B)	3.94		pH_Units		Field			8/20/19 12:34	BGS	C
Sample Depth	55.00		Feet		Field			8/20/19 12:34	BGS	C
Specific Conductance, Field	261		umhos/cm	1	Field			8/20/19 12:34	BGS	C
Temperature	12.13		Deg. C		Field			8/20/19 12:34	BGS	C
Total Well Depth	60.50		Feet		Field			8/20/19 12:34	BGS	C
Volume in Water Column	32.47		Gallons		Field			8/20/19 12:34	BGS	C
Water Level After Purge	44.59		Feet		Field			8/20/19 12:34	BGS	C
Well Volumes Purged	3.08		Vol		Field			8/20/19 12:34	BGS	C

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ANALYTICAL RESULTS

Workorder: 3052795 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052795005** Date Collected: 8/20/2019 14:25 Matrix: Ground Water
Sample ID: **FFMP005W** Date Received: 8/20/2019 15:36

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:33	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/27/19 19:33	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/19 19:33	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/19 19:33	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:33	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:33	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:33	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:33	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/27/19 19:33	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:33	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:33	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/27/19 19:33	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/27/19 19:33	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/27/19 19:33	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/27/19 19:33	TMP	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	108		%	62 - 133	SW846 8260B			8/27/19 19:33	TMP	G
4-Bromofluorobenzene (S)	106		%	79 - 114	SW846 8260B			8/27/19 19:33	TMP	G
Dibromofluoromethane (S)	99.8		%	78 - 116	SW846 8260B			8/27/19 19:33	TMP	G
Toluene-d8 (S)	97.8		%	76 - 127	SW846 8260B			8/27/19 19:33	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	52		mg/L	5	SM2320B-2011			8/23/19 08:44	MBW	B
Alkalinity, Total	52	2	mg/L	5	SM2320B-2011			8/23/19 08:44	MBW	B
Ammonia-N	0.133		mg/L	0.100	D6919-09			8/28/19 15:22	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/26/19 14:55	AK	A
Chloride	188		mg/L	5.0	EPA 300.0			8/21/19 14:01	CHW	B
Fluoride	ND		mg/L	0.50	EPA 300.0			8/21/19 14:01	CHW	B
Nitrate-N	2.2		mg/L	0.50	EPA 300.0			8/21/19 14:01	CHW	B
pH	6.07	1	pH_Units		S4500HB-11			8/23/19 08:44	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/23/19 14:19	C_D	8/26/19 05:46	C_D	F
Specific Conductance	888		umhos/cm	1	SW846 9050A			8/23/19 08:44	MBW	B
Sulfate	59.2		mg/L	5.0	EPA 300.0			8/21/19 14:01	CHW	B
Total Dissolved Solids	592		mg/L	5	S2540C-11			8/26/19 11:36	D1C	B
Total Organic Carbon (TOC)	1.3		mg/L	0.50	SW846 9060A			8/29/19 00:27	PAG	D
Turbidity	0.12		NTU	0.10	SM2130B-2011			8/21/19 07:13	R2B	B

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ANALYTICAL RESULTS

Workorder: 3052795 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3052795005** Date Collected: 8/20/2019 14:25 Matrix: Ground Water

Sample ID: **FFMP005W** Date Received: 8/20/2019 15:36

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	72.2		mg/L	0.11	SW846 6010C	8/23/19 17:30	AHI	8/26/19 14:35	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	8/23/19 17:30	AHI	8/26/19 14:35	SRT	J1
Magnesium, Total	16.6		mg/L	0.11	SW846 6010C	8/23/19 17:30	AHI	8/26/19 14:35	SRT	J1
Manganese, Total	0.080		mg/L	0.0056	SW846 6010C	8/23/19 17:30	AHI	8/26/19 14:35	SRT	J1
Potassium, Total	2.8		mg/L	0.56	SW846 6010C	8/23/19 17:30	AHI	8/26/19 14:35	SRT	J1
Sodium, Total	42.1		mg/L	0.56	SW846 6010C	8/23/19 17:30	AHI	8/26/19 14:35	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	68.45		Feet		Field			8/20/19 14:25	BGS	C
Elev Top MW Casing above MSL	537.40		Feet		Field			8/20/19 14:25	BGS	C
Flow Rate	2.36		gal/min		Field			8/20/19 14:25	BGS	C
Ground Water Elevation	468.95		ft/MSL		Field			8/20/19 14:25	BGS	C
pH, Field (SM4500B)	5.14		pH_Units		Field			8/20/19 14:25	BGS	C
Sample Depth	135.00		Feet		Field			8/20/19 14:25	BGS	C
Specific Conductance, Field	914		umhos/cm	1	Field			8/20/19 14:25	BGS	C
Temperature	10.95		Deg. C		Field			8/20/19 14:25	BGS	C
Total Well Depth	149.70		Feet		Field			8/20/19 14:25	BGS	C
Volume in Water Column	119.44		Gallons		Field			8/20/19 14:25	BGS	C
Water Level After Purge	93.63		Feet		Field			8/20/19 14:25	BGS	C
Well Volumes Purged	1.38		Vol		Field			8/20/19 14:25	BGS	C

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Project Coordinator

ANALYTICAL RESULTS

Workorder: 3052795 3rd QTR 2019 GWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3052795001	1	FFMP017W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3052795001	2	FFMP017W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3052795002	1	FFMP018W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3052795002	2	FFMP018W	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 128 and the control limits were 71 to 122.				
3052795002	3	FFMP018W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3052795003	1	FFMP019W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3052795003	2	FFMP019W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3052795004	1	FFMP029W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3052795004	2	FFMP029W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3052795005	1	FFMP005W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3052795005	2	FFMP005W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3052795 3rd QTR 2019 GWMP-FORM 19Q

Lab ID	Sample ID	Analysis Method	Prep Method
3052795001	FFMP017W	D6919-09	
3052795001	FFMP017W	EPA 300.0	
3052795001	FFMP017W	EPA 410.4	
3052795001	FFMP017W	Field	
3052795001	FFMP017W	S2540C-11	
3052795001	FFMP017W	S4500HB-11	
3052795001	FFMP017W	SM2130B-2011	
3052795001	FFMP017W	SM2320B-2011	
3052795001	FFMP017W	SW846 6010C	SW846 3015
3052795001	FFMP017W	SW846 8260B	
3052795001	FFMP017W	SW846 9050A	
3052795001	FFMP017W	SW846 9060A	
3052795001	FFMP017W	SW846 9066	420.4/9066
3052795002	FFMP018W	D6919-09	
3052795002	FFMP018W	EPA 300.0	
3052795002	FFMP018W	EPA 410.4	
3052795002	FFMP018W	Field	
3052795002	FFMP018W	S2540C-11	
3052795002	FFMP018W	S4500HB-11	
3052795002	FFMP018W	SM2130B-2011	
3052795002	FFMP018W	SM2320B-2011	
3052795002	FFMP018W	SW846 6010C	SW846 3015
3052795002	FFMP018W	SW846 8260B	
3052795002	FFMP018W	SW846 9050A	
3052795002	FFMP018W	SW846 9060A	
3052795002	FFMP018W	SW846 9066	420.4/9066
3052795003	FFMP019W	D6919-09	
3052795003	FFMP019W	EPA 300.0	
3052795003	FFMP019W	EPA 410.4	
3052795003	FFMP019W	Field	
3052795003	FFMP019W	S2540C-11	
3052795003	FFMP019W	S4500HB-11	
3052795003	FFMP019W	SM2130B-2011	
3052795003	FFMP019W	SM2320B-2011	
3052795003	FFMP019W	SW846 6010C	SW846 3015
3052795003	FFMP019W	SW846 8260B	
3052795003	FFMP019W	SW846 9050A	
3052795003	FFMP019W	SW846 9060A	
3052795003	FFMP019W	SW846 9066	420.4/9066
3052795004	FFMP029W	D6919-09	
3052795004	FFMP029W	EPA 300.0	
3052795004	FFMP029W	EPA 410.4	
3052795004	FFMP029W	Field	
3052795004	FFMP029W	S2540C-11	
3052795004	FFMP029W	S4500HB-11	
3052795004	FFMP029W	SM2130B-2011	

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3052795 3rd QTR 2019 GWMP-FORM 19Q

Lab ID	Sample ID	Analysis Method	Prep Method
3052795004	FFMP029W	SM2320B-2011	
3052795004	FFMP029W	SW846 6010C	SW846 3015
3052795004	FFMP029W	SW846 8260B	
3052795004	FFMP029W	SW846 9050A	
3052795004	FFMP029W	SW846 9060A	
3052795004	FFMP029W	SW846 9066	420.4/9066
3052795005	FFMP005W	D6919-09	
3052795005	FFMP005W	EPA 300.0	
3052795005	FFMP005W	EPA 410.4	
3052795005	FFMP005W	Field	
3052795005	FFMP005W	S2540C-11	
3052795005	FFMP005W	S4500HB-11	
3052795005	FFMP005W	SM2130B-2011	
3052795005	FFMP005W	SM2320B-2011	
3052795005	FFMP005W	SW846 6010C	SW846 3015
3052795005	FFMP005W	SW846 8260B	
3052795005	FFMP005W	SW846 9050A	
3052795005	FFMP005W	SW846 9060A	
3052795005	FFMP005W	SW846 9066	420.4/9066

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

COC ALS *30527955* 1 of 1

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Client Name: Lancaster County Solid Waste MA

Address: 1299 Harrisburg Pike, P.O. Box 4424
Lancaster, PA 17604

Contact: Mark Reider

Phone#: (717) 735-0193

Project Name/#: Frey Farm Quarterly (GWMP)

Bill To: Lancaster County Solid Waste MA

TAT [X] Normal-Standard TAT is 10-12 business days.
[ ] Rush-Subject to ALS approval and surcharges.

Date Required: _____ Approved By: _____

Email? [X] -Y mreider@LCSWMA.com

Fax? [X] -Y No.: (717) 397-9973

Container Type	AG	AN	CG	—	—	PL	PL	PL	PL	
Container Size	40 ml	120 ml	40 ml	—	—	250 ml	120 ml	500 ml	500 ml	
Preservative	HCl	H2SO4	HCl	—	—	H2SO4	HNO3	None	None	

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	VOC - Form 19Q	Field Measurements	Sample Depth for AUX Data	NH3-N, COD	Metals: Fe, Mn, Na, Ca, K, Mg	pH, Cl, SpC, F, SO4, TDS, NO3, Turb.	Alkalinity Bicarbonate	
					Enter Number of Containers Per Sample or Field Results Below.									
1. FFMP017W	08/20/19	0941	G	GW	2	1	2	x	x	1	1	1	1	
2. FFMP018W	08/20/19	1026	G	GW	2	1	2	x	x	1	1	1	1	
3. FFMP019W	08/20/19	1111	G	GW	2	1	2	x	x	1	1	1	1	
4. FFMP029W	08/20/19	1234	G	GW	2	1	2	x	x	1	1	1	1	
5. FFMP005W	08/20/19	1425	G	GW	2	1	2	x	x	1	1	1	1	
6														
7														
8														
9														
10														

Receipt Information (completed by receiving Lab)

Cooler Temp: 8°C Therm ID: 3S

No. of Coolers: 1

	Y	N	Initial
Custody Seals Present?			
(If present) Seals Intact?			
Received on Ice?	X		3S
COC/Labels Complete/Accurate?			
Cont. In Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

Sample/COC Comments

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other:

Project Comments:

LOGGED BY(signature): Date: Time:

REVIEWED BY(signature): Date: Time:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [illegible] ALS	8/20/19	1534	2	8/20/19	1536
3			4		
5			6		
7			8		
9			10		

Data Deliverables: ☐Standard ☐CLP-like ☐USACE ☐

Special Processing: USACE ☐ Navy ☐ ☐

State Samples Collected In: ☐NY ☐NJ [X]PA ☐NC ☐

Reportable to PADEP? Yes ☐ PWSID #

Sample Disposal: Lab [X] Special ☐

* EDDS: Format Type:

* G=Grab; C=Composite

** Matrix - Al=Air; DW=Drinking Water; GW=Groundwater; Oi=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

Rev 8/04

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: Lancaster County Solid WMA | Work Order #: 3052795 | Initials: JAB | Date: 8/20/19

1. Were airbills / tracking numbers present and recorded?	NONE	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		YES	NO
5g. Does the COC note the matrix of the sample(s)?		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		YES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #: —

Temperature (°C): 8°C

Thermometer ID: 318

Radiological (µCi): —

COMMENTS (Required for all NO responses above and any sample non-conformance):

Collected + Rec'd same day. Collected by ARS. GW - Not Reportable. Received out of hold for pH testing. JAB/MRS 8/20/19

Rev. 4/29/2019

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

September 4, 2019

Mr. Daniel Brown
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**FREY FARM**	Workorder:	**3053834**
Purchase Order:	**PO1000126**	Workorder ID:	**3rd QTR 2019 GWMP-FORM 19Q**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 23, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Ms. Jordan Gallagher , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3053834 3rd QTR 2019 GWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3053834001	FFMP26RW	Ground Water	8/23/2019 09:21	8/23/2019 17:59	Mr. Brian G Shade
3053834002	FFMP016W	Ground Water	8/23/2019 10:05	8/23/2019 17:59	Mr. Brian G Shade
3053834003	FIELD BLANK	Water	8/23/2019 16:00	8/23/2019 17:59	Mr. Brian G Shade
3053834004	TRIP BLANK	Water	8/23/2019 17:59	8/23/2019 17:59	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3053834 3rd QTR 2019 GWMP-FORM 19Q

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3053834 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053834001** Date Collected: 8/23/2019 09:21 Matrix: Ground Water
Sample ID: **FFMP26RW** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/29/19 23:42	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/29/19 23:42	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 23:42	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 23:42	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 23:42	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 23:42	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 23:42	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/29/19 23:42	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 23:42	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 23:42	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			8/29/19 23:42	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/29/19 23:42	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 23:42	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 23:42	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 23:42	PDK	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	126		%	62 - 133	SW846 8260B			8/29/19 23:42	PDK	G
4-Bromofluorobenzene (S)	101		%	79 - 114	SW846 8260B			8/29/19 23:42	PDK	G
Dibromofluoromethane (S)	104		%	78 - 116	SW846 8260B			8/29/19 23:42	PDK	G
Toluene-d8 (S)	110		%	76 - 127	SW846 8260B			8/29/19 23:42	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	46		mg/L	5	SM2320B-2011			8/29/19 07:58	MBW	B
Alkalinity, Total	46	2	mg/L	5	SM2320B-2011			8/29/19 07:58	MBW	B
Ammonia-N	ND		mg/L	0.100	D6919-09			8/29/19 20:41	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/28/19 13:26	AK	A
Chloride	191		mg/L	5.0	EPA 300.0			8/28/19 10:06	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/24/19 14:11	CHW	B
Nitrate-N	2.3		mg/L	0.20	EPA 300.0			8/24/19 14:11	CHW	B
pH	6.00	1	pH_Units		S4500HB-11			8/29/19 07:58	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/28/19 06:54	C_D	8/28/19 08:23	C_D	F
Specific Conductance	912		umhos/cm	1	SW846 9050A			8/29/19 07:58	MBW	B
Sulfate	74.5		mg/L	2.0	EPA 300.0			8/24/19 14:11	CHW	B
Total Dissolved Solids	622		mg/L	5	S2540C-11			8/29/19 15:32	D1C	B
Total Organic Carbon (TOC)	1.6		mg/L	0.50	SW846 9060A			8/31/19 09:03	PAG	D
Turbidity	0.44		NTU	0.10	SM2130B-2011			8/24/19 06:53	R2B	B

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ANALYTICAL RESULTS

Workorder: 3053834 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053834001** Date Collected: 8/23/2019 09:21 Matrix: Ground Water

Sample ID: **FFMP26RW** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	67.8		mg/L	0.11	SW846 6010C	8/27/19 16:40	SXC	8/28/19 12:02	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	8/27/19 16:40	SXC	8/28/19 12:02	SRT	J1
Magnesium, Total	19.1		mg/L	0.11	SW846 6010C	8/27/19 16:40	SXC	8/28/19 12:02	SRT	J1
Manganese, Total	0.51		mg/L	0.0056	SW846 6010C	8/27/19 16:40	SXC	8/28/19 12:02	SRT	J1
Potassium, Total	8.0		mg/L	0.56	SW846 6010C	8/27/19 16:40	SXC	8/28/19 12:02	SRT	J1
Sodium, Total	60.0		mg/L	0.56	SW846 6010C	8/27/19 16:40	SXC	8/28/19 12:02	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	78.81		Feet		Field			8/23/19 09:21	BGS	C
Elev Top MW Casing above MSL	547.40		Feet		Field			8/23/19 09:21	BGS	C
Flow Rate	2.52		gal/min		Field			8/23/19 09:21	BGS	C
Ground Water Elevation	468.59		ft/MSL		Field			8/23/19 09:21	BGS	C
pH, Field (SM4500B)	5.61		pH_Units		Field			8/23/19 09:21	BGS	C
Sample Depth	105.00		Feet		Field			8/23/19 09:21	BGS	C
Specific Conductance, Field	945		umhos/cm	1	Field			8/23/19 09:21	BGS	C
Temperature	11.79		Deg. C		Field			8/23/19 09:21	BGS	C
Total Well Depth	118.30		Feet		Field			8/23/19 09:21	BGS	C
Volume in Water Column	58.05		Gallons		Field			8/23/19 09:21	BGS	C
Water Level After Purge	94.93		Feet		Field			8/23/19 09:21	BGS	C
Well Volumes Purged	2.60		Vol		Field			8/23/19 09:21	BGS	C

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3053834 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053834002** Date Collected: 8/23/2019 10:05 Matrix: Ground Water
Sample ID: **FFMP016W** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND	6	ug/L	1.0	SW846 8260B			8/30/19 00:04	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/30/19 00:04	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 00:04	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 00:04	PDK	G
1,1-Dichloroethene	ND	3	ug/L	1.0	SW846 8260B			8/30/19 00:04	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 00:04	PDK	G
trans-1,2-Dichloroethene	ND	5	ug/L	1.0	SW846 8260B			8/30/19 00:04	PDK	G
Ethylbenzene	ND	9	ug/L	1.0	SW846 8260B			8/30/19 00:04	PDK	G
Methylene Chloride	ND	4	ug/L	1.0	SW846 8260B			8/30/19 00:04	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 00:04	PDK	G
Toluene	ND	7,8	ug/L	1.0	SW846 8260B			8/30/19 00:04	PDK	G
Total Xylenes	ND	2	ug/L	3.0	SW846 8260B			8/30/19 00:04	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 00:04	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 00:04	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 00:04	PDK	G
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	128		%	62 - 133	SW846 8260B			8/30/19 00:04	PDK	G
4-Bromofluorobenzene (S)	99.9		%	79 - 114	SW846 8260B			8/30/19 00:04	PDK	G
Dibromofluoromethane (S)	103		%	78 - 116	SW846 8260B			8/30/19 00:04	PDK	G
Toluene-d8 (S)	108		%	76 - 127	SW846 8260B			8/30/19 00:04	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	42		mg/L	5	SM2320B-2011			8/29/19 08:32	MBW	B
Alkalinity, Total	42	10	mg/L	5	SM2320B-2011			8/29/19 08:32	MBW	B
Ammonia-N	ND		mg/L	0.100	D6919-09			8/29/19 21:31	AK	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/28/19 13:26	AK	A
Chloride	83.1		mg/L	2.0	EPA 300.0			8/24/19 14:26	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/24/19 14:26	CHW	B
Nitrate-N	11.5		mg/L	0.20	EPA 300.0			8/24/19 14:26	CHW	B
pH	6.22	1	pH_Units		S4500HB-11			8/29/19 08:32	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/28/19 06:54	C_D	8/28/19 08:23	C_D	F
Specific Conductance	479		umhos/cm	1	SW846 9050A			8/29/19 08:32	MBW	B
Sulfate	27.8		mg/L	2.0	EPA 300.0			8/24/19 14:26	CHW	B
Total Dissolved Solids	322		mg/L	5	S2540C-11			8/29/19 15:32	D1C	B
Total Organic Carbon (TOC)	0.97		mg/L	0.50	SW846 9060A			8/31/19 09:03	PAG	D
Turbidity	0.26		NTU	0.10	SM2130B-2011			8/24/19 06:53	R2B	B

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ANALYTICAL RESULTS

Workorder: 3053834 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053834002** Date Collected: 8/23/2019 10:05 Matrix: Ground Water
Sample ID: **FFMP016W** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS										
Calcium, Total	29.9		mg/L	0.11	SW846 6010C	8/27/19 16:40	SXC	8/28/19 12:06	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	8/27/19 16:40	SXC	8/28/19 12:06	SRT	J1
Magnesium, Total	14.2		mg/L	0.11	SW846 6010C	8/27/19 16:40	SXC	8/28/19 12:06	SRT	J1
Manganese, Total	0.026		mg/L	0.0056	SW846 6010C	8/27/19 16:40	SXC	8/28/19 12:06	SRT	J1
Potassium, Total	2.2		mg/L	0.56	SW846 6010C	8/27/19 16:40	SXC	8/28/19 12:06	SRT	J1
Sodium, Total	26.7		mg/L	0.56	SW846 6010C	8/27/19 16:40	SXC	8/28/19 12:06	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	13.81		Feet		Field			8/23/19 11:45	BGS	C
Elev Top MW Casing above MSL	474.60		Feet		Field			8/23/19 11:45	BGS	C
Ground Water Elevation	460.79		ft/MSL		Field			8/23/19 11:45	BGS	C
pH, Field (SM4500B)	6.27		pH_Units		Field			8/23/19 11:45	BGS	C
Sample Depth	135.00		Feet		Field			8/23/19 11:45	BGS	C
Specific Conductance, Field	7		umhos/cm	1	Field			8/23/19 11:45	BGS	C
Temperature	17.58		Deg. C		Field			8/23/19 11:45	BGS	C
Total Well Depth	149.80		Feet		Field			8/23/19 11:45	BGS	C
Volume in Water Column	354.93		Gallons		Field			8/23/19 11:45	BGS	C

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ANALYTICAL RESULTS

Workorder: 3053834 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053834003** Date Collected: 8/23/2019 16:00 Matrix: Water

Sample ID: **FIELD BLANK** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
VOLATILE ORGANICS										
Acetone	13.0		ug/L	10.0	SW846 8260B			8/29/19 21:49	PDK	H
Acrylonitrile	ND		ug/L	5.0	SW846 8260B			8/29/19 21:49	PDK	H
Benzene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Bromochloromethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Bromoform	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Bromomethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
2-Butanone	ND		ug/L	10.0	SW846 8260B			8/29/19 21:49	PDK	H
Carbon Disulfide	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Chloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Chloroform	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Chloromethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
3-Chloro-1-propene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
1,2-Dibromo-3-chloropropane	ND		ug/L	7.0	SW846 8260B			8/29/19 21:49	PDK	H
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Dibromomethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
trans-1,4-Dichloro-2-butene	ND		ug/L	3.0	SW846 8260B			8/29/19 21:49	PDK	H
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Dichlorodifluoromethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
cis-1,3-Dichloropropene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
trans-1,3-Dichloropropene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
2-Hexanone	ND		ug/L	5.0	SW846 8260B			8/29/19 21:49	PDK	H
Iodomethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
4-Methyl-2-Pentanone(MIBK)	ND		ug/L	5.0	SW846 8260B			8/29/19 21:49	PDK	H

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ANALYTICAL RESULTS

Workorder: 3053834 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053834003** Date Collected: 8/23/2019 16:00 Matrix: Water

Sample ID: **FIELD BLANK** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Styrene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
1,1,1,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Toluene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/29/19 21:49	PDK	H
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			8/29/19 21:49	PDK	H
Vinyl Acetate	ND		ug/L	5.0	SW846 8260B			8/29/19 21:49	PDK	H
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 21:49	PDK	H
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	121		%	62 - 133	SW846 8260B			8/29/19 21:49	PDK	H
4-Bromofluorobenzene (S)	102		%	79 - 114	SW846 8260B			8/29/19 21:49	PDK	H
Dibromofluoromethane (S)	103		%	78 - 116	SW846 8260B			8/29/19 21:49	PDK	H
Toluene-d8 (S)	111		%	76 - 127	SW846 8260B			8/29/19 21:49	PDK	H
WET CHEMISTRY										
Alkalinity, Bicarbonate	ND		mg/L	5	SM2320B-2011			8/29/19 08:40	MBW	B
Alkalinity, Total	ND	1	mg/L	5	SM2320B-2011			8/29/19 08:40	MBW	B
Ammonia-N	ND		mg/L	0.100	D6919-09			8/29/19 21:48	AK	C
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/28/19 13:26	AK	C
Chloride	ND		mg/L	1.0	EPA 300.0			8/24/19 14:42	CHW	B
Fluoride	ND		mg/L	0.10	EPA 300.0			8/24/19 14:42	CHW	B
Nitrate-N	ND		mg/L	0.10	EPA 300.0			8/24/19 14:42	CHW	B
pH	6.22	2	pH_Units		S4500HB-11			8/29/19 08:40	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	8/28/19 06:54	C_D	8/28/19 08:23	C_D	G
Specific Conductance	ND		umhos/cm	1	SM2510B-2011			8/29/19 08:40	MBW	B
Sulfate	ND		mg/L	1.0	EPA 300.0			8/24/19 14:42	CHW	B
Total Dissolved Solids	ND		mg/L	25	S2540C-11			8/29/19 15:32	D1C	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			8/31/19 18:57	PAG	E
Turbidity	ND		NTU	0.10	SM2130B-2011			8/24/19 06:53	R2B	B
METALS										
Calcium, Total	0.11		mg/L	0.11	SW846 6020A	9/3/19 16:40	AHI	9/4/19 14:50	MO	D1

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ANALYTICAL RESULTS

Workorder: 3053834 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053834003** Date Collected: 8/23/2019 16:00 Matrix: Water
Sample ID: **FIELD BLANK** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Iron, Total	ND		mg/L	0.056	SW846 6020A	9/3/19 16:40	AHI	9/4/19 14:50	MO	D1
Magnesium, Total	ND		mg/L	0.11	SW846 6020A	9/3/19 16:40	AHI	9/4/19 14:50	MO	D1
Manganese, Total	ND		mg/L	0.0056	SW846 6020A	9/3/19 16:40	AHI	9/4/19 14:50	MO	D1
Potassium, Total	ND		mg/L	0.11	SW846 6020A	9/3/19 16:40	AHI	9/4/19 14:50	MO	D1
Sodium, Total	0.13		mg/L	0.11	SW846 6020A	9/3/19 16:40	AHI	9/4/19 14:50	MO	D1

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ANALYTICAL RESULTS

Workorder: 3053834 3rd QTR 2019 GWMP-FORM 19Q

Lab ID: **3053834004** Date Collected: 8/23/2019 17:59 Matrix: Water

Sample ID: **TRIP BLANK** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/29/19 22:57	PDK	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/29/19 22:57	PDK	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 22:57	PDK	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 22:57	PDK	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 22:57	PDK	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 22:57	PDK	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 22:57	PDK	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/29/19 22:57	PDK	A
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 22:57	PDK	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 22:57	PDK	A
Toluene	ND		ug/L	1.0	SW846 8260B			8/29/19 22:57	PDK	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/29/19 22:57	PDK	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 22:57	PDK	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 22:57	PDK	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 22:57	PDK	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	126		%	62 - 133	SW846 8260B			8/29/19 22:57	PDK	A
4-Bromofluorobenzene (S)	102		%	79 - 114	SW846 8260B			8/29/19 22:57	PDK	A
Dibromofluoromethane (S)	106		%	78 - 116	SW846 8260B			8/29/19 22:57	PDK	A
Toluene-d8 (S)	110		%	76 - 127	SW846 8260B			8/29/19 22:57	PDK	A

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3053834 3rd QTR 2019 GWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3053834001	1	FFMP26RW	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3053834001	2	FFMP26RW	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053834002	1	FFMP016W	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3053834002	2	FFMP016W	SW846 8260B	Total Xylenes
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte Total Xylenes. The % Recovery was reported as 137 and the control limits were 79 to 125.				
3053834002	3	FFMP016W	SW846 8260B	1,1-Dichloroethene
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 129 and the control limits were 63 to 128.				
3053834002	4	FFMP016W	SW846 8260B	Methylene Chloride
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte Methylene Chloride. The % Recovery was reported as 122 and the control limits were 76 to 121.				
3053834002	5	FFMP016W	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 129 and the control limits were 71 to 122.				
3053834002	6	FFMP016W	SW846 8260B	Benzene
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte Benzene. The % Recovery was reported as 135 and the control limits were 80 to 124.				
3053834002	7	FFMP016W	SW846 8260B	Toluene
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte Toluene. The % Recovery was reported as 173 and the control limits were 80 to 125.				
3053834002	8	FFMP016W	SW846 8260B	Toluene
The QC sample type MSD for method SW846 8260B was outside the control limits for the analyte Toluene. The RPD was reported as 32.3 and the upper control limit is 20.				
3053834002	9	FFMP016W	SW846 8260B	Ethylbenzene
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte Ethylbenzene. The % Recovery was reported as 125 and the control limits were 80 to 124.				
3053834002	10	FFMP016W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053834003	1	FIELD BLANK	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053834003	2	FIELD BLANK	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3053834 3rd QTR 2019 GWMP-FORM 19Q

Lab ID	Sample ID	Analysis Method	Prep Method
3053834001	FFMP26RW	D6919-09	
3053834001	FFMP26RW	EPA 300.0	
3053834001	FFMP26RW	EPA 410.4	
3053834001	FFMP26RW	Field	
3053834001	FFMP26RW	S2540C-11	
3053834001	FFMP26RW	S4500HB-11	
3053834001	FFMP26RW	SM2130B-2011	
3053834001	FFMP26RW	SM2320B-2011	
3053834001	FFMP26RW	SW846 6010C	SW846 3015
3053834001	FFMP26RW	SW846 8260B	
3053834001	FFMP26RW	SW846 9050A	
3053834001	FFMP26RW	SW846 9060A	
3053834001	FFMP26RW	SW846 9066	420.4/9066
3053834002	FFMP016W	D6919-09	
3053834002	FFMP016W	EPA 300.0	
3053834002	FFMP016W	EPA 410.4	
3053834002	FFMP016W	Field	
3053834002	FFMP016W	S2540C-11	
3053834002	FFMP016W	S4500HB-11	
3053834002	FFMP016W	SM2130B-2011	
3053834002	FFMP016W	SM2320B-2011	
3053834002	FFMP016W	SW846 6010C	SW846 3015
3053834002	FFMP016W	SW846 8260B	
3053834002	FFMP016W	SW846 9050A	
3053834002	FFMP016W	SW846 9060A	
3053834002	FFMP016W	SW846 9066	420.4/9066
3053834003	FIELD BLANK	D6919-09	
3053834003	FIELD BLANK	EPA 300.0	
3053834003	FIELD BLANK	EPA 410.4	
3053834003	FIELD BLANK	S2540C-11	
3053834003	FIELD BLANK	S4500HB-11	
3053834003	FIELD BLANK	SM2130B-2011	
3053834003	FIELD BLANK	SM2320B-2011	
3053834003	FIELD BLANK	SM2510B-2011	
3053834003	FIELD BLANK	SM5310B-2011	
3053834003	FIELD BLANK	SW846 6020A	SW846 3015
3053834003	FIELD BLANK	SW846 8260B	
3053834003	FIELD BLANK	SW846 9066	420.4/9066
3053834004	TRIP BLANK	SW846 8260B	

ALS Environmental
34 Dogwood Lane • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430

CHAIN OF CUSTODY / REQUEST FOR ANALYSIS

Generated by ALS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

COC ALS

* 3 0 5 3 8 3 4 *

1 of 1

Client Name: Lancaster County Solid Waste MA
Address: 1299 Harrisburg Pike, P.O. Box 4424
Lancaster, PA 17604
Contact: Mark Reider
Phone#: (717) 735-0193
Project Name/#: Frey Farm Quarterly (GWMP)
Bill To: Lancaster County Solid Waste MA

TAT [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.
Date Required: _____ Approved By: _____
Email? [X] -Y mreider@LCSWMA.com
Fax? [X] -Y No.: (717) 397-9973

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	VOC - Form 19Q	Field Measurements	Sample Depth for AUX Data	NH3-N, COD	Metals: Fe, Mn, Na, Ca, K, Mg	pH, Cl, SpC, F, SO4, TDS, NO3, Turb.	Alkalinity Bicarbonate	
Container Type					AG	AN	CG	—	—	PL	PL	PL	PL	
Container Size					40 ml	120 ml	40 ml	—	—	250 ml	120 ml	500 ml	500 ml	
Preservative					HCl	H2SO4	HCl	—	—	H2SO4	HNO3	None	None	
					ANALYSES/METHOD REQUESTED									
					Enter Number of Containers Per Sample or Field Results Below.									
1. FFMP26RW	08/23/19	0921	G	GW	2	1	2	X	X	1	1	1	1	
2. FFMP016W	08/23/19	1005	G	GW	2	1	2	X	X	1	1	1	1	
3. Field Blank	08/23/19	1600	G	GW	2	1	2			1	1	1	1	
4. Trip Blank	08/23/19	1259	G	GW			2							
5														
6														
7														
8														
9														
10														

Receipt Information (completed by Receiving Lab)
Cooler Temp: 9°C Therm ID: 403
No. of Coolers: _____

	Y	N	Initial
Custody Seals Present?			
(If present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. in Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:
Sample/COC Comments

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: _____

Project Comments:

LOGGED BY(signature): DATE TIME
REVIEWED BY(signature): DATE TIME

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] ALS	8/20/19	1259	2 [signature]	8/29/19	1759
3			4		
5			6		
7			8		
9			10		

Data Deliverables: ☐Standard ☐CLP-like ☐USACE ☐
Special Processing: USACE ☐ Navy ☐ ☐
State Samples Collected In: ☐NY ☐NJ [X]PA ☐NC ☐
Reportable to PADEP? Yes ☐ PWSID # _____
Sample Disposal: Lab [X] Special ☐
EDDS: Format Type- _____

* G=Grab; C=Composite **Matrix - AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

Rev 8/04

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
LC3WMA	3053834	QD	8/24/19

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (Lt. Hg)?	N/A	(YES)	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C collected same day		YES	(NO)
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	(NO)
13a. Are the samples required for SDWA compliance reporting?	(N/A)	YES	NO
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #:								
Temperature (°C):	9.C							
Thermometer ID:	403							
Radiological (µCi):								

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

2540-FM-BWM0158 Rev. 10/2010

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/17/2019
DEP USE ONLY
Date Received

FORM 50

MUNICIPAL WASTE LANDFILL LEACHATE ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 50, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.255(d) and (e) and 273.276(a)
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. SITE IDENTIFIER

Applicant/permittee:	Lancaster County Solid Waste Management Aut
Site Name:	Frey Farm Landfill
Facitlity ID (as issued by DEP):	101389

SECTION B. FACILITY INFORMATION

Facility Name: Frey Farm Landfill

Sampling Point Number: FFLEINFS

Location: County Lancaster County Municipality: Manor

Sampling Point Latitude: 39 o 57 ' 11.29 " Longitude: 76 o 27 ' 6.42 "

Sampling Method: ___Pumped ___Bailed X Grab

Sample Field Filtered (must be 0.45 micron): ____Yes X No

Sample Date (mm/dd/yy): 8/28/2019 Sample Collection Time: 14:10

Sample Collector's Name: Mr. Jeff Musser

Sample Collector's Affiliation: LCSWMA

Laboratory(ies) Performing Analysis: ALS Environmental

Lab Certification Number(s): 22-293

Lab Sample Number(s): 3054578001 Final Lab Analysis Completion Date: 9/7/2019

Were any holding times exceeded?: ____Yes X No If yes, please explain in comments field.

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Monitoring Point No.	FFLEINFS
Sample Date	8/28/2019
I.D. No	101389

FORM 50
QUARTERLY MUNICIPAL WASTE LANDFILL LEACHATE ANALYSES

For new facilities and cells as well as existing facilities which were permitted and which received waste after April 9, 1988, discharge flow volume from leachate collection shall be measured daily [273.276(a)(1)]. Discharge flow volume from the detection zone shall be estimated weekly [273.255(d)(2)]. Form 50 is due quarterly after the flow of leachate from the collection system has started. For facilities or cells which have received no waste since April 9, 1988, detection zone monitoring will meet permit/closure requirements.

FLOW FACTOR	LEACHATE DISCHARGE	DETECTION ZONE DISCHARGE
Volume (average gpd)	14104.78	
Area Drained (acres)	92.63	
Ratio (gallons/acre/day)	152.27	

Once leachate flow begins from a leachate collection system, leachate discharge will be analyzed quarterly for all analytes listed below. In the leachate detection zone, any fluid found in any detection zone monitoring point must be sampled during the initial four quarters for the leachate indicator parameters (designated by *, below) to establish a baseline fluid composition. Thereafter, any fluid detected in each monitoring point in the leachate detection zone must be sampled annually for the leachate indicator parameters. Quarterly sampling of the fluid in any detection zone monitoring point for leachate indicator parameters is required only when the quarterly flow at that monitoring point exceeds 10 gallons per acre per day (weekly average for the quarter) for the cell(s) served by that monitoring point. If the indicator analytes confirm leachate contamination in the detection zone, the fluid will be analyzed initially within 30 days and thereafter annually for all analytes listed below. When MCL's (where established) of any detection zone analytes on this form are exceeded, annual groundwater monitoring must include the Subtitle D detection zone add-on list analytes found on Form 19.

	ANALYTE mg/l unless otherwise indicated		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
1.	ALKALINITY	p	487		SM20-2320B
2.	AMMONIA-NITROGEN	p	1690		ASTM D6919-03
3.	BICARBONATE ALKALINITY	p	487		SM20-2321
4.	CALCIUM, TOTAL	p	1640		SW846 6010C
5.	COD (CHEMICAL OXYGEN DEMAND)	p	3120		EPA 410.4
6.	CHLORIDE	p	19400		EPA 300
7.	MAGNESIUM, TOTAL	p	264		SW846 6010C
8.	pH-FIELD (SU)	p	6.94		FIELD
9.	pH-LAB (SU)	p	7.12		150.1/4500B
10.	POTASSIUM, TOTAL	p	1650		SW846 6010C
11.	SPEC. COND., FIELD (umhos/cm)	p	62200		FIELD
12.	SPEC. COND., LAB (umhos/cm)	p	61100		EPA 120.1
13.	SODIUM, TOTAL	p	1980		SW846 6010C
14.	SULFATE	p	162		EPA 300
15.	TOC (TOTAL ORGANIC CARBON)	p	370		SM20-5310B
16.	FLUORIDE	p	1 ND		EPA 300
17.	IRON, TOTAL	p	10.3		SW846 6010C
18.	MANGANESE, TOTAL	p	1.5		SW846 6010C
19.	NITRATE-NITROGEN	p	1 ND		EPA 300

T - Please indicate detection limit if analyte is not detected

Monitoring Point No. FFLEINFS
Sample Date 8/28/2019
I.D. No 101389

FORM 50

	ANALYTE mg/l unless otherwise indicated		LEACHATE T DISCHARGE	DETECTION ZONE T DISCHARGE	ANALYSIS METHOD NUMBER
20.	TOTAL PHENOLICS (mg/l)	p	0.05		SW846 9066
21.	TDS (TOT. DISSOLVED SOLIDS) (mg/l)	p	40900		SM20-2540C
22.	TRITIUM (pCi/l)	p			EPA 906
23.	TURBIDITY (NTU)	p	152		SM20-2130B
24.	ANTIMONY (ug/l)	p	51		SW846 6010C
25.	ARSENIC, TOTAL (ug/l)	p	34		EPA 200.7
26.	BARIUM, TOTAL (ug/l)	p	5400		EPA 200.7
27.	BERYLLIUM (ug/l)	p	44 ND		SW846 6010C
28.	CADMIUM, TOTAL (ug/l)	p	20		EPA 200.7
29.	CHROMIUM, TOTAL (ug/l)	p	16		EPA 200.7
30.	COBALT (ug/l)	p	8.2		SW846 6010C
31.	COPPER, TOTAL (ug/l)	p	18		EPA 200.7
32.	LEAD-FLAMELESS, TOTAL (ug/l)	p	6.7 ND		EPA 200.7
33.	MERCURY, TOTAL (ug/l)	p	0.5 ND		EPA 245.1
34.	NICKEL (ug/l)	p	61		EPA 200.7
35.	SELENIUM, TOTAL (ug/l)	p	22 ND		EPA 200.7
36.	SILVER, TOTAL (ug/l)	p	4.4 ND		EPA 200.7
37.	THALLIUM (ug/l)	p	22 ND		SW846 6010C
38.	VANADIUM (ug/l)	p	5.6 ND		SW846 6010C
39.	ZINC, TOTAL (ug/l)	p	170		EPA 200.7
40.	ACETONE (ug/l)	p	265		SW 846 8260B
41.	ACRYLONITRILE (ug/l)	p	25 ND		SW 846 8260B
42.	BENZENE (ug/l)	p	5 ND		SW 846 8260B
43.	BROMOCHLOROMETHANE (CHLOROBR	p	5 ND		SW 846 8260B
44.	BROMODICHLOROMETHANE (ug/l)	p	5 ND		SW 846 8260B
45.	BROMOFORM (ug/l)	p	5 ND		SW 846 8260B
46.	CARBON DISULFIDE (ug/l)	p	5 ND		SW 846 8260B
47.	CARBON TETRACHLORIDE (ug/l)	p	5 ND		SW 846 8260B
48.	CHLOROBENZENE (ug/l)	p	5 ND		SW 846 8260B
49.	CHLOROETHANE (ug/l)	p	5 ND		SW 846 8260B
50.	CHLOROFORM (ug/l)	p	5 ND		SW 846 8260B
51.	3-CHLORO-1-PROPENE (ug/l)	p	5 ND		SW 846 8260B
52.	DIBROMOCHLOROMETHANE (ug/l)	p	5 ND		SW 846 8260B
53.	1,2-DIBROMO-3-CHLOROPROPANE (ug/l)	p	35 ND		SW 846 8260B
54.	1,2-DIBROMOETHANE (ug/l)	p	5 ND		SW 846 8260B
55.	1,2-DICHLOROBENZENE (ug/l)	p	5 ND		SW 846 8260B
56.	1,3-DICHLOROBENZENE (ug/l)	p	5 ND		SW 846 8260B

T - Please indicate detection limit if analyte is not detected

Monitoring Point No.	FFLEINFS
Sample Date	8/28/2019
I.D. No	101389

FORM 50

	ANALYTE ug/l		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
57.	1,4-DICHLOROBENZENE	p	5 ND		SW 846 8260B
58.	TRANS 1,4-DICHLORO-2-BUTENE	p	15 ND		SW 846 8260B
59.	DICHLORODIFLUOROMETHANE	p	5 ND		SW 846 8260B
60.	1,1-DICHLOROETHANE	p	5 ND		SW 846 8260B
61.	1,2-DICHLOROETHANE	p	5 ND		SW 846 8260B
62.	1,1-DICHLOROETHENE	p	5 ND		SW 846 8260B
63.	CIS 1,2-DICHLOROETHENE	p	5 ND		SW 846 8260B
64.	TRANS 1,2-DICHLOROETHENE	p	5 ND		SW 846 8260B
65.	1,2-DICHLOROPROPANE	p	5 ND		SW 846 8260B
66.	CIS 1,3-DICHLOROPROPENE	p	5 ND		SW 846 8260B
67.	TRANS 1,3-DICHLOROPROPENE	p	5 ND		SW 846 8260B
68.	ETHYLBENZENE	p	5 ND		SW 846 8260B
69.	2-HEXANONE	p	25 ND		SW 846 8260B
70.	BROMOMETHANE	p	5 ND		SW 846 8260B
71.	CHLOROMETHANE	p	5 ND		SW 846 8260B
72.	DIBROMOMETHANE	p	5 ND		SW 846 8260B
73.	METHYLENE CHLORIDE	p	5 ND		SW 846 8260B
74.	2-BUTANONE (MEK)	p	71.8		SW 846 8260B
75.	IODOMETHANE	p	5 ND		SW 846 8260B
76.	4-METHYL-2-PENTANONE	p	25 ND		SW 846 8260B
77.	STYRENE	p	5 ND		SW 846 8260B
78.	1,1,2,2-TETRACHLOROETHANE	p	5 ND		SW 846 8260B
79.	1,1,1,2-TETRACHLOROETHANE	p	5 ND		SW 846 8260B
80.	TETRACHLOROETHENE	p	5 ND		SW 846 8260B
81.	TOLUENE	p	5 ND		SW 846 8260B
82.	1,1,1-TRICHLOROETHANE	p	5 ND		SW 846 8260B
83.	1,1,2-TRICHLOROETHANE	p	5 ND		SW 846 8260B
84.	TRICHLOROETHENE	p	5 ND		SW 846 8260B

T - Please indicate detection limit if analyte is not detected

Monitoring Point No.	FFLEINFS
Sample Date	8/28/2019
I.D. No	101389

FORM 50

	ANALYTE ug/l		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
85.	TRICHLOROFLUOROMETHANE	p	5 ND		SW 846 8260B
86.	1,2,3-TRICHLOROPROPANE	p	10 ND		SW 846 8260B
87.	VINYL ACETATE	p	25 ND		SW 846 8260B
88.	VINYL CHLORIDE	p	5 ND		SW 846 8260B
89.	XYLENES (TOTAL)	p	15 ND		SW 846 8260B

p = PADEP 273,284 analyte exclusively
d = Subtitle D, Appendix I analyte exclusively
All other analytes are common to both lists.
T - Please indicate detection limit if analyte is not detected

Analyzed in the 4th calendar quarter only

FORM 50

Monitoring Point No.	FFLEINFS
Sample Date	8/28/2019
I.D. No	101389

4. Qualitatively Identified Organic Compounds

List at least ten volatile organic compounds not otherwise identified in this section. Their identification should be based upon those compounds showing the greatest apparent concentration from the peaks of a mass spectrum of each sample. These ten compounds shall be identified but the concentration of each is not required.

Constituent	CAS Number
DIHYDRO-TERPINEOL	0-00-0
BENZOIC ACID, 2-TRIMETHYL	3789-85-3
2,4-DIMETHYL-3-PENTANONE	565-80-0
T-BUTYL ALCOHOL	75-65-0

ALS Environmental

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

September 9, 2019

Ms. Jordan Gallagher
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**FREY FARM**	Workorder:	**3054578**
Purchase Order:	**PO1000126**	Workorder ID:	**FFLEINFS**

Dear Ms. Gallagher:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, August 28, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Mr. Daniel Brown , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3054578 FFLEINFS

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3054578001	FFLEINFS	Water	8/28/2019 14:10	8/28/2019 17:56	Mr. Jeff Musser

ALS Environmental

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3054578 FFLEINFS

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

ANALYTICAL RESULTS

Workorder: 3054578 FFLEINFS

Lab ID: **3054578001** Date Collected: 8/28/2019 14:10 Matrix: Water

Sample ID: **FFLEINFS** Date Received: 8/28/2019 17:56

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
VOLATILE ORGANICS										
Acetone	265		ug/L	50.0	SW846 8260B			9/4/19 13:24	TMP	J
Acrylonitrile	ND		ug/L	25.0	SW846 8260B			9/4/19 13:24	TMP	J
Benzene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Bromochloromethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Bromodichloromethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Bromoform	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Bromomethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
2-Butanone	71.8		ug/L	50.0	SW846 8260B			9/4/19 13:24	TMP	J
Carbon Disulfide	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Carbon Tetrachloride	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Chlorobenzene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Chlorodibromomethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Chloroethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Chloroform	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Chloromethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
3-Chloro-1-propene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
1,2-Dibromo-3-chloropropane	ND		ug/L	35.0	SW846 8260B			9/4/19 13:24	TMP	J
1,2-Dibromoethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Dibromomethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
trans-1,4-Dichloro-2-butene	ND		ug/L	15.0	SW846 8260B			9/4/19 13:24	TMP	J
1,2-Dichlorobenzene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
1,3-Dichlorobenzene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
1,4-Dichlorobenzene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Dichlorodifluoromethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
1,1-Dichloroethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
1,2-Dichloroethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
1,1-Dichloroethene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
cis-1,2-Dichloroethene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
trans-1,2-Dichloroethene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
1,2-Dichloropropane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
cis-1,3-Dichloropropene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
trans-1,3-Dichloropropene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Ethylbenzene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
2-Hexanone	ND		ug/L	25.0	SW846 8260B			9/4/19 13:24	TMP	J
Iodomethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
4-Methyl-2-Pentanone(MIBK)	ND		ug/L	25.0	SW846 8260B			9/4/19 13:24	TMP	J

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3054578 FFLEINFS

Lab ID: **3054578001** Date Collected: 8/28/2019 14:10 Matrix: Water
Sample ID: **FFLEINFS** Date Received: 8/28/2019 17:56

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Methylene Chloride	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Styrene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
1,1,1,2-Tetrachloroethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
1,1,2,2-Tetrachloroethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Tetrachloroethene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Toluene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Total Xylenes	ND		ug/L	15.0	SW846 8260B			9/4/19 13:24	TMP	J
1,1,1-Trichloroethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
1,1,2-Trichloroethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Trichloroethene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
Trichlorofluoromethane	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
1,2,3-Trichloropropane	ND		ug/L	10.0	SW846 8260B			9/4/19 13:24	TMP	J
Vinyl Acetate	ND		ug/L	25.0	SW846 8260B			9/4/19 13:24	TMP	J
Vinyl Chloride	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
o-Xylene	ND		ug/L	5.0	SW846 8260B			9/4/19 13:24	TMP	J
mp-Xylene	ND		ug/L	10.0	SW846 8260B			9/4/19 13:24	TMP	J
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	62 - 133	SW846 8260B			9/4/19 13:24	TMP	J
4-Bromofluorobenzene (S)	108		%	79 - 114	SW846 8260B			9/4/19 13:24	TMP	J
Dibromofluoromethane (S)	98.7		%	78 - 116	SW846 8260B			9/4/19 13:24	TMP	J
Toluene-d8 (S)	96.2		%	76 - 127	SW846 8260B			9/4/19 13:24	TMP	J
Library Search - Volatiles										
2-Propanol, 2-methyl-	20.3	J N	ug/L		SW846 8260B			9/4/19 13:24	TMP	J
SILANOL, TERT-BUTYLDIMETHYL-	68.6	J N	ug/L		SW846 8260B			9/4/19 13:24	TMP	J
3-Pentanone, 2,4-dimethyl-	6.8	J N	ug/L		SW846 8260B			9/4/19 13:24	TMP	J
Unknown	31.1	J	ug/L		SW846 8260B			9/4/19 13:24	TMP	J
Benzoic acid, 2-[(trimethylsil	26.0	J N	ug/L		SW846 8260B			9/4/19 13:24	TMP	J
WET CHEMISTRY										
Alkalinity, Bicarbonate	487		mg/L	5	SM2320B-2011			8/31/19 10:16	MBW	B
Alkalinity, Total	487	4	mg/L	5	SM2320B-2011			8/31/19 10:16	MBW	B
Ammonia-N	1690		mg/L	10.0	D6919-09			9/7/19 19:04	AK	F
Chemical Oxygen Demand (COD)	3120		mg/L	75	EPA 410.4			9/6/19 17:22	AK	F
Chloride	19400		mg/L	500	EPA 300.0			8/31/19 12:00	CHW	B
Fluoride	ND	2	mg/L	1.0	EPA 300.0			8/29/19 14:25	CHW	B
Nitrate-N	ND	3	mg/L	1.0	EPA 300.0			8/29/19 14:25	CHW	B
pH	7.12	1	pH_Units		S4500HB-11			8/31/19 10:16	MBW	B

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3054578 FFLEINFS

Lab ID: **3054578001** Date Collected: 8/28/2019 14:10 Matrix: Water
Sample ID: **FFLEINFS** Date Received: 8/28/2019 17:56

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Phenolics	0.05		mg/L	0.005	SW846 9066	8/30/19 13:05	C_D	9/2/19 05:55	C_D	H
Specific Conductance	61100		umhos/cm	1	SW846 9050A			8/31/19 10:16	MBW	B
Sulfate	162		mg/L	10.0	EPA 300.0			8/29/19 14:25	CHW	B
Total Dissolved Solids	40900		mg/L	5	S2540C-11			9/3/19 14:42	D1C	B
Total Organic Carbon (TOC)	370		mg/L	50.0	SW846 9060A			8/31/19 18:57	PAG	C
Turbidity	152		NTU	0.10	SM2130B-2011			8/29/19 06:08	R2B	B
METALS										
Antimony, Total	0.051		mg/L	0.022	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Arsenic, Total	0.034		mg/L	0.0090	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Barium, Total	5.4		mg/L	0.011	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Beryllium, Total	ND		mg/L	0.044	SW846 6010C	8/30/19 15:15	AHI	9/6/19 14:04	MNP	G
Cadmium, Total	0.020		mg/L	0.0022	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Calcium, Total	1640		mg/L	0.11	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Chromium, Total	0.016		mg/L	0.0056	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Cobalt, Total	0.0082		mg/L	0.0056	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Copper, Total	0.018		mg/L	0.011	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Iron, Total	10.3		mg/L	0.067	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Lead, Total	ND		mg/L	0.0067	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Magnesium, Total	264		mg/L	0.11	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Manganese, Total	1.5		mg/L	0.0056	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Mercury, Total	ND		mg/L	0.00050	SW846 7470A	8/30/19 11:05	AHI	8/31/19 05:25	MSA	G
Nickel, Total	0.061		mg/L	0.022	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Potassium, Total	1650		mg/L	0.56	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Selenium, Total	ND		mg/L	0.022	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Silver, Total	ND		mg/L	0.0044	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Sodium, Total	1980		mg/L	0.56	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Thallium, Total	ND		mg/L	0.022	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Vanadium, Total	ND		mg/L	0.0056	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
Zinc, Total	0.17		mg/L	0.022	SW846 6010C	8/30/19 15:15	AHI	9/3/19 16:37	SRT	G
FIELD PARAMETERS										
pH, Field (SM4500B)	6.94		pH_Units		Field			8/28/19 14:10	CLT	A
Specific Conductance, Field	62200		umhos/cm	1	Field			8/28/19 14:10	CLT	A
Temperature	24.20		Deg. C		Field			8/28/19 14:10	CLT	A

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ANALYTICAL RESULTS

Workorder: 3054578 FFLEINFS

Lab ID:	**3054578001**	Date Collected:	8/28/2019 14:10	Matrix:	Water
Sample ID:	**FFLEINFS**	Date Received:	8/28/2019 17:56		

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3054578 FFLEINFS

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3054578001	1	FFLEINFS	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3054578001	2	FFLEINFS	EPA 300.0	Fluoride
Due to sample matrix interferences, this analyte was analyzed at a dilution and the detection levels adjusted accordingly.				
3054578001	3	FFLEINFS	EPA 300.0	Nitrate-N
Due to sample matrix interferences, this analyte was analyzed at a dilution and the detection levels adjusted accordingly.				
3054578001	4	FFLEINFS	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3054578 FFLEINFS

Lab ID	Sample ID	Analysis Method	Prep Method
3054578001	FFLEINFS	D6919-09	
3054578001	FFLEINFS	EPA 300.0	
3054578001	FFLEINFS	EPA 410.4	
3054578001	FFLEINFS	Field	
3054578001	FFLEINFS	Lib Search VOC	
3054578001	FFLEINFS	S2540C-11	
3054578001	FFLEINFS	S4500HB-11	
3054578001	FFLEINFS	SM2130B-2011	
3054578001	FFLEINFS	SM2320B-2011	
3054578001	FFLEINFS	SW846 6010C	SW846 3015
3054578001	FFLEINFS	SW846 7470A	SW846 7470A
3054578001	FFLEINFS	SW846 8260B	
3054578001	FFLEINFS	SW846 9050A	
3054578001	FFLEINFS	SW846 9060A	
3054578001	FFLEINFS	SW846 9066	420.4/9066

ALS Environmental
34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY / REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

3054578

Completed by Recei

Client Name: Lancaster County Solid Waste Mgmt Authority
Address: 1299 Harrisburg Pike
Lancaster PA 17604
Contact: Mr. Nick Rogers
Phone#: (717) 874-4428
Project Name/#: FFLF Leachate Combined Form 50-FFLEINFS
Bill To: LCSWMA

TAT [x] Normal-Standard TAT is 10-12 business days.
[ ] Rush-Subject to ALS approval and surcharges.
Date Required: _____ Approved By: _____
Email? [x] -Y nrogers@lcswma.org
Fax? [ ] -Y No.: _____

Cooler Temp: 16 Therm ID: 402
No. of Coolers: _____

	Y	N
Custody Seals Present?		
(If present) Seals Intact?		
Received on Ice?		
COC/Labels Complete/Accurate?		
Cont. in Good Cond.?		
Correct Containers?		
Correct Sample Volumes?		
Correct Preservation?		
Headspace/Volatiles?		

Courier/Tracking #:

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	Alkalinity, Bicarbonate	Cl, pH, SpC, SO4, F, NO3, TDS, Tb	NH3, COD	Total Metals-Form 50*	Phenols, Total	TOC	8260-Form 50 + Library Search	6.94	62,200	24.2	Sample/COC Comments
Container Type					PL	PL	PL	PL	AW	AG	CG				
Container Size					500mL	500 ml	250 ml	125 ml	125 ml	40mL	40mL				
Preservative					NONE	NONE	H2SO4	HNO3	H2SO4	HCl	HCl				
					Enter Number of Containers Per Sample or Field Results Below.										
1) FFLEINFS	8/28/2019	14:10	C	WW	1	1	1	1	1	2	2	pH	SpC	T °C	
2															
3															
4															
5															
6															
7															
8															
9															
10															

ALS Field Services: _Pickup _I
_Composite Sampling _Rental Eq
_Other: _____

Project Comments: Form 50; Metals = Mg, K, Na, Fe, Mn, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Hg, Ni, Se, Ag, Tl, V, Zn

LOGGED BY(signature): DATE: TIME:
REVIEWED BY(signature): DATE: TIME:

Data Deliverables: [x] Standard [ ] CLP-like [ ] USACE [x] Landlinks EDD
Special Processing: USACE [ ] Navy [ ]
Stat Col

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] LCSWMA	8-28-19	1547	2 [signature] ALS	8-28-19	1547
3 [signature] ALS	8-28-19	1756	4 [signature]	8/28/19	1456
5			6		
7			8		
9			10		

Reportable to PADEP? Yes [ ]
PWSID # _____
Sample Disposal: Lab [x] Special [ ] [x]
EDDS: Format Type: _____

* G=Grab, C=Composite
**Matrix - AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
LCSW	3054578	DN	8/29

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	(N/A)	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	(NO)
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	(NO)
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	(NO)
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #:								
Temperature (°C):	10							
Thermometer ID:	402							
Radiological (µCi):								

COMMENTS (Required for all NO responses above and any sample non-conformance):

-> Temp > 6°
- Same day
-> PH 3 out of hold

Rev. 4/29/2019

2540-FM-BWM0158 Rev. 10/2010

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/17/2019
DEP USE ONLY
Date Received

FORM 50

MUNICIPAL WASTE LANDFILL LEACHATE ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 50, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.255(d) and (e) and 273.276(a)
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Management Aut

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Facility Name: Frey Farm Landfill

Sampling Point Number: FFMH01SS

Location: County Lancaster County Municipality:

Sampling Point Latitude: 0 o 0 ' " Longitude: 0 o 0 ' "

Sampling Method: ___Pumped ___Bailed X Grab

Sample Field Filtered (must be 0.45 micron): ____Yes X No

Sample Date (mm/dd/yy): 8/29/2019 Sample Collection Time: 10:05

Sample Collector's Name: Collected by Cli

Sample Collector's Affiliation: LCSWMA

Laboratory(ies) Performing Analysis: ALS Environmental

Lab Certification Number(s): 22-293

Lab Sample Number(s): 3054916001 Final Lab Analysis Completion Date: 9/11/2019

Were any holding times exceeded?: ____Yes X No If yes, please explain in comments field.

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Monitoring Point No.	FFMH01SS
Sample Date	8/29/2019
I.D. No	101389

FORM 50
QUARTERLY MUNICIPAL WASTE LANDFILL LEACHATE ANALYSES

For new facilities and cells as well as existing facilities which were permitted and which received waste after April 9, 1988, discharge flow volume from leachate collection shall be measured daily [273.276(a)(1)]. Discharge flow volume from the detection zone shall be estimated weekly [273.255(d)(2)]. Form 50 is due quarterly after the flow of leachate from the collection system has started. For facilities or cells which have received no waste since April 9, 1988, detection zone monitoring will meet permit/closure requirements.

FLOW FACTOR	LEACHATE DISCHARGE	DETECTION ZONE DISCHARGE
Volume (average gpd)		76.2
Area Drained (acres)		17.55
Ratio (gallons/acre/day)		4.34

Once leachate flow begins from a leachate collection system, leachate discharge will be analyzed quarterly for all analytes listed below. In the leachate detection zone, any fluid found in any detection zone monitoring point must be sampled during the initial four quarters for the leachate indicator parameters (designated by *, below) to establish a baseline fluid composition. Thereafter, any fluid detected in each monitoring point in the leachate detection zone must be sampled annually for the leachate indicator parameters. Quarterly sampling of the fluid in any detection zone monitoring point for leachate indicator parameters is required only when the quarterly flow at that monitoring point exceeds 10 gallons per acre per day (weekly average for the quarter) for the cell(s) served by that monitoring point. If the indicator analytes confirm leachate contamination in the detection zone, the fluid will be analyzed initially within 30 days and thereafter annually for all analytes listed below. When MCL's (where established) of any detection zone analytes on this form are exceeded, annual groundwater monitoring must include the Subtitle D detection zone add-on list analytes found on Form 19.

	ANALYTE mg/l unless otherwise indicated		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
1.	ALKALINITY	p		440	SM20-2320B
2.	AMMONIA-NITROGEN	p		252	ASTM D6919-03
3.	BICARBONATE ALKALINITY	p		440	SM20-2321
4.	CALCIUM, TOTAL	p		4420	SW846 6010C
5.	COD (CHEMICAL OXYGEN DEMAND)	p		1100	EPA 410.4
6.	CHLORIDE	p		22700	EPA 300
7.	MAGNESIUM, TOTAL	p		453	SW846 6010C
8.	pH-FIELD (SU)	p		6.48	FIELD
9.	pH-LAB (SU)	p		6.47	150.1/4500B
10.	POTASSIUM, TOTAL	p		2140	SW846 6010C
11.	SPEC. COND., FIELD (umhos/cm)	p		46900	FIELD
12.	SPEC. COND., LAB (umhos/cm)	p		48300	EPA 120.1
13.	SODIUM, TOTAL	p		5830	SW846 6010C
14.	SULFATE	p		81.4	EPA 300
15.	TOC (TOTAL ORGANIC CARBON)	p		94.3	SM20-5310B
16.	FLUORIDE	p		1 ND	EPA 300
17.	IRON, TOTAL	p		236	SW846 6010C
18.	MANGANESE, TOTAL	p		8.1	SW846 6010C
19.	NITRATE-NITROGEN	p		1 ND	EPA 300

T - Please indicate detection limit if analyte is not detected

Monitoring Point No. FFMH01SS
Sample Date 8/29/2019
I.D. No 101389

FORM 50

	ANALYTE mg/l unless otherwise indicated		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
20.	TOTAL PHENOLICS (mg/l)	p		0.02	SW846 9066
21.	TDS (TOT. DISSOLVED SOLIDS) (mg/l)	p		42200	SM20-2540C
22.	TRITIUM (pCi/l)	p			EPA 906
23.	TURBIDITY (NTU)	p		995	SM20-2130B
24.	ANTIMONY (ug/l)	p		220 ND	SW846 6010C
25.	ARSENIC, TOTAL (ug/l)	p		90 ND	EPA 200.7
26.	BARIUM, TOTAL (ug/l)	p		2500	EPA 200.7
27.	BERYLLIUM (ug/l)	p		44 ND	SW846 6010C
28.	CADMIUM, TOTAL (ug/l)	p		23	EPA 200.7
29.	CHROMIUM, TOTAL (ug/l)	p		56 ND	EPA 200.7
30.	COBALT (ug/l)	p		56 ND	SW846 6010C
31.	COPPER, TOTAL (ug/l)	p		110 ND	EPA 200.7
32.	LEAD-FLAMELESS, TOTAL (ug/l)	p		67 ND	EPA 200.7
33.	MERCURY, TOTAL (ug/l)	p		0.5 ND	EPA 245.1
34.	NICKEL (ug/l)	p		220 ND	EPA 200.7
35.	SELENIUM, TOTAL (ug/l)	p		220 ND	EPA 200.7
36.	SILVER, TOTAL (ug/l)	p		44 ND	EPA 200.7
37.	THALLIUM (ug/l)	p		220 ND	SW846 6010C
38.	VANADIUM (ug/l)	p		56 ND	SW846 6010C
39.	ZINC, TOTAL (ug/l)	p		220 ND	EPA 200.7
40.	ACETONE (ug/l)	p		17.8	SW 846 8260B
41.	ACRYLONITRILE (ug/l)	p		5 ND	SW 846 8260B
42.	BENZENE (ug/l)	p		1.1	SW 846 8260B
43.	BROMOCHLOROMETHANE (CHLOROBR	p		1 ND	SW 846 8260B
44.	BROMODICHLOROMETHANE (ug/l)	p		1 ND	SW 846 8260B
45.	BROMOFORM (ug/l)	p		1 ND	SW 846 8260B
46.	CARBON DISULFIDE (ug/l)	p		1 ND	SW 846 8260B
47.	CARBON TETRACHLORIDE (ug/l)	p		1 ND	SW 846 8260B
48.	CHLOROBENZENE (ug/l)	p		1 ND	SW 846 8260B
49.	CHLOROETHANE (ug/l)	p		1 ND	SW 846 8260B
50.	CHLOROFORM (ug/l)	p		1 ND	SW 846 8260B
51.	3-CHLORO-1-PROPENE (ug/l)	p		1 ND	SW 846 8260B
52.	DIBROMOCHLOROMETHANE (ug/l)	p		1 ND	SW 846 8260B
53.	1,2-DIBROMO-3-CHLOROPROPANE (ug/l)	p		7 ND	SW 846 8260B
54.	1,2-DIBROMOETHANE (ug/l)	p		1 ND	SW 846 8260B
55.	1,2-DICHLOROBENZENE (ug/l)	p		1 ND	SW 846 8260B
56.	1,3-DICHLOROBENZENE (ug/l)	p		1 ND	SW 846 8260B

T - Please indicate detection limit if analyte is not detected

Monitoring Point No.	FFMH01SS
Sample Date	8/29/2019
I.D. No	101389

FORM 50

	ANALYTE ug/l		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
57.	1,4-DICHLOROBENZENE	p		1.9	SW 846 8260B
58.	TRANS 1,4-DICHLORO-2-BUTENE	p		3 ND	SW 846 8260B
59.	DICHLORODIFLUOROMETHANE	p		1 ND	SW 846 8260B
60.	1,1-DICHLOROETHANE	p		1 ND	SW 846 8260B
61.	1,2-DICHLOROETHANE	p		1 ND	SW 846 8260B
62.	1,1-DICHLOROETHENE	p		1 ND	SW 846 8260B
63.	CIS 1,2-DICHLOROETHENE	p		1 ND	SW 846 8260B
64.	TRANS 1,2-DICHLOROETHENE	p		1 ND	SW 846 8260B
65.	1,2-DICHLOROPROPANE	p		1 ND	SW 846 8260B
66.	CIS 1,3-DICHLOROPROPENE	p		1 ND	SW 846 8260B
67.	TRANS 1,3-DICHLOROPROPENE	p		1 ND	SW 846 8260B
68.	ETHYLBENZENE	p		4.1	SW 846 8260B
69.	2-HEXANONE	p		5 ND	SW 846 8260B
70.	BROMOMETHANE	p		1 ND	SW 846 8260B
71.	CHLOROMETHANE	p		1 ND	SW 846 8260B
72.	DIBROMOMETHANE	p		1 ND	SW 846 8260B
73.	METHYLENE CHLORIDE	p		1 ND	SW 846 8260B
74.	2-BUTANONE (MEK)	p		10 ND	SW 846 8260B
75.	IODOMETHANE	p		1 ND	SW 846 8260B
76.	4-METHYL-2-PENTANONE	p		5 ND	SW 846 8260B
77.	STYRENE	p		1 ND	SW 846 8260B
78.	1,1,2,2-TETRACHLOROETHANE	p		1 ND	SW 846 8260B
79.	1,1,1,2-TETRACHLOROETHANE	p		1 ND	SW 846 8260B
80.	TETRACHLOROETHENE	p		1 ND	SW 846 8260B
81.	TOLUENE	p		1 ND	SW 846 8260B
82.	1,1,1-TRICHLOROETHANE	p		1 ND	SW 846 8260B
83.	1,1,2-TRICHLOROETHANE	p		1 ND	SW 846 8260B
84.	TRICHLOROETHENE	p		1 ND	SW 846 8260B

T - Please indicate detection limit if analyte is not detected

Monitoring Point No.	FFMH01SS
Sample Date	8/29/2019
I.D. No	101389

FORM 50

	ANALYTE ug/l		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
85.	TRICHLOROFLUOROMETHANE	p		1 ND	SW 846 8260B
86.	1,2,3-TRICHLOROPROPANE	p		2 ND	SW 846 8260B
87.	VINYL ACETATE	p		5 ND	SW 846 8260B
88.	VINYL CHLORIDE	p		1 ND	SW 846 8260B
89.	XYLENES (TOTAL)	p		6.5	SW 846 8260B

p = PADEP 273,284 analyte exclusively
d = Subtitle D, Appendix I analyte exclusively
All other analytes are common to both lists.
T - Please indicate detection limit if analyte is not detected

Analyzed in the 4th calendar quarter only

FORM 50

Monitoring Point No.	FFMH01SS
Sample Date	8/29/2019
I.D. No	101389

4. Qualitatively Identified Organic Compounds

List at least ten volatile organic compounds not otherwise identified in this section. Their identification should be based upon those compounds showing the greatest apparent concentration from the peaks of a mass spectrum of each sample. These ten compounds shall be identified but the concentration of each is not required.

Constituent	CAS Number
DIHYDRO-TERPINEOL	0-00-0

2540-FM-BWM0158 Rev. 10/2010

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/17/2019
DEP USE ONLY
Date Received

FORM 50

MUNICIPAL WASTE LANDFILL LEACHATE ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 50, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.255(d) and (e) and 273.276(a)
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Management Aut

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP): 101389

SECTION B. FACILITY INFORMATION

Facility Name: Frey Farm Landfill

Sampling Point Number: FFMH03SS

Location: County Lancaster County Municipality:

Sampling Point Latitude: 0 o 0 ' " Longitude: 0 o 0 ' "

Sampling Method: ___Pumped ___Bailed X Grab

Sample Field Filtered (must be 0.45 micron): ____Yes X No

Sample Date (mm/dd/yy): 8/29/2019 Sample Collection Time: 10:15

Sample Collector's Name: Collected by Cli

Sample Collector's Affiliation: LCSWMA

Laboratory(ies) Performing Analysis: ALS Environmental

Lab Certification Number(s): 22-293

Lab Sample Number(s): 3054916002 Final Lab Analysis Completion Date: 9/10/2019

Were any holding times exceeded?: ____Yes X No If yes, please explain in comments field.

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Monitoring Point No.	FFMH03SS
Sample Date	8/29/2019
I.D. No	101389

FORM 50
QUARTERLY MUNICIPAL WASTE LANDFILL LEACHATE ANALYSES

For new facilities and cells as well as existing facilities which were permitted and which received waste after April 9, 1988, discharge flow volume from leachate collection shall be measured daily [273.276(a)(1)]. Discharge flow volume from the detection zone shall be estimated weekly [273.255(d)(2)]. Form 50 is due quarterly after the flow of leachate from the collection system has started. For facilities or cells which have received no waste since April 9, 1988, detection zone monitoring will meet permit/closure requirements.

FLOW FACTOR	LEACHATE DISCHARGE	DETECTION ZONE DISCHARGE
Volume (average gpd)		2.94
Area Drained (acres)		17.69
Ratio (gallons/acre/day)		0.17

Once leachate flow begins from a leachate collection system, leachate discharge will be analyzed quarterly for all analytes listed below. In the leachate detection zone, any fluid found in any detection zone monitoring point must be sampled during the initial four quarters for the leachate indicator parameters (designated by *, below) to establish a baseline fluid composition. Thereafter, any fluid detected in each monitoring point in the leachate detection zone must be sampled annually for the leachate indicator parameters. Quarterly sampling of the fluid in any detection zone monitoring point for leachate indicator parameters is required only when the quarterly flow at that monitoring point exceeds 10 gallons per acre per day (weekly average for the quarter) for the cell(s) served by that monitoring point. If the indicator analytes confirm leachate contamination in the detection zone, the fluid will be analyzed initially within 30 days and thereafter annually for all analytes listed below. When MCL's (where established) of any detection zone analytes on this form are exceeded, annual groundwater monitoring must include the Subtitle D detection zone add-on list analytes found on Form 19.

	ANALYTE mg/l unless otherwise indicated		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
1.	ALKALINITY	p		36	SM20-2320B
2.	AMMONIA-NITROGEN	p		104	ASTM D6919-03
3.	BICARBONATE ALKALINITY	p		36	SM20-2321
4.	CALCIUM, TOTAL	p		283	SW846 6010C
5.	COD (CHEMICAL OXYGEN DEMAND)	p		563	EPA 410.4
6.	CHLORIDE	p		3440	EPA 300
7.	MAGNESIUM, TOTAL	p		193	SW846 6010C
8.	pH-FIELD (SU)	p		5.78	FIELD
9.	pH-LAB (SU)	p		6.03	150.1/4500B
10.	POTASSIUM, TOTAL	p		267	SW846 6010C
11.	SPEC. COND., FIELD (umhos/cm)	p		10530	FIELD
12.	SPEC. COND., LAB (umhos/cm)	p		11300	EPA 120.1
13.	SODIUM, TOTAL	p		1700	SW846 6010C
14.	SULFATE	p		688	EPA 300
15.	TOC (TOTAL ORGANIC CARBON)	p		135	SM20-5310B
16.	FLUORIDE	p		1 ND	EPA 300
17.	IRON, TOTAL	p		1.8	SW846 6010C
18.	MANGANESE, TOTAL	p		2.9	SW846 6010C
19.	NITRATE-NITROGEN	p		195	EPA 300

T - Please indicate detection limit if analyte is not detected

Monitoring Point No. FFMH03SS
Sample Date 8/29/2019
I.D. No 101389

FORM 50

	ANALYTE mg/l unless otherwise indicated		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
20.	TOTAL PHENOLICS (mg/l)	p		0.005 ND	SW846 9066
21.	TDS (TOT. DISSOLVED SOLIDS) (mg/l)	p		8560	SM20-2540C
22.	TRITIUM (pCi/l)	p			EPA 906
23.	TURBIDITY (NTU)	p		3.8	SM20-2130B
24.	ANTIMONY (ug/l)	p		220 ND	SW846 6010C
25.	ARSENIC, TOTAL (ug/l)	p		90 ND	EPA 200.7
26.	BARIUM, TOTAL (ug/l)	p		200	EPA 200.7
27.	BERYLLIUM (ug/l)	p		44 ND	SW846 6010C
28.	CADMIUM, TOTAL (ug/l)	p		22 ND	EPA 200.7
29.	CHROMIUM, TOTAL (ug/l)	p		56 ND	EPA 200.7
30.	COBALT (ug/l)	p		56 ND	SW846 6010C
31.	COPPER, TOTAL (ug/l)	p		110 ND	EPA 200.7
32.	LEAD-FLAMELESS, TOTAL (ug/l)	p		67 ND	EPA 200.7
33.	MERCURY, TOTAL (ug/l)	p		0.5 ND	EPA 245.1
34.	NICKEL (ug/l)	p		220 ND	EPA 200.7
35.	SELENIUM, TOTAL (ug/l)	p		220 ND	EPA 200.7
36.	SILVER, TOTAL (ug/l)	p		44 ND	EPA 200.7
37.	THALLIUM (ug/l)	p		220 ND	SW846 6010C
38.	VANADIUM (ug/l)	p		56 ND	SW846 6010C
39.	ZINC, TOTAL (ug/l)	p		250	EPA 200.7
40.	ACETONE (ug/l)	p		10 ND	SW 846 8260B
41.	ACRYLONITRILE (ug/l)	p		5 ND	SW 846 8260B
42.	BENZENE (ug/l)	p		1 ND	SW 846 8260B
43.	BROMOCHLOROMETHANE (CHLOROBR	p		1 ND	SW 846 8260B
44.	BROMODICHLOROMETHANE (ug/l)	p		1 ND	SW 846 8260B
45.	BROMOFORM (ug/l)	p		1 ND	SW 846 8260B
46.	CARBON DISULFIDE (ug/l)	p		1 ND	SW 846 8260B
47.	CARBON TETRACHLORIDE (ug/l)	p		1 ND	SW 846 8260B
48.	CHLOROBENZENE (ug/l)	p		1 ND	SW 846 8260B
49.	CHLOROETHANE (ug/l)	p		1 ND	SW 846 8260B
50.	CHLOROFORM (ug/l)	p		1 ND	SW 846 8260B
51.	3-CHLORO-1-PROPENE (ug/l)	p		1 ND	SW 846 8260B
52.	DIBROMOCHLOROMETHANE (ug/l)	p		1 ND	SW 846 8260B
53.	1,2-DIBROMO-3-CHLOROPROPANE (ug/l)	p		7 ND	SW 846 8260B
54.	1,2-DIBROMOETHANE (ug/l)	p		1 ND	SW 846 8260B
55.	1,2-DICHLOROBENZENE (ug/l)	p		1 ND	SW 846 8260B
56.	1,3-DICHLOROBENZENE (ug/l)	p		1 ND	SW 846 8260B

T - Please indicate detection limit if analyte is not detected

Monitoring Point No.	FFMH03SS
Sample Date	8/29/2019
I.D. No	101389

FORM 50

	ANALYTE ug/l		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
57.	1,4-DICHLOROBENZENE	p		1 ND	SW 846 8260B
58.	TRANS 1,4-DICHLORO-2-BUTENE	p		3 ND	SW 846 8260B
59.	DICHLORODIFLUOROMETHANE	p		1 ND	SW 846 8260B
60.	1,1-DICHLOROETHANE	p		1 ND	SW 846 8260B
61.	1,2-DICHLOROETHANE	p		1 ND	SW 846 8260B
62.	1,1-DICHLOROETHENE	p		1 ND	SW 846 8260B
63.	CIS 1,2-DICHLOROETHENE	p		1 ND	SW 846 8260B
64.	TRANS 1,2-DICHLOROETHENE	p		1 ND	SW 846 8260B
65.	1,2-DICHLOROPROPANE	p		1 ND	SW 846 8260B
66.	CIS 1,3-DICHLOROPROPENE	p		1 ND	SW 846 8260B
67.	TRANS 1,3-DICHLOROPROPENE	p		1 ND	SW 846 8260B
68.	ETHYLBENZENE	p		1 ND	SW 846 8260B
69.	2-HEXANONE	p		5 ND	SW 846 8260B
70.	BROMOMETHANE	p		1 ND	SW 846 8260B
71.	CHLOROMETHANE	p		1 ND	SW 846 8260B
72.	DIBROMOMETHANE	p		1 ND	SW 846 8260B
73.	METHYLENE CHLORIDE	p		1 ND	SW 846 8260B
74.	2-BUTANONE (MEK)	p		10 ND	SW 846 8260B
75.	IODOMETHANE	p		1 ND	SW 846 8260B
76.	4-METHYL-2-PENTANONE	p		5 ND	SW 846 8260B
77.	STYRENE	p		1 ND	SW 846 8260B
78.	1,1,2,2-TETRACHLOROETHANE	p		1 ND	SW 846 8260B
79.	1,1,1,2-TETRACHLOROETHANE	p		1 ND	SW 846 8260B
80.	TETRACHLOROETHENE	p		1 ND	SW 846 8260B
81.	TOLUENE	p		1 ND	SW 846 8260B
82.	1,1,1-TRICHLOROETHANE	p		1 ND	SW 846 8260B
83.	1,1,2-TRICHLOROETHANE	p		1 ND	SW 846 8260B
84.	TRICHLOROETHENE	p		1 ND	SW 846 8260B

T - Please indicate detection limit if analyte is not detected

Monitoring Point No.	FFMH03SS
Sample Date	8/29/2019
I.D. No	101389

FORM 50

	ANALYTE ug/l		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
85.	TRICHLOROFLUOROMETHANE	p		1 ND	SW 846 8260B
86.	1,2,3-TRICHLOROPROPANE	p		2 ND	SW 846 8260B
87.	VINYL ACETATE	p		5 ND	SW 846 8260B
88.	VINYL CHLORIDE	p		1 ND	SW 846 8260B
89.	XYLENES (TOTAL)	p		3 ND	SW 846 8260B

p = PADEP 273,284 analyte exclusively
d = Subtitle D, Appendix I analyte exclusively
All other analytes are common to both lists.
T - Please indicate detection limit if analyte is not detected

Analyzed in the 4th calendar quarter only

FORM 50

Monitoring Point No.	FFMH03SS
Sample Date	8/29/2019
I.D. No	101389

4. Qualitatively Identified Organic Compounds

List at least ten volatile organic compounds not otherwise identified in this section. Their identification should be based upon those compounds showing the greatest apparent concentration from the peaks of a mass spectrum of each sample. These ten compounds shall be identified but the concentration of each is not required.

Constituent	CAS Number

2540-FM-BWM0158 Rev. 10/2010

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/17/2019
DEP USE ONLY
Date Received

FORM 50

MUNICIPAL WASTE LANDFILL LEACHATE ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 50, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.255(d) and (e) and 273.276(a)
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Management Aut

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP):

SECTION B. FACILITY INFORMATION

Facility Name: Frey Farm Landfill

Sampling Point Number: FFMH05SS

Location: County Lancaster County Municipality:

Sampling Point Latitude: o ' " Longitude: o ' "

Sampling Method: ___Pumped ___Bailed X Grab

Sample Field Filtered (must be 0.45 micron): ____Yes X No

Sample Date (mm/dd/yy): 8/29/2019 Sample Collection Time: 9:50

Sample Collector's Name: Collected by Cli

Sample Collector's Affiliation: LCSWMA

Laboratory(ies) Performing Analysis: ALS Environmental

Lab Certification Number(s): 22-293

Lab Sample Number(s): 3054916003 Final Lab Analysis Completion Date: 9/11/2019

Were any holding times exceeded?: ____Yes X No If yes, please explain in comments field.

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Monitoring Point No. FFMH05SS
Sample Date 8/29/2019
I.D. No

FORM 50
QUARTERLY MUNICIPAL WASTE LANDFILL LEACHATE ANALYSES

For new facilities and cells as well as existing facilities which were permitted and which received waste after April 9, 1988, discharge flow volume from leachate collection shall be measured daily [273.276(a)(1)]. Discharge flow volume from the detection zone shall be estimated weekly [273.255(d)(2)]. Form 50 is due quarterly after the flow of leachate from the collection system has started. For facilities or cells which have received no waste since April 9, 1988, detection zone monitoring will meet permit/closure requirements.

FLOW FACTOR	LEACHATE DISCHARGE	DETECTION ZONE DISCHARGE
Volume (average gpd)		2.57
Area Drained (acres)		21.44
Ratio (gallons/acre/day)		0.12

Once leachate flow begins from a leachate collection system, leachate discharge will be analyzed quarterly for all analytes listed below. In the leachate detection zone, any fluid found in any detection zone monitoring point must be sampled during the initial four quarters for the leachate indicator parameters (designated by *, below) to establish a baseline fluid composition. Thereafter, any fluid detected in each monitoring point in the leachate detection zone must be sampled annually for the leachate indicator parameters. Quarterly sampling of the fluid in any detection zone monitoring point for leachate indicator parameters is required only when the quarterly flow at that monitoring point exceeds 10 gallons per acre per day (weekly average for the quarter) for the cell(s) served by that monitoring point. If the indicator analytes confirm leachate contamination in the detection zone, the fluid will be analyzed initially within 30 days and thereafter annually for all analytes listed below. When MCL's (where established) of any detection zone analytes on this form are exceeded, annual groundwater monitoring must include the Subtitle D detection zone add-on list analytes found on Form 19.

	ANALYTE mg/l unless otherwise indicated		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
1.	ALKALINITY	p		705	SM20-2320B
2.	AMMONIA-NITROGEN	p		2.19	ASTM D6919-03
3.	BICARBONATE ALKALINITY	p		616	SM20-2321
4.	CALCIUM, TOTAL	p		20.9	SW846 6010C
5.	COD (CHEMICAL OXYGEN DEMAND)	p		25	EPA 410.4
6.	CHLORIDE	p		494	EPA 300
7.	MAGNESIUM, TOTAL	p		6	SW846 6010C
8.	pH-FIELD (SU)	p		8.46	FIELD
9.	pH-LAB (SU)	p		8.78	150.1/4500B
10.	POTASSIUM, TOTAL	p		9	SW846 6010C
11.	SPEC. COND., FIELD (umhos/cm)	p		3400	FIELD
12.	SPEC. COND., LAB (umhos/cm)	p		3450	EPA 120.1
13.	SODIUM, TOTAL	p		705	SW846 6010C
14.	SULFATE	p		375	EPA 300
15.	TOC (TOTAL ORGANIC CARBON)	p		8.6	SM20-5310B
16.	FLUORIDE	p		0.6	EPA 300
17.	IRON, TOTAL	p		0.11	SW846 6010C
18.	MANGANESE, TOTAL	p		0.0099	SW846 6010C
19.	NITRATE-NITROGEN	p		6	EPA 300

T - Please indicate detection limit if analyte is not detected

Monitoring Point No. FFMH05SS
Sample Date 8/29/2019
I.D. No

FORM 50

	ANALYTE mg/l unless otherwise indicated		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
20.	TOTAL PHENOLICS (mg/l)	p		0.005 ND	SW846 9066
21.	TDS (TOT. DISSOLVED SOLIDS) (mg/l)	p		2240	SM20-2540C
22.	TRITIUM (pCi/l)	p			EPA 906
23.	TURBIDITY (NTU)	p		1.04	SM20-2130B
24.	ANTIMONY (ug/l)	p		22 ND	SW846 6010C
25.	ARSENIC, TOTAL (ug/l)	p		18	EPA 200.7
26.	BARIUM, TOTAL (ug/l)	p		20	EPA 200.7
27.	BERYLLIUM (ug/l)	p		4.4 ND	SW846 6010C
28.	CADMIUM, TOTAL (ug/l)	p		2.2 ND	EPA 200.7
29.	CHROMIUM, TOTAL (ug/l)	p		5.6 ND	EPA 200.7
30.	COBALT (ug/l)	p		5.6 ND	SW846 6010C
31.	COPPER, TOTAL (ug/l)	p		14	EPA 200.7
32.	LEAD-FLAMELESS, TOTAL (ug/l)	p		6.7 ND	EPA 200.7
33.	MERCURY, TOTAL (ug/l)	p		0.5 ND	EPA 245.1
34.	NICKEL (ug/l)	p		22 ND	EPA 200.7
35.	SELENIUM, TOTAL (ug/l)	p		22 ND	EPA 200.7
36.	SILVER, TOTAL (ug/l)	p		4.4 ND	EPA 200.7
37.	THALLIUM (ug/l)	p		22 ND	SW846 6010C
38.	VANADIUM (ug/l)	p		5.6 ND	SW846 6010C
39.	ZINC, TOTAL (ug/l)	p		22 ND	EPA 200.7
40.	ACETONE (ug/l)	p		10 ND	SW 846 8260B
41.	ACRYLONITRILE (ug/l)	p		5 ND	SW 846 8260B
42.	BENZENE (ug/l)	p		1 ND	SW 846 8260B
43.	BROMOCHLOROMETHANE (CHLOROBR	p		1 ND	SW 846 8260B
44.	BROMODICHLOROMETHANE (ug/l)	p		1 ND	SW 846 8260B
45.	BROMOFORM (ug/l)	p		1 ND	SW 846 8260B
46.	CARBON DISULFIDE (ug/l)	p		1 ND	SW 846 8260B
47.	CARBON TETRACHLORIDE (ug/l)	p		1 ND	SW 846 8260B
48.	CHLOROBENZENE (ug/l)	p		1 ND	SW 846 8260B
49.	CHLOROETHANE (ug/l)	p		1 ND	SW 846 8260B
50.	CHLOROFORM (ug/l)	p		1 ND	SW 846 8260B
51.	3-CHLORO-1-PROPENE (ug/l)	p		1 ND	SW 846 8260B
52.	DIBROMOCHLOROMETHANE (ug/l)	p		1 ND	SW 846 8260B
53.	1,2-DIBROMO-3-CHLOROPROPANE (ug/l)	p		7 ND	SW 846 8260B
54.	1,2-DIBROMOETHANE (ug/l)	p		1 ND	SW 846 8260B
55.	1,2-DICHLOROBENZENE (ug/l)	p		1 ND	SW 846 8260B
56.	1,3-DICHLOROBENZENE (ug/l)	p		1 ND	SW 846 8260B

T - Please indicate detection limit if analyte is not detected

Monitoring Point No. FFMH05SS
Sample Date 8/29/2019
I.D. No

FORM 50

	ANALYTE ug/l		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
57.	1,4-DICHLOROBENZENE	p		1 ND	SW 846 8260B
58.	TRANS 1,4-DICHLORO-2-BUTENE	p		3 ND	SW 846 8260B
59.	DICHLORODIFLUOROMETHANE	p		1 ND	SW 846 8260B
60.	1,1-DICHLOROETHANE	p		1 ND	SW 846 8260B
61.	1,2-DICHLOROETHANE	p		1 ND	SW 846 8260B
62.	1,1-DICHLOROETHENE	p		1 ND	SW 846 8260B
63.	CIS 1,2-DICHLOROETHENE	p		1 ND	SW 846 8260B
64.	TRANS 1,2-DICHLOROETHENE	p		1 ND	SW 846 8260B
65.	1,2-DICHLOROPROPANE	p		1 ND	SW 846 8260B
66.	CIS 1,3-DICHLOROPROPENE	p		1 ND	SW 846 8260B
67.	TRANS 1,3-DICHLOROPROPENE	p		1 ND	SW 846 8260B
68.	ETHYLBENZENE	p		1 ND	SW 846 8260B
69.	2-HEXANONE	p		5 ND	SW 846 8260B
70.	BROMOMETHANE	p		1 ND	SW 846 8260B
71.	CHLOROMETHANE	p		1 ND	SW 846 8260B
72.	DIBROMOMETHANE	p		1 ND	SW 846 8260B
73.	METHYLENE CHLORIDE	p		1 ND	SW 846 8260B
74.	2-BUTANONE (MEK)	p		10 ND	SW 846 8260B
75.	IODOMETHANE	p		1 ND	SW 846 8260B
76.	4-METHYL-2-PENTANONE	p		5 ND	SW 846 8260B
77.	STYRENE	p		1 ND	SW 846 8260B
78.	1,1,2,2-TETRACHLOROETHANE	p		1 ND	SW 846 8260B
79.	1,1,1,2-TETRACHLOROETHANE	p		1 ND	SW 846 8260B
80.	TETRACHLOROETHENE	p		1 ND	SW 846 8260B
81.	TOLUENE	p		1 ND	SW 846 8260B
82.	1,1,1-TRICHLOROETHANE	p		1 ND	SW 846 8260B
83.	1,1,2-TRICHLOROETHANE	p		1 ND	SW 846 8260B
84.	TRICHLOROETHENE	p		1 ND	SW 846 8260B

T - Please indicate detection limit if analyte is not detected

Monitoring Point No. FFMH05SS
Sample Date 8/29/2019
I.D. No

FORM 50

	ANALYTE ug/l		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
85.	TRICHLOROFLUOROMETHANE	p		1 ND	SW 846 8260B
86.	1,2,3-TRICHLOROPROPANE	p		2 ND	SW 846 8260B
87.	VINYL ACETATE	p		5 ND	SW 846 8260B
88.	VINYL CHLORIDE	p		1 ND	SW 846 8260B
89.	XYLENES (TOTAL)	p		3 ND	SW 846 8260B

p = PADEP 273,284 analyte exclusively
d = Subtitle D, Appendix I analyte exclusively
All other analytes are common to both lists.
T - Please indicate detection limit if analyte is not detected

Analyzed in the 4th calendar quarter only

FORM 50

Monitoring Point No. FFMH05SS
Sample Date 8/29/2019
I.D. No

4. Qualitatively Identified Organic Compounds

List at least ten volatile organic compounds not otherwise identified in this section. Their identification should be based upon those compounds showing the greatest apparent concentration from the peaks of a mass spectrum of each sample. These ten compounds shall be identified but the concentration of each is not required.

Constituent	CAS Number

2540-FM-BWM0158 Rev. 10/2010

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/17/2019
DEP USE ONLY
Date Received

FORM 50

MUNICIPAL WASTE LANDFILL LEACHATE ANALYSES

This form must be fully and accurately completed. All required information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 50, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Section 273.255(d) and (e) and 273.276(a)
Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Management Aut

Site Name: Frey Farm Landfill

Facitlity ID (as issued by DEP):

SECTION B. FACILITY INFORMATION

Facility Name: Frey Farm Landfill

Sampling Point Number: FFMH06SS

Location: County Lancaster County Municipality:

Sampling Point Latitude: o ' " Longitude: o ' "

Sampling Method: ___Pumped ___Bailed X Grab

Sample Field Filtered (must be 0.45 micron): ____Yes X No

Sample Date (mm/dd/yy): 8/29/2019 Sample Collection Time: 9:30

Sample Collector's Name: Collected by Cli

Sample Collector's Affiliation: LCSWMA

Laboratory(ies) Performing Analysis: ALS Environmental

Lab Certification Number(s): 22-293

Lab Sample Number(s): 3054916004 Final Lab Analysis Completion Date: 9/9/2019

Were any holding times exceeded?: ____Yes X No If yes, please explain in comments field.

Name/Affiliation of Person who Filled Out Form: Nick R. Rogers

Comments:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Monitoring Point No. FFMH06SS
Sample Date 8/29/2019
I.D. No

FORM 50
QUARTERLY MUNICIPAL WASTE LANDFILL LEACHATE ANALYSES

For new facilities and cells as well as existing facilities which were permitted and which received waste after April 9, 1988, discharge flow volume from leachate collection shall be measured daily [273.276(a)(1)]. Discharge flow volume from the detection zone shall be estimated weekly [273.255(d)(2)]. Form 50 is due quarterly after the flow of leachate from the collection system has started. For facilities or cells which have received no waste since April 9, 1988, detection zone monitoring will meet permit/closure requirements.

FLOW FACTOR	LEACHATE DISCHARGE	DETECTION ZONE DISCHARGE
Volume (average gpd)		5.46
Area Drained (acres)		11.67
Ratio (gallons/acre/day)		0.47

Once leachate flow begins from a leachate collection system, leachate discharge will be analyzed quarterly for all analytes listed below. In the leachate detection zone, any fluid found in any detection zone monitoring point must be sampled during the initial four quarters for the leachate indicator parameters (designated by *, below) to establish a baseline fluid composition. Thereafter, any fluid detected in each monitoring point in the leachate detection zone must be sampled annually for the leachate indicator parameters. Quarterly sampling of the fluid in any detection zone monitoring point for leachate indicator parameters is required only when the quarterly flow at that monitoring point exceeds 10 gallons per acre per day (weekly average for the quarter) for the cell(s) served by that monitoring point. If the indicator analytes confirm leachate contamination in the detection zone, the fluid will be analyzed initially within 30 days and thereafter annually for all analytes listed below. When MCL's (where established) of any detection zone analytes on this form are exceeded, annual groundwater monitoring must include the Subtitle D detection zone add-on list analytes found on Form 19.

	ANALYTE mg/l unless otherwise indicated		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
1.	ALKALINITY	p		191	SM20-2320B
2.	AMMONIA-NITROGEN	p		0.1 ND	ASTM D6919-03
3.	BICARBONATE ALKALINITY	p		191	SM20-2321
4.	CALCIUM, TOTAL	p		94.8	SW846 6010C
5.	COD (CHEMICAL OXYGEN DEMAND)	p		15 ND	EPA 410.4
6.	CHLORIDE	p		127	EPA 300
7.	MAGNESIUM, TOTAL	p		28.4	SW846 6010C
8.	pH-FIELD (SU)	p		7.45	FIELD
9.	pH-LAB (SU)	p		8.09	150.1/4500B
10.	POTASSIUM, TOTAL	p		22.5	SW846 6010C
11.	SPEC. COND., FIELD (umhos/cm)	p		1238	FIELD
12.	SPEC. COND., LAB (umhos/cm)	p		1290	EPA 120.1
13.	SODIUM, TOTAL	p		137	SW846 6010C
14.	SULFATE	p		276	EPA 300
15.	TOC (TOTAL ORGANIC CARBON)	p		2.5	SM20-5310B
16.	FLUORIDE	p		0.2 ND	EPA 300
17.	IRON, TOTAL	p		0.067 ND	SW846 6010C
18.	MANGANESE, TOTAL	p		0.0056 ND	SW846 6010C
19.	NITRATE-NITROGEN	p		1.7	EPA 300

T - Please indicate detection limit if analyte is not detected

Monitoring Point No. FFMH06SS
Sample Date 8/29/2019
I.D. No

FORM 50

	ANALYTE mg/l unless otherwise indicated		LEACHATE T DISCHARGE	DETECTION ZONE T DISCHARGE	ANALYSIS METHOD NUMBER
20.	TOTAL PHENOLICS (mg/l)	p		0.005 ND	SW846 9066
21.	TDS (TOT. DISSOLVED SOLIDS) (mg/l)	p		869	SM20-2540C
22.	TRITIUM (pCi/l)	p			EPA 906
23.	TURBIDITY (NTU)	p		0.67	SM20-2130B
24.	ANTIMONY (ug/l)	p		22 ND	SW846 6010C
25.	ARSENIC, TOTAL (ug/l)	p		9 ND	EPA 200.7
26.	BARIUM, TOTAL (ug/l)	p		39	EPA 200.7
27.	BERYLLIUM (ug/l)	p		4.4 ND	SW846 6010C
28.	CADMIUM, TOTAL (ug/l)	p		2.2 ND	EPA 200.7
29.	CHROMIUM, TOTAL (ug/l)	p		5.6 ND	EPA 200.7
30.	COBALT (ug/l)	p		5.6 ND	SW846 6010C
31.	COPPER, TOTAL (ug/l)	p		11 ND	EPA 200.7
32.	LEAD-FLAMELESS, TOTAL (ug/l)	p		6.7 ND	EPA 200.7
33.	MERCURY, TOTAL (ug/l)	p		0.5 ND	EPA 245.1
34.	NICKEL (ug/l)	p		22 ND	EPA 200.7
35.	SELENIUM, TOTAL (ug/l)	p		22 ND	EPA 200.7
36.	SILVER, TOTAL (ug/l)	p		5.9	EPA 200.7
37.	THALLIUM (ug/l)	p		22 ND	SW846 6010C
38.	VANADIUM (ug/l)	p		5.6 ND	SW846 6010C
39.	ZINC, TOTAL (ug/l)	p		22 ND	EPA 200.7
40.	ACETONE (ug/l)	p		10.2	SW 846 8260B
41.	ACRYLONITRILE (ug/l)	p		5 ND	SW 846 8260B
42.	BENZENE (ug/l)	p		1 ND	SW 846 8260B
43.	BROMOCHLOROMETHANE (CHLOROBR	p		1 ND	SW 846 8260B
44.	BROMODICHLOROMETHANE (ug/l)	p		1 ND	SW 846 8260B
45.	BROMOFORM (ug/l)	p		1 ND	SW 846 8260B
46.	CARBON DISULFIDE (ug/l)	p		1 ND	SW 846 8260B
47.	CARBON TETRACHLORIDE (ug/l)	p		1 ND	SW 846 8260B
48.	CHLOROBENZENE (ug/l)	p		1 ND	SW 846 8260B
49.	CHLOROETHANE (ug/l)	p		1 ND	SW 846 8260B
50.	CHLOROFORM (ug/l)	p		1 ND	SW 846 8260B
51.	3-CHLORO-1-PROPENE (ug/l)	p		1 ND	SW 846 8260B
52.	DIBROMOCHLOROMETHANE (ug/l)	p		1 ND	SW 846 8260B
53.	1,2-DIBROMO-3-CHLOROPROPANE (ug/l)	p		7 ND	SW 846 8260B
54.	1,2-DIBROMOETHANE (ug/l)	p		1 ND	SW 846 8260B
55.	1,2-DICHLOROBENZENE (ug/l)	p		1 ND	SW 846 8260B
56.	1,3-DICHLOROBENZENE (ug/l)	p		1 ND	SW 846 8260B

T - Please indicate detection limit if analyte is not detected

Monitoring Point No. FFMH06SS
Sample Date 8/29/2019
I.D. No

FORM 50

	ANALYTE ug/l		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
57.	1,4-DICHLOROBENZENE	p		1 ND	SW 846 8260B
58.	TRANS 1,4-DICHLORO-2-BUTENE	p		3 ND	SW 846 8260B
59.	DICHLORODIFLUOROMETHANE	p		1 ND	SW 846 8260B
60.	1,1-DICHLOROETHANE	p		1 ND	SW 846 8260B
61.	1,2-DICHLOROETHANE	p		1 ND	SW 846 8260B
62.	1,1-DICHLOROETHENE	p		1 ND	SW 846 8260B
63.	CIS 1,2-DICHLOROETHENE	p		1 ND	SW 846 8260B
64.	TRANS 1,2-DICHLOROETHENE	p		1 ND	SW 846 8260B
65.	1,2-DICHLOROPROPANE	p		1 ND	SW 846 8260B
66.	CIS 1,3-DICHLOROPROPENE	p		1 ND	SW 846 8260B
67.	TRANS 1,3-DICHLOROPROPENE	p		1 ND	SW 846 8260B
68.	ETHYLBENZENE	p		1 ND	SW 846 8260B
69.	2-HEXANONE	p		5 ND	SW 846 8260B
70.	BROMOMETHANE	p		1 ND	SW 846 8260B
71.	CHLOROMETHANE	p		1 ND	SW 846 8260B
72.	DIBROMOMETHANE	p		1 ND	SW 846 8260B
73.	METHYLENE CHLORIDE	p		1 ND	SW 846 8260B
74.	2-BUTANONE (MEK)	p		10 ND	SW 846 8260B
75.	IODOMETHANE	p		1 ND	SW 846 8260B
76.	4-METHYL-2-PENTANONE	p		5 ND	SW 846 8260B
77.	STYRENE	p		1 ND	SW 846 8260B
78.	1,1,2,2-TETRACHLOROETHANE	p		1 ND	SW 846 8260B
79.	1,1,1,2-TETRACHLOROETHANE	p		1 ND	SW 846 8260B
80.	TETRACHLOROETHENE	p		1 ND	SW 846 8260B
81.	TOLUENE	p		1 ND	SW 846 8260B
82.	1,1,1-TRICHLOROETHANE	p		1 ND	SW 846 8260B
83.	1,1,2-TRICHLOROETHANE	p		1 ND	SW 846 8260B
84.	TRICHLOROETHENE	p		1 ND	SW 846 8260B

T - Please indicate detection limit if analyte is not detected

Monitoring Point No. FFMH06SS
Sample Date 8/29/2019
I.D. No

FORM 50

	ANALYTE ug/l		LEACHATE DISCHARGE T	DETECTION ZONE DISCHARGE T	ANALYSIS METHOD NUMBER
85.	TRICHLOROFLUOROMETHANE	p		1 ND	SW 846 8260B
86.	1,2,3-TRICHLOROPROPANE	p		2 ND	SW 846 8260B
87.	VINYL ACETATE	p		5 ND	SW 846 8260B
88.	VINYL CHLORIDE	p		1 ND	SW 846 8260B
89.	XYLENES (TOTAL)	p		3 ND	SW 846 8260B

p = PADEP 273,284 analyte exclusively
d = Subtitle D, Appendix I analyte exclusively
All other analytes are common to both lists.
T - Please indicate detection limit if analyte is not detected

Analyzed in the 4th calendar quarter only

FORM 50

Monitoring Point No. FFMH06SS
Sample Date 8/29/2019
I.D. No

4. Qualitatively Identified Organic Compounds

List at least ten volatile organic compounds not otherwise identified in this section. Their identification should be based upon those compounds showing the greatest apparent concentration from the peaks of a mass spectrum of each sample. These ten compounds shall be identified but the concentration of each is not required.

Constituent	CAS Number

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

September 12, 2019

Mr. Daniel Brown
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**FREY FARM**	Workorder:	**3054916**
Purchase Order:	**PO1000126**	Workorder ID:	**3RD QTR 2019 FFMH-FORM 50**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Thursday, August 29, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Ms. Jordan Gallagher , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3054916001	FFMH01SS	Water	8/29/2019 10:05	8/29/2019 14:50	Collected by Client
3054916002	FFMH03SS	Water	8/29/2019 10:15	8/29/2019 14:50	Collected by Client
3054916003	FFMH05SS	Water	8/29/2019 09:50	8/29/2019 14:50	Collected by Client
3054916004	FFMH06SS	Water	8/29/2019 09:30	8/29/2019 14:50	Collected by Client

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

ANALYTICAL RESULTS

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Lab ID: **3054916001** Date Collected: 8/29/2019 10:05 Matrix: Water

Sample ID: **FFMH01SS** Date Received: 8/29/2019 14:50

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
VOLATILE ORGANICS										
Acetone	17.8		ug/L	10.0	SW846 8260B			9/6/19 17:48	TMP	J
Acrylonitrile	ND		ug/L	5.0	SW846 8260B			9/6/19 17:48	TMP	J
Benzene	1.1		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Bromochloromethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Bromoform	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Bromomethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
2-Butanone	ND		ug/L	10.0	SW846 8260B			9/6/19 17:48	TMP	J
Carbon Disulfide	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Chloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Chloroform	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Chloromethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
3-Chloro-1-propene	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
1,2-Dibromo-3-chloropropane	ND		ug/L	7.0	SW846 8260B			9/6/19 17:48	TMP	J
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Dibromomethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
trans-1,4-Dichloro-2-butene	ND		ug/L	3.0	SW846 8260B			9/6/19 17:48	TMP	J
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
1,4-Dichlorobenzene	1.9		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Dichlorodifluoromethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
cis-1,3-Dichloropropene	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
trans-1,3-Dichloropropene	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Ethylbenzene	4.1		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
2-Hexanone	ND		ug/L	5.0	SW846 8260B			9/6/19 17:48	TMP	J
Iodomethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
4-Methyl-2-Pentanone(MIBK)	ND		ug/L	5.0	SW846 8260B			9/6/19 17:48	TMP	J

ANALYTICAL RESULTS

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Lab ID: **3054916001** Date Collected: 8/29/2019 10:05 Matrix: Water

Sample ID: **FFMH01SS** Date Received: 8/29/2019 14:50

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Styrene	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
1,1,1,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Toluene	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Total Xylenes	6.5		ug/L	3.0	SW846 8260B			9/6/19 17:48	TMP	J
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Trichloroethene	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			9/6/19 17:48	TMP	J
Vinyl Acetate	ND		ug/L	5.0	SW846 8260B			9/6/19 17:48	TMP	J
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
o-Xylene	2.9		ug/L	1.0	SW846 8260B			9/6/19 17:48	TMP	J
mp-Xylene	3.6		ug/L	2.0	SW846 8260B			9/6/19 17:48	TMP	J
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	62 - 133	SW846 8260B			9/6/19 17:48	TMP	J
4-Bromofluorobenzene (S)	113		%	79 - 114	SW846 8260B			9/6/19 17:48	TMP	J
Dibromofluoromethane (S)	98.2		%	78 - 116	SW846 8260B			9/6/19 17:48	TMP	J
Toluene-d8 (S)	98.2		%	76 - 127	SW846 8260B			9/6/19 17:48	TMP	J
Library Search - Volatiles										
SILANOL, TERT-BUTYLDIMETHYL	18.7	J N	ug/L		SW846 8260B			9/6/19 17:48	TMP	J
WET CHEMISTRY										
Alkalinity, Bicarbonate	440		mg/L	5	SM2320B-2011			9/4/19 09:04	MBW	B
Alkalinity, Total	440	4	mg/L	5	SM2320B-2011			9/4/19 09:04	MBW	B
Ammonia-N	252		mg/L	1.00	D6919-09			9/11/19 19:08	AK	F
Chemical Oxygen Demand (COD)	1100		mg/L	75	EPA 410.4			9/11/19 19:55	AK	F
Chloride	22700		mg/L	500	EPA 300.0			8/30/19 10:55	CHW	B
Fluoride	ND	2	mg/L	1.0	EPA 300.0			8/30/19 10:39	CHW	B
Nitrate-N	ND	3	mg/L	1.0	EPA 300.0			8/30/19 10:39	CHW	B
pH	6.47	1	pH_Units		S4500HB-11			9/4/19 09:04	MBW	B
Phenolics	0.02		mg/L	0.01	SW846 9066	9/3/19 09:17	C_D	9/4/19 09:17	C_D	H
Specific Conductance	48300		umhos/cm	1	SW846 9050A			9/4/19 09:04	MBW	B
Sulfate	81.4		mg/L	10.0	EPA 300.0			8/30/19 10:39	CHW	B

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Lab ID: **3054916001** Date Collected: 8/29/2019 10:05 Matrix: Water

Sample ID: **FFMH01SS** Date Received: 8/29/2019 14:50

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Total Dissolved Solids	42200		mg/L	5	S2540C-11			9/5/19 14:42	D1C	B
Total Organic Carbon (TOC)	94.3		mg/L	12.5	SW846 9060A			9/4/19 08:19	PAG	C
Turbidity	995		NTU	0.10	SM2130B-2011			8/31/19 06:36	R2B	B
METALS										
Antimony, Total	ND		mg/L	0.22	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Arsenic, Total	ND		mg/L	0.090	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Barium, Total	2.5		mg/L	0.11	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Beryllium, Total	ND		mg/L	0.044	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Cadmium, Total	0.023		mg/L	0.022	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Calcium, Total	4420		mg/L	1.1	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Chromium, Total	ND		mg/L	0.056	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Cobalt, Total	ND		mg/L	0.056	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Copper, Total	ND		mg/L	0.11	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Iron, Total	236		mg/L	0.67	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Lead, Total	ND		mg/L	0.067	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Magnesium, Total	453		mg/L	1.1	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Manganese, Total	8.1		mg/L	0.056	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Mercury, Total	ND		mg/L	0.00050	SW846 7470A	9/4/19 10:00	AHI	9/4/19 13:09	AHI	G
Nickel, Total	ND		mg/L	0.22	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Potassium, Total	2140		mg/L	5.6	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Selenium, Total	ND		mg/L	0.22	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Silver, Total	ND		mg/L	0.044	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Sodium, Total	5830		mg/L	11.1	SW846 6010C	9/3/19 17:20	AHI	9/10/19 17:00	SRT	G1
Thallium, Total	ND		mg/L	0.22	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Vanadium, Total	ND		mg/L	0.056	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
Zinc, Total	ND		mg/L	0.22	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:22	SRT	G1
FIELD PARAMETERS										
pH, Field (SM4500B)	6.48		pH_Units		S4500HB-11			8/29/19 10:05	CLT	A
Specific Conductance, Field	46900		umhos/cm	1	SM2510B-2011			8/29/19 10:05	CLT	A

Ms. Susan J Scherer
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Lab ID: **3054916002** Date Collected: 8/29/2019 10:15 Matrix: Water

Sample ID: **FFMH03SS** Date Received: 8/29/2019 14:50

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
VOLATILE ORGANICS										
Acetone	ND		ug/L	10.0	SW846 8260B			9/6/19 18:10	TMP	J
Acrylonitrile	ND		ug/L	5.0	SW846 8260B			9/6/19 18:10	TMP	J
Benzene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Bromochloromethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Bromoform	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Bromomethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
2-Butanone	ND		ug/L	10.0	SW846 8260B			9/6/19 18:10	TMP	J
Carbon Disulfide	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Chloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Chloroform	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Chloromethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
3-Chloro-1-propene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
1,2-Dibromo-3-chloropropane	ND		ug/L	7.0	SW846 8260B			9/6/19 18:10	TMP	J
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Dibromomethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
trans-1,4-Dichloro-2-butene	ND		ug/L	3.0	SW846 8260B			9/6/19 18:10	TMP	J
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Dichlorodifluoromethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
cis-1,3-Dichloropropene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
trans-1,3-Dichloropropene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
2-Hexanone	ND		ug/L	5.0	SW846 8260B			9/6/19 18:10	TMP	J
Iodomethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
4-Methyl-2-Pentanone(MIBK)	ND		ug/L	5.0	SW846 8260B			9/6/19 18:10	TMP	J

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Lab ID: **3054916002** Date Collected: 8/29/2019 10:15 Matrix: Water

Sample ID: **FFMH03SS** Date Received: 8/29/2019 14:50

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Styrene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
1,1,1,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Toluene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Total Xylenes	ND		ug/L	3.0	SW846 8260B			9/6/19 18:10	TMP	J
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Trichloroethene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			9/6/19 18:10	TMP	J
Vinyl Acetate	ND		ug/L	5.0	SW846 8260B			9/6/19 18:10	TMP	J
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
o-Xylene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:10	TMP	J
mp-Xylene	ND		ug/L	2.0	SW846 8260B			9/6/19 18:10	TMP	J
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	99.9		%	62 - 133	SW846 8260B			9/6/19 18:10	TMP	J
4-Bromofluorobenzene (S)	111		%	79 - 114	SW846 8260B			9/6/19 18:10	TMP	J
Dibromofluoromethane (S)	97.4		%	78 - 116	SW846 8260B			9/6/19 18:10	TMP	J
Toluene-d8 (S)	97.5		%	76 - 127	SW846 8260B			9/6/19 18:10	TMP	J
LIBRARY SEARCH - VOLATILES										
No TIC's Detected	.				Lib Search VOC			9/6/19 18:10	CPK	I
WET CHEMISTRY										
Alkalinity, Bicarbonate	36		mg/L	5	SM2320B-2011			9/4/19 09:12	MBW	B
Alkalinity, Total	36	3	mg/L	5	SM2320B-2011			9/4/19 09:12	MBW	B
Ammonia-N	104		mg/L	0.500	D6919-09			9/9/19 22:01	AK	F
Chemical Oxygen Demand (COD)	563		mg/L	75	EPA 410.4			9/6/19 17:22	AK	F
Chloride	3440		mg/L	250	EPA 300.0			8/30/19 11:26	CHW	B
Fluoride	ND	2	mg/L	1.0	EPA 300.0			8/30/19 11:10	CHW	B
Nitrate-N	195		mg/L	25.0	EPA 300.0			8/30/19 11:26	CHW	B
pH	6.03	1	pH_Units		S4500HB-11			9/4/19 09:12	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	9/3/19 09:17	C_D	9/4/19 09:17	C_D	H
Specific Conductance	11300		umhos/cm	1	SW846 9050A			9/4/19 09:12	MBW	B
Sulfate	688		mg/L	10.0	EPA 300.0			8/30/19 11:10	CHW	B
Total Dissolved Solids	8560		mg/L	5	S2540C-11			9/5/19 14:42	D1C	B

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ANALYTICAL RESULTS

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Lab ID: **3054916002** Date Collected: 8/29/2019 10:15 Matrix: Water
Sample ID: **FFMH03SS** Date Received: 8/29/2019 14:50

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Total Organic Carbon (TOC)	135		mg/L	12.5	SW846 9060A			9/4/19 23:10	PAG	C
Turbidity	3.80		NTU	0.10	SM2130B-2011			8/31/19 06:36	R2B	B
METALS										
Antimony, Total	ND		mg/L	0.22	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Arsenic, Total	ND		mg/L	0.090	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Barium, Total	0.20		mg/L	0.11	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Beryllium, Total	ND		mg/L	0.044	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Cadmium, Total	ND		mg/L	0.022	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Calcium, Total	283		mg/L	1.1	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Chromium, Total	ND		mg/L	0.056	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Cobalt, Total	ND		mg/L	0.056	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Copper, Total	ND		mg/L	0.11	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Iron, Total	1.8		mg/L	0.67	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Lead, Total	ND		mg/L	0.067	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Magnesium, Total	193		mg/L	1.1	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Manganese, Total	2.9		mg/L	0.056	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Mercury, Total	ND		mg/L	0.00050	SW846 7470A	9/4/19 10:00	AHI	9/4/19 13:10	AHI	G
Nickel, Total	ND		mg/L	0.22	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Potassium, Total	267		mg/L	5.6	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Selenium, Total	ND		mg/L	0.22	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Silver, Total	ND		mg/L	0.044	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Sodium, Total	1700		mg/L	5.6	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Thallium, Total	ND		mg/L	0.22	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Vanadium, Total	ND		mg/L	0.056	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
Zinc, Total	0.25		mg/L	0.22	SW846 6010C	9/3/19 17:20	AHI	9/10/19 15:26	SRT	G1
FIELD PARAMETERS										
pH, Field (SM4500B)	5.78		pH_Units		S4500HB-11			8/29/19 10:15	CLT	A
Specific Conductance, Field	10530		umhos/cm	1	SM2510B-2011			8/29/19 10:15	CLT	A

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Lab ID: **3054916003** Date Collected: 8/29/2019 09:50 Matrix: Water

Sample ID: **FFMH05SS** Date Received: 8/29/2019 14:50

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
VOLATILE ORGANICS										
Acetone	ND		ug/L	10.0	SW846 8260B			9/6/19 18:33	TMP	J
Acrylonitrile	ND		ug/L	5.0	SW846 8260B			9/6/19 18:33	TMP	J
Benzene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Bromochloromethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Bromoform	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Bromomethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
2-Butanone	ND		ug/L	10.0	SW846 8260B			9/6/19 18:33	TMP	J
Carbon Disulfide	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Chloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Chloroform	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Chloromethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
3-Chloro-1-propene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
1,2-Dibromo-3-chloropropane	ND		ug/L	7.0	SW846 8260B			9/6/19 18:33	TMP	J
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Dibromomethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
trans-1,4-Dichloro-2-butene	ND		ug/L	3.0	SW846 8260B			9/6/19 18:33	TMP	J
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Dichlorodifluoromethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
cis-1,3-Dichloropropene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
trans-1,3-Dichloropropene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
2-Hexanone	ND		ug/L	5.0	SW846 8260B			9/6/19 18:33	TMP	J
Iodomethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
4-Methyl-2-Pentanone(MIBK)	ND		ug/L	5.0	SW846 8260B			9/6/19 18:33	TMP	J

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ANALYTICAL RESULTS

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Lab ID: **3054916003** Date Collected: 8/29/2019 09:50 Matrix: Water

Sample ID: **FFMH05SS** Date Received: 8/29/2019 14:50

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Styrene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
1,1,1,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Toluene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Total Xylenes	ND		ug/L	3.0	SW846 8260B			9/6/19 18:33	TMP	J
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Trichloroethene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			9/6/19 18:33	TMP	J
Vinyl Acetate	ND		ug/L	5.0	SW846 8260B			9/6/19 18:33	TMP	J
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
o-Xylene	ND		ug/L	1.0	SW846 8260B			9/6/19 18:33	TMP	J
mp-Xylene	ND		ug/L	2.0	SW846 8260B			9/6/19 18:33	TMP	J
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	100		%	62 - 133	SW846 8260B			9/6/19 18:33	TMP	J
4-Bromofluorobenzene (S)	111		%	79 - 114	SW846 8260B			9/6/19 18:33	TMP	J
Dibromofluoromethane (S)	98		%	78 - 116	SW846 8260B			9/6/19 18:33	TMP	J
Toluene-d8 (S)	98.6		%	76 - 127	SW846 8260B			9/6/19 18:33	TMP	J
LIBRARY SEARCH - VOLATILES										
No TIC's Detected	.				Lib Search VOC			9/6/19 18:33	CPK	I
WET CHEMISTRY										
Alkalinity, Bicarbonate	616		mg/L	5	SM2320B-2011			9/4/19 09:25	MBW	B
Alkalinity, Total	705	2	mg/L	5	SM2320B-2011			9/4/19 09:25	MBW	B
Ammonia-N	2.19		mg/L	0.100	D6919-09			9/11/19 19:21	AK	F
Chemical Oxygen Demand (COD)	25		mg/L	15	EPA 410.4			9/4/19 19:56	AK	F
Chloride	494		mg/L	25.0	EPA 300.0			8/31/19 15:42	CHW	B
Fluoride	0.60		mg/L	0.50	EPA 300.0			8/30/19 11:41	CHW	B
Nitrate-N	6.0		mg/L	0.50	EPA 300.0			8/30/19 11:41	CHW	B
pH	8.78	1	pH_Units		S4500HB-11			9/4/19 09:25	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	9/3/19 09:17	C_D	9/4/19 09:17	C_D	H
Specific Conductance	3450		umhos/cm	1	SW846 9050A			9/4/19 09:25	MBW	B
Sulfate	375		mg/L	5.0	EPA 300.0			8/30/19 11:41	CHW	B
Total Dissolved Solids	2240		mg/L	5	S2540C-11			9/5/19 14:42	D1C	B

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ANALYTICAL RESULTS

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Lab ID: **3054916003** Date Collected: 8/29/2019 09:50 Matrix: Water
Sample ID: **FFMH05SS** Date Received: 8/29/2019 14:50

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Total Organic Carbon (TOC)	8.6		mg/L	2.5	SW846 9060A			9/4/19 08:19	PAG	C
Turbidity	1.04		NTU	0.10	SM2130B-2011			8/31/19 06:36	R2B	B
METALS										
Antimony, Total	ND		mg/L	0.022	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Arsenic, Total	0.018		mg/L	0.0090	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Barium, Total	0.020		mg/L	0.011	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Beryllium, Total	ND		mg/L	0.0044	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Cadmium, Total	ND		mg/L	0.0022	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Calcium, Total	20.9		mg/L	0.11	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Chromium, Total	ND		mg/L	0.0056	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Cobalt, Total	ND		mg/L	0.0056	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Copper, Total	0.014		mg/L	0.011	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Iron, Total	0.11		mg/L	0.067	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Lead, Total	ND		mg/L	0.0067	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Magnesium, Total	6.0		mg/L	0.11	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Manganese, Total	0.0099		mg/L	0.0056	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Mercury, Total	ND		mg/L	0.00050	SW846 7470A	9/4/19 10:00	AHI	9/4/19 13:11	AHI	G
Nickel, Total	ND		mg/L	0.022	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Potassium, Total	9.0		mg/L	0.56	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Selenium, Total	ND		mg/L	0.022	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Silver, Total	ND		mg/L	0.0044	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Sodium, Total	705		mg/L	0.56	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Thallium, Total	ND		mg/L	0.022	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Vanadium, Total	ND		mg/L	0.0056	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
Zinc, Total	ND		mg/L	0.022	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:37	MNP	G1
FIELD PARAMETERS										
pH, Field (SM4500B)	8.46		pH_Units		S4500HB-11			8/29/19 09:50	CLT	A
Specific Conductance, Field	3400		umhos/cm	1	SM2510B-2011			8/29/19 09:50	CLT	A

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ANALYTICAL RESULTS

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Lab ID: **3054916004** Date Collected: 8/29/2019 09:30 Matrix: Water

Sample ID: **FFMH06SS** Date Received: 8/29/2019 14:50

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
VOLATILE ORGANICS										
Acetone	10.2		ug/L	10.0	SW846 8260B			9/5/19 04:54	PDK	I
Acrylonitrile	ND		ug/L	5.0	SW846 8260B			9/5/19 04:54	PDK	I
Benzene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Bromochloromethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Bromoform	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Bromomethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
2-Butanone	ND		ug/L	10.0	SW846 8260B			9/5/19 04:54	PDK	I
Carbon Disulfide	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Chloroethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Chloroform	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Chloromethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
3-Chloro-1-propene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
1,2-Dibromo-3-chloropropane	ND		ug/L	7.0	SW846 8260B			9/5/19 04:54	PDK	I
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Dibromomethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
trans-1,4-Dichloro-2-butene	ND		ug/L	3.0	SW846 8260B			9/5/19 04:54	PDK	I
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Dichlorodifluoromethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
cis-1,3-Dichloropropene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
trans-1,3-Dichloropropene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
2-Hexanone	ND		ug/L	5.0	SW846 8260B			9/5/19 04:54	PDK	I
Iodomethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
4-Methyl-2-Pentanone(MIBK)	ND		ug/L	5.0	SW846 8260B			9/5/19 04:54	PDK	I

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Lab ID: **3054916004** Date Collected: 8/29/2019 09:30 Matrix: Water

Sample ID: **FFMH06SS** Date Received: 8/29/2019 14:50

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Styrene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
1,1,1,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Toluene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Total Xylenes	ND		ug/L	3.0	SW846 8260B			9/5/19 04:54	PDK	I
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Trichloroethene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			9/5/19 04:54	PDK	I
Vinyl Acetate	ND		ug/L	5.0	SW846 8260B			9/5/19 04:54	PDK	I
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
o-Xylene	ND		ug/L	1.0	SW846 8260B			9/5/19 04:54	PDK	I
mp-Xylene	ND		ug/L	2.0	SW846 8260B			9/5/19 04:54	PDK	I
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	133		%	62 - 133	SW846 8260B			9/5/19 04:54	PDK	I
4-Bromofluorobenzene (S)	98.3		%	79 - 114	SW846 8260B			9/5/19 04:54	PDK	I
Dibromofluoromethane (S)	109		%	78 - 116	SW846 8260B			9/5/19 04:54	PDK	I
Toluene-d8 (S)	105		%	76 - 127	SW846 8260B			9/5/19 04:54	PDK	I
LIBRARY SEARCH - VOLATILES										
No TIC's Detected	.				Lib Search VOC			9/4/19 04:54	CPK	I
WET CHEMISTRY										
Alkalinity, Bicarbonate	191		mg/L	5	SM2320B-2011			9/4/19 09:35	MBW	B
Alkalinity, Total	191	2	mg/L	5	SM2320B-2011			9/4/19 09:35	MBW	B
Ammonia-N	ND		mg/L	0.100	D6919-09			9/7/19 16:56	AK	F
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			9/4/19 19:56	AK	F
Chloride	127		mg/L	2.0	EPA 300.0			8/30/19 13:31	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			8/30/19 13:31	CHW	B
Nitrate-N	1.7		mg/L	0.20	EPA 300.0			8/30/19 13:31	CHW	B
pH	8.09	1	pH_Units		S4500HB-11			9/4/19 09:35	MBW	B
Phenolics	ND		mg/L	0.005	SW846 9066	9/3/19 09:17	C_D	9/4/19 09:17	C_D	H
Specific Conductance	1290		umhos/cm	1	SW846 9050A			9/4/19 09:35	MBW	B
Sulfate	276		mg/L	5.0	EPA 300.0			8/31/19 15:55	CHW	B
Total Dissolved Solids	869		mg/L	5	S2540C-11			9/5/19 14:42	D1C	B

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Lab ID: **3054916004** Date Collected: 8/29/2019 09:30 Matrix: Water
Sample ID: **FFMH06SS** Date Received: 8/29/2019 14:50

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Total Organic Carbon (TOC)	2.5		mg/L	0.50	SW846 9060A			9/4/19 08:19	PAG	C
Turbidity	0.67		NTU	0.10	SM2130B-2011			8/31/19 06:36	R2B	B
METALS										
Antimony, Total	ND		mg/L	0.022	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Arsenic, Total	ND		mg/L	0.0090	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Barium, Total	0.039		mg/L	0.011	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Beryllium, Total	ND		mg/L	0.0044	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Cadmium, Total	ND		mg/L	0.0022	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Calcium, Total	94.8		mg/L	0.11	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Chromium, Total	ND		mg/L	0.0056	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Cobalt, Total	ND		mg/L	0.0056	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Copper, Total	ND		mg/L	0.011	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Iron, Total	ND		mg/L	0.067	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Lead, Total	ND		mg/L	0.0067	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Magnesium, Total	28.4		mg/L	0.11	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Mercury, Total	ND		mg/L	0.00050	SW846 7470A	9/4/19 10:00	AHI	9/4/19 13:12	AHI	G
Nickel, Total	ND		mg/L	0.022	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Potassium, Total	22.5		mg/L	0.56	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Selenium, Total	ND		mg/L	0.022	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Silver, Total	0.0059		mg/L	0.0044	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Sodium, Total	137		mg/L	0.56	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Thallium, Total	ND		mg/L	0.022	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Vanadium, Total	ND		mg/L	0.0056	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
Zinc, Total	ND		mg/L	0.022	SW846 6010C	9/4/19 19:45	SXC	9/9/19 12:47	MNP	G1
FIELD PARAMETERS										
pH, Field (SM4500B)	7.45		pH_Units		S4500HB-11			8/29/19 09:30	CLT	A
Specific Conductance, Field	1238		umhos/cm	1	SM2510B-2011			8/29/19 09:30	CLT	A

Ms. Susan J Scherer
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3054916001	1	FFMH01SS	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3054916001	2	FFMH01SS	EPA 300.0	Fluoride
Due to sample matrix interferences, this analyte was analyzed at a dilution and the detection levels adjusted accordingly.				
3054916001	3	FFMH01SS	EPA 300.0	Nitrate-N
Due to sample matrix interferences, this analyte was analyzed at a dilution and the detection levels adjusted accordingly.				
3054916001	4	FFMH01SS	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3054916002	1	FFMH03SS	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3054916002	2	FFMH03SS	EPA 300.0	Fluoride
Due to sample matrix interferences, this analyte was analyzed at a dilution and the detection levels adjusted accordingly.				
3054916002	3	FFMH03SS	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3054916003	1	FFMH05SS	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3054916003	2	FFMH05SS	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3054916004	1	FFMH06SS	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3054916004	2	FFMH06SS	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Lab ID	Sample ID	Analysis Method	Prep Method
3054916001	FFMH01SS	D6919-09	
3054916001	FFMH01SS	EPA 300.0	
3054916001	FFMH01SS	EPA 410.4	
3054916001	FFMH01SS	Lib Search VOC	
3054916001	FFMH01SS	S2540C-11	
3054916001	FFMH01SS	S4500HB-11	
3054916001	FFMH01SS	SM2130B-2011	
3054916001	FFMH01SS	SM2320B-2011	
3054916001	FFMH01SS	SM2510B-2011	
3054916001	FFMH01SS	SW846 6010C	SW846 3015
3054916001	FFMH01SS	SW846 7470A	SW846 7470A
3054916001	FFMH01SS	SW846 8260B	
3054916001	FFMH01SS	SW846 9050A	
3054916001	FFMH01SS	SW846 9060A	
3054916001	FFMH01SS	SW846 9066	420.4/9066
3054916002	FFMH03SS	D6919-09	
3054916002	FFMH03SS	EPA 300.0	
3054916002	FFMH03SS	EPA 410.4	
3054916002	FFMH03SS	Lib Search VOC	
3054916002	FFMH03SS	S2540C-11	
3054916002	FFMH03SS	S4500HB-11	
3054916002	FFMH03SS	SM2130B-2011	
3054916002	FFMH03SS	SM2320B-2011	
3054916002	FFMH03SS	SM2510B-2011	
3054916002	FFMH03SS	SW846 6010C	SW846 3015
3054916002	FFMH03SS	SW846 7470A	SW846 7470A
3054916002	FFMH03SS	SW846 8260B	
3054916002	FFMH03SS	SW846 9050A	
3054916002	FFMH03SS	SW846 9060A	
3054916002	FFMH03SS	SW846 9066	420.4/9066
3054916003	FFMH05SS	D6919-09	
3054916003	FFMH05SS	EPA 300.0	
3054916003	FFMH05SS	EPA 410.4	
3054916003	FFMH05SS	Lib Search VOC	
3054916003	FFMH05SS	S2540C-11	
3054916003	FFMH05SS	S4500HB-11	
3054916003	FFMH05SS	SM2130B-2011	
3054916003	FFMH05SS	SM2320B-2011	
3054916003	FFMH05SS	SM2510B-2011	
3054916003	FFMH05SS	SW846 6010C	SW846 3015
3054916003	FFMH05SS	SW846 7470A	SW846 7470A
3054916003	FFMH05SS	SW846 8260B	
3054916003	FFMH05SS	SW846 9050A	
3054916003	FFMH05SS	SW846 9060A	
3054916003	FFMH05SS	SW846 9066	420.4/9066
3054916004	FFMH06SS	D6919-09	

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3054916 3RD QTR 2019 FFMH-FORM 50

Lab ID	Sample ID	Analysis Method	Prep Method
3054916004	FFMH06SS	EPA 300.0	
3054916004	FFMH06SS	EPA 410.4	
3054916004	FFMH06SS	Lib Search VOC	
3054916004	FFMH06SS	S2540C-11	
3054916004	FFMH06SS	S4500HB-11	
3054916004	FFMH06SS	SM2130B-2011	
3054916004	FFMH06SS	SM2320B-2011	
3054916004	FFMH06SS	SM2510B-2011	
3054916004	FFMH06SS	SW846 6010C	SW846 3015
3054916004	FFMH06SS	SW846 7470A	SW846 7470A
3054916004	FFMH06SS	SW846 8260B	
3054916004	FFMH06SS	SW846 9050A	
3054916004	FFMH06SS	SW846 9060A	
3054916004	FFMH06SS	SW846 9066	420.4/9066

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F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

CO
AL
* 3 0 5 4 9 1 6 *
of

(eiving Lab)

Client Name: LCSWMA
Address: 1299 Harrisburg Pike
Lancaster PA 17604
Contact: Nick Rogers
Phone#: (717) 874-4428
Project Name/#:
Bill To:

TAT ☐ Normal-Standard TAT is 10-12 business days.
☐ Rush-Subject to ALS approval and surcharges.
Date Required: Approved By:
Email? ☐ -Y
Fax? ☐ -Y No.:

Cooler Temp: 4 Therm ID: 402
No. of Coolers: _____

	Y	N	Initial
Custody Seals Present?			
(if present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. in Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

Container Type	P	P	P	AN	P	AV	CG			
Container Size	500	500	250	125	125	40	40			
Preservative	none	none	H2SO4	H2SO4	HNO3	HCl	HCl			

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	ALK, HCO3	Cl, pH, SpC, SO4, F, NO3, TDS,Tb	NH3, COD	O-OH	Total metals-form 50	TOC	8260-form 50 (+) library search		Field pH	Field SpC	Sample/COC Comments
					Enter Number of Containers Per Sample or Field Results Below.										
FFMH01SS	8/29/2019	10:05	G	WW	1	1	1	1	1	2	2		6.48	46900	
FFMH03SS	8/29/2019	10:15	G	WW	1	1	1	1	1	2	2		5.78	10530	
FFMH05SS	8/29/2019	9:50	G	WW	1	1	1	1	1	2	2		8.46	3400	
FFMH06SS	8/29/2019	9:30	G	WW	1	1	1	1	1	2	2		7.45	1238	
6															
7															
8															
9															
10															

ALS Field Services: _Pickup _Labor
_Composite Sampling _Rental Equipment
_Other:

Project Comments:

LOGGED BY(signature): DATE TIME
REVIEWED BY(signature): DATE TIME

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Jordan Gallagher/LCSWMA	8/29/19	15:38	2 [signature] ALS	8/29/19	1140
3 [signature]	8/29/19	1450	4 Courtney [signature]	8/29/19	1450
5			6		
7			8		
9			10		

Data Deliverables: ☐ Standard ☐ CLP-like ☐ USACE ☐

Special Processing: USACE ☐ Navy ☐ ☐

State Samples Collected In: ☐ NY ☐ NJ ☐ PA ☐ NC ☐

Reportable to PADEP? Yes ☐
PWSID #

Sample Disposal: Lab ☐ Special ☐

EDDS: Format Type:

* G=Grab; C=Composite **Matrix - Al=Air; DW=Drinking Water; GW=Groundwater; Oi=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

Rev 10/14

ALS

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSWMA | Work Order #: 3054416 | Initials: DN | Date: 8/30

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	(N/A)	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	(NO)
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #: ____

Temperature (°C): 4

Thermometer ID: 402

Radiological (µCi): ____

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

Year	2019
Quarter	3

			CELL 1		CELL 2			CELL 3		CELL 4		CELL 5		CELL 6	
Month	Week	Rain Total	FFMH01SS GPD (Avg.)	FFMH01SS GPD/ACRE (Avg.)	FFLFCEL2AS GPD (Avg.)	FFLFCELL2BS GPD (Avg.)	FFMH02SS GPD/ACRE (Avg.)	FFMH03SS GPD (Avg.)	FFMH03SS GPD/ACRE (Avg.)	FFMH04SS GPD (Avg.)	FFMH04SS GPD/ACRE (Avg.)	FFMH05SS GPD (Avg.)	FFMH05SS GPD/ACRE (Avg.)	FFMH06SS GPD (Avg.)	FFMH06SS GPD/ACRE (Avg.)
7															
	1	0.30	80.00	4.56	0.00	0.00	0.00	2.14	0.12	0.00	0.00	1.47	0.07	0.00	0.00
	2	1.63	80.00	4.56	0.00	0.00	0.00	2.90	0.16	0.00	0.00	3.53	0.16	7.90	0.68
	3	0.84	81.43	4.64	0.00	0.00	0.00	5.14	0.29	0.00	0.00	1.50	0.07	0.00	0.00
	4	0.71	68.57	3.91	0.00	0.00	0.00	1.46	0.08	0.00	0.00	4.31	0.20	8.26	0.71
	5	0.41	80.00	4.56	0.00	0.00	0.00	5.13	0.29	0.00	0.00	0.00	0.00	20.03	1.72
8															
	1	0.81	2.50	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.83	0.18	0.00	0.00
	2	0.73	35.71	2.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.89	0.68
	3	0.20	105.71	6.02	0.00	0.00	0.00	7.63	0.43	0.00	0.00	7.99	0.37	0.00	0.00
	4	0.27	120.00	6.84	0.00	0.00	0.00	6.67	0.38	0.00	0.00	2.17	0.10	8.33	0.71
	5	0.34	83.33	4.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.04	9.57	0.82
9															
	1	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.84	1.43	0.08	0.00	0.00	0.00	1.81	0.10	0.00	0.00	2.14	0.10	7.61	0.65
	3	0.64	130.00	7.41	0.00	0.00	0.00	1.50	0.08	0.00	0.00	1.31	0.06	7.43	0.64
	4	0.00	104.29	5.94	0.00	0.00	0.00	3.81	0.22	0.00	0.00	0.66	0.03	0.00	0.00
	5	0.04	74.29	4.23	0.00	0.00	0.00	2.81	0.16	0.00	0.00	5.76	0.27	7.60	0.65
	6	0.00	90.00	5.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Quarterly Average		**7.76**	**76.20**	**4.34**	**0.00**	**0.00**	**0.00**	**2.94**	**0.17**	**0.00**	**0.00**	**2.57**	**0.12**	**5.46**	**0.47**

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/23/2019
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

All information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 52, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: LCSWMA

Address: 3044 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39 o 57 ' 30.58 " Longitude: 76 o 26 ' 11.25 "

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

Sample Field Filtered (must be 0.45 micron)?: [X] Yes [ ] No

Sample Date:(mm/dd/yy) 08/23/2019 Sample Collection Time: 2:55 PM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 09/04/2019

Were any holding times exceeded?: Yes X No If yes, please explain in comments field.

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 08/23/2019

1. Inorganics (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.249	SM4500D
BICARBONATE ALKALINITY	6	SM20-2321
CALCIUM, TOTAL	13.2	EPA 200.7
CALCIUM, DISSOLVED	14.1	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	22.7	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	10.1	EPA 200.7
MAGNESIUM, DISSOLVED	10.5	EPA 200.7
MANGANESE, TOTAL (ug/l)	29	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	31	EPA 200.7
NITRATE-NITROGEN	19.4	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 08/23/2019

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	6.15	FIELD
pH-LAB (SU)	6.2	SM4500B
POTASSIUM, TOTAL	1.6	EPA 200.7
POTASSIUM, DISSOLVED	1.6	EPA 200.7
SODIUM, TOTAL	8.2	EPA 200.7
SODIUM, DISSOLVED	8.5	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	219	FIELD
SPEC. COND., LAB (umhos/cm)	213	EPA 120.1
SULFATE	2 ND	EPA 300
ALKALINITY	6	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	164	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.17	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 08/23/2019

2. Organics (Enter all data in ug/l)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/23/2019
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

All information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 52, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: MILLER

Address: 3052 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39 o 57 ' 29.85 " Longitude: 76 o 26 ' 11.45 "

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

Sample Field Filtered (must be 0.45 micron)?: [X] Yes [ ] No

Sample Date:(mm/dd/yy) 08/23/2019 Sample Collection Time: 2:46 PM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 09/04/2019

Were any holding times exceeded?: Yes X No If yes, please explain in comments field.

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS MILLER

Sample Date: 08/23/2019

1. Inorganics (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.19	SM4500D
BICARBONATE ALKALINITY	6	SM20-2321
CALCIUM, TOTAL	16.5	EPA 200.7
CALCIUM, DISSOLVED	16.8	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	22.3	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	8.6	EPA 200.7
MAGNESIUM, DISSOLVED	8.8	EPA 200.7
MANGANESE, TOTAL (ug/l)	36	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	39	EPA 200.7
NITRATE-NITROGEN	18.7	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS MILLER

Sample Date: 08/23/2019

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	6.09	FIELD
pH-LAB (SU)	6.13	SM4500B
POTASSIUM, TOTAL	1.7	EPA 200.7
POTASSIUM, DISSOLVED	1.8	EPA 200.7
SODIUM, TOTAL	7.8	EPA 200.7
SODIUM, DISSOLVED	8	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	216	FIELD
SPEC. COND., LAB (umhos/cm)	211	EPA 120.1
SULFATE	2.1	EPA 300
ALKALINITY	6	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	153	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.2	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS MILLER

Sample Date: 08/23/2019

2. Organics (Enter all data in ug/l)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/23/2019
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

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General Reference: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: LCSWMA

Address: 3056 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39 o 57 ' 28.44 " Longitude: 76 o 26 ' 10.43 "

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

Sample Field Filtered (must be 0.45 micron)?: [X] Yes [ ] No

Sample Date:(mm/dd/yy) 08/23/2019 Sample Collection Time: 2:39 PM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 09/05/2019

Were any holding times exceeded?: Yes X No If yes, please explain in comments field.

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 08/23/2019

1. Inorganics (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.179	SM4500D
BICARBONATE ALKALINITY	5 ND	SM20-2321
CALCIUM, TOTAL	10.2	EPA 200.7
CALCIUM, DISSOLVED	10.6	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	26.3	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	13.5	EPA 200.7
MAGNESIUM, DISSOLVED	13.7	EPA 200.7
MANGANESE, TOTAL (ug/l)	130	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	130	EPA 200.7
NITRATE-NITROGEN	20	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 08/23/2019

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	5.22	FIELD
pH-LAB (SU)	5.18	SM4500B
POTASSIUM, TOTAL	2.1	EPA 200.7
POTASSIUM, DISSOLVED	2.1	EPA 200.7
SODIUM, TOTAL	8.4	EPA 200.7
SODIUM, DISSOLVED	8.7	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	248	FIELD
SPEC. COND., LAB (umhos/cm)	237	EPA 120.1
SULFATE	2 ND	EPA 300
ALKALINITY	5 ND	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	186	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.17	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 08/23/2019

2. Organics (Enter all data in ug/l)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/23/2019
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

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General Reference: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: LCSWMA

Address: 3060 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39 o 57 ' 27.63 " Longitude: 76 o 26 ' 10.01 "

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

Sample Field Filtered (must be 0.45 micron)?: [X] Yes [ ] No

Sample Date:(mm/dd/yy) 08/28/2019 Sample Collection Time: 4:37 PM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 09/06/2019

Were any holding times exceeded?: Yes X No If yes, please explain in comments field.

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 08/28/2019

1. Inorganics (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	5 ND	SM20-2321
CALCIUM, TOTAL	8.9	EPA 200.7
CALCIUM, DISSOLVED	8.6	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	20.3	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	32	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	10.5	EPA 200.7
MAGNESIUM, DISSOLVED	10.3	EPA 200.7
MANGANESE, TOTAL (ug/l)	110	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	100	EPA 200.7
NITRATE-NITROGEN	14.5	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 08/28/2019

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	5.27	FIELD
pH-LAB (SU)	5.39	SM4500B
POTASSIUM, TOTAL	2	EPA 200.7
POTASSIUM, DISSOLVED	1.9	EPA 200.7
SODIUM, TOTAL	9	EPA 200.7
SODIUM, DISSOLVED	8.1	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	178	FIELD
SPEC. COND., LAB (umhos/cm)	187	EPA 120.1
SULFATE	9.3	EPA 300
ALKALINITY	5 ND	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	152	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.57	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 08/28/2019

2. Organics (Enter all data in ug/l)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/23/2019
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

All information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 52, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: SENSENICH

Address: 3076 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39 o 57 ' 28.2 " Longitude: 76 o 26 ' 11.1 "

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

Sample Field Filtered (must be 0.45 micron)?: [X] Yes [ ] No

Sample Date:(mm/dd/yy) 08/23/2019 Sample Collection Time: 2:25 PM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 09/05/2019

Were any holding times exceeded?: Yes X No If yes, please explain in comments field.

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS SENSENICH

Sample Date: 08/23/2019

1. Inorganics (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.185	SM4500D
BICARBONATE ALKALINITY	7	SM20-2321
CALCIUM, TOTAL	15.7	EPA 200.7
CALCIUM, DISSOLVED	16.7	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	57.1	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	33	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	8.2	EPA 200.7
MAGNESIUM, DISSOLVED	8.6	EPA 200.7
MANGANESE, TOTAL (ug/l)	190	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	200	EPA 200.7
NITRATE-NITROGEN	10.4	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS SENSENICH

Sample Date: 08/23/2019

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	6.11	FIELD
pH-LAB (SU)	6.16	SM4500B
POTASSIUM, TOTAL	3.4	EPA 200.7
POTASSIUM, DISSOLVED	3.5	EPA 200.7
SODIUM, TOTAL	24.6	EPA 200.7
SODIUM, DISSOLVED	25.9	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	288	FIELD
SPEC. COND., LAB (umhos/cm)	291	EPA 120.1
SULFATE	12.7	EPA 300
ALKALINITY	7	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	188	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.75	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.21	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS SENSENICH

Sample Date: 08/23/2019

2. Organics (Enter all data in ug/l)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/23/2019
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

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General Reference: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: LCSWMA

Address: 3079 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39 o 57 ' 21.99 " Longitude: 76 o 26 ' 10.58 "

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

Sample Field Filtered (must be 0.45 micron)?: [X] Yes [ ] No

Sample Date:(mm/dd/yy) 08/23/2019 Sample Collection Time: 4:02 PM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 09/04/2019

Were any holding times exceeded?: Yes X No If yes, please explain in comments field.

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 08/23/2019

1. Inorganics (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.251	SM4500D
BICARBONATE ALKALINITY	23	SM20-2321
CALCIUM, TOTAL	10	EPA 200.7
CALCIUM, DISSOLVED	9.9	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	35.9	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	5.4	EPA 200.7
MAGNESIUM, DISSOLVED	5.5	EPA 200.7
MANGANESE, TOTAL (ug/l)	410	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	410	EPA 200.7
NITRATE-NITROGEN	0.2 ND	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 08/23/2019

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	6.62	FIELD
pH-LAB (SU)	6.67	SM4500B
POTASSIUM, TOTAL	2	EPA 200.7
POTASSIUM, DISSOLVED	2.1	EPA 200.7
SODIUM, TOTAL	14.3	EPA 200.7
SODIUM, DISSOLVED	14.5	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	193	FIELD
SPEC. COND., LAB (umhos/cm)	181	EPA 120.1
SULFATE	15.4	EPA 300
ALKALINITY	23	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	111	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.18	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS LCSWMA

Sample Date: 08/23/2019

2. Organics (Enter all data in ug/l)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/23/2019
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

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General Reference: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: WEBER

Address: 3088 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39 o 57 ' 21 " Longitude: 76 o 26 ' 7.1 "

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

Sample Field Filtered (must be 0.45 micron)?: [X] Yes [ ] No

Sample Date:(mm/dd/yy) 08/23/2019 Sample Collection Time: 2:15 PM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 09/04/2019

Were any holding times exceeded?: ___ Yes X No If yes, please explain in comments field.

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS WEBER

Sample Date: 08/23/2019

1. Inorganics (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.229	SM4500D
BICARBONATE ALKALINITY	150	SM20-2321
CALCIUM, TOTAL	0.1	EPA 200.7
CALCIUM, DISSOLVED	0.1 ND	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	235	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	0.05 ND	EPA 200.7
MAGNESIUM, DISSOLVED	0.1 ND	EPA 200.7
MANGANESE, TOTAL (ug/l)	2.5 ND	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	5 ND	EPA 200.7
NITRATE-NITROGEN	6.6	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS WEBER

Sample Date: 08/23/2019

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	7.19	FIELD
pH-LAB (SU)	7.24	SM4500B
POTASSIUM, TOTAL	2	EPA 200.7
POTASSIUM, DISSOLVED	1.9	EPA 200.7
SODIUM, TOTAL	198	EPA 200.7
SODIUM, DISSOLVED	216	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	1082	FIELD
SPEC. COND., LAB (umhos/cm)	1090	EPA 120.1
SULFATE	2 ND	EPA 300
ALKALINITY	150	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	602	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.12	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS WEBER

Sample Date: 08/23/2019

2. Organics (Enter all data in ug/l)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/23/2019
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

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General Reference: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: KIRCHNER

Address: 3100 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39 o 57 ' 17.9 " Longitude: 76 o 26 ' 6.28 "

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

Sample Field Filtered (must be 0.45 micron)?: [X] Yes [ ] No

Sample Date:(mm/dd/yy) 08/23/2019 Sample Collection Time: 2:02 PM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 09/05/2019

Were any holding times exceeded?: Yes X No If yes, please explain in comments field.

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS KIRCHNER

Sample Date: 08/23/2019

1. Inorganics (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.293	SM4500D
BICARBONATE ALKALINITY	7	SM20-2321
CALCIUM, TOTAL	12.5	EPA 200.7
CALCIUM, DISSOLVED	13	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	42.7	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	6.1	EPA 200.7
MAGNESIUM, DISSOLVED	6.2	EPA 200.7
MANGANESE, TOTAL (ug/l)	12	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	12	EPA 200.7
NITRATE-NITROGEN	4.9	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS KIRCHNER

Sample Date: 08/23/2019

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	6.09	FIELD
pH-LAB (SU)	6.18	SM4500B
POTASSIUM, TOTAL	1.5	EPA 200.7
POTASSIUM, DISSOLVED	1.5	EPA 200.7
SODIUM, TOTAL	17.1	EPA 200.7
SODIUM, DISSOLVED	18.4	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	200	FIELD
SPEC. COND., LAB (umhos/cm)	212	EPA 120.1
SULFATE	14.5	EPA 300
ALKALINITY	7	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	133	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.11	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS KIRCHNER

Sample Date: 08/23/2019

2. Organics (Enter all data in ug/l)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/23/2019
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

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General Reference: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: FRY

Address: 3106 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39 o 57 ' 17.27 " Longitude: 76 o 26 ' 5.6 "

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

Sample Field Filtered (must be 0.45 micron)?: [X] Yes [ ] No

Sample Date:(mm/dd/yy) 08/23/2019 Sample Collection Time: 1:54 PM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 08/31/2019

Were any holding times exceeded?: Yes X No If yes, please explain in comments field.

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS FRY

Sample Date: 08/23/2019

1. Inorganics (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	11	SM20-2321
CALCIUM, TOTAL	21.3	EPA 200.7
CALCIUM, DISSOLVED	22.9	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	137	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	140	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	14.7	EPA 200.7
MAGNESIUM, DISSOLVED	15.9	EPA 200.7
MANGANESE, TOTAL (ug/l)	92	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	90	EPA 200.7
NITRATE-NITROGEN	13.2	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS FRY

Sample Date: 08/23/2019

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	6.02	FIELD
pH-LAB (SU)	5.96	SM4500B
POTASSIUM, TOTAL	2	EPA 200.7
POTASSIUM, DISSOLVED	2	EPA 200.7
SODIUM, TOTAL	54.5	EPA 200.7
SODIUM, DISSOLVED	56.5	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	552	FIELD
SPEC. COND., LAB (umhos/cm)	546	EPA 120.1
SULFATE	8.5	EPA 300
ALKALINITY	11	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	347	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	0.68	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.18	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS FRY

Sample Date: 08/23/2019

2. Organics (Enter all data in ug/l)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

2540-FM-BWM0060 Rev. 6/2005

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
10/23/2019
DEP USE ONLY
Date Received

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

All information must be typed or legibly printed in the spaces provided. If additional space is necessary, identify each attached sheet as Form 52, reference the item number and identify the date prepared. The "date prepared/revised" on any attached sheets needs to match the "date prepared/revised" on this page.

General Reference: Act 101 Section 1103

SECTION A. SITE IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Manage

Site Name: Frey Farm Landfill

Facility ID (as issued by DEP): 101389

SECTION B. PRIVATE WATER SUPPLY INFORMATION

INDICATE THE LATITUDE AND LONGITUDE TO THE NEAREST ONE TENTH OF A SECOND (DD° MM' SS.S")

Facility Name: Frey Farm Landfill

County: Lancaster County

Township or Municipality: MANOR TOWNSHIP

Landowner Name: BECK

Address: 3125 RIVER ROAD

Phone No.:

Sampling Point: Latitude: 39 o 57 ' 11.6 " Longitude: 76 o 26 ' 5.4 "

Depth to Water Level: ft. Measured from: [X] Land Surface [ ] TOC

Casing Stick Up: ft. Elevation of Water Level: ft./MSL

Total Well Depth: ft.

Sampling Depth: ft. Sampling Method: [ ] Pumped [ ] Bailed

Well Purged: [ ] Yes [X] No Well Volumes Purged:

Sample Field Filtered (must be 0.45 micron)?: [X] Yes [ ] No

Sample Date:(mm/dd/yy) 08/23/2019 Sample Collection Time: 1:44 PM

Laboratory(ies) Performing Analysis ALS Environmental

(include address and phone number) 34 Dogwood Lane

Middletown, PA 17057 (717) 944-5541

Lab Accreditation Number(s) 22-293

Lab Analysis Date 08/31/2019

Were any holding times exceeded?: Yes X No If yes, please explain in comments field.

Comments:

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS BECK

Sample Date: 08/23/2019

1. Inorganics (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
AMMONIA-NITROGEN	0.1 ND	SM4500D
BICARBONATE ALKALINITY	224	SM20-2321
CALCIUM, TOTAL	0.86	EPA 200.7
CALCIUM, DISSOLVED	0.77	EPA 200.7
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.2
CHLORIDE	95.9	EPA 300
FLUORIDE	0.2 ND	EPA 300
IRON, TOTAL (ug/l)	30 ND	EPA 200.7
IRON, DISSOLVED (ug/l)	60 ND	EPA 200.7
MAGNESIUM, TOTAL	0.12	EPA 200.7
MAGNESIUM, DISSOLVED	0.12	EPA 200.7
MANGANESE, TOTAL (ug/l)	2.5 ND	EPA 200.7
MANGANESE, DISSOLVED (ug/l)	5 ND	EPA 200.7
NITRATE-NITROGEN	5.7	EPA 300

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS BECK

Sample Date: 08/23/2019

1. Inorganics, continued (Enter all data in mg/l except as noted)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
NITRITE - NITROGEN	0.2 ND	EPA 300
pH-FIELD (SU)	7.36	FIELD
pH-LAB (SU)	7.4	SM4500B
POTASSIUM, TOTAL	3.2	EPA 200.7
POTASSIUM, DISSOLVED	3.1	EPA 200.7
SODIUM, TOTAL	158	EPA 200.7
SODIUM, DISSOLVED	161	EPA 200.7
SPEC. COND., FIELD (umhos/cm)	732	FIELD
SPEC. COND., LAB (umhos/cm)	723	EPA 120.1
SULFATE	13.7	EPA 300
ALKALINITY	224	SM20-2320B
TDS (TOT. DISSOLVED SOLIDS)	411	SM20-2540C
TOC (TOTAL ORGANIC CARBON)	1.1	SM20-5310B
TOTAL PHENOLICS (ug/l)	5 ND	EPA 420.4
TURBIDITY (NTU)	0.15	SM 2130B

T Please indicate detection limit if analyte is not detected.

FORM 52
MUNICIPAL WASTE LANDFILL
PRIVATE WATER SUPPLY
QUARTERLY WATER QUALITY ANALYSES

Facility I.D. Number: 101389

Monitoring Point I.D. No.: PS BECK

Sample Date: 08/23/2019

2. Organics (Enter all data in ug/l)

PARAMETER	VALUE	ANALYSIS METHOD NUMBER
BENZENE	1 ND	EPA 524.2
1,2-DIBROMOETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHANE	1 ND	EPA 524.2
1,1-DICHLOROETHENE	1 ND	EPA 524.2
1,2-DICHLOROETHANE	1 ND	EPA 524.2
CIS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
TRANS 1,2-DICHLOROETHENE	1 ND	EPA 524.2
ETHYLBENZENE	1 ND	EPA 524.2
METHYLENE CHLORIDE	1 ND	EPA 524.2
TETRACHLOROETHENE	1 ND	EPA 524.2
TOLUENE	1 ND	EPA 524.2
1,1,1-TRICHLOROETHANE	1 ND	EPA 524.2
TRICHLOROETHENE	1 ND	EPA 524.2
TRICHLOROFLUOROMETHANE	1 ND	EPA 524.2
VINYL CHLORIDE	1 ND	EPA 524.2
XYLENES (TOTAL)	3 ND	EPA 524.2

T Please indicate detection limit if analyte is not detected.

ALS Environmental

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

September 8, 2019

Ms. Jordan Gallagher
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**CONTIGUOUS LANDOWNER-3044 RIVER RD**	Workorder:	**3053809**
Purchase Order:	**PO1000126**	Workorder ID:	**3RD QTR 2019-3044 RIVER RD**

Dear Ms. Gallagher:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 23, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Mr. Daniel Brown , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3053809 3RD QTR 2019-3044 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3053809001	3044 River Road, Conestoga, PA	Water	8/23/2019 14:55	8/23/2019 17:59	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3053809 3RD QTR 2019-3044 RIVER RD

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3053809 3RD QTR 2019-3044 RIVER RD

Lab ID: **3053809001** Date Collected: 8/23/2019 14:55 Matrix: Water
Sample ID: **3044 River Road, Conestoga, PA** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:11	VLM	K
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/30/19 01:11	VLM	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 01:11	VLM	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 01:11	VLM	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:11	VLM	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:11	VLM	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:11	VLM	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:11	VLM	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 01:11	VLM	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:11	VLM	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:11	VLM	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/30/19 01:11	VLM	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 01:11	VLM	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:11	VLM	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/30/19 01:11	VLM	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 01:11	VLM	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	117		%	62 - 133	SW846 8260B			8/30/19 01:11	VLM	K
4-Bromofluorobenzene (S)	105		%	79 - 114	SW846 8260B			8/30/19 01:11	VLM	K
Dibromofluoromethane (S)	102		%	78 - 116	SW846 8260B			8/30/19 01:11	VLM	K
Toluene-d8 (S)	95.7		%	76 - 127	SW846 8260B			8/30/19 01:11	VLM	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	6		mg/L	5	SM2320B-2011			8/28/19 13:55	MBW	C
Alkalinity, Total	6	1	mg/L	5	SM2320B-2011			8/28/19 13:55	MBW	C
Ammonia-N	0.249		mg/L	0.100	D6919-09			9/4/19 13:05	AK	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/28/19 13:26	AK	B
Chloride	22.7		mg/L	2.0	EPA 300.0			8/24/19 10:33	CHW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			8/24/19 10:33	CHW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/27/19 11:03	PAG	I
Nitrate-N	19.4		mg/L	0.20	EPA 300.0			8/24/19 10:33	CHW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/24/19 10:33	CHW	C
pH	6.20	2	pH_Units		S4500HB-11			8/28/19 13:55	MBW	C
Phenolics	ND		mg/L	0.005	EPA 420.4	8/27/19 13:01	C_D	8/28/19 08:23	C_D	H
Specific Conductance	213		umhos/cm	1	SM2510B-2011			8/28/19 13:55	MBW	C

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ANALYTICAL RESULTS

Workorder: 3053809 3RD QTR 2019-3044 RIVER RD

Lab ID: **3053809001** Date Collected: 8/23/2019 14:55 Matrix: Water
Sample ID: **3044 River Road, Conestoga, PA** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Sulfate	ND		mg/L	2.0	EPA 300.0			8/24/19 10:33	CHW	C
Total Dissolved Solids	164		mg/L	25	S2540C-11			8/29/19 14:05	D1C	C
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			8/30/19 21:51	PAG	F
Turbidity	0.17		NTU	0.10	SM2130B-2011			8/24/19 06:00	R2B	C
METALS										
Calcium, Total	13.2		mg/L	0.050	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:55	MNP	D1
Calcium, Dissolved	14.1		mg/L	0.10	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:47	MNP	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:55	MNP	D1
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:47	MNP	E
Magnesium, Total	10.1		mg/L	0.050	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:55	MNP	D1
Magnesium, Dissolved	10.5		mg/L	0.10	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:47	MNP	E
Manganese, Total	0.029		mg/L	0.0025	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:55	MNP	D1
Manganese, Dissolved	0.031		mg/L	0.0050	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:47	MNP	E
Potassium, Total	1.6		mg/L	0.25	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:55	MNP	D1
Potassium, Dissolved	1.6		mg/L	0.50	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:47	MNP	E
Sodium, Total	8.2		mg/L	0.25	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:55	MNP	D1
Sodium, Dissolved	8.5		mg/L	0.50	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:47	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	6.15		pH_Units		Field			8/23/19 14:55	BGS	N
Specific Conductance, Field	219		umhos/cm	1	Field			8/23/19 14:55	BGS	N
Temperature	17.60		Deg. C		Field			8/23/19 14:55	BGS	N

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3053809 3RD QTR 2019-3044 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3053809001	1	3044 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053809001	2	3044 River Road, Conestoga, PA	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				

ALS Environmental

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3053809 3RD QTR 2019-3044 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3053809001	3044 River Road, Conestoga, PA	D6919-09	
3053809001	3044 River Road, Conestoga, PA	EPA 200.7	EPA ACID
3053809001	3044 River Road, Conestoga, PA	EPA 200.7	EPA TRMD
3053809001	3044 River Road, Conestoga, PA	EPA 300.0	
3053809001	3044 River Road, Conestoga, PA	EPA 410.4	
3053809001	3044 River Road, Conestoga, PA	EPA 420.4	420.4/9066
3053809001	3044 River Road, Conestoga, PA	Field	
3053809001	3044 River Road, Conestoga, PA	S2540C-11	
3053809001	3044 River Road, Conestoga, PA	S4500HB-11	
3053809001	3044 River Road, Conestoga, PA	SM2130B-2011	
3053809001	3044 River Road, Conestoga, PA	SM2320B-2011	
3053809001	3044 River Road, Conestoga, PA	SM2510B-2011	
3053809001	3044 River Road, Conestoga, PA	SM5310B-2011	
3053809001	3044 River Road, Conestoga, PA	SW846 8260B	
3053809001	3044 River Road, Conestoga, PA	SW846 9020B	

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

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COC: ALS (

3053809

1 of 1

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Client Name: Lancaster County Solid Waste MA

Address: 1299 Harrisburg Pike, P.O. Box 4424
Lancaster, PA 17604

Contact: Mark Reider

Phone#: (717) 735-0193

Project Name/#: LCSWMA - Quarterly

Bill To: Lancaster County Solid Waste MA

TAT [X] Normal-Standard TAT is 10-12 business days.
[ ] Rush-Subject to ALS approval and surcharges.

Date Required: _____ Approved By: _____

Email? [ ] -Y _____

Fax? [ ] -Y No.: _____

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	Container Type	Container Size	Preservative	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3
					AG	AN	AN	CG	—	PL	PL	PL	PL	PL			
					40 ml	125 ml	250 ml	40 ml	—	250 ml	120 ml	120 ml	500 ml	500 ml			
					HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None			
					ANALYSES/METHOD REQUESTED												
					Enter Number of Containers Per Sample or Field Results Below.												
1 3044RIVERRD	08/23/19	1455	G	DW	2	1	2	23	X	1	1	1	1	1			
								90 8/24/19									
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Project Comments:

LOGGED BY(signature): DATE TIME

REVIEWED BY(signature): DATE TIME

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [illegible] ALS	8/23/19	1259	2	8/23/19	1759
3			4		
5			6		
7			8		
9			10		

* G=Grab; C=Composite **Matrix - Al=Air; DW=Drinking Water; GW=Groundwater; Oi=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

Cooler Temp: 6 Therm ID: 403

No. of Coolers: _____

	Y	N	Initial
Custody Seals Present?			
(if present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. in Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

Sample/COC Comments

ALS Field Services: [ ] Pickup [ ] Labor [ ] Composite_Sampling [ ] Rental_Equipment [ ] Other: _____

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]

Special Processing: USACE [ ] Navy [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ]

Reportable to PADEP? Yes [ ]

PWSID # _____

Sample Disposal: Lab [X] Special [ ]

EDDS: Format Type- _____

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

Rev 8/04

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
LCSWMA	3053809	QV	8/24/19

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(YES)	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	(NO)
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #: _____

Temperature (°C): 6 C

Thermometer ID: 403

Radiological (µCi): _____

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

September 8, 2019

Ms. Jordan Gallagher
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**CONTIGUOUS LANDOWNER-3052 RIVER RD**	Workorder:	**3053808**
Purchase Order:	**PO1000126**	Workorder ID:	**3RD QTR 2019-3052 RIVER RD**

Dear Ms. Gallagher:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 23, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Mr. Daniel Brown , Landowner , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3053808 3RD QTR 2019-3052 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3053808001	3052 River Road, Conestoga, PA	Water	8/23/2019 14:46	8/23/2019 17:59	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3053808 3RD QTR 2019-3052 RIVER RD

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3053808 3RD QTR 2019-3052 RIVER RD

Lab ID: **3053808001** Date Collected: 8/23/2019 14:46 Matrix: Water
Sample ID: **3052 River Road, Conestoga, PA** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/30/19 00:48	VLM	K
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/30/19 00:48	VLM	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 00:48	VLM	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 00:48	VLM	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 00:48	VLM	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 00:48	VLM	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 00:48	VLM	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/30/19 00:48	VLM	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 00:48	VLM	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 00:48	VLM	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/30/19 00:48	VLM	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/30/19 00:48	VLM	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 00:48	VLM	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 00:48	VLM	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/30/19 00:48	VLM	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 00:48	VLM	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	118		%	62 - 133	SW846 8260B			8/30/19 00:48	VLM	K
4-Bromofluorobenzene (S)	104		%	79 - 114	SW846 8260B			8/30/19 00:48	VLM	K
Dibromofluoromethane (S)	103		%	78 - 116	SW846 8260B			8/30/19 00:48	VLM	K
Toluene-d8 (S)	97.3		%	76 - 127	SW846 8260B			8/30/19 00:48	VLM	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	6		mg/L	5	SM2320B-2011			8/28/19 13:46	MBW	C
Alkalinity, Total	6	1	mg/L	5	SM2320B-2011			8/28/19 13:46	MBW	C
Ammonia-N	0.190		mg/L	0.100	D6919-09			9/4/19 12:52	AK	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/28/19 13:26	AK	B
Chloride	22.3		mg/L	2.0	EPA 300.0			8/24/19 10:17	CHW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			8/24/19 10:17	CHW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/26/19 14:58	PAG	I
Nitrate-N	18.7		mg/L	0.20	EPA 300.0			8/24/19 10:17	CHW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/24/19 10:17	CHW	C
pH	6.13	2	pH_Units		S4500HB-11			8/28/19 13:46	MBW	C
Phenolics	ND		mg/L	0.005	EPA 420.4	8/27/19 13:01	C_D	8/28/19 08:23	C_D	H
Specific Conductance	211		umhos/cm	1	SM2510B-2011			8/28/19 13:46	MBW	C

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3053808 3RD QTR 2019-3052 RIVER RD

Lab ID: **3053808001** Date Collected: 8/23/2019 14:46 Matrix: Water
Sample ID: **3052 River Road, Conestoga, PA** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Sulfate	2.1		mg/L	2.0	EPA 300.0			8/24/19 10:17	CHW	C
Total Dissolved Solids	153		mg/L	25	S2540C-11			8/29/19 14:05	D1C	C
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			8/30/19 21:51	PAG	F
Turbidity	0.20		NTU	0.10	SM2130B-2011			8/24/19 06:00	R2B	C
METALS										
Calcium, Total	16.5		mg/L	0.050	EPA 200.7	8/28/19 13:05	SXC	8/29/19 12:15	MNP	D1
Calcium, Dissolved	16.8		mg/L	0.10	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:43	MNP	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	8/28/19 13:05	SXC	8/29/19 12:15	MNP	D1
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:43	MNP	E
Magnesium, Total	8.6		mg/L	0.050	EPA 200.7	8/28/19 13:05	SXC	8/29/19 12:15	MNP	D1
Magnesium, Dissolved	8.8		mg/L	0.10	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:43	MNP	E
Manganese, Total	0.036		mg/L	0.0025	EPA 200.7	8/28/19 13:05	SXC	8/29/19 12:15	MNP	D1
Manganese, Dissolved	0.039		mg/L	0.0050	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:43	MNP	E
Potassium, Total	1.7		mg/L	0.25	EPA 200.7	8/28/19 13:05	SXC	8/29/19 12:15	MNP	D1
Potassium, Dissolved	1.8		mg/L	0.50	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:43	MNP	E
Sodium, Total	7.8		mg/L	0.25	EPA 200.7	8/28/19 13:05	SXC	8/29/19 12:15	MNP	D1
Sodium, Dissolved	8.0		mg/L	0.50	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:43	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	6.09		pH_Units		Field			8/23/19 14:46	BGS	N
Specific Conductance, Field	216		umhos/cm	1	Field			8/23/19 14:46	BGS	N
Temperature	17.50		Deg. C		Field			8/23/19 14:46	BGS	N

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3053808 3RD QTR 2019-3052 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3053808001	1	3052 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053808001	2	3052 River Road, Conestoga, PA	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3053808 3RD QTR 2019-3052 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3053808001	3052 River Road, Conestoga, PA	D6919-09	
3053808001	3052 River Road, Conestoga, PA	EPA 200.7	EPA ACID
3053808001	3052 River Road, Conestoga, PA	EPA 200.7	EPA TRMD
3053808001	3052 River Road, Conestoga, PA	EPA 300.0	
3053808001	3052 River Road, Conestoga, PA	EPA 410.4	
3053808001	3052 River Road, Conestoga, PA	EPA 420.4	420.4/9066
3053808001	3052 River Road, Conestoga, PA	Field	
3053808001	3052 River Road, Conestoga, PA	S2540C-11	
3053808001	3052 River Road, Conestoga, PA	S4500HB-11	
3053808001	3052 River Road, Conestoga, PA	SM2130B-2011	
3053808001	3052 River Road, Conestoga, PA	SM2320B-2011	
3053808001	3052 River Road, Conestoga, PA	SM2510B-2011	
3053808001	3052 River Road, Conestoga, PA	SM5310B-2011	
3053808001	3052 River Road, Conestoga, PA	SW846 8260B	
3053808001	3052 River Road, Conestoga, PA	SW846 9020B	

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COC ALS

* 3 0 5 3 8 0 8 *

1 of 1

Container Type	AG	AN	AN	CG	—	PL	PL	PL	PL	PL	(Receiving Lab)
Container Size	40 ml	125 ml	250 ml	40 ml	----	250 ml	120 ml	120 ml	500 ml	500 ml	
Preservative	HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None	

Client Name: LCSWMA - Gerald E. Miller, Sr.

Address: 3052 River Road, Conestoga, PA 17516

Contact: Gerald E. Miller, Sr.

Phone#: (717) 872-5117

Project Name/#: LCSWMA - Quarterly

Bill To: Lancaster County Solid Waste MA

TAT [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.

Date Required: _____ Approved By: _____

Email? [ ] -Y _____

Fax? [ ] -Y No.: _____

Cooler Temp: 9 Therm ID: 403

No. of Coolers: _____

	Y	N	Initial
Custody Seals Present?			
(If present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. in Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

ANALYSES/METHOD REQUESTED

Enter Number of Containers Per Sample or Field Results Below.

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3	Sample/COC Comments
1 3052RIVERRD	08/23/19	1446	G	DW	2	1	2	2 3	X	1	1	1	1	1	
2								2 8260 8/23/19							
3															
4															
5															
6															
7															
8															
9															
10															

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: _____

Project Comments:

LOGGED BY(signature): DATE TIME

REVIEWED BY(signature): DATE TIME

	Relinquished By / Company Name	Date	Time		Received By / Company Name	Date	Time
1	[signature] ALS	8/23/19	1759	2	[signature]	8/23/19	1759
3				4			
5				6			
7				8			
9				10			

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]

Special Processing: USACE [ ] Navy [ ] [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ]

Reportable to PADEP? Yes [ ]

PWSID # _____

Sample Disposal: Lab [X] Special [ ]

EDDS: Format Type-

* G=Grab; C=Composite **Matrix - Al=Air; DW=Drinking Water; GW=Groundwater; Ol=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

Rev 8/04

ALS

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
LCSWMA	3053808	QV	8/24/19

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C... collected same day		YES	(NO)
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(YES)	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	(NO)
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #:								
Temperature (°C):	9°C							
Thermometer ID:	403							
Radiological (µCi):								

COMMENTS (Required for all NO responses above and any sample non-conformance):

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

September 8, 2019

Ms. Jordan Gallagher
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**FREY FARM**	Workorder:	**3053816**
Purchase Order:	**PO1000126**	Workorder ID:	**3RD QTR 2019 3056 RIVER RD**

Dear Ms. Gallagher:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 23, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Mr. Daniel Brown , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3053816 3RD QTR 2019 3056 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3053816001	3056RIVERRD	Water	8/23/2019 14:39	8/23/2019 17:59	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3053816 3RD QTR 2019 3056 RIVER RD

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3053816 3RD QTR 2019 3056 RIVER RD

Lab ID: **3053816001** Date Collected: 8/23/2019 14:39 Matrix: Water
Sample ID: **3056RIVERRD** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/30/19 02:44	VLM	K
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/30/19 02:44	VLM	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 02:44	VLM	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 02:44	VLM	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 02:44	VLM	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 02:44	VLM	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 02:44	VLM	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/30/19 02:44	VLM	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 02:44	VLM	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 02:44	VLM	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/30/19 02:44	VLM	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/30/19 02:44	VLM	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 02:44	VLM	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 02:44	VLM	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/30/19 02:44	VLM	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 02:44	VLM	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	119		%	62 - 133	SW846 8260B			8/30/19 02:44	VLM	K
4-Bromofluorobenzene (S)	105		%	79 - 114	SW846 8260B			8/30/19 02:44	VLM	K
Dibromofluoromethane (S)	104		%	78 - 116	SW846 8260B			8/30/19 02:44	VLM	K
Toluene-d8 (S)	97.2		%	76 - 127	SW846 8260B			8/30/19 02:44	VLM	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	ND		mg/L	5	SM2320B-2011			8/28/19 14:28	MBW	C
Alkalinity, Total	ND	1	mg/L	5	SM2320B-2011			8/28/19 14:28	MBW	C
Ammonia-N	0.179		mg/L	0.100	D6919-09			9/5/19 02:54	AK	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/28/19 13:26	AK	B
Chloride	26.3		mg/L	2.0	EPA 300.0			8/24/19 06:54	CHW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			8/24/19 06:54	CHW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/28/19 12:13	PAG	I
Nitrate-N	20.0		mg/L	0.20	EPA 300.0			8/24/19 06:54	CHW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/24/19 06:54	CHW	C
pH	5.18	2	pH_Units		S4500HB-11			8/28/19 14:28	MBW	C
Phenolics	ND		mg/L	0.005	EPA 420.4	8/27/19 13:01	C_D	8/28/19 08:23	C_D	H
Specific Conductance	237		umhos/cm	1	SM2510B-2011			8/28/19 14:28	MBW	C

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ANALYTICAL RESULTS

Workorder: 3053816 3RD QTR 2019 3056 RIVER RD

Lab ID: **3053816001** Date Collected: 8/23/2019 14:39 Matrix: Water
Sample ID: **3056RIVERRD** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Sulfate	ND		mg/L	2.0	EPA 300.0			8/24/19 06:54	CHW	C
Total Dissolved Solids	186		mg/L	25	S2540C-11			8/29/19 14:05	D1C	C
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			8/31/19 03:15	PAG	F
Turbidity	0.17		NTU	0.10	SM2130B-2011			8/24/19 06:00	R2B	C
METALS										
Calcium, Total	10.2		mg/L	0.050	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:35	MNP	D1
Calcium, Dissolved	10.6		mg/L	0.10	EPA 200.7	8/27/19 08:49	MNP	8/28/19 12:00	MNP	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:35	MNP	D1
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/27/19 08:49	MNP	8/28/19 12:00	MNP	E
Magnesium, Total	13.5		mg/L	0.050	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:35	MNP	D1
Magnesium, Dissolved	13.7		mg/L	0.10	EPA 200.7	8/27/19 08:49	MNP	8/28/19 12:00	MNP	E
Manganese, Total	0.13		mg/L	0.0025	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:35	MNP	D1
Manganese, Dissolved	0.13		mg/L	0.0050	EPA 200.7	8/27/19 08:49	MNP	8/28/19 12:00	MNP	E
Potassium, Total	2.1		mg/L	0.25	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:35	MNP	D1
Potassium, Dissolved	2.1		mg/L	0.50	EPA 200.7	8/27/19 08:49	MNP	8/28/19 12:00	MNP	E
Sodium, Total	8.4		mg/L	0.25	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:35	MNP	D1
Sodium, Dissolved	8.7		mg/L	0.50	EPA 200.7	8/27/19 08:49	MNP	8/28/19 12:00	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	5.22		pH_Units		Field			8/23/19 14:39	BGS	N
Specific Conductance, Field	248		umhos/cm	1	Field			8/23/19 14:39	BGS	N
Temperature	17.40		Deg. C		Field			8/23/19 14:39	BGS	N

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3053816 3RD QTR 2019 3056 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3053816001	1	3056RIVERRD	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053816001	2	3056RIVERRD	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3053816 3RD QTR 2019 3056 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3053816001	3056RIVERRD	D6919-09	
3053816001	3056RIVERRD	EPA 200.7	EPA ACID
3053816001	3056RIVERRD	EPA 200.7	EPA TRMD
3053816001	3056RIVERRD	EPA 300.0	
3053816001	3056RIVERRD	EPA 410.4	
3053816001	3056RIVERRD	EPA 420.4	420.4/9066
3053816001	3056RIVERRD	Field	
3053816001	3056RIVERRD	S2540C-11	
3053816001	3056RIVERRD	S4500HB-11	
3053816001	3056RIVERRD	SM2130B-2011	
3053816001	3056RIVERRD	SM2320B-2011	
3053816001	3056RIVERRD	SM2510B-2011	
3053816001	3056RIVERRD	SM5310B-2011	
3053816001	3056RIVERRD	SW846 8260B	
3053816001	3056RIVERRD	SW846 9020B	

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

COC ALS *30538816* 1 of 1

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Client Name: Lancaster County Solid Waste MA

Address: 1299 Harrisburg Pike, P.O. Box 4424
Lancaster, PA 17604

Contact: Mark Reider

Phone#: (717) 735-0193

Project Name/#: LCSWMA - Quarterly

Bill To: Lancaster County Solid Waste MA

TAT [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.

Date Required: _____ Approved By: _____

Email? [ ] -Y

Fax? [ ] -Y No.: _____

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	Container Type	Container Size	Preservative	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3
					AG	AN	AN	AN	CG	—	PL	PL	PL	PL	PL		
					40 ml	125 ml	250 ml	40 ml	---	250 ml	120 ml	120 ml	500 ml	500 ml			
					HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None			
					ANALYSES/METHOD REQUESTED												
					Enter Number of Containers Per Sample or Field Results Below.												
1 3056RIVERRD	08/23/19	1439	G	DW	2	1	2	2 3 8/24/19	X	1	1	1	1	1			
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Receipt Information (completed by receiving Lab)

Cooler Temp: 2.2 Therm ID: 1103

No. of Coolers: _____

	Y	N	Initial
Custody Seals Present?			
(if present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. In Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

Sample/COC Comments

ALS Field Services: [ ] Pickup [ ] Labor [ ] Composite_Sampling [ ] Rental_Equipment [ ] Other: _____

Project Comments:

LOGGED BY(signature): DATE TIME

REVIEWED BY(signature): DATE TIME

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [illegible] ALS	8/23/19	1254	2	8/23/19	1759
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]

Special Processing: USACE [ ] Navy [ ] [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ]

Reportable to PADEP? Yes [ ] PWSID # _____

Sample Disposal: Lab [X] Special [ ]

EDDS: Format Type- _____

* G=Grab; C=Composite **Matrix - Al=Air; DW=Drinking Water; GW=Groundwater; Oil=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

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Rev 8/04

ALS

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P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
LCSWMA	3053816	QO	8/24/19

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(YES)	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	(NO)
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #: _____

Temperature (°C): 2°C

Thermometer ID: 403

Radiological (µCi): _____

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

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September 17, 2019

Mr. Daniel Brown
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**FREY FARM**	Workorder:	**3054572**
Purchase Order:	**PO1000126**	Workorder ID:	**3RD QTR 2019 3060 RIVER RD**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, August 28, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Ms. Jordan Gallagher , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3054572 3RD QTR 2019 3060 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3054572001	3060RIVERRD	Water	8/28/2019 16:37	8/28/2019 17:56	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3054572 3RD QTR 2019 3060 RIVER RD

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
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(S)	Surrogate Compound
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*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3054572 3RD QTR 2019 3060 RIVER RD

Lab ID: **3054572001** Date Collected: 8/28/2019 16:37 Matrix: Water
Sample ID: **3060RIVERRD** Date Received: 8/28/2019 17:56

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY										
Alkalinity, Bicarbonate	ND		mg/L	5	SM2320B-2011			8/31/19 09:21	MBW	C
Alkalinity, Total	ND	1	mg/L	5	SM2320B-2011			8/31/19 09:21	MBW	C
Ammonia-N	ND		mg/L	0.100	D6919-09			9/6/19 07:07	AK	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			9/4/19 19:56	AK	B
Chloride	20.3		mg/L	2.0	EPA 300.0			8/29/19 14:10	CHW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			8/29/19 14:10	CHW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/29/19 13:56	PAG	I
Nitrate-N	14.5		mg/L	0.20	EPA 300.0			8/29/19 14:10	CHW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/29/19 14:10	CHW	C
pH	5.39	2	pH_Units		S4500HB-11			8/31/19 09:21	MBW	C
Phenolics	ND		mg/L	0.005	EPA 420.4	8/30/19 13:05	C_D	9/2/19 05:55	C_D	H
Specific Conductance	187		umhos/cm	1	SM2510B-2011			8/31/19 09:21	MBW	C
Sulfate	9.3		mg/L	2.0	EPA 300.0			8/29/19 14:10	CHW	C
Total Dissolved Solids	152		mg/L	25	S2540C-11			9/3/19 14:42	D1C	C
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			8/31/19 18:57	PAG	F
Turbidity	0.57		NTU	0.10	SM2130B-2011			8/29/19 06:08	R2B	C
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/31/19 00:09	VLM	K
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/31/19 00:09	VLM	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/31/19 00:09	VLM	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/31/19 00:09	VLM	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/31/19 00:09	VLM	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/31/19 00:09	VLM	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/31/19 00:09	VLM	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/31/19 00:09	VLM	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/31/19 00:09	VLM	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/31/19 00:09	VLM	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/31/19 00:09	VLM	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/31/19 00:09	VLM	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/31/19 00:09	VLM	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/31/19 00:09	VLM	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/31/19 00:09	VLM	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/31/19 00:09	VLM	K

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*

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ANALYTICAL RESULTS

Workorder: 3054572 3RD QTR 2019 3060 RIVER RD

Lab ID: **3054572001** Date Collected: 8/28/2019 16:37 Matrix: Water
Sample ID: **3060RIVERRD** Date Received: 8/28/2019 17:56

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
1,2-Dichloroethane-d4 (S)	119		%	62 - 133	SW846 8260B			8/31/19 00:09	VLM	K
4-Bromofluorobenzene (S)	105		%	79 - 114	SW846 8260B			8/31/19 00:09	VLM	K
Dibromofluoromethane (S)	104		%	78 - 116	SW846 8260B			8/31/19 00:09	VLM	K
Toluene-d8 (S)	96.6		%	76 - 127	SW846 8260B			8/31/19 00:09	VLM	K
METALS										
Calcium, Total	8.9		mg/L	0.050	EPA 200.7	8/30/19 14:15	SXC	9/3/19 10:01	MNP	D1
Calcium, Dissolved	8.6		mg/L	0.10	EPA 200.7	8/30/19 07:57	MNP	9/4/19 14:00	MNP	E
Iron, Total	0.032		mg/L	0.030	EPA 200.7	8/30/19 14:15	SXC	9/3/19 10:01	MNP	D1
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/30/19 07:57	MNP	9/4/19 14:00	MNP	E
Magnesium, Total	10.5		mg/L	0.050	EPA 200.7	8/30/19 14:15	SXC	9/3/19 10:01	MNP	D1
Magnesium, Dissolved	10.3		mg/L	0.10	EPA 200.7	8/30/19 07:57	MNP	9/4/19 14:00	MNP	E
Manganese, Total	0.11		mg/L	0.0025	EPA 200.7	8/30/19 14:15	SXC	9/3/19 10:01	MNP	D1
Manganese, Dissolved	0.10		mg/L	0.0050	EPA 200.7	8/30/19 07:57	MNP	9/4/19 14:00	MNP	E
Potassium, Total	2.0		mg/L	0.25	EPA 200.7	8/30/19 14:15	SXC	9/3/19 10:01	MNP	D1
Potassium, Dissolved	1.9		mg/L	0.50	EPA 200.7	8/30/19 07:57	MNP	9/4/19 14:00	MNP	E
Sodium, Total	9.0		mg/L	0.25	EPA 200.7	8/30/19 14:15	SXC	9/3/19 10:01	MNP	D1
Sodium, Dissolved	8.1		mg/L	0.50	EPA 200.7	8/30/19 07:57	MNP	9/4/19 14:00	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	5.27		pH_Units		Field			8/28/19 16:37	BGS	
Specific Conductance, Field	178		umhos/cm	1	Field			8/28/19 16:37	BGS	
Temperature	16.20		Deg. C		Field			8/28/19 16:37	BGS	

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3054572 3RD QTR 2019 3060 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3054572001	1	3060RIVERRD	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3054572001	2	3060RIVERRD	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3054572 3RD QTR 2019 3060 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3054572001	3060RIVERRD	D6919-09	
3054572001	3060RIVERRD	EPA 200.7	EPA ACID
3054572001	3060RIVERRD	EPA 200.7	EPA TRMD
3054572001	3060RIVERRD	EPA 300.0	
3054572001	3060RIVERRD	EPA 410.4	
3054572001	3060RIVERRD	EPA 420.4	420.4/9066
3054572001	3060RIVERRD	Field	
3054572001	3060RIVERRD	S2540C-11	
3054572001	3060RIVERRD	S4500HB-11	
3054572001	3060RIVERRD	SM2130B-2011	
3054572001	3060RIVERRD	SM2320B-2011	
3054572001	3060RIVERRD	SM2510B-2011	
3054572001	3060RIVERRD	SM5310B-2011	
3054572001	3060RIVERRD	SW846 8260B	
3054572001	3060RIVERRD	SW846 9020B	

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

30-54572

1 of 1

Client Name: Lancaster County Solid Waste MA
Address: 1299 Harrisburg Pike, P.O. Box 4424
Lancaster, PA 17604
Contact: Mark Reider
Phone#: (717) 735-0193
Project Name/#: LCSWMA - Quarterly
Bill To: Lancaster County Solid Waste MA

TAT [X] Normal-Standard TAT is 10-12 business days.
[ ] Rush-Subject to ALS approval and surcharges.

Date Required: ______ Approved By: ______
Email? [ ]-Y
Fax? [ ]-Y No.:

				Container Type	AG	AN	AN	CG	—	PL	PL	PL	PL	PL	
				Container Size	40 ml	125 ml	250 ml	40 ml	—	500 ml	250 ml	250 ml	2 L	500 ml	
				Preservative	HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None	
					ANALYSES/METHOD REQUESTED										
Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3	Sample/COC Comments
					Enter Number of Containers Per Sample or Field Results Below.										
1 3060RIVERRD	08/28/19	1637	G	DW	2	1	2	2	x	1	1	1	1	1	
2															
3															
4															
5															
6															
7															
8															
9															
10															

Receipt Information (completed by Receiving Lab)

Cooler Temp: 15 Therm ID: 402
No. of Coolers: ______

	Y	N	Initial
Custody Seals Present?			
(if present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. In Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other:

Project Comments:

LOGGED BY(signature): Date Time
REVIEWED BY(signature): Date Time

	Relinquished By / Company Name	Date	Time		Received By / Company Name	Date	Time
1	[signature] ALS	8/28/19	1756	2	[signature]	8/28/19	1756
3				4			
5				6			
7				8			
9				10			

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]

Reportable to PADEP? Yes [ ]
PWSID #

Special Processing: USACE [ ] Navy [ ] [ ]

Sample Disposal: Lab [X] Special [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ]

EDDS: Format Type-

* G=Grab; C=Composite   **Matrix - Al=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

Rev 8/04

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: LCSW | Work Order #: 3054572 | Initials: DN | Date: 8/24

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	(N/A)	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	(NO)
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	(NO)
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #: ____

Temperature (°C): 19

Thermometer ID: 402

Radiological (µCi): ____

COMMENTS (Required for all NO responses above and any sample non-conformance):

-> Temp > 6°
- Same day
-> pH is out of hold

Rev. 4/29/2019

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September 8, 2019

Ms. Jordan Gallagher
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**CONTIGUOUS LANDOWNER-3076 RIVER RD**	Workorder:	**3053811**
Purchase Order:	**PO1000126**	Workorder ID:	**3RD QTR 2019-3076 RIVER RD**

Dear Ms. Gallagher:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 23, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

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ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Mr. Daniel Brown , Landowner , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3053811 3RD QTR 2019-3076 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3053811001	3076 River Road, Conestoga, PA	Water	8/23/2019 14:25	8/23/2019 17:59	Mr. Brian G Shade

ALS Environmental

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SAMPLE SUMMARY

Workorder: 3053811 3RD QTR 2019-3076 RIVER RD

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
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-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
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RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
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*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3053811 3RD QTR 2019-3076 RIVER RD

Lab ID: **3053811001** Date Collected: 8/23/2019 14:25 Matrix: Water

Sample ID: **3076 River Road, Conestoga, PA** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:34	VLM	K
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/30/19 01:34	VLM	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 01:34	VLM	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 01:34	VLM	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:34	VLM	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:34	VLM	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:34	VLM	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:34	VLM	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 01:34	VLM	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:34	VLM	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:34	VLM	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/30/19 01:34	VLM	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 01:34	VLM	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:34	VLM	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/30/19 01:34	VLM	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 01:34	VLM	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	120		%	62 - 133	SW846 8260B			8/30/19 01:34	VLM	K
4-Bromofluorobenzene (S)	105		%	79 - 114	SW846 8260B			8/30/19 01:34	VLM	K
Dibromofluoromethane (S)	105		%	78 - 116	SW846 8260B			8/30/19 01:34	VLM	K
Toluene-d8 (S)	97		%	76 - 127	SW846 8260B			8/30/19 01:34	VLM	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	7		mg/L	5	SM2320B-2011			8/28/19 14:03	MBW	C
Alkalinity, Total	7	1	mg/L	5	SM2320B-2011			8/28/19 14:03	MBW	C
Ammonia-N	0.185		mg/L	0.100	D6919-09			9/5/19 02:15	AK	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/30/19 18:22	AK	B
Chloride	57.1		mg/L	2.0	EPA 300.0			8/24/19 10:48	CHW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			8/24/19 10:48	CHW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/27/19 11:21	PAG	I
Nitrate-N	10.4		mg/L	0.20	EPA 300.0			8/24/19 10:48	CHW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/24/19 10:48	CHW	C
pH	6.16	2	pH_Units		S4500HB-11			8/28/19 14:03	MBW	C
Phenolics	ND		mg/L	0.005	EPA 420.4	8/27/19 13:01	C_D	8/28/19 08:23	C_D	H
Specific Conductance	291		umhos/cm	1	SM2510B-2011			8/28/19 14:03	MBW	C

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3053811 3RD QTR 2019-3076 RIVER RD

Lab ID: **3053811001** Date Collected: 8/23/2019 14:25 Matrix: Water

Sample ID: **3076 River Road, Conestoga, PA** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Sulfate	12.7		mg/L	2.0	EPA 300.0			8/24/19 10:48	CHW	C
Total Dissolved Solids	188		mg/L	25	S2540C-11			8/29/19 14:05	D1C	C
Total Organic Carbon (TOC)	0.75		mg/L	0.50	SM5310B-2011			8/31/19 03:15	PAG	F
Turbidity	0.21		NTU	0.10	SM2130B-2011			8/24/19 06:00	R2B	C
METALS										
Calcium, Total	15.7		mg/L	0.050	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:32	MNP	D1
Calcium, Dissolved	16.7		mg/L	0.10	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:50	MNP	E
Iron, Total	0.033		mg/L	0.030	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:32	MNP	D1
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:50	MNP	E
Magnesium, Total	8.2		mg/L	0.050	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:32	MNP	D1
Magnesium, Dissolved	8.6		mg/L	0.10	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:50	MNP	E
Manganese, Total	0.19		mg/L	0.0025	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:32	MNP	D1
Manganese, Dissolved	0.20		mg/L	0.0050	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:50	MNP	E
Potassium, Total	3.4		mg/L	0.25	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:32	MNP	D1
Potassium, Dissolved	3.5		mg/L	0.50	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:50	MNP	E
Sodium, Total	24.6		mg/L	0.25	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:32	MNP	D1
Sodium, Dissolved	25.9		mg/L	0.50	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:50	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	6.11		pH_Units		Field			8/23/19 14:25	BGS	N
Specific Conductance, Field	288		umhos/cm	1	Field			8/23/19 14:25	BGS	N
Temperature	17.20		Deg. C		Field			8/23/19 14:25	BGS	N

Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3053811 3RD QTR 2019-3076 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3053811001	1	3076 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053811001	2	3076 River Road, Conestoga, PA	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3053811 3RD QTR 2019-3076 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3053811001	3076 River Road, Conestoga, PA	D6919-09	
3053811001	3076 River Road, Conestoga, PA	EPA 200.7	EPA ACID
3053811001	3076 River Road, Conestoga, PA	EPA 200.7	EPA TRMD
3053811001	3076 River Road, Conestoga, PA	EPA 300.0	
3053811001	3076 River Road, Conestoga, PA	EPA 410.4	
3053811001	3076 River Road, Conestoga, PA	EPA 420.4	420.4/9066
3053811001	3076 River Road, Conestoga, PA	Field	
3053811001	3076 River Road, Conestoga, PA	S2540C-11	
3053811001	3076 River Road, Conestoga, PA	S4500HB-11	
3053811001	3076 River Road, Conestoga, PA	SM2130B-2011	
3053811001	3076 River Road, Conestoga, PA	SM2320B-2011	
3053811001	3076 River Road, Conestoga, PA	SM2510B-2011	
3053811001	3076 River Road, Conestoga, PA	SM5310B-2011	
3053811001	3076 River Road, Conestoga, PA	SW846 8260B	
3053811001	3076 River Road, Conestoga, PA	SW846 9020B	

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

COC / ALS * 3 0 5 3 8 1 1 *

1 of 1

Client Name: LCSWMA - Brian Sensenich
Address: 3076 Rover Road
Conestoga, PA 17516
Contact: Brian Sensenich
Phone#: (717) 676-5779
Project Name/#: LCSWMA - Quarterly
Bill To: LCSWMA - Brian Sensenich

TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.
Date Required: ______ Approved By: ______
Email? [ ]-Y ______
Fax? [ ]-Y No.: ______

Container Type					AG	AN	AN	CG	—	PL	PL	PL	PL	PL	
Container Size					40 ml	125 ml	250 ml	40 ml	—	250 ml	120 ml	120 ml	500 ml	500 ml	
Preservative					HCl *	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None	
ANALYSES/METHOD REQUESTED					TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3	
Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	Enter Number of Containers Per Sample or Field Results Below.										Sample/COC Comments
1 3076RIVERRD	08/23/19	1425	G	DW	2	1	2	~~2~~ 3 (JW 8/24/19)	x	1	1	1	1	1	
2															
3															
4															
5															
6															
7															
8															
9															
10															

Receipt Information (completed by Receiving Lab)
Cooler Temp: 3 Therm ID: 403
No. of Coolers: ______

	Y	N	Initial
Custody Seals Present?			
(if present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. in Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: ______

Project Comments:

LOGGED BY(signature): DATE TIME
REVIEWED BY(signature): DATE TIME

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] ALS	8/23/19	1759	2 [signature]	8/23/19	1759
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]
Special Processing: USACE [ ] Navy [ ] [ ]
State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ]
Reportable to PADEP? Yes [ ]
PWSID #
Sample Disposal: Lab [X] Special [ ]
EDDS: Format Type-

* G=Grab; C=Composite **Matrix - AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

Rev 8/04

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
LCSWMA	3053811	QV	8/24/19

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(YES)	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	(NO)
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #: _____

Temperature (°C): 3°C

Thermometer ID: 403

Radiological (µCi): _____

COMMENTS (Required for all NO responses above and any sample non-conformance):

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September 8, 2019

Ms. Jordan Gallagher
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**FREY FARM**	Workorder:	**3053817**
Purchase Order:	**PO1000126**	Workorder ID:	**3RD QTR 2019 3079 RIVER RD**

Dear Ms. Gallagher:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 23, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Mr. Daniel Brown , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3053817 3RD QTR 2019 3079 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3053817001	3079RIVERRD	Water	8/23/2019 16:02	8/23/2019 17:59	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3053817 3RD QTR 2019 3079 RIVER RD

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3053817 3RD QTR 2019 3079 RIVER RD

Lab ID: **3053817001** Date Collected: 8/23/2019 16:02 Matrix: Water
Sample ID: **3079RIVERRD** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/30/19 03:07	VLM	K
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/30/19 03:07	VLM	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 03:07	VLM	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 03:07	VLM	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 03:07	VLM	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 03:07	VLM	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 03:07	VLM	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/30/19 03:07	VLM	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 03:07	VLM	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 03:07	VLM	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/30/19 03:07	VLM	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/30/19 03:07	VLM	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 03:07	VLM	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 03:07	VLM	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/30/19 03:07	VLM	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 03:07	VLM	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	120		%	62 - 133	SW846 8260B			8/30/19 03:07	VLM	K
4-Bromofluorobenzene (S)	106		%	79 - 114	SW846 8260B			8/30/19 03:07	VLM	K
Dibromofluoromethane (S)	105		%	78 - 116	SW846 8260B			8/30/19 03:07	VLM	K
Toluene-d8 (S)	98		%	76 - 127	SW846 8260B			8/30/19 03:07	VLM	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	23		mg/L	5	SM2320B-2011			8/28/19 14:37	MBW	C
Alkalinity, Total	23	1	mg/L	5	SM2320B-2011			8/28/19 14:37	MBW	C
Ammonia-N	0.251		mg/L	0.100	D6919-09			9/4/19 14:09	AK	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/28/19 13:26	AK	B
Chloride	35.9		mg/L	2.0	EPA 300.0			8/24/19 07:10	CHW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			8/24/19 07:10	CHW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/28/19 12:51	PAG	I
Nitrate-N	ND		mg/L	0.20	EPA 300.0			8/24/19 07:10	CHW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/24/19 07:10	CHW	C
pH	6.67	2	pH_Units		S4500HB-11			8/28/19 14:37	MBW	C
Phenolics	ND		mg/L	0.005	EPA 420.4	8/27/19 13:01	C_D	8/28/19 08:23	C_D	H
Specific Conductance	181		umhos/cm	1	SM2510B-2011			8/28/19 14:37	MBW	C

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ANALYTICAL RESULTS

Workorder: 3053817 3RD QTR 2019 3079 RIVER RD

Lab ID: **3053817001** Date Collected: 8/23/2019 16:02 Matrix: Water
Sample ID: **3079RIVERRD** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Sulfate	15.4		mg/L	2.0	EPA 300.0			8/24/19 07:10	CHW	C
Total Dissolved Solids	111		mg/L	25	S2540C-11			8/29/19 14:05	D1C	C
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			8/31/19 03:15	PAG	F
Turbidity	0.18		NTU	0.10	SM2130B-2011			8/24/19 06:00	R2B	C
METALS										
Calcium, Total	10		mg/L	0.050	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:50	MNP	D1
Calcium, Dissolved	9.9		mg/L	0.10	EPA 200.7	8/27/19 08:49	MNP	8/28/19 12:10	MNP	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:50	MNP	D1
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/27/19 08:49	MNP	8/28/19 12:10	MNP	E
Magnesium, Total	5.4		mg/L	0.050	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:50	MNP	D1
Magnesium, Dissolved	5.5		mg/L	0.10	EPA 200.7	8/27/19 08:49	MNP	8/28/19 12:10	MNP	E
Manganese, Total	0.41		mg/L	0.0025	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:50	MNP	D1
Manganese, Dissolved	0.41		mg/L	0.0050	EPA 200.7	8/27/19 08:49	MNP	8/28/19 12:10	MNP	E
Potassium, Total	2.0		mg/L	0.25	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:50	MNP	D1
Potassium, Dissolved	2.1		mg/L	0.50	EPA 200.7	8/27/19 08:49	MNP	8/28/19 12:10	MNP	E
Sodium, Total	14.3		mg/L	0.25	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:50	MNP	D1
Sodium, Dissolved	14.5		mg/L	0.50	EPA 200.7	8/27/19 08:49	MNP	8/28/19 12:10	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	6.62		pH_Units		Field			8/23/19 16:02	BGS	N
Specific Conductance, Field	193		umhos/cm	1	Field			8/23/19 16:02	BGS	N
Temperature	17.20		Deg. C		Field			8/23/19 16:02	BGS	N

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3053817 3RD QTR 2019 3079 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3053817001	1	3079RIVERRD	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053817001	2	3079RIVERRD	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3053817 3RD QTR 2019 3079 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3053817001	3079RIVERRD	D6919-09	
3053817001	3079RIVERRD	EPA 200.7	EPA ACID
3053817001	3079RIVERRD	EPA 200.7	EPA TRMD
3053817001	3079RIVERRD	EPA 300.0	
3053817001	3079RIVERRD	EPA 410.4	
3053817001	3079RIVERRD	EPA 420.4	420.4/9066
3053817001	3079RIVERRD	Field	
3053817001	3079RIVERRD	S2540C-11	
3053817001	3079RIVERRD	S4500HB-11	
3053817001	3079RIVERRD	SM2130B-2011	
3053817001	3079RIVERRD	SM2320B-2011	
3053817001	3079RIVERRD	SM2510B-2011	
3053817001	3079RIVERRD	SM5310B-2011	
3053817001	3079RIVERRD	SW846 8260B	
3053817001	3079RIVERRD	SW846 9020B	

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CHAIN OF CUSTODY / REQUEST FOR ANALYSIS

Generated by ALS

COC ALS *3053817* 1 of 1

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Client Name: Lancaster County Solid Waste MA

Address: 1299 Harrisburg Pike, P.O. Box 4424
Lancaster, PA 17604

Contact: Mark Reider

Phone#: (717) 735-0193

Project Name/#: LCSWMA - Quarterly Fire Co.

Bill To: Lancaster County Solid Waste MA

TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.

Date Required: _____ Approved By: _____

Email? [ ] -Y _____

Fax? [ ] -Y No.: _____

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3
Container Type					AG	AN	AN	CG	—	PL	PL	PL	PL	PL
Container Size					40 ml	125 ml	250 ml	40 ml	—	250 ml	120 ml	120 ml	500 ml	500 ml
Preservative					HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None
					ANALYSES/METHOD REQUESTED									
					Enter Number of Containers Per Sample or Field Results Below.									
1 3079RIVERRD	08/23/19	1602	G	DW	2	1	2	23	X	1	1	1	1	1
2								90 5/24/19						
3														
4														
5														
6														
7														
8														
9														
10														

Receipt Information (completed by Receiving Lab)

Cooler Temp: 4°C Therm ID: 403

No. of Coolers: _____

	Y	N	Initial
Custody Seals Present?			
(If present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. in Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

Sample/COC Comments

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: _____

Project Comments:

LOGGED BY(signature): _____ DATE _____ TIME _____

REVIEWED BY(signature): _____ DATE _____ TIME _____

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [illegible] DEV ALS	8/23/19	1259	2 [signature]	8/23/19	1359
3			4		
5			6		
7			8		
9			10		

Data Deliverables: ☐Standard ☐CLP-like ☐USACE ☐

Special Processing: USACE ☐ Navy ☐ ☐

State Samples Collected In: ☐NY ☐NJ ☒PA ☐NC ☐

Reportable to PADEP? Yes ☐ PWSID # _____

Sample Disposal: Lab ☒ Special ☐

EDDS: Format Type- _____

* G=Grab; C=Composite

**Matrix - AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

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Rev 8/04

ALS

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Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
LCSWMA	3053817	QV	8/24/19

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(YES)	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	(NO)
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #: _____

Temperature (°C): 4°C

Thermometer ID: 403

Radiological (µCi): _____

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

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September 8, 2019

Ms. Jordan Gallagher
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**CONTIGUOUS LANDOWNER-3088 RIVER RD**	Workorder:	**3053802**
Purchase Order:	**PO1000126**	Workorder ID:	**3rd QTR 2019-3088 RIVER RD**

Dear Ms. Gallagher:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 23, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Mr. Daniel Brown , Landowner , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3053802 3rd QTR 2019-3088 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3053802001	3088 River Road, Conestoga PA	Water	8/23/2019 14:15	8/23/2019 17:59	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3053802 3rd QTR 2019-3088 RIVER RD

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3053802 3rd QTR 2019-3088 RIVER RD

Lab ID: **3053802001** Date Collected: 8/23/2019 14:15 Matrix: Water
Sample ID: **3088 River Road, Conestoga PA** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/29/19 23:15	VLM	K
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/29/19 23:15	VLM	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 23:15	VLM	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 23:15	VLM	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 23:15	VLM	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 23:15	VLM	K
trans-1,2-Dichloroethene	ND	5	ug/L	1.0	SW846 8260B			8/29/19 23:15	VLM	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/29/19 23:15	VLM	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 23:15	VLM	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 23:15	VLM	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/29/19 23:15	VLM	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/29/19 23:15	VLM	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/29/19 23:15	VLM	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/29/19 23:15	VLM	K
Trichlorofluoromethane	ND	3,4	ug/L	1.0	SW846 8260B			8/29/19 23:15	VLM	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/29/19 23:15	VLM	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	118		%	62 - 133	SW846 8260B			8/29/19 23:15	VLM	K
4-Bromofluorobenzene (S)	106		%	79 - 114	SW846 8260B			8/29/19 23:15	VLM	K
Dibromofluoromethane (S)	105		%	78 - 116	SW846 8260B			8/29/19 23:15	VLM	K
Toluene-d8 (S)	98		%	76 - 127	SW846 8260B			8/29/19 23:15	VLM	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	150		mg/L	5	SM2320B-2011			8/28/19 12:38	MBW	C
Alkalinity, Total	150	1	mg/L	5	SM2320B-2011			8/28/19 12:38	MBW	C
Ammonia-N	0.229		mg/L	0.100	D6919-09			9/4/19 11:10	AK	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/28/19 13:26	AK	B
Chloride	235		mg/L	5.0	EPA 300.0			8/28/19 07:54	CHW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			8/24/19 07:57	CHW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/26/19 12:04	PAG	I
Nitrate-N	6.6		mg/L	0.20	EPA 300.0			8/24/19 07:57	CHW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/24/19 07:57	CHW	C
pH	7.24	2	pH_Units		S4500HB-11			8/28/19 12:38	MBW	C
Phenolics	ND		mg/L	0.005	EPA 420.4	8/27/19 13:01	C_D	8/28/19 08:23	C_D	H
Specific Conductance	1090		umhos/cm	1	SM2510B-2011			8/28/19 12:38	MBW	C

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ANALYTICAL RESULTS

Workorder: 3053802 3rd QTR 2019-3088 RIVER RD

Lab ID: **3053802001** Date Collected: 8/23/2019 14:15 Matrix: Water

Sample ID: **3088 River Road, Conestoga PA** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Sulfate	ND		mg/L	2.0	EPA 300.0			8/24/19 07:57	CHW	C
Total Dissolved Solids	602		mg/L	25	S2540C-11			8/29/19 14:05	D1C	C
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			8/30/19 21:51	PAG	F
Turbidity	0.12		NTU	0.10	SM2130B-2011			8/24/19 06:00	R2B	C
METALS										
Calcium, Total	0.10		mg/L	0.050	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:45	MNP	D1
Calcium, Dissolved	ND		mg/L	0.10	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:30	MNP	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:45	MNP	D1
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:30	MNP	E
Magnesium, Total	ND		mg/L	0.050	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:45	MNP	D1
Magnesium, Dissolved	ND		mg/L	0.10	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:30	MNP	E
Manganese, Total	ND		mg/L	0.0025	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:45	MNP	D1
Manganese, Dissolved	ND		mg/L	0.0050	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:30	MNP	E
Potassium, Total	2.0		mg/L	0.25	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:45	MNP	D1
Potassium, Dissolved	1.9		mg/L	0.50	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:30	MNP	E
Sodium, Total	198		mg/L	0.25	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:45	MNP	D1
Sodium, Dissolved	216		mg/L	0.50	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:30	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	7.19		pH_Units		Field			8/23/19 14:15	BGS	N
Specific Conductance, Field	1082		umhos/cm	1	Field			8/23/19 14:15	BGS	N
Temperature	19.10		Deg. C		Field			8/23/19 14:15	BGS	N

Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3053802 3rd QTR 2019-3088 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3053802001	1	3088 River Road, Conestoga PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053802001	2	3088 River Road, Conestoga PA	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3053802001	3	3088 River Road, Conestoga PA	SW846 8260B	Trichlorofluoromethane
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte Trichlorofluoromethane. The % Recovery was reported as 151 and the control limits were 38 to 123.				
3053802001	4	3088 River Road, Conestoga PA	SW846 8260B	Trichlorofluoromethane
The QC sample type MSD for method SW846 8260B was outside the control limits for the analyte Trichlorofluoromethane. The % Recovery was reported as 127 and the control limits were 38 to 123.				
3053802001	5	3088 River Road, Conestoga PA	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 131 and the control limits were 71 to 122.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3053802 3rd QTR 2019-3088 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3053802001	3088 River Road, Conestoga PA	D6919-09	
3053802001	3088 River Road, Conestoga PA	EPA 200.7	EPA ACID
3053802001	3088 River Road, Conestoga PA	EPA 200.7	EPA TRMD
3053802001	3088 River Road, Conestoga PA	EPA 300.0	
3053802001	3088 River Road, Conestoga PA	EPA 410.4	
3053802001	3088 River Road, Conestoga PA	EPA 420.4	420.4/9066
3053802001	3088 River Road, Conestoga PA	Field	
3053802001	3088 River Road, Conestoga PA	S2540C-11	
3053802001	3088 River Road, Conestoga PA	S4500HB-11	
3053802001	3088 River Road, Conestoga PA	SM2130B-2011	
3053802001	3088 River Road, Conestoga PA	SM2320B-2011	
3053802001	3088 River Road, Conestoga PA	SM2510B-2011	
3053802001	3088 River Road, Conestoga PA	SM5310B-2011	
3053802001	3088 River Road, Conestoga PA	SW846 8260B	
3053802001	3088 River Road, Conestoga PA	SW846 9020B	

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CHAIN OF CUSTODY / REQUEST FOR ANALYSIS

Generated by ALS

COC ALS *30538802* 1 of 1

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Client Name: LCSWMA - Hans Weber and Deb Kalbach

Address: 3088 River Road
Conestoga, PA 17516

Contact: Hans Weber and Deb Kalbach

Phone#: (717) 419-7982

Project Name/#: LCSWMA - Quarterly

Bill To: LCSWMA - Hans Weber and Deb Kalbach

TAT [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.

Date Required: _____ Approved By: _____

Email? [ ] -Y _____

Fax? [ ] -Y No.: _____

Container Type	AG	AN	AN	CG	—	PL	PL	PL	PL	PL
Container Size	40 ml	125 ml	250 ml	40 ml	—	250 ml	120 ml	120 ml	500 ml	500 ml
Preservative	HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3
			Enter Number of Containers Per Sample or Field Results Below.											
1 3088RIVER RD	08/23/19	1415	G	DW	2	1	2	Z3	X	1	1	1	1	1
2								8/24/19						
3														
4														
5														
6														
7														
8														
9														
10														

Receipt Information (completed by Receiving Lab)

Cooler Temp: 7.2 Therm ID: 403

No. of Coolers: _____

	Y	N	Initial
Custody Seals Present?			
(if present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. in Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

Sample/COC Comments

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other: _____

Project Comments:

LOGGED BY(signature): DATE TIME

REVIEWED BY(signature): DATE TIME

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [illegible] ALS	8/24/19	1759	2	8/23	1759
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]

Special Processing: USACE [ ] Navy [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ]

Reportable to PADEP? Yes [ ]

PWSID # _____

Sample Disposal: Lab [X] Special [ ]

- EDDS: Format Type: _____

* G=Grab; C=Composite **Matrix - Al=Air; DW=Drinking Water; GW=Groundwater; Ol=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
LCSWMA	3053802	QV	8/24/19

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C collected same day		YES	(NO)
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(YES)	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	(NO)
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #:								
Temperature (°C):	7.6							
Thermometer ID:	403							
Radiological (µCi):								

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

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September 8, 2019

Ms. Jordan Gallagher
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**CONTIGUOUS LANDOWNER-3100 RIVER RD**	Workorder:	**3053812**
Purchase Order:	**PO1000126**	Workorder ID:	**3RD QTR 2019-3100 RIVER RD**

Dear Ms. Gallagher:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 23, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Mr. Daniel Brown , Landowner , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3053812 3RD QTR 2019-3100 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3053812001	3100 River Road, Conestoga, PA	Water	8/23/2019 14:02	8/23/2019 17:59	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3053812 3RD QTR 2019-3100 RIVER RD

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3053812 3RD QTR 2019-3100 RIVER RD

Lab ID: **3053812001** Date Collected: 8/23/2019 14:02 Matrix: Water

Sample ID: **3100 River Road, Conestoga, PA** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:58	VLM	K
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/30/19 01:58	VLM	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 01:58	VLM	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 01:58	VLM	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:58	VLM	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:58	VLM	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:58	VLM	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:58	VLM	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 01:58	VLM	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:58	VLM	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:58	VLM	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/30/19 01:58	VLM	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 01:58	VLM	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 01:58	VLM	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/30/19 01:58	VLM	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 01:58	VLM	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	118		%	62 - 133	SW846 8260B			8/30/19 01:58	VLM	K
4-Bromofluorobenzene (S)	106		%	79 - 114	SW846 8260B			8/30/19 01:58	VLM	K
Dibromofluoromethane (S)	104		%	78 - 116	SW846 8260B			8/30/19 01:58	VLM	K
Toluene-d8 (S)	97.4		%	76 - 127	SW846 8260B			8/30/19 01:58	VLM	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	7		mg/L	5	SM2320B-2011			8/28/19 14:12	MBW	C
Alkalinity, Total	7	1	mg/L	5	SM2320B-2011			8/28/19 14:12	MBW	C
Ammonia-N	0.293		mg/L	0.100	D6919-09			9/5/19 02:28	AK	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/28/19 13:26	AK	B
Chloride	42.7		mg/L	2.0	EPA 300.0			8/24/19 11:04	CHW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			8/24/19 11:04	CHW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/27/19 11:40	PAG	I
Nitrate-N	4.9		mg/L	0.20	EPA 300.0			8/24/19 11:04	CHW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/24/19 11:04	CHW	C
pH	6.18	2	pH_Units		S4500HB-11			8/28/19 14:12	MBW	C
Phenolics	ND		mg/L	0.005	EPA 420.4	8/27/19 13:01	C_D	8/28/19 08:23	C_D	H
Specific Conductance	212		umhos/cm	1	SM2510B-2011			8/28/19 14:12	MBW	C

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ANALYTICAL RESULTS

Workorder: 3053812 3RD QTR 2019-3100 RIVER RD

Lab ID: **3053812001** Date Collected: 8/23/2019 14:02 Matrix: Water

Sample ID: **3100 River Road, Conestoga, PA** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Sulfate	14.5		mg/L	2.0	EPA 300.0			8/24/19 11:04	CHW	C
Total Dissolved Solids	133		mg/L	25	S2540C-11			8/29/19 14:05	D1C	C
Total Organic Carbon (TOC)	ND		mg/L	0.50	SM5310B-2011			8/31/19 03:15	PAG	F
Turbidity	0.11		NTU	0.10	SM2130B-2011			8/24/19 06:00	R2B	C
METALS										
Calcium, Total	12.5		mg/L	0.050	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:52	MNP	D1
Calcium, Dissolved	13.0		mg/L	0.10	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:53	MNP	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:52	MNP	D1
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:53	MNP	E
Magnesium, Total	6.1		mg/L	0.050	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:52	MNP	D1
Magnesium, Dissolved	6.2		mg/L	0.10	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:53	MNP	E
Manganese, Total	0.012		mg/L	0.0025	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:52	MNP	D1
Manganese, Dissolved	0.012		mg/L	0.0050	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:53	MNP	E
Potassium, Total	1.5		mg/L	0.25	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:52	MNP	D1
Potassium, Dissolved	1.5		mg/L	0.50	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:53	MNP	E
Sodium, Total	17.1		mg/L	0.25	EPA 200.7	8/28/19 13:05	SXC	8/29/19 11:52	MNP	D1
Sodium, Dissolved	18.4		mg/L	0.50	EPA 200.7	8/27/19 08:49	MNP	8/28/19 11:53	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	6.09		pH_Units		Field			8/23/19 14:02	BGS	N
Specific Conductance, Field	200		umhos/cm	1	Field			8/23/19 14:02	BGS	N
Temperature	17.80		Deg. C		Field			8/23/19 14:02	BGS	N

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3053812 3RD QTR 2019-3100 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3053812001	1	3100 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053812001	2	3100 River Road, Conestoga, PA	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3053812 3RD QTR 2019-3100 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3053812001	3100 River Road, Conestoga, PA	D6919-09	
3053812001	3100 River Road, Conestoga, PA	EPA 200.7	EPA ACID
3053812001	3100 River Road, Conestoga, PA	EPA 200.7	EPA TRMD
3053812001	3100 River Road, Conestoga, PA	EPA 300.0	
3053812001	3100 River Road, Conestoga, PA	EPA 410.4	
3053812001	3100 River Road, Conestoga, PA	EPA 420.4	420.4/9066
3053812001	3100 River Road, Conestoga, PA	Field	
3053812001	3100 River Road, Conestoga, PA	S2540C-11	
3053812001	3100 River Road, Conestoga, PA	S4500HB-11	
3053812001	3100 River Road, Conestoga, PA	SM2130B-2011	
3053812001	3100 River Road, Conestoga, PA	SM2320B-2011	
3053812001	3100 River Road, Conestoga, PA	SM2510B-2011	
3053812001	3100 River Road, Conestoga, PA	SM5310B-2011	
3053812001	3100 River Road, Conestoga, PA	SW846 8260B	
3053812001	3100 River Road, Conestoga, PA	SW846 9020B	

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

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COC #: ALS Q… *3053812*

1 of 1

Client Name: LCSWMA - Larry Kirchner
Address: 3100 River Road
Conestoga, PA 17516
Contact: Larry Kirchner
Phone#: (717) 584-0030
Project Name/#: LCSWMA - Quarterly
Bill To: Lancaster County Solid Waste MA

TAT [X] Normal-Standard TAT is 10-12 business days.
[ ] Rush-Subject to ALS approval and surcharges.
Date Required: ______ Approved By: ______
Email? [ ]-Y
Fax? [ ]-Y No.:

Container Type	AG	AN	AN	CG	—	PL	PL	PL	PL	PL
Container Size	40 ml	125 ml	250 ml	40 ml	—	250 ml	120 ml	120 ml	500 ml	500 ml
Preservative	HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None

ANALYSES/METHOD REQUESTED — Enter Number of Containers Per Sample or Field Results Below.

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3	Sample/COC Comments
1 3100RIVERRD	08/23/19	1402	G	DW	2	1	2	23 (8/24/19)	X	1	1	1	1	1	
2															
3															
4															
5															
6															
7															
8															
9															
10															

Receipt Information (completed by Receiving Lab)
Cooler Temp: 4 °C Therm ID: 423
No. of Coolers: ______ Y N Initial
Custody Seals Present?
(If present) Seals Intact?
Received on Ice?
COC/Labels Complete/Accurate?
Cont. in Good Cond.?
Correct Containers?
Correct Sample Volumes?
Correct Preservation?
Headspace/Volatiles?
Courier/Tracking #:

ALS Field Services: ☐Pickup ☐Labor ☐Composite_Sampling ☐Rental_Equipment ☐Other:

Project Comments:

LOGGED BY(signature): DATE TIME
REVIEWED BY(signature): DATE TIME

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] ALS	8/23/19	1759	2 [signature]	8/23/19	1759
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]

Special Processing: USACE [ ] Navy [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC

Reportable to PADEP? Yes [ ]
PWSID #

Sample Disposal: Lab [X] Special [ ]

EDDs: Format Type-

* G=Grab; C=Composite **Matrix - AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

Rev 8/04

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
LCSWMA	3053812	QD	8/24/19

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(YES)	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	(NO)
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #: _____

Temperature (°C): 4°C

Thermometer ID: 403

Radiological (µCi): _____

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

September 3, 2019

Mr. Daniel Brown
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**CONTIGUOUS LANDOWNER-3106 RIVER RD**	Workorder:	**3053829**
Purchase Order:	**PO1000126**	Workorder ID:	**3RD QTR 2019-3106 RIVER RD**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 23, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Ms. Jordan Gallagher , Landowner , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3053829 3RD QTR 2019-3106 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3053829001	3106 River Road, Conestoga, PA	Water	8/23/2019 13:54	8/23/2019 17:59	Mr. Brian G Shade

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3053829 3RD QTR 2019-3106 RIVER RD

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3053829 3RD QTR 2019-3106 RIVER RD

Lab ID: **3053829001** Date Collected: 8/23/2019 13:54 Matrix: Water

Sample ID: **3106 River Road, Conestoga, PA** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY										
Alkalinity, Bicarbonate	11		mg/L	5	SM2320B-2011			8/29/19 07:17	MBW	C
Alkalinity, Total	11	1	mg/L	5	SM2320B-2011			8/29/19 07:17	MBW	C
Ammonia-N	ND		mg/L	0.100	D6919-09			8/29/19 20:24	AK	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/28/19 13:26	AK	B
Chloride	137		mg/L	2.0	EPA 300.0			8/24/19 13:55	CHW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			8/24/19 13:55	CHW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/29/19 12:23	PAG	I
Nitrate-N	13.2		mg/L	0.20	EPA 300.0			8/24/19 13:55	CHW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/24/19 13:55	CHW	C
pH	5.96	2	pH_Units		S4500HB-11			8/29/19 07:17	MBW	C
Phenolics	ND		mg/L	0.005	EPA 420.4	8/27/19 13:01	C_D	8/28/19 08:23	C_D	H
Specific Conductance	546		umhos/cm	1	SM2510B-2011			8/29/19 07:17	MBW	C
Sulfate	8.5		mg/L	2.0	EPA 300.0			8/24/19 13:55	CHW	C
Total Dissolved Solids	347		mg/L	25	S2540C-11			8/29/19 15:32	D1C	C
Total Organic Carbon (TOC)	0.68		mg/L	0.50	SM5310B-2011			8/31/19 09:03	PAG	F
Turbidity	0.18		NTU	0.10	SM2130B-2011			8/24/19 06:00	R2B	C
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/30/19 05:27	VLM	K
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/30/19 05:27	VLM	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 05:27	VLM	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 05:27	VLM	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 05:27	VLM	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 05:27	VLM	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 05:27	VLM	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/30/19 05:27	VLM	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 05:27	VLM	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 05:27	VLM	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/30/19 05:27	VLM	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/30/19 05:27	VLM	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 05:27	VLM	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 05:27	VLM	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/30/19 05:27	VLM	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 05:27	VLM	K

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3053829 3RD QTR 2019-3106 RIVER RD

Lab ID: **3053829001** Date Collected: 8/23/2019 13:54 Matrix: Water

Sample ID: **3106 River Road, Conestoga, PA** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
1,2-Dichloroethane-d4 (S)	120		%	62 - 133	SW846 8260B			8/30/19 05:27	VLM	K
4-Bromofluorobenzene (S)	105		%	79 - 114	SW846 8260B			8/30/19 05:27	VLM	K
Dibromofluoromethane (S)	103		%	78 - 116	SW846 8260B			8/30/19 05:27	VLM	K
Toluene-d8 (S)	97.3		%	76 - 127	SW846 8260B			8/30/19 05:27	VLM	K
METALS										
Calcium, Total	21.3		mg/L	0.050	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:40	MNP	D1
Calcium, Dissolved	22.9		mg/L	0.10	EPA 200.7	8/27/19 08:50	MNP	8/28/19 12:30	MNP	E
Iron, Total	0.14		mg/L	0.030	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:40	MNP	D1
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/27/19 08:50	MNP	8/28/19 12:30	MNP	E
Magnesium, Total	14.7		mg/L	0.050	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:40	MNP	D1
Magnesium, Dissolved	15.9		mg/L	0.10	EPA 200.7	8/27/19 08:50	MNP	8/28/19 12:30	MNP	E
Manganese, Total	0.092		mg/L	0.0025	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:40	MNP	D1
Manganese, Dissolved	0.090		mg/L	0.0050	EPA 200.7	8/27/19 08:50	MNP	8/28/19 12:30	MNP	E
Potassium, Total	2.0		mg/L	0.25	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:40	MNP	D1
Potassium, Dissolved	2.0		mg/L	0.50	EPA 200.7	8/27/19 08:50	MNP	8/28/19 12:30	MNP	E
Sodium, Total	54.5		mg/L	0.25	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:40	MNP	D1
Sodium, Dissolved	56.5		mg/L	0.50	EPA 200.7	8/27/19 08:50	MNP	8/28/19 12:30	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	6.02		pH_Units		Field			8/23/19 13:54	BGS	N
Specific Conductance, Field	552		umhos/cm	1	Field			8/23/19 13:54	BGS	N
Temperature	17.20		Deg. C		Field			8/23/19 13:54	BGS	N

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3053829 3RD QTR 2019-3106 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3053829001	1	3106 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053829001	2	3106 River Road, Conestoga, PA	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3053829 3RD QTR 2019-3106 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3053829001	3106 River Road, Conestoga, PA	D6919-09	
3053829001	3106 River Road, Conestoga, PA	EPA 200.7	EPA ACID
3053829001	3106 River Road, Conestoga, PA	EPA 200.7	EPA TRMD
3053829001	3106 River Road, Conestoga, PA	EPA 300.0	
3053829001	3106 River Road, Conestoga, PA	EPA 410.4	
3053829001	3106 River Road, Conestoga, PA	EPA 420.4	420.4/9066
3053829001	3106 River Road, Conestoga, PA	Field	
3053829001	3106 River Road, Conestoga, PA	S2540C-11	
3053829001	3106 River Road, Conestoga, PA	S4500HB-11	
3053829001	3106 River Road, Conestoga, PA	SM2130B-2011	
3053829001	3106 River Road, Conestoga, PA	SM2320B-2011	
3053829001	3106 River Road, Conestoga, PA	SM2510B-2011	
3053829001	3106 River Road, Conestoga, PA	SM5310B-2011	
3053829001	3106 River Road, Conestoga, PA	SW846 8260B	
3053829001	3106 River Road, Conestoga, PA	SW846 9020B	

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CHAIN OF CUSTODY / REQUEST FOR ANALYSIS

Generated by ALS

COC ALS

3053829

1 of 1

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Client Name: LCSWMA - Aaron Fry

Address: 3106 River Road
Conestoga, PA 17516

Contact: Aaron Fry

Phone#: (717) 669-6831

Project Name/#: LCSWMA - Quarterly

Bill To: LCSWMA - Aaron Fry

TAT [X] Normal-Standard TAT is 10-12 business days.
[ ] Rush-Subject to ALS approval and surcharges.

Date Required: _____ Approved By: _____

Email? [ ] -Y _____

Fax? [ ] -Y No.: _____

Receipt Information: (completed by Receiving Lab)

Cooler Temp: 10 Therm ID: 403

No. of Coolers: _____

	Y	N	Initial
Custody Seals Present?			
(If present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. in Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

Container Type	AG	AN	AN	CG	—	PL	PL	PL	PL	PL
Container Size	40 ml	125 ml	250 ml	40 ml	—	250 ml	120 ml	120 ml	500 ml	500 ml
Preservative	HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3	Sample/COC Comments
					Enter Number of Containers Per Sample or Field Results Below.										
1 3106RIVERRD	08/23/19	1354	G	DW	2	1	2	23	X	1	1	1	1	1	
2								90 8/24/19							
3															
4															
5															
6															
7															
8															
9															
10															

ALS Field Services: [ ] Pickup [ ] Labor [ ] Composite_Sampling [ ] Rental_Equipment [ ] Other: _____

Project Comments:

LOGGED BY(signature): _____ DATE _____ TIME _____

REVIEWED BY(signature): _____ DATE _____ TIME _____

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] ALS	8/23/19	1259	2 [signature]	8/23/19	1759
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]

Special Processing: USACE [ ] Navy [ ] _____ [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ]

Reportable to PADEP? Yes [ ]

PWSID # _____

Sample Disposal: Lab [X] Special [ ]

EDDS: Format Type: _____

* G=Grab; C=Composite **Matrix - AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057

Rev 8/04

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
LCSWMA	3053829	QD	8/24/19

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C collected same day		YES	(NO)
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(YES)	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	(NO)
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #: _____

Temperature (°C): 10 C

Thermometer ID: 403

Radiological (µCi): _____

COMMENTS (Required for all NO responses above and any sample non-conformance):

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

September 3, 2019

Mr. Daniel Brown
Lancaster County Solid Waste Authority
1299 Hbg Pike, P.O. Box 4425
Lancaster, PA 17604

Certificate of Analysis

Project Name:	**CONTIGUOUS LANDOWNER-3125 RIVER RD**	Workorder:	**3053823**
Purchase Order:	**PO1000126**	Workorder ID:	**3RD QTR 2019-3125 RIVER RD**

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, August 23, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Nicholas Rogers , Ms. Jordan Gallagher , Landowner , Mr. Jeff Musser

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3053823 3RD QTR 2019-3125 RIVER RD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3053823001	3125 River Road, Conestoga, PA	Water	8/23/2019 13:44	8/23/2019 17:59	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 3053823 3RD QTR 2019-3125 RIVER RD

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3053823 3RD QTR 2019-3125 RIVER RD

Lab ID: **3053823001** Date Collected: 8/23/2019 13:44 Matrix: Water
Sample ID: **3125 River Road, Conestoga, PA** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			8/30/19 04:40	VLM	K
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			8/30/19 04:40	VLM	K
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 04:40	VLM	K
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 04:40	VLM	K
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 04:40	VLM	K
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 04:40	VLM	K
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 04:40	VLM	K
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			8/30/19 04:40	VLM	K
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 04:40	VLM	K
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 04:40	VLM	K
Toluene	ND		ug/L	1.0	SW846 8260B			8/30/19 04:40	VLM	K
Total Xylenes	ND		ug/L	3.0	SW846 8260B			8/30/19 04:40	VLM	K
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			8/30/19 04:40	VLM	K
Trichloroethene	ND		ug/L	1.0	SW846 8260B			8/30/19 04:40	VLM	K
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			8/30/19 04:40	VLM	K
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			8/30/19 04:40	VLM	K
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	119		%	62 - 133	SW846 8260B			8/30/19 04:40	VLM	K
4-Bromofluorobenzene (S)	102		%	79 - 114	SW846 8260B			8/30/19 04:40	VLM	K
Dibromofluoromethane (S)	102		%	78 - 116	SW846 8260B			8/30/19 04:40	VLM	K
Toluene-d8 (S)	95.7		%	76 - 127	SW846 8260B			8/30/19 04:40	VLM	K
WET CHEMISTRY										
Alkalinity, Bicarbonate	224		mg/L	5	SM2320B-2011			8/29/19 07:00	MBW	C
Alkalinity, Total	224	1	mg/L	5	SM2320B-2011			8/29/19 07:00	MBW	C
Ammonia-N	ND		mg/L	0.100	D6919-09			8/29/19 19:50	AK	B
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			8/28/19 13:26	AK	B
Chloride	95.9		mg/L	2.0	EPA 300.0			8/24/19 11:51	CHW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			8/24/19 11:51	CHW	C
Halogen, Total Organic (TOX)	ND		ug/L	20.0	SW846 9020B			8/28/19 15:49	PAG	I
Nitrate-N	5.7		mg/L	0.20	EPA 300.0			8/24/19 11:51	CHW	C
Nitrite-N	ND		mg/L	0.20	EPA 300.0			8/24/19 11:51	CHW	C
pH	7.40	2	pH_Units		S4500HB-11			8/29/19 07:00	MBW	C
Phenolics	ND		mg/L	0.005	EPA 420.4	8/27/19 13:01	C_D	8/28/19 08:23	C_D	H
Specific Conductance	723		umhos/cm	1	SM2510B-2011			8/29/19 07:00	MBW	C

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ANALYTICAL RESULTS

Workorder: 3053823 3RD QTR 2019-3125 RIVER RD

Lab ID: **3053823001** Date Collected: 8/23/2019 13:44 Matrix: Water

Sample ID: **3125 River Road, Conestoga, PA** Date Received: 8/23/2019 17:59

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	*Cntr*
Sulfate	13.7		mg/L	2.0	EPA 300.0			8/24/19 11:51	CHW	C
Total Dissolved Solids	411		mg/L	25	S2540C-11			8/29/19 14:05	D1C	C
Total Organic Carbon (TOC)	1.1		mg/L	0.50	SM5310B-2011			8/31/19 03:15	PAG	F
Turbidity	0.15		NTU	0.10	SM2130B-2011			8/24/19 06:00	R2B	C
METALS										
Calcium, Total	0.86		mg/L	0.050	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:57	MNP	D1
Calcium, Dissolved	0.77		mg/L	0.10	EPA 200.7	8/27/19 08:50	MNP	8/28/19 12:23	MNP	E
Iron, Total	ND		mg/L	0.030	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:57	MNP	D1
Iron, Dissolved	ND		mg/L	0.060	EPA 200.7	8/27/19 08:50	MNP	8/28/19 12:23	MNP	E
Magnesium, Total	0.12		mg/L	0.050	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:57	MNP	D1
Magnesium, Dissolved	0.12		mg/L	0.10	EPA 200.7	8/27/19 08:50	MNP	8/28/19 12:23	MNP	E
Manganese, Total	ND		mg/L	0.0025	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:57	MNP	D1
Manganese, Dissolved	ND		mg/L	0.0050	EPA 200.7	8/27/19 08:50	MNP	8/28/19 12:23	MNP	E
Potassium, Total	3.2		mg/L	0.25	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:57	MNP	D1
Potassium, Dissolved	3.1		mg/L	0.50	EPA 200.7	8/27/19 08:50	MNP	8/28/19 12:23	MNP	E
Sodium, Total	158		mg/L	0.25	EPA 200.7	8/29/19 14:30	SXC	8/30/19 11:57	MNP	D1
Sodium, Dissolved	161		mg/L	0.50	EPA 200.7	8/27/19 08:50	MNP	8/28/19 12:23	MNP	E
FIELD PARAMETERS										
pH, Field (SM4500B)	7.36		pH_Units		Field			8/23/19 13:44	BGS	N
Specific Conductance, Field	732		umhos/cm	1	Field			8/23/19 13:44	BGS	N
Temperature	17.90		Deg. C		Field			8/23/19 13:44	BGS	N

Susan J. Scherer

Ms. Susan J Scherer
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3053823 3RD QTR 2019-3125 RIVER RD

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3053823001	1	3125 River Road, Conestoga, PA	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3053823001	2	3125 River Road, Conestoga, PA	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3053823 3RD QTR 2019-3125 RIVER RD

Lab ID	Sample ID	Analysis Method	Prep Method
3053823001	3125 River Road, Conestoga, PA	D6919-09	
3053823001	3125 River Road, Conestoga, PA	EPA 200.7	EPA ACID
3053823001	3125 River Road, Conestoga, PA	EPA 200.7	EPA TRMD
3053823001	3125 River Road, Conestoga, PA	EPA 300.0	
3053823001	3125 River Road, Conestoga, PA	EPA 410.4	
3053823001	3125 River Road, Conestoga, PA	EPA 420.4	420.4/9066
3053823001	3125 River Road, Conestoga, PA	Field	
3053823001	3125 River Road, Conestoga, PA	S2540C-11	
3053823001	3125 River Road, Conestoga, PA	S4500HB-11	
3053823001	3125 River Road, Conestoga, PA	SM2130B-2011	
3053823001	3125 River Road, Conestoga, PA	SM2320B-2011	
3053823001	3125 River Road, Conestoga, PA	SM2510B-2011	
3053823001	3125 River Road, Conestoga, PA	SM5310B-2011	
3053823001	3125 River Road, Conestoga, PA	SW846 8260B	
3053823001	3125 River Road, Conestoga, PA	SW846 9020B	

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Generated by ALS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

CO
AL

* 3 0 5 3 8 2 3 *

Client Name: LCSWMA - Christian C. Beck
Address: 3125 River Road
Conestoga, PA 17516
Contact: Christian C. Beck
Phone#: (717) 871-0448
Project Name/#: LCSWMA - Quarterly
Bill To: Lancaster County Solid Waste MA

TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.

Date Required: ______ Approved By: ______
Email? [ ] -Y
Fax? [ ] -Y No.:

Container Type	AG	AN	AN	CG	—	PL	PL	PL	PL	PL
Container Size	40 ml	125 ml	250 ml	40 ml	—	250 ml	120 ml	120 ml	500 ml	500 ml
Preservative	HCl	H2SO4	H2SO4	HCl	—	H2SO4	HNO3	HNO3	None	None

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	TOC	O-OH	TOX	SW846-8260 VOCs	FM	NH3-N, COD	Dissolved Metals: Ca, Fe, Mg, Mn, K, Na	Metals: Ca, Fe, Mg, Mn, K, Na	pH, TDS, NO2, NO3, Cl, SO4, F, Tb, SpC	Alkalinity, HCO3	Sample/COC Comments
1 3125RIVERRD	08/23/19	1344	G	DW	2	1	2	~~2~~ 3 (8/24/19)	X	1	1	1	1	1	
2															
3															
4															
5															
6															
7															
8															
9															
10															

Enter Number of Containers Per Sample or Field Results Below.

Receipt Information (completed by Receiving Lab)

Cooler Temp: 8.2 Therm ID: 403
No. of Coolers: ______

	Y	N	Initial
Custody Seals Present?			
(if present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. In Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

ALS Field Services: [ ] Pickup [ ] Labor [ ] Composite_Sampling [ ] Rental_Equipment [ ] Other:

Project Comments:

LOGGED BY(signature): ______ DATE ______ TIME ______
REVIEWED BY(signature): ______ DATE ______ TIME ______

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] ALS	8/23/19	0759	2 [signature]	8/23/19	1759
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] USACE [ ]

Special Processing: USACE [ ] Navy [ ]

State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC

Reportable to PADEP? Yes [ ]
PWSID #

Sample Disposal: Lab [X] Special [ ]

EDDS: Format Type-

* G=Grab; C=Composite **Matrix - AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

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Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
LCSWMA	3053823	QV	8/24/19

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number: _____			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C ..... collected ... same ... day		YES	(NO)
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		(YES)	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	(NO)
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #:								
Temperature (°C):	8°C							
Thermometer ID:	403							
Radiological (µCi):								

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019