

December 7, 2018

Ms. Charlene Sauls; Regional Hydrogeologist
Pennsylvania Department of Environmental Protection
Bureau of Land Recycling and Waste Management
909 Elmerton Avenue
Harrisburg, PA 17110-8200

REF: Creswell Landfill (BWM Permit #100008)
Groundwater Monitoring; 4th Quarter 2018

Dear Ms. Sauls:

Enclosed, as a PDF file, are the Form 19 reports for the sampling period completed at the above referenced facility. The laboratory results were reviewed to evaluate the quality of the data and historic trends.

- This sampling event was for the “Quarterly” Form 19 parameters, all the thirteen (13) GWMP locations were sampled.
- Enclosed, on CD, is a csv file that should be in the format compatible with your LandLinks software. Additionally, the CD includes a PDF file of all the Forms 19, PDF files of the laboratory reports, MCL and SMCL exceedance reports as you have requested.
- Up gradient well samples were below MCL and SMCL except for nitrate, iron, and manganese on well 1.
- Down gradient wells had similar results with 17 & 18 (surface Mann’s Run) showing high concentration of chlorides, TDS, nitrates, manganese and iron (17 only) related to surface influences and Turkey Hill discharge. Wells 3 & 7 exceeded MCL for nitrate. Well 9 had elevated TDS and chlorides which shows surface influence of Mann’s Run. Wells 2 & 5 show manganese, 8 thru 12 show iron and manganese above the SMCL which is due to natural geologic parent material.
- Wells 2,3,4,8,9 and 12 with historic VOCs concentrations detected either stabilized or continue to decrease.

Page 2 of 2
Creswell Landfill (BWM Permit #100008)

1299 HARRISBURG PIKE | PO BOX 4425 | LANCASTER, PA 17604
PHONE: 717-397-9968 | FAX: 717-397-9973

www.lcswma.org

In summary, we observed no unusual trends, and the values reported are generally consistent with historic or seasonal results.

Please do not hesitate in contacting me if you have any questions or concerns at 570-590-1599 or nrogers@lcswma.org.

Respectfully Submitted,



Nick R. Rogers
Environmental Compliance Manager

Enclosures

cc: Mark Reider, Daniel Brown; Bob Eshbach; Jeff Musser; Jordan Gallagher
Randy Weiss (PA DEP)



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Date Prepared/Revised
11/28/2018

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: Creswell Landfill

Facility ID (as issued by DEP): 100008

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^o MM' SS.S")

Monitoring Point Number: CWMP007W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 24.53 " Longitude: 76 ° 26 ' 33.28 "

Depth to Water Level: 5.74 ft Measured from: Land Surface TOC

Casing Stickup: 1.50 ft Elevation of Water Level: 447.66 ft./MSL

Sampling Depth: 33 ft Volume of Water Column: 45.18 gal

Total Well Depth: 36.5 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 2.0

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

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 10/15/2018 Sample Collection Time: 11:27

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 No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2344348001 Final Lab Analysis CompletionDate: 10/25/2019

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP007W

Sample Date 10/15/2018

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	EPA 350.3
BICARBONATE	13	SM18-2321
CALCIUM, TOTAL	36.5	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	70.6	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	67 ND	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	15	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	17	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	10.3	EPA 300.0
pH-FIELD (SU)	5.08	FIELD
pH-LAB (SU)	5.84	EPA 150.1
POTASSIUM, TOTAL	7.4	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	123	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	395	FIELD
SPEC. COND., LAB (umhos/cm)	361	EPA 120.1
SULFATE	20.9	EPA 300.0
ALKALINITY	13	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	188	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.69	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.1 ND	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 100008

Monitoring Point No. CWMP007W

Sample Date 10/15/2018

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 (EDB) (ETHYLENE D	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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General Reference: Section 273.284
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SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP001W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 27.43 " Longitude: 76 ° 26 ' 14.4 "

Depth to Water Level: 23.44 ft Measured from: Land Surface TOC

Casing Stickup: 1.23 ft Elevation of Water Level: 491.69 ft./MSL

Sampling Depth: 57 ft Volume of Water Column: 62.95 gal

Total Well Depth: 66.3 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 1.9

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

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 10/15/2018 Sample Collection Time: 12:42

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 No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2344348002 Final Lab Analysis CompletionDate: 10/25/2019

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP001W

Sample Date 10/15/2018

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	EPA 350.3
BICARBONATE	17	SM18-2321
CALCIUM, TOTAL	17	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	30.8	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	2100	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	11.6	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	87	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	18.6	EPA 300.0
pH-FIELD (SU)	5.01	FIELD
pH-LAB (SU)	6.07	EPA 150.1
POTASSIUM, TOTAL	2.1	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	14.8	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	301	FIELD
SPEC. COND., LAB (umhos/cm)	277	EPA 120.1
SULFATE	2.3	EPA 300.0
ALKALINITY	17	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	152	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	52.6	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 100008

Monitoring Point No. CWMP001W

Sample Date 10/15/2018

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 (EDB) (ETHYLENE D	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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Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP005W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 11.17 " Longitude: 76 ° 26 ' 7.08 "

Depth to Water Level: 34.95 ft Measured from: Land Surface TOC

Casing Stickup: -0.37 ft Elevation of Water Level: 478.48 ft./MSL

Sampling Depth: 130 ft Volume of Water Column: 154.28 gal

Total Well Depth: 140 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 1.8

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

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 10/15/2018 Sample Collection Time: 14:10

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 No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2344348003 Final Lab Analysis CompletionDate: 10/25/2019

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP005W

Sample Date 10/15/2018

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	EPA 350.3
BICARBONATE	18	SM18-2321
CALCIUM, TOTAL	14.5	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	67.4	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	67 ND	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	7.8	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	51	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	9.6	EPA 300.0
pH-FIELD (SU)	4.73	FIELD
pH-LAB (SU)	6.09	EPA 150.1
POTASSIUM, TOTAL	1.8	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	31.7	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	335	FIELD
SPEC. COND., LAB (umhos/cm)	310	EPA 120.1
SULFATE	2.9	EPA 300.0
ALKALINITY	18	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	192	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.5 ND	SM18-5310B
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 100008

Monitoring Point No. CWMP005W

Sample Date 10/15/2018

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 (EDB) (ETHYLENE D	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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BUREAU OF WASTE MANAGEMENT

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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: Creswell Landfill

Facility ID (as issued by DEP): 100008

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^o MM' SS.S")

Monitoring Point Number: CWMP002W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 19.97 " Longitude: 76 ° 26 ' 12.3 "

Depth to Water Level: 69.31 ft Measured from: Land Surface TOC

Casing Stickup: -1.19 ft Elevation of Water Level: 456.5 ft./MSL

Sampling Depth: 85 ft Volume of Water Column: 45.07 gal

Total Well Depth: 100 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: _____

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 10/16/2018 Sample Collection Time: 12:35

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 No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2344533001 Final Lab Analysis Completion Date: 10/30/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP002W

Sample Date 10/16/2018

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	0.12	EPA 350.3
BICARBONATE	73	SM18-2321
CALCIUM, TOTAL	56.8	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	20	EPA 410.4
CHLORIDE	128	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	67 ND	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	18.2	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	1200	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	3.3	EPA 300.0
pH-FIELD (SU)	5.82	FIELD
pH-LAB (SU)	6.01	EPA 150.1
POTASSIUM, TOTAL	2.6	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	24	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	619	FIELD
SPEC. COND., LAB (umhos/cm)	631	EPA 120.1
SULFATE	23.5	EPA 300.0
ALKALINITY	73	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	351	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	6.3	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.11	SM 2130B

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Monitoring Point No. CWMP002W

Sample Date 10/16/2018

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ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1 ND	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	7.5	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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Monitoring Point Number: CWMP004W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 17.9 " Longitude: 76 ° 26 ' 7.05 "

Depth to Water Level: 60.22 ft Measured from: Land Surface TOC

Casing Stickup: -1.37 ft Elevation of Water Level: 469.31 ft./MSL

Sampling Depth: 130 ft Volume of Water Column: 117.17 gal

Total Well Depth: 140 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: _____

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 10/16/2018 Sample Collection Time: 14:16

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 No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2344533002 Final Lab Analysis CompletionDate: 10/30/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP004W

Sample Date 10/16/2018

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	EPA 350.3
BICARBONATE	27	SM18-2321
CALCIUM, TOTAL	21.8	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	55.4	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	67 ND	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	7.4	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	6.7	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	6.4	EPA 300.0
pH-FIELD (SU)	5.56	FIELD
pH-LAB (SU)	6.34	EPA 150.1
POTASSIUM, TOTAL	1.1	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	18.3	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	297	FIELD
SPEC. COND., LAB (umhos/cm)	276	EPA 120.1
SULFATE	5.7	EPA 300.0
ALKALINITY	27	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	175	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.95	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.1 ND	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 100008

Monitoring Point No. CWMP004W

Sample Date 10/16/2018

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 (EDB) (ETHYLENE D	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 WASTE MANAGEMENT

Date Prepared/Revised
11/28/2018

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: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP003W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 20.17 " Longitude: 76 ° 26 ' 8.37 "

Depth to Water Level: 89.5 ft Measured from: Land Surface TOC

Casing Stickup: -1.29 ft Elevation of Water Level: 434.71 ft./MSL

Sampling Depth: 100 ft Volume of Water Column: -21.30 gal

Total Well Depth: 75 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: _____

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 10/16/2018 Sample Collection Time: 14:18

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 No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2344533003 Final Lab Analysis Completion Date: 10/30/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP003W

Sample Date 10/16/2018

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	EPA 350.3
BICARBONATE	16	SM18-2321
CALCIUM, TOTAL	33.9	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	109	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	67 ND	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	12.2	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	6.2	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	10.6	EPA 300.0
pH-FIELD (SU)	5.44	FIELD
pH-LAB (SU)	5.99	EPA 150.1
POTASSIUM, TOTAL	1.6	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	26.5	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	464	FIELD
SPEC. COND., LAB (umhos/cm)	477	EPA 120.1
SULFATE	6.2	EPA 300.0
ALKALINITY	16	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	247	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.65	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.1 ND	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 100008

Monitoring Point No. CWMP003W

Sample Date 10/16/2018

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 (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1.4	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 WASTE MANAGEMENT

Date Prepared/Revised
11/28/2018

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: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP016W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 56 ' 55.57 " Longitude: 76 ° 26 ' 50.59 "

Depth to Water Level: 9.08 ft Measured from: Land Surface TOC

Casing Stickup: 2.53 ft Elevation of Water Level: 302.89 ft./MSL

Sampling Depth: 71 ft Volume of Water Column: _____ gal

Total Well Depth: 78.03 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 1.5

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 10/18/2018 Sample Collection Time: 11:57

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 No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2345236001 Final Lab Analysis Completion Date: 11/1/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP016W

Sample Date 10/18/2018

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	EPA 350.3
BICARBONATE	7	SM18-2321
CALCIUM, TOTAL	4.8	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	2	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	310	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	1.2	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	12	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	0.7	EPA 300.0
pH-FIELD (SU)	5.13	FIELD
pH-LAB (SU)	6.25	EPA 150.1
POTASSIUM, TOTAL	0.56 ND	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	3.1	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	61	FIELD
SPEC. COND., LAB (umhos/cm)	52	EPA 120.1
SULFATE	12.3	EPA 300.0
ALKALINITY	7	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	44	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.87	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	1.75	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 100008

Monitoring Point No. CWMP016W

Sample Date 10/18/2018

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 (EDB) (ETHYLENE D	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 WASTE MANAGEMENT

Date Prepared/Revised
11/28/2018

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: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP010W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 2.38 " Longitude: 76 ° 26 ' 57.92 "

Depth to Water Level: 8.61 ft Measured from: Land Surface TOC

Casing Stickup: 2.10 ft Elevation of Water Level: 352.29 ft./MSL

Sampling Depth: 17 ft Volume of Water Column: 7.17 gal

Total Well Depth: 19.6 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 1.5

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

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 10/18/2018 Sample Collection Time: 13:19

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 No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2345236002 Final Lab Analysis Completion Date: 11/1/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP010W

Sample Date 10/18/2018

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	EPA 350.3
BICARBONATE	176	SM18-2321
CALCIUM, TOTAL	36.6	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	199	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	390	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	30.6	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	230	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	3.9	EPA 300.0
pH-FIELD (SU)	6.35	FIELD
pH-LAB (SU)	6.93	EPA 150.1
POTASSIUM, TOTAL	7.2	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	111	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	1105	FIELD
SPEC. COND., LAB (umhos/cm)	1010	EPA 120.1
SULFATE	28.7	EPA 300.0
ALKALINITY	176	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	478	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	5.9	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	2.48	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 100008

Monitoring Point No. CWMP010W

Sample Date 10/18/2018

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 (EDB) (ETHYLENE D	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 WASTE MANAGEMENT



Date Prepared/Revised
11/28/2018

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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: Creswell Landfill

Facility ID (as issued by DEP): 100008

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^o MM' SS.S")

Monitoring Point Number: CWMP009W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 10.82 " Longitude: 76 ° 26 ' 55.8 "

Depth to Water Level: 9.11 ft Measured from: Land Surface TOC

Casing Stickup: 2.70 ft Elevation of Water Level: 395.09 ft./MSL

Sampling Depth: 16 ft Volume of Water Column: 6.91 gal

Total Well Depth: 19.7 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 4.6

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

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 10/18/2018 Sample Collection Time: 13:51

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 No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2345236003 Final Lab Analysis Completion Date: 11/7/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP009W

Sample Date 10/18/2018

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	26.2	EPA 350.3
BICARBONATE	588	SM18-2321
CALCIUM, TOTAL	147	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	106	EPA 410.4
CHLORIDE	529	EPA 300.0
FLUORIDE	0.22	EPA 300.0
IRON, TOTAL (ug/l)	34900	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	73.1	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	12100	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	0.2 ND	EPA 300.0
pH-FIELD (SU)	6.21	FIELD
pH-LAB (SU)	6.42	EPA 150.1
POTASSIUM, TOTAL	33.8	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	167	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	2584	FIELD
SPEC. COND., LAB (umhos/cm)	2580	EPA 120.1
SULFATE	6.7	EPA 300.0
ALKALINITY	588	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	1320	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	33.9	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	93.6	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 100008

Monitoring Point No. CWMP009W

Sample Date 10/18/2018

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	3.7	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	1.6	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 WASTE MANAGEMENT

Date Prepared/Revised
11/28/2018

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: Creswell Landfill

Facility ID (as issued by DEP): 100008

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^o MM' SS.S")

Monitoring Point Number: CWMP008W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 16.97 " Longitude: 76 ° 26 ' 47.58 "

Depth to Water Level: 3.26 ft Measured from: Land Surface TOC

Casing Stickup: 2.80 ft Elevation of Water Level: 419.04 ft./MSL

Sampling Depth: 19 ft Volume of Water Column: 3.19 gal

Total Well Depth: 22.8 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: 6.6

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

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 10/18/2018 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 No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2345236004 Final Lab Analysis Completion Date: 11/7/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP008W

Sample Date 10/18/2018

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	6.15	EPA 350.3
BICARBONATE	483	SM18-2321
CALCIUM, TOTAL	69.2	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	33	EPA 410.4
CHLORIDE	36	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	30100	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	31.4	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	17000	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	0.2 ND	EPA 300.0
pH-FIELD (SU)	6.1	FIELD
pH-LAB (SU)	6.36	EPA 150.1
POTASSIUM, TOTAL	8.3	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	39.4	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	918	FIELD
SPEC. COND., LAB (umhos/cm)	913	EPA 120.1
SULFATE	6.3	EPA 300.0
ALKALINITY	483	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	449	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	10.8	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	69.6	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 100008

Monitoring Point No. CWMP008W

Sample Date 10/18/2018

FORM 19**QUARTERLY AND ANNUAL WATER QUALITY ANALYSES****2-Q. Organics (Enter all data in ug/l)**

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	2.3	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	2.6	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 WASTE MANAGEMENT

Date Prepared/Revised
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SECTION A. APPLICANT IDENTIFIER

Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP018S Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor

Sampling Point: Latitude: 39 ° 56 ' 55.11 " Longitude: 76 ° 26 ' 51.66 "

Depth to Water Level: _____ ft Measured from: Land Surface TOC

Casing Stickup: _____ ft Elevation of Water Level: #Error ft./MSL

Sampling Depth: 0 ft Volume of Water Column: #Error gal

Total Well Depth: _____ ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: _____

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 10/19/2018 Sample Collection Time: 10:14

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 No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2345510001 Final Lab Analysis CompletionDate: 11/2/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP018S

Sample Date 10/19/2018

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	0.119	EPA 350.3
BICARBONATE	326	SM18-2321
CALCIUM, TOTAL	58.8	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	19	EPA 410.4
CHLORIDE	418	EPA 300.0
FLUORIDE	0.5 ND	EPA 300.0
IRON, TOTAL (ug/l)	100	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	65.9	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	33	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	18.8	EPA 300.0
pH-FIELD (SU)	7.99	FIELD
pH-LAB (SU)	8.36	EPA 150.1
POTASSIUM, TOTAL	14.9	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	199	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	1908	FIELD
SPEC. COND., LAB (umhos/cm)	1970	EPA 120.1
SULFATE	34.8	EPA 300.0
ALKALINITY	337	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	1020	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	8.8	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.34	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 100008

Monitoring Point No. CWMP018S

Sample Date 10/19/2018

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 (EDB) (ETHYLENE D	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 WASTE MANAGEMENT

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FORM 19
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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: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP017S Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 20.41 " Longitude: 76 ° 26 ' 45.1 "

Depth to Water Level: _____ ft Measured from: Land Surface TOC

Casing Stickup: _____ ft Elevation of Water Level: #Error ft./MSL

Sampling Depth: 0 ft Volume of Water Column: #Error gal

Total Well Depth: _____ ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: _____

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 10/19/2018 Sample Collection Time: 10:34

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 No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2345510002 Final Lab Analysis CompletionDate: 11/2/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP017S

Sample Date 10/19/2018

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	EPA 350.3
BICARBONATE	384	SM18-2321
CALCIUM, TOTAL	58.6	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	514	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	340	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	83.3	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	140	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	21.1	EPA 300.0
pH-FIELD (SU)	7.61	FIELD
pH-LAB (SU)	8.17	EPA 150.1
POTASSIUM, TOTAL	13.3	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	257	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	2360	FIELD
SPEC. COND., LAB (umhos/cm)	2420	EPA 120.1
SULFATE	51.7	EPA 300.0
ALKALINITY	384	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	1270	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	3.5	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.95	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 100008

Monitoring Point No. CWMP017S

Sample Date 10/19/2018

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 (EDB) (ETHYLENE D	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 WASTE MANAGEMENT

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Applicant/permittee: Lancaster County Solid Waste Mana

Site Name: Creswell Landfill

Facility ID (as issued by DEP): 100008

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: CWMP012W Well Spring Stream Other
 Upgradient/Upstream Downgradient/Downstream

Location (County): Lancaster County

Municipality: Manor Township

Sampling Point: Latitude: 39 ° 57 ' 1.48 " Longitude: 76 ° 26 ' 36.02 "

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

Casing Stickup: 1.90 ft Elevation of Water Level: 317.88 ft./MSL

Sampling Depth: 0 ft Volume of Water Column: 54.46 gal

Total Well Depth: 101.9 ft Sampling Method: Pumped Bailed Grab

Well Purged: Yes No Well Volumes Purged: _____

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

Spring Flow Rate: gpm

Sample Date (mm/dd/yy): 10/19/2018 Sample Collection Time: 12:01

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 No If yes, please explain in comments field.

Lab Accreditation Number(s): 22-293

Lab Sample Number(s): 2345510003 Final Lab Analysis CompletionDate: 11/2/2018

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

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP012W

Sample Date 10/19/2018

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	EPA 350.3
BICARBONATE	75	SM18-2321
CALCIUM, TOTAL	32.2	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	15 ND	EPA 410.4
CHLORIDE	36.6	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	76300	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	9	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	180	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	9.3	EPA 300.0
pH-FIELD (SU)	5.42	FIELD
pH-LAB (SU)	6.66	EPA 150.1
POTASSIUM, TOTAL	1.5	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	13.1	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	391	FIELD
SPEC. COND., LAB (umhos/cm)	316	EPA 120.1
SULFATE	5.2	EPA 300.0
ALKALINITY	75	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	189	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	2.1	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	217	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

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Remaining quarterly samples only require total metals analysis.

I.D. No 100008

Monitoring Point No. CWMP012W

Sample Date 10/19/2018

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 (EDB) (ETHYLENE D	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.

November 2, 2018

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

Certificate of Analysis

Project Name:	2018-CRESWELL	Workorder:	2344348
Purchase Order:	PO1000127	Workorder ID:	4TH QTR 2018 CWMP-FORM 19Q

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Monday, October 15, 2018.

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.

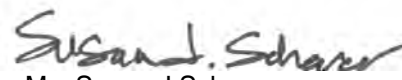
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications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

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

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.


Ms. Susan J Scherer
Project Coordinator

ALS Environmental Laboratory Locations Across North America

Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

SAMPLE SUMMARY

Workorder: 2344348 4TH QTR 2018 CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2344348001	CWMP007W	Ground Water	10/15/2018 11:27	10/15/2018 17:09	Mr. Brian G Shade
2344348002	CWMP001W	Ground Water	10/15/2018 12:42	10/15/2018 17:09	Mr. Brian G Shade
2344348003	CWMP005W	Ground Water	10/15/2018 14:10	10/15/2018 17:09	Mr. Brian G Shade

ALS Environmental Laboratory Locations Across North AmericaCanada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

SAMPLE SUMMARY

Workorder: 2344348 4TH QTR 2018 CWMP-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 performed 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.

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: 2344348 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2344348001** Date Collected: 10/15/2018 11:27 Matrix: Ground Water
Sample ID: **CWMP007W** Date Received: 10/15/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/19/18 02:47	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/19/18 02:47	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 02:47	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 02:47	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 02:47	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 02:47	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 02:47	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/19/18 02:47	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/19/18 02:47	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 02:47	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/19/18 02:47	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/19/18 02:47	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 02:47	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 02:47	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/19/18 02:47	PDK	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	107		%	62 - 133	SW846 8260B			10/19/18 02:47	PDK	G
4-Bromofluorobenzene (S)	96.5		%	79 - 114	SW846 8260B			10/19/18 02:47	PDK	G
Dibromofluoromethane (S)	104		%	78 - 116	SW846 8260B			10/19/18 02:47	PDK	G
Toluene-d8 (S)	98.7		%	76 - 127	SW846 8260B			10/19/18 02:47	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	13		mg/L	5	SM2320B-2011			10/19/18 12:53	MSA	B
Alkalinity, Total	13	2	mg/L	5	SM2320B-2011			10/19/18 12:53	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			10/24/18 20:37	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			10/25/19 15:18	AK	A
Chloride	70.6		mg/L	2.0	EPA 300.0			10/16/18 07:43	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/16/18 07:43	CHW	B
Nitrate-N	10.3		mg/L	0.20	EPA 300.0			10/16/18 07:43	CHW	B
pH	5.84	1	pH_Units		S4500HB-11			10/19/18 12:53	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/18/18 15:21	C_D	10/24/18 06:32	C_D	F
Specific Conductance	361		umhos/cm	1	SW846 9050A			10/19/18 12:53	MSA	B
Sulfate	20.9		mg/L	2.0	EPA 300.0			10/16/18 07:43	CHW	B
Total Dissolved Solids	188		mg/L	5	S2540C-11			10/22/18 11:05	CXI	B
Total Organic Carbon (TOC)	0.69		mg/L	0.50	SW846 9060A			11/1/18 07:40	PAG	D
Turbidity	ND		NTU	0.10	SM2130B-2011			10/17/18 06:46	MSA	B

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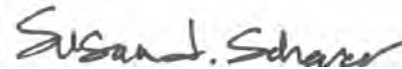
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ANALYTICAL RESULTS

Workorder: 2344348 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2344348001** Date Collected: 10/15/2018 11:27 Matrix: Ground Water
Sample ID: **CWMP007W** Date Received: 10/15/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed By	Cntr	
METALS									
Calcium, Total	36.5		mg/L	0.11	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:44 DAG	J1	
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:44 DAG	J1	
Magnesium, Total	15.0		mg/L	0.11	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:44 DAG	J1	
Manganese, Total	0.017		mg/L	0.0056	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:44 DAG	J1	
Potassium, Total	7.4		mg/L	0.56	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:44 DAG	J1	
Sodium, Total	123		mg/L	0.56	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:44 DAG	J1	
FIELD PARAMETERS									
Depth to Water Level	5.74		Feet		Field		10/15/18 11:27 BGS	C	
Elev Top MW Casing above MSL	453.40		Feet		Field		10/15/18 11:27 BGS	C	
Flow Rate	1.54		gal/min		Field		10/15/18 11:27 BGS	C	
Ground Water Elevation	447.66		ft/MSL		Field		10/15/18 11:27 BGS	C	
pH, Field (SM4500B)	5.08		pH_Units		Field		10/15/18 11:27 BGS	C	
Sample Depth	33.00		Feet		Field		10/15/18 11:27 BGS	C	
Specific Conductance, Field	395		umhos/cm	1	Field		10/15/18 11:27 BGS	C	
Temperature	11.44		Deg. C		Field		10/15/18 11:27 BGS	C	
Total Well Depth	36.50		Feet		Field		10/15/18 11:27 BGS	C	
Volume in Water Column	45.22		Gallons		Field		10/15/18 11:27 BGS	C	
Water Level After Purge	6.51		Feet		Field		10/15/18 11:27 BGS	C	
Well Volumes Purged	2.05		Vol		Field		10/15/18 11:27 BGS	C	



Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2344348 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: 2344348002 **Date Collected:** 10/15/2018 12:42 **Matrix:** Ground Water
Sample ID: CWMP001W **Date Received:** 10/15/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:09	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/19/18 03:09	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 03:09	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 03:09	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:09	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:09	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:09	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:09	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/19/18 03:09	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:09	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:09	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/19/18 03:09	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 03:09	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:09	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/19/18 03:09	PDK	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	108		%	62 - 133	SW846 8260B			10/19/18 03:09	PDK	G
4-Bromofluorobenzene (S)	99.9		%	79 - 114	SW846 8260B			10/19/18 03:09	PDK	G
Dibromofluoromethane (S)	106		%	78 - 116	SW846 8260B			10/19/18 03:09	PDK	G
Toluene-d8 (S)	99		%	76 - 127	SW846 8260B			10/19/18 03:09	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	17		mg/L	5	SM2320B-2011			10/19/18 13:07	MSA	B
Alkalinity, Total	17	2	mg/L	5	SM2320B-2011			10/19/18 13:07	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			10/24/18 20:50	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			10/25/19 15:18	AK	A
Chloride	30.8		mg/L	2.0	EPA 300.0			10/16/18 07:56	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/16/18 07:56	CHW	B
Nitrate-N	18.6		mg/L	1.0	EPA 300.0			10/16/18 08:10	CHW	B
pH	6.07	1	pH_Units		S4500HB-11			10/19/18 13:07	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/18/18 15:21	C_D	10/24/18 06:32	C_D	F
Specific Conductance	277		umhos/cm	1	SW846 9050A			10/19/18 13:07	MSA	B
Sulfate	2.3		mg/L	2.0	EPA 300.0			10/16/18 07:56	CHW	B
Total Dissolved Solids	152		mg/L	5	S2540C-11			10/22/18 11:05	CXI	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	SW846 9060A			11/1/18 13:08	PAG	D
Turbidity	52.6		NTU	0.10	SM2130B-2011			10/17/18 06:46	MSA	B

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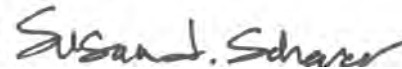
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ANALYTICAL RESULTS

Workorder: 2344348 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2344348002** Date Collected: 10/15/2018 12:42 Matrix: Ground Water
Sample ID: **CWMP001W** Date Received: 10/15/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed By	Cntr
METALS								
Calcium, Total	17.0		mg/L	0.11	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:48 DAG	J1
Iron, Total	2.1		mg/L	0.067	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:48 DAG	J1
Magnesium, Total	11.6		mg/L	0.11	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:48 DAG	J1
Manganese, Total	0.087		mg/L	0.0056	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:48 DAG	J1
Potassium, Total	2.1		mg/L	0.56	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:48 DAG	J1
Sodium, Total	14.8		mg/L	0.56	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:48 DAG	J1
FIELD PARAMETERS								
Depth to Water Level	23.44		Feet		Field		10/15/18 12:53 BGS	C
Elev Top MW Casing above MSL	515.13		Feet		Field		10/15/18 12:53 BGS	C
Flow Rate	2.00		gal/min		Field		10/15/18 12:53 BGS	C
Ground Water Elevation	491.69		ft/MSL		Field		10/15/18 12:53 BGS	C
pH, Field (SM4500B)	5.01		pH_Units		Field		10/15/18 12:53 BGS	C
Sample Depth	57.00		Feet		Field		10/15/18 12:53 BGS	C
Specific Conductance, Field	301		umhos/cm	1	Field		10/15/18 12:53 BGS	C
Temperature	11.37		Deg. C		Field		10/15/18 12:53 BGS	C
Total Well Depth	66.30		Feet		Field		10/15/18 12:53 BGS	C
Volume in Water Column	63.00		Gallons		Field		10/15/18 12:53 BGS	C
Water Level After Purge	46.58		Feet		Field		10/15/18 12:53 BGS	C
Well Volumes Purged	1.90		Vol		Field		10/15/18 12:53 BGS	C



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ANALYTICAL RESULTS

Workorder: 2344348 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2344348003** Date Collected: 10/15/2018 14:10 Matrix: Ground Water
Sample ID: **CWMP005W** Date Received: 10/15/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:32	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/19/18 03:32	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 03:32	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 03:32	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:32	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:32	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:32	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:32	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/19/18 03:32	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:32	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:32	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/19/18 03:32	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 03:32	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 03:32	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/19/18 03:32	PDK	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	108		%	62 - 133	SW846 8260B			10/19/18 03:32	PDK	G
4-Bromofluorobenzene (S)	98.9		%	79 - 114	SW846 8260B			10/19/18 03:32	PDK	G
Dibromofluoromethane (S)	109		%	78 - 116	SW846 8260B			10/19/18 03:32	PDK	G
Toluene-d8 (S)	99.5		%	76 - 127	SW846 8260B			10/19/18 03:32	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	18		mg/L	5	SM2320B-2011			10/19/18 13:16	MSA	B
Alkalinity, Total	18	2	mg/L	5	SM2320B-2011			10/19/18 13:16	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			10/24/18 21:03	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			10/25/19 15:18	AK	A
Chloride	67.4		mg/L	2.0	EPA 300.0			10/16/18 08:23	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/16/18 08:23	CHW	B
Nitrate-N	9.6		mg/L	0.20	EPA 300.0			10/16/18 08:23	CHW	B
pH	6.09	1	pH_Units		S4500HB-11			10/19/18 13:16	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/18/18 15:21	C_D	10/24/18 06:32	C_D	F
Specific Conductance	310		umhos/cm	1	SW846 9050A			10/19/18 13:16	MSA	B
Sulfate	2.9		mg/L	2.0	EPA 300.0			10/16/18 08:23	CHW	B
Total Dissolved Solids	192		mg/L	5	S2540C-11			10/22/18 11:05	CXI	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	SW846 9060A			11/1/18 13:08	PAG	D
Turbidity	0.12		NTU	0.10	SM2130B-2011			10/17/18 06:46	MSA	B

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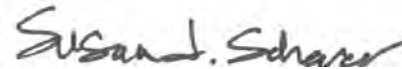
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ANALYTICAL RESULTS

Workorder: 2344348 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2344348003** Date Collected: 10/15/2018 14:10 Matrix: Ground Water
Sample ID: **CWMP005W** Date Received: 10/15/2018 17:09

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed By	Cntr
METALS								
Calcium, Total	14.5		mg/L	0.11	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:51 DAG	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:51 DAG	J1
Magnesium, Total	7.8		mg/L	0.11	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:51 DAG	J1
Manganese, Total	0.051		mg/L	0.0056	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:51 DAG	J1
Potassium, Total	1.8		mg/L	0.56	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:51 DAG	J1
Sodium, Total	31.7		mg/L	0.56	SW846 6010C	10/19/18 10:30 BMK	10/24/18 10:51 DAG	J1
FIELD PARAMETERS								
Depth to Water Level	34.95		Feet		Field		10/15/18 14:10 BGS	C
Elev Top MW Casing above MSL	513.43		Feet		Field		10/15/18 14:10 BGS	C
Flow Rate	4.00		gal/min		Field		10/15/18 14:10 BGS	C
Ground Water Elevation	478.48		ft/MSL		Field		10/15/18 14:10 BGS	C
pH, Field (SM4500B)	4.73		pH_Units		Field		10/15/18 14:10 BGS	C
Sample Depth	130.00		Feet		Field		10/15/18 14:10 BGS	C
Specific Conductance, Field	335		umhos/cm	1	Field		10/15/18 14:10 BGS	C
Temperature	10.91		Deg. C		Field		10/15/18 14:10 BGS	C
Total Well Depth	138.92		Feet		Field		10/15/18 14:10 BGS	C
Volume in Water Column	152.84		Gallons		Field		10/15/18 14:10 BGS	C
Water Level After Purge	36.70		Feet		Field		10/15/18 14:10 BGS	C
Well Volumes Purged	1.83		Vol		Field		10/15/18 14:10 BGS	C



Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2344348 4TH QTR 2018 CWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2344348001	1	CWMP007W	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.				
2344348001	2	CWMP007W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2344348002	1	CWMP001W	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.				
2344348002	2	CWMP001W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2344348003	1	CWMP005W	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.				
2344348003	2	CWMP005W	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: 2344348 4TH QTR 2018 CWMP-FORM 19Q

Lab ID	Sample ID	Analysis Method	Prep Method
2344348001	CWMP007W	D6919-09	
2344348001	CWMP007W	EPA 300.0	
2344348001	CWMP007W	EPA 410.4	
2344348001	CWMP007W	Field	
2344348001	CWMP007W	S2540C-11	
2344348001	CWMP007W	S4500HB-11	
2344348001	CWMP007W	SM2130B-2011	
2344348001	CWMP007W	SM2320B-2011	
2344348001	CWMP007W	SW846 6010C	SW846 3015
2344348001	CWMP007W	SW846 8260B	
2344348001	CWMP007W	SW846 9050A	
2344348001	CWMP007W	SW846 9060A	
2344348001	CWMP007W	SW846 9066	420.4/9066
2344348002	CWMP001W	D6919-09	
2344348002	CWMP001W	EPA 300.0	
2344348002	CWMP001W	EPA 410.4	
2344348002	CWMP001W	Field	
2344348002	CWMP001W	S2540C-11	
2344348002	CWMP001W	S4500HB-11	
2344348002	CWMP001W	SM2130B-2011	
2344348002	CWMP001W	SM2320B-2011	
2344348002	CWMP001W	SW846 6010C	SW846 3015
2344348002	CWMP001W	SW846 8260B	
2344348002	CWMP001W	SW846 9050A	
2344348002	CWMP001W	SW846 9060A	
2344348002	CWMP001W	SW846 9066	420.4/9066
2344348003	CWMP005W	D6919-09	
2344348003	CWMP005W	EPA 300.0	
2344348003	CWMP005W	EPA 410.4	
2344348003	CWMP005W	Field	
2344348003	CWMP005W	S2540C-11	
2344348003	CWMP005W	S4500HB-11	
2344348003	CWMP005W	SM2130B-2011	
2344348003	CWMP005W	SM2320B-2011	
2344348003	CWMP005W	SW846 6010C	SW846 3015
2344348003	CWMP005W	SW846 8260B	
2344348003	CWMP005W	SW846 9050A	
2344348003	CWMP005W	SW846 9060A	
2344348003	CWMP005W	SW846 9066	420.4/9066

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**CHAIN OF CUSTODY/
 REQUEST FOR ANALYSIS**
**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#: Creswell/GWMP Form 19Q Wells
Bill To: Lancaster County Solid Waste MA

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

Date Required: _____ **Approved By:** _____
Email? Y N **mreider@LCSWMA.com**
Fax? Y N **(717) 397-3973**

Sample Description/Location (as it will appear on the lab report)	Sample Date		Matrix	Enter Number of Containers Per Sample or Field Results Below.										Field Measurements	Sample Depth for ALX Data	Total Metals: Ca, Fe, Mn, Mg, K, Na	pH, NO3, Cl, F, SPC, SO4, Turb.	TDS	Alkalinity, HCO3	
	Time	Date		1	2	3	4	5	6	7	8	9	10							
1. CWMP007W	11:27	10-15-18	GW	2	1	1	2	X	X	1	1	1	1	1	1	1	1	1	1	1
2. CWMP008W	13:42	10-15-18	GW	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3. CWMP005W	14:10	10-15-18	GW	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Project Comments: _____

Relinquished By / Company Name: ALS **Date:** 10-15-18 **Time:** 17:09
Received By / Company Name: _____ **Date:** 10-18-18 **Time:** 17:09

LOGGED BY (signature): _____ **REVIEWED BY (signature):** _____

ALS Field Services: Pickup Labor
 Composite_Sampling Rental_Equipment
 Other: _____

Special Processing: USACE Navy
 Reportable to PADEP? Yes No
 Sample Disposal: Lab Special
 State Samples Collected In: NY NJ PA NC

Cooler Temp: 3 **Therm ID:** 35
No. of Coolers: Y N **id by Receiving Lab:** _____

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

Count/Tracking #: _____ **Sample/COC Comments:** _____

October 30, 2018

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

Certificate of Analysis

Project Name:	2018-CRESWELL	Workorder:	2344533
Purchase Order:	PO1000127	Workorder ID:	4TH QTR 2018 CWMP-FORM 19Q

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, October 16, 2018.

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.

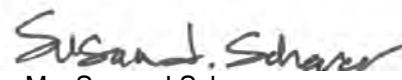
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications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

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

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.


Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 2344533 4TH QTR 2018 CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2344533001	CWMP002W	Ground Water	10/16/2018 12:35	10/16/2018 16:39	Mr. Brian G Shade
2344533002	CWMP004W	Ground Water	10/16/2018 14:16	10/16/2018 16:39	Mr. Brian G Shade
2344533003	CWMP003W	Ground Water	10/16/2018 14:18	10/16/2018 16:39	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2344533 4TH QTR 2018 CWMP-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 performed 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.

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: 2344533 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: 2344533001	Date Collected: 10/16/2018 12:35	Matrix: Ground Water
Sample ID: CWMP002W	Date Received: 10/16/2018 16:39	

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Bromoform	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Bromomethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Chloroethane	17.7		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Chloroform	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Chloromethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
1,1-Dichloroethane	7.5		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			10/18/18 16:34	DD	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Styrene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/18/18 16:34	DD	G
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			10/18/18 16:34	DD	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			10/18/18 16:34	DD	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/18/18 16:34	DD	G
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr

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ANALYTICAL RESULTS

Workorder: 2344533 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: 2344533001 **Date Collected:** 10/16/2018 12:35 **Matrix:** Ground Water
Sample ID: CWMP002W **Date Received:** 10/16/2018 16:39

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	85.7		%	62 - 133	SW846 8260B			10/18/18 16:34	DD	G
4-Bromofluorobenzene (S)	92.1		%	79 - 114	SW846 8260B			10/18/18 16:34	DD	G
Dibromofluoromethane (S)	79.4		%	78 - 116	SW846 8260B			10/18/18 16:34	DD	G
Toluene-d8 (S)	82.4		%	76 - 127	SW846 8260B			10/18/18 16:34	DD	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	73		mg/L	5	SM2320B-2011			10/22/18 10:49	MSA	B
Alkalinity, Total	73	3	mg/L	5	SM2320B-2011			10/22/18 10:49	MSA	B
Ammonia-N	0.120		mg/L	0.100	D6919-09			10/24/18 15:50	CMM	A
Chemical Oxygen Demand (COD)	20		mg/L	15	EPA 410.4			10/23/18 16:45	AK	A
Chloride	128		mg/L	2.0	EPA 300.0			10/17/18 08:32	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/17/18 08:32	CHW	B
Nitrate-N	3.3		mg/L	0.20	EPA 300.0			10/17/18 08:32	CHW	B
pH	6.01	1	pH_Units		S4500HB-11			10/19/18 15:54	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/18/18 15:21	C_D	10/24/18 06:32	C_D	F
Specific Conductance	631		umhos/cm	1	SW846 9050A			10/19/18 15:54	MSA	B
Sulfate	23.5		mg/L	2.0	EPA 300.0			10/17/18 08:32	CHW	B
Total Dissolved Solids	351	2	mg/L	5	S2540C-11			10/22/18 13:35	CXI	B
Total Organic Carbon (TOC)	6.3		mg/L	0.50	SW846 9060A			10/30/18 06:28	PAG	D
Turbidity	0.11		NTU	0.10	SM2130B-2011			10/17/18 06:46	MSA	B
METALS										
Calcium, Total	56.8		mg/L	0.11	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:03	DAG	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:03	DAG	J1
Magnesium, Total	18.2		mg/L	0.11	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:03	DAG	J1
Manganese, Total	1.2		mg/L	0.0056	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:03	DAG	J1
Potassium, Total	2.6		mg/L	0.56	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:03	DAG	J1
Sodium, Total	24.0		mg/L	0.56	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:03	DAG	J1
FIELD PARAMETERS										
Depth to Water Level	69.31		Feet		Field			10/16/18 12:35	BGS	C
Elev Top MW Casing above MSL	525.81		Feet		Field			10/16/18 12:35	BGS	C
Ground Water Elevation	456.50		ft/MSL		Field			10/16/18 12:35	BGS	C
pH, Field (SM4500B)	5.82		pH_Units		Field			10/16/18 12:35	BGS	C
Sample Depth	85.00		Feet		Field			10/16/18 12:35	BGS	C
Specific Conductance, Field	619		umhos/cm	1	Field			10/16/18 12:35	BGS	C
Temperature	9.73		Deg. C		Field			10/16/18 12:35	BGS	C
Total Well Depth	100.00		Feet		Field			10/16/18 12:35	BGS	C

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ANALYTICAL RESULTS

Workorder: 2344533 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2344533001** Date Collected: 10/16/2018 12:35 Matrix: Ground Water
 Sample ID: **CWMP002W** Date Received: 10/16/2018 16:39

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed By	Cntr
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Susan J. Scherer
 Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2344533 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: 2344533002	Date Collected: 10/16/2018 14:16	Matrix: Ground Water
Sample ID: CWMP004W	Date Received: 10/16/2018 16:39	

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Bromoform	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Bromomethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Chloroethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Chloroform	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Chloromethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			10/18/18 16:56	DD	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Styrene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/18/18 16:56	DD	G
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			10/18/18 16:56	DD	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			10/18/18 16:56	DD	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/18/18 16:56	DD	G
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr

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ANALYTICAL RESULTS

Workorder: 2344533 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: 2344533002 **Date Collected:** 10/16/2018 14:16 **Matrix:** Ground Water
Sample ID: CWMP004W **Date Received:** 10/16/2018 16:39

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	86.6		%	62 - 133	SW846 8260B			10/18/18 16:56	DD	G
4-Bromofluorobenzene (S)	94.7		%	79 - 114	SW846 8260B			10/18/18 16:56	DD	G
Dibromofluoromethane (S)	79.6		%	78 - 116	SW846 8260B			10/18/18 16:56	DD	G
Toluene-d8 (S)	82.8		%	76 - 127	SW846 8260B			10/18/18 16:56	DD	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	27		mg/L	5	SM2320B-2011			10/22/18 10:57	MSA	B
Alkalinity, Total	27	3	mg/L	5	SM2320B-2011			10/22/18 10:57	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			10/22/18 13:13	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			10/23/18 16:45	AK	A
Chloride	55.4		mg/L	2.0	EPA 300.0			10/17/18 08:45	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/17/18 08:45	CHW	B
Nitrate-N	6.4		mg/L	0.20	EPA 300.0			10/17/18 08:45	CHW	B
pH	6.34	1	pH_Units		S4500HB-11			10/19/18 16:03	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/18/18 15:21	C_D	10/24/18 06:32	C_D	F
Specific Conductance	276		umhos/cm	1	SW846 9050A			10/19/18 16:03	MSA	B
Sulfate	5.7		mg/L	2.0	EPA 300.0			10/17/18 08:45	CHW	B
Total Dissolved Solids	175	2	mg/L	5	S2540C-11			10/22/18 13:35	CXI	B
Total Organic Carbon (TOC)	0.95		mg/L	0.50	SW846 9060A			10/30/18 06:28	PAG	D
Turbidity	ND		NTU	0.10	SM2130B-2011			10/17/18 06:46	MSA	B
METALS										
Calcium, Total	21.8		mg/L	0.11	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:06	DAG	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:06	DAG	J1
Magnesium, Total	7.4		mg/L	0.11	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:06	DAG	J1
Manganese, Total	0.0067		mg/L	0.0056	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:06	DAG	J1
Potassium, Total	1.1		mg/L	0.56	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:06	DAG	J1
Sodium, Total	18.3		mg/L	0.56	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:06	DAG	J1
FIELD PARAMETERS										
Depth to Water Level	60.22		Feet		Field			10/16/18 14:16	BGS	C
Elev Top MW Casing above MSL	529.53		Feet		Field			10/16/18 14:16	BGS	C
Ground Water Elevation	469.31		ft/MSL		Field			10/16/18 14:16	BGS	C
pH, Field (SM4500B)	5.56		pH_Units		Field			10/16/18 14:16	BGS	C
Sample Depth	130.00		Feet		Field			10/16/18 14:16	BGS	C
Specific Conductance, Field	297		umhos/cm	1	Field			10/16/18 14:16	BGS	C
Temperature	11.83		Deg. C		Field			10/16/18 14:16	BGS	C
Total Well Depth	140.00		Feet		Field			10/16/18 14:16	BGS	C

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ANALYTICAL RESULTS

Workorder: 2344533 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2344533002** Date Collected: 10/16/2018 14:16 Matrix: Ground Water
 Sample ID: **CWMP004W** Date Received: 10/16/2018 16:39

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed By	Cntr
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Susan J. Scherer
 Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2344533 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: 2344533003 **Date Collected:** 10/16/2018 14:18 **Matrix:** Ground Water
Sample ID: CWMP003W **Date Received:** 10/16/2018 16:39

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Bromoform	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Bromomethane	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Chloroethane	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Chloroform	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Chloromethane	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
1,1-Dichloroethane	1.4		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			10/18/18 17:17	DD	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Styrene	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/18/18 17:17	DD	G
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			10/18/18 17:17	DD	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			10/18/18 17:17	DD	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/18/18 17:17	DD	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>

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ANALYTICAL RESULTS

Workorder: 2344533 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: 2344533003 **Date Collected:** 10/16/2018 14:18 **Matrix:** Ground Water
Sample ID: CWMP003W **Date Received:** 10/16/2018 16:39

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	87.5		%	62 - 133	SW846 8260B			10/18/18 17:17	DD	G
4-Bromofluorobenzene (S)	93.8		%	79 - 114	SW846 8260B			10/18/18 17:17	DD	G
Dibromofluoromethane (S)	81.9		%	78 - 116	SW846 8260B			10/18/18 17:17	DD	G
Toluene-d8 (S)	82.8		%	76 - 127	SW846 8260B			10/18/18 17:17	DD	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	16		mg/L	5	SM2320B-2011			10/22/18 11:06	MSA	B
Alkalinity, Total	16	3	mg/L	5	SM2320B-2011			10/22/18 11:06	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			10/22/18 13:27	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			10/23/18 16:45	AK	A
Chloride	109		mg/L	2.0	EPA 300.0			10/17/18 10:19	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/17/18 10:19	CHW	B
Nitrate-N	10.6		mg/L	0.20	EPA 300.0			10/17/18 10:19	CHW	B
pH	5.99	1	pH_Units		S4500HB-11			10/19/18 16:48	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/18/18 15:21	C_D	10/24/18 06:32	C_D	F
Specific Conductance	477		umhos/cm	1	SW846 9050A			10/19/18 16:48	MSA	B
Sulfate	6.2		mg/L	2.0	EPA 300.0			10/17/18 10:19	CHW	B
Total Dissolved Solids	247	2	mg/L	5	S2540C-11			10/22/18 13:35	CXI	B
Total Organic Carbon (TOC)	0.65		mg/L	0.50	SW846 9060A			10/30/18 06:28	PAG	D
Turbidity	ND		NTU	0.10	SM2130B-2011			10/17/18 06:46	MSA	B
METALS										
Calcium, Total	33.9		mg/L	0.11	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:09	DAG	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:09	DAG	J1
Magnesium, Total	12.2		mg/L	0.11	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:09	DAG	J1
Manganese, Total	0.0062		mg/L	0.0056	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:09	DAG	J1
Potassium, Total	1.6		mg/L	0.56	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:09	DAG	J1
Sodium, Total	26.5		mg/L	0.56	SW846 6010C	10/18/18 10:10	BMK	10/24/18 10:09	DAG	J1
FIELD PARAMETERS										
Depth to Water Level	89.50		Feet		Field			10/16/18 14:18	BGS	C
Elev Top MW Casing above MSL	524.21		Feet		Field			10/16/18 14:18	BGS	C
Ground Water Elevation	434.71		ft/MSL		Field			10/16/18 14:18	BGS	C
pH, Field (SM4500B)	5.44		pH_Units		Field			10/16/18 14:18	BGS	C
Sample Depth	100.00		Feet		Field			10/16/18 14:18	BGS	C
Specific Conductance, Field	464		umhos/cm	1	Field			10/16/18 14:18	BGS	C
Temperature	12.15		Deg. C		Field			10/16/18 14:18	BGS	C
Total Well Depth	140.00		Feet		Field			10/16/18 14:18	BGS	C

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ANALYTICAL RESULTS

Workorder: 2344533 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2344533003** Date Collected: 10/16/2018 14:18 Matrix: Ground Water
 Sample ID: **CWMP003W** Date Received: 10/16/2018 16:39

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed By	Cntr
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Susan J. Scherer
 Ms. Susan J Scherer
 Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2344533 4TH QTR 2018 CWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2344533001	1	CWMP002W	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.				
2344533001	2	CWMP002W	S2540C-11	Total Dissolved Solids
The method blank associated with the sample was recovered at 15 mg/L. The method reporting limit for this analysis is <5 mg/L. A bias may exist with the result.				
2344533001	3	CWMP002W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2344533002	1	CWMP004W	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.				
2344533002	2	CWMP004W	S2540C-11	Total Dissolved Solids
The method blank associated with the sample was recovered at 15 mg/L. The method reporting limit for this analysis is <5 mg/L. A bias may exist with the result.				
2344533002	3	CWMP004W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2344533003	1	CWMP003W	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.				
2344533003	2	CWMP003W	S2540C-11	Total Dissolved Solids
The method blank associated with the sample was recovered at 15 mg/L. The method reporting limit for this analysis is <5 mg/L. A bias may exist with the result.				
2344533003	3	CWMP003W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 2344533 4TH QTR 2018 CWMP-FORM 19Q

Lab ID	Sample ID	Analysis Method	Prep Method
2344533001	CWMP002W	D6919-09	
2344533001	CWMP002W	EPA 300.0	
2344533001	CWMP002W	EPA 410.4	
2344533001	CWMP002W	Field	
2344533001	CWMP002W	S2540C-11	
2344533001	CWMP002W	S4500HB-11	
2344533001	CWMP002W	SM2130B-2011	
2344533001	CWMP002W	SM2320B-2011	
2344533001	CWMP002W	SW846 6010C	SW846 3015
2344533001	CWMP002W	SW846 8260B	
2344533001	CWMP002W	SW846 9050A	
2344533001	CWMP002W	SW846 9060A	
2344533001	CWMP002W	SW846 9066	420.4/9066
2344533002	CWMP004W	D6919-09	
2344533002	CWMP004W	EPA 300.0	
2344533002	CWMP004W	EPA 410.4	
2344533002	CWMP004W	Field	
2344533002	CWMP004W	S2540C-11	
2344533002	CWMP004W	S4500HB-11	
2344533002	CWMP004W	SM2130B-2011	
2344533002	CWMP004W	SM2320B-2011	
2344533002	CWMP004W	SW846 6010C	SW846 3015
2344533002	CWMP004W	SW846 8260B	
2344533002	CWMP004W	SW846 9050A	
2344533002	CWMP004W	SW846 9060A	
2344533002	CWMP004W	SW846 9066	420.4/9066
2344533003	CWMP003W	D6919-09	
2344533003	CWMP003W	EPA 300.0	
2344533003	CWMP003W	EPA 410.4	
2344533003	CWMP003W	Field	
2344533003	CWMP003W	S2540C-11	
2344533003	CWMP003W	S4500HB-11	
2344533003	CWMP003W	SM2130B-2011	
2344533003	CWMP003W	SM2320B-2011	
2344533003	CWMP003W	SW846 6010C	SW846 3015
2344533003	CWMP003W	SW846 8260B	
2344533003	CWMP003W	SW846 9050A	
2344533003	CWMP003W	SW846 9060A	
2344533003	CWMP003W	SW846 9066	420.4/9066

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**CHAIN OF CUSTODY/
 REQUEST FOR ANALYSIS**
**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#: Creswell/GWMP Form 19Q Wells
 Bill To: Lancaster County Solid Waste MA

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

Date Required: _____ Approved By: _____

Email? Y mreider@LCSWMA.com

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

Sample Description/Location (as it will appear on the lab report)

Sample Date Time

1. CWMP002W 10-16-18 1235

2. CWMP004W 1416

3. CWMP003W 1416

4.

5.

6.

7.

8.

9.

10.

Project Comments:

LOGGED BY (signature): [Signature]

REVIEWED BY (signature): [Signature]

Relinquished By / Company Name: [Signature] ALS

Date Time Received By / Company Name

1. 10-16-18 1639 2 [Signature]

3. 4

5. 6

7. 8

9. 10

Receiving Lab) 58

Therm ID: 6C

No. of Coolers: 1

Custody Seals Present?

(if present) Seals Intact?

Received on Ice?

CO Labels Complete/Accurate?

Cont. in Good Cond.?

Correct Containers?

Correct Sample Volumes?

Correct Preservation?

Headspace/Volatiles?

Counter/Tracking #: _____

Sample/COC Comments

ALS Field Services: Pickup Labor

Composite_Sampling Rental_Equipment

Other:

Standard

CLP-like

USACE

USACE

Navy

State Samples Collected In NY NJ PA NC

Reportable to PADEP? Yes No

Sample Disposal Lab Special

PWSID # _____

EDDS: Format Type _____

**Matrix - A=Air; DW=Drinking Water; GW=Groundwater; O=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

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

November 9, 2018

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

Certificate of Analysis

Project Name:	2018-CRESWELL	Workorder:	2345236
Purchase Order:	PO1000127	Workorder ID:	4TH QTR 2018 CWMP-FORM 19Q

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Thursday, October 18, 2018.

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.

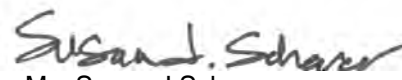
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications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

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

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.


Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 2345236 4TH QTR 2018 CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2345236001	CWMP016W	Ground Water	10/18/2018 11:57	10/18/2018 16:51	Mr. Brian G Shade
2345236002	CWMP010W	Ground Water	10/18/2018 13:19	10/18/2018 16:51	Mr. Brian G Shade
2345236003	CWMP009W	Ground Water	10/18/2018 13:51	10/18/2018 16:51	Mr. Brian G Shade
2345236004	CWMP008W	Ground Water	10/18/2018 14:25	10/18/2018 16:51	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2345236 4TH QTR 2018 CWMP-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 performed 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.

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: 2345236 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345236001** Date Collected: 10/18/2018 11:57 Matrix: Ground Water
Sample ID: **CWMP016W** Date Received: 10/18/2018 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:11	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/19/18 23:11	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 23:11	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 23:11	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:11	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:11	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:11	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:11	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/19/18 23:11	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:11	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:11	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/19/18 23:11	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 23:11	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:11	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/19/18 23:11	PDK	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	86.4		%	62 - 133	SW846 8260B			10/19/18 23:11	PDK	G
4-Bromofluorobenzene (S)	93.3		%	79 - 114	SW846 8260B			10/19/18 23:11	PDK	G
Dibromofluoromethane (S)	78.1		%	78 - 116	SW846 8260B			10/19/18 23:11	PDK	G
Toluene-d8 (S)	82.6		%	76 - 127	SW846 8260B			10/19/18 23:11	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	7		mg/L	5	SM2320B-2011			10/24/18 10:22	MSA	B
Alkalinity, Total	7	2	mg/L	5	SM2320B-2011			10/24/18 10:22	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			10/25/18 12:18	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			10/26/18 18:37	AK	A
Chloride	2.0		mg/L	2.0	EPA 300.0			10/19/18 14:26	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/19/18 14:26	CHW	B
Nitrate-N	0.70		mg/L	0.20	EPA 300.0			10/19/18 14:26	CHW	B
pH	6.25	1	pH_Units		S4500HB-11			10/24/18 10:22	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/24/18 09:04	C_D	10/24/18 06:32	C_D	F
Specific Conductance	52		umhos/cm	1	SW846 9050A			10/24/18 10:22	MSA	B
Sulfate	12.3		mg/L	2.0	EPA 300.0			10/19/18 14:26	CHW	B
Total Dissolved Solids	44		mg/L	5	S2540C-11			10/24/18 14:30	CXI	B
Total Organic Carbon (TOC)	0.87		mg/L	0.50	SW846 9060A			11/1/18 18:08	PAG	D
Turbidity	1.75		NTU	0.10	SM2130B-2011			10/20/18 08:32	MSA	B

ALS Environmental Laboratory Locations Across North America

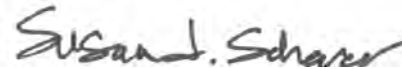
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ANALYTICAL RESULTS

Workorder: 2345236 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345236001** Date Collected: 10/18/2018 11:57 Matrix: Ground Water
Sample ID: **CWMP016W** Date Received: 10/18/2018 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	4.8		mg/L	0.11	SW846 6010C	10/22/18 11:55	BMK	10/24/18 10:54	DAG	J1
Iron, Total	0.31		mg/L	0.067	SW846 6010C	10/22/18 11:55	BMK	10/24/18 10:54	DAG	J1
Magnesium, Total	1.2		mg/L	0.11	SW846 6010C	10/22/18 11:55	BMK	10/24/18 10:54	DAG	J1
Manganese, Total	0.012		mg/L	0.0056	SW846 6010C	10/22/18 11:55	BMK	10/24/18 10:54	DAG	J1
Potassium, Total	ND		mg/L	0.56	SW846 6010C	10/22/18 11:55	BMK	10/24/18 10:54	DAG	J1
Sodium, Total	3.1		mg/L	0.56	SW846 6010C	10/22/18 11:55	BMK	10/24/18 10:54	DAG	J1
FIELD PARAMETERS										
Depth to Water Level	9.08		Feet		Field			10/18/18 11:57	BGS	C
Elev Top MW Casing above MSL	311.97		Feet		Field			10/18/18 11:57	BGS	C
Flow Rate	2.34		gal/min		Field			10/18/18 11:57	BGS	C
Ground Water Elevation	302.89		ft/MSL		Field			10/18/18 11:57	BGS	C
pH, Field (SM4500B)	5.13		pH_Units		Field			10/18/18 11:57	BGS	C
Sample Depth	71.00		Feet		Field			10/18/18 11:57	BGS	C
Specific Conductance, Field	61		umhos/cm	1	Field			10/18/18 11:57	BGS	C
Temperature	9.94		Deg. C		Field			10/18/18 11:57	BGS	C
Total Well Depth	73.52		Feet		Field			10/18/18 11:57	BGS	C
Volume in Water Column	94.73		Gallons		Field			10/18/18 11:57	BGS	C
Water Level After Purge	18.71		Feet		Field			10/18/18 11:57	BGS	C
Well Volumes Purged	1.48		Vol		Field			10/18/18 11:57	BGS	C



Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2345236 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345236002** Date Collected: 10/18/2018 13:19 Matrix: Ground Water
Sample ID: **CWMP010W** Date Received: 10/18/2018 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:33	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/19/18 23:33	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 23:33	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 23:33	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:33	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:33	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:33	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:33	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/19/18 23:33	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:33	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:33	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/19/18 23:33	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 23:33	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:33	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/19/18 23:33	PDK	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	90.2		%	62 - 133	SW846 8260B			10/19/18 23:33	PDK	G
4-Bromofluorobenzene (S)	95.8		%	79 - 114	SW846 8260B			10/19/18 23:33	PDK	G
Dibromofluoromethane (S)	81		%	78 - 116	SW846 8260B			10/19/18 23:33	PDK	G
Toluene-d8 (S)	84.3		%	76 - 127	SW846 8260B			10/19/18 23:33	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	176		mg/L	5	SM2320B-2011			10/24/18 10:45	MSA	I
Alkalinity, Total	176	2	mg/L	5	SM2320B-2011			10/24/18 10:45	MSA	I
Ammonia-N	ND		mg/L	0.100	D6919-09			10/25/18 12:33	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			10/26/18 18:37	AK	A
Chloride	199		mg/L	10.0	EPA 300.0			10/19/18 12:28	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/19/18 12:11	CHW	B
Nitrate-N	3.9		mg/L	0.20	EPA 300.0			10/19/18 12:11	CHW	B
pH	6.93	1	pH_Units		S4500HB-11			10/24/18 10:45	MSA	I
Phenolics	ND		mg/L	0.005	SW846 9066	10/24/18 09:04	C_D	10/24/18 06:32	C_D	F
Specific Conductance	1010		umhos/cm	1	SW846 9050A			10/24/18 10:45	MSA	I
Sulfate	28.7		mg/L	2.0	EPA 300.0			10/19/18 12:11	CHW	B
Total Dissolved Solids	478		mg/L	5	S2540C-11			10/24/18 14:30	CXI	B
Total Organic Carbon (TOC)	5.9		mg/L	0.50	SW846 9060A			11/1/18 18:08	PAG	D
Turbidity	2.48		NTU	0.10	SM2130B-2011			10/20/18 08:32	MSA	B

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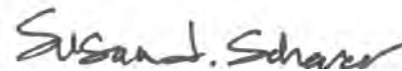
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ANALYTICAL RESULTS

Workorder: 2345236 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345236002** Date Collected: 10/18/2018 13:19 Matrix: Ground Water
Sample ID: **CWMP010W** Date Received: 10/18/2018 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	36.6		mg/L	0.11	SW846 6010C	10/22/18 11:55	BMK	10/24/18 11:04	DAG	J1
Iron, Total	0.39		mg/L	0.067	SW846 6010C	10/22/18 11:55	BMK	10/24/18 11:04	DAG	J1
Magnesium, Total	30.6		mg/L	0.11	SW846 6010C	10/22/18 11:55	BMK	10/24/18 11:04	DAG	J1
Manganese, Total	0.23		mg/L	0.0056	SW846 6010C	10/22/18 11:55	BMK	10/24/18 11:04	DAG	J1
Potassium, Total	7.2		mg/L	0.56	SW846 6010C	10/22/18 11:55	BMK	10/24/18 11:04	DAG	J1
Sodium, Total	111		mg/L	0.56	SW846 6010C	10/22/18 11:55	BMK	10/24/18 11:04	DAG	J1
FIELD PARAMETERS										
Depth to Water Level	8.61		Feet		Field			10/18/18 13:19	BGS	C
Elev Top MW Casing above MSL	360.90		Feet		Field			10/18/18 13:19	BGS	C
Flow Rate	1.06		gal/min		Field			10/18/18 13:19	BGS	C
Ground Water Elevation	352.29		ft/MSL		Field			10/18/18 13:19	BGS	C
pH, Field (SM4500B)	6.35		pH_Units		Field			10/18/18 13:19	BGS	C
Sample Depth	17.00		Feet		Field			10/18/18 13:19	BGS	C
Specific Conductance, Field	1105		umhos/cm	1	Field			10/18/18 13:19	BGS	C
Temperature	14.20		Deg. C		Field			10/18/18 13:19	BGS	C
Total Well Depth	19.60		Feet		Field			10/18/18 13:19	BGS	C
Volume in Water Column	7.14		Gallons		Field			10/18/18 13:19	BGS	C
Water Level After Purge	16.51		Feet		Field			10/18/18 13:19	BGS	C
Well Volumes Purged	1.48		Vol		Field			10/18/18 13:19	BGS	C



Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2345236 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345236003** Date Collected: 10/18/2018 13:51 Matrix: Ground Water
Sample ID: **CWMP009W** Date Received: 10/18/2018 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	3.7		ug/L	1.0	SW846 8260B			10/19/18 23:55	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/19/18 23:55	PDK	G
1,1-Dichloroethane	1.6		ug/L	1.0	SW846 8260B			10/19/18 23:55	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 23:55	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:55	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:55	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:55	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:55	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/19/18 23:55	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:55	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:55	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/19/18 23:55	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/19/18 23:55	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/19/18 23:55	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/19/18 23:55	PDK	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	89.6		%	62 - 133	SW846 8260B			10/19/18 23:55	PDK	G
4-Bromofluorobenzene (S)	97		%	79 - 114	SW846 8260B			10/19/18 23:55	PDK	G
Dibromofluoromethane (S)	81.6		%	78 - 116	SW846 8260B			10/19/18 23:55	PDK	G
Toluene-d8 (S)	82		%	76 - 127	SW846 8260B			10/19/18 23:55	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	588		mg/L	5	SM2320B-2011			10/24/18 10:59	MSA	B
Alkalinity, Total	588	2	mg/L	5	SM2320B-2011			10/24/18 10:59	MSA	B
Ammonia-N	26.2		mg/L	0.100	D6919-09			10/25/18 12:47	CMM	A
Chemical Oxygen Demand (COD)	106		mg/L	15	EPA 410.4			10/26/18 18:37	AK	A
Chloride	529		mg/L	10.0	EPA 300.0			10/19/18 14:59	CHW	B
Fluoride	0.22		mg/L	0.20	EPA 300.0			10/19/18 14:43	CHW	B
Nitrate-N	ND		mg/L	0.20	EPA 300.0			10/19/18 14:43	CHW	B
pH	6.42	1	pH_Units		S4500HB-11			10/24/18 10:59	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/24/18 09:04	C_D	10/24/18 06:32	C_D	F
Specific Conductance	2580		umhos/cm	1	SW846 9050A			10/24/18 10:59	MSA	B
Sulfate	6.7		mg/L	2.0	EPA 300.0			10/19/18 14:43	CHW	B
Total Dissolved Solids	1320		mg/L	5	S2540C-11			10/24/18 14:30	CXI	B
Total Organic Carbon (TOC)	33.9		mg/L	5.0	SW846 9060A			11/7/18 08:26	PAG	D
Turbidity	93.6		NTU	0.10	SM2130B-2011			10/20/18 08:32	MSA	B

ALS Environmental Laboratory Locations Across North America

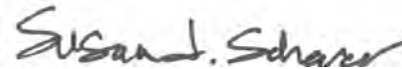
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ANALYTICAL RESULTS

Workorder: 2345236 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345236003** Date Collected: 10/18/2018 13:51 Matrix: Ground Water
Sample ID: **CWMP009W** Date Received: 10/18/2018 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	147		mg/L	0.11	SW846 6010C	10/22/18 11:55	BMK	10/24/18 11:07	DAG	J1
Iron, Total	34.9		mg/L	0.067	SW846 6010C	10/22/18 11:55	BMK	10/24/18 11:07	DAG	J1
Magnesium, Total	73.1		mg/L	0.11	SW846 6010C	10/22/18 11:55	BMK	10/24/18 11:07	DAG	J1
Manganese, Total	12.1		mg/L	0.0056	SW846 6010C	10/22/18 11:55	BMK	10/24/18 11:07	DAG	J1
Potassium, Total	33.8		mg/L	0.56	SW846 6010C	10/22/18 11:55	BMK	10/24/18 11:07	DAG	J1
Sodium, Total	167		mg/L	0.56	SW846 6010C	10/22/18 11:55	BMK	10/24/18 11:07	DAG	J1
FIELD PARAMETERS										
Depth to Water Level	9.11		Feet		Field			10/18/18 13:51	BGS	C
Elev Top MW Casing above MSL	404.20		Feet		Field			10/18/18 13:51	BGS	C
Flow Rate	1.57		gal/min		Field			10/18/18 13:51	BGS	C
Ground Water Elevation	395.09		ft/MSL		Field			10/18/18 13:51	BGS	C
pH, Field (SM4500B)	6.21		pH_Units		Field			10/18/18 13:51	BGS	C
Sample Depth	16.00		Feet		Field			10/18/18 13:51	BGS	C
Specific Conductance, Field	2584		umhos/cm	1	Field			10/18/18 13:51	BGS	C
Temperature	13.34		Deg. C		Field			10/18/18 13:51	BGS	C
Total Well Depth	19.70		Feet		Field			10/18/18 13:51	BGS	C
Volume in Water Column	6.88		Gallons		Field			10/18/18 13:51	BGS	C
Water Level After Purge	11.04		Feet		Field			10/18/18 13:51	BGS	C
Well Volumes Purged	4.55		Vol		Field			10/18/18 13:51	BGS	C



Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2345236 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345236004** Date Collected: 10/18/2018 14:25 Matrix: Ground Water
Sample ID: **CWMP008W** Date Received: 10/18/2018 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	2.3		ug/L	1.0	SW846 8260B			10/20/18 01:00	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/20/18 01:00	PDK	G
1,1-Dichloroethane	2.6		ug/L	1.0	SW846 8260B			10/20/18 01:00	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/18 01:00	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/18 01:00	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/18 01:00	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/18 01:00	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/20/18 01:00	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/20/18 01:00	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/20/18 01:00	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/20/18 01:00	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/20/18 01:00	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/18 01:00	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/18 01:00	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/20/18 01:00	PDK	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	87.4		%	62 - 133	SW846 8260B			10/20/18 01:00	PDK	G
4-Bromofluorobenzene (S)	94.8		%	79 - 114	SW846 8260B			10/20/18 01:00	PDK	G
Dibromofluoromethane (S)	81.1		%	78 - 116	SW846 8260B			10/20/18 01:00	PDK	G
Toluene-d8 (S)	83.9		%	76 - 127	SW846 8260B			10/20/18 01:00	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	483		mg/L	5	SM2320B-2011			10/24/18 11:11	MSA	B
Alkalinity, Total	483	2	mg/L	5	SM2320B-2011			10/24/18 11:11	MSA	B
Ammonia-N	6.15		mg/L	0.100	D6919-09			10/25/18 13:02	CMM	A
Chemical Oxygen Demand (COD)	33		mg/L	15	EPA 410.4			10/26/18 18:37	AK	A
Chloride	36.0		mg/L	2.0	EPA 300.0			10/19/18 15:16	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/19/18 15:16	CHW	B
Nitrate-N	ND		mg/L	0.20	EPA 300.0			10/19/18 15:16	CHW	B
pH	6.36	1	pH_Units		S4500HB-11			10/24/18 11:11	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/24/18 09:04	C_D	10/24/18 06:32	C_D	F
Specific Conductance	913		umhos/cm	1	SW846 9050A			10/24/18 11:11	MSA	B
Sulfate	6.3		mg/L	2.0	EPA 300.0			10/19/18 15:16	CHW	B
Total Dissolved Solids	449		mg/L	5	S2540C-11			10/24/18 14:30	CXI	B
Total Organic Carbon (TOC)	10.8		mg/L	2.5	SW846 9060A			11/7/18 08:26	PAG	D
Turbidity	69.6		NTU	0.10	SM2130B-2011			10/20/18 08:32	MSA	B

ALS Environmental Laboratory Locations Across North America

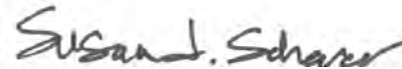
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ANALYTICAL RESULTS

Workorder: 2345236 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345236004** Date Collected: 10/18/2018 14:25 Matrix: Ground Water
Sample ID: **CWMP008W** Date Received: 10/18/2018 16:51

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed By	Cntr	
METALS									
Calcium, Total	69.2		mg/L	0.11	SW846 6010C	10/22/18 11:55 BMK	10/24/18 11:11 DAG	J1	
Iron, Total	30.1		mg/L	0.067	SW846 6010C	10/22/18 11:55 BMK	10/24/18 11:11 DAG	J1	
Magnesium, Total	31.4		mg/L	0.11	SW846 6010C	10/22/18 11:55 BMK	10/24/18 11:11 DAG	J1	
Manganese, Total	17.0		mg/L	0.0056	SW846 6010C	10/22/18 11:55 BMK	10/24/18 11:11 DAG	J1	
Potassium, Total	8.3		mg/L	0.56	SW846 6010C	10/22/18 11:55 BMK	10/24/18 11:11 DAG	J1	
Sodium, Total	39.4		mg/L	0.56	SW846 6010C	10/22/18 11:55 BMK	10/24/18 11:11 DAG	J1	
FIELD PARAMETERS									
Depth to Water Level	3.26		Feet		Field		10/18/18 14:25 BGS	C	
Elev Top MW Casing above MSL	422.30		Feet		Field		10/18/18 14:25 BGS	C	
Flow Rate	1.03		gal/min		Field		10/18/18 14:25 BGS	C	
Ground Water Elevation	419.04		ft/MSL		Field		10/18/18 14:25 BGS	C	
pH, Field (SM4500B)	6.10		pH_Units		Field		10/18/18 14:25 BGS	C	
Sample Depth	19.00		Feet		Field		10/18/18 14:25 BGS	C	
Specific Conductance, Field	918		umhos/cm	1	Field		10/18/18 14:25 BGS	C	
Temperature	13.80		Deg. C		Field		10/18/18 14:25 BGS	C	
Total Well Depth	22.80		Feet		Field		10/18/18 14:25 BGS	C	
Volume in Water Column	3.13		Gallons		Field		10/18/18 14:25 BGS	C	
Water Level After Purge	16.98		Feet		Field		10/18/18 14:25 BGS	C	
Well Volumes Purged	6.56		Vol		Field		10/18/18 14:25 BGS	C	



Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2345236 4TH QTR 2018 CWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2345236001	1	CWMP016W	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.				
2345236001	2	CWMP016W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2345236002	1	CWMP010W	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.				
2345236002	2	CWMP010W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2345236003	1	CWMP009W	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.				
2345236003	2	CWMP009W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2345236004	1	CWMP008W	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.				
2345236004	2	CWMP008W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 2345236 4TH QTR 2018 CWMP-FORM 19Q

Lab ID	Sample ID	Analysis Method	Prep Method
2345236001	CWMP016W	D6919-09	
2345236001	CWMP016W	EPA 300.0	
2345236001	CWMP016W	EPA 410.4	
2345236001	CWMP016W	Field	
2345236001	CWMP016W	S2540C-11	
2345236001	CWMP016W	S4500HB-11	
2345236001	CWMP016W	SM2130B-2011	
2345236001	CWMP016W	SM2320B-2011	
2345236001	CWMP016W	SW846 6010C	SW846 3015
2345236001	CWMP016W	SW846 8260B	
2345236001	CWMP016W	SW846 9050A	
2345236001	CWMP016W	SW846 9060A	
2345236001	CWMP016W	SW846 9066	420.4/9066
2345236002	CWMP010W	D6919-09	
2345236002	CWMP010W	EPA 300.0	
2345236002	CWMP010W	EPA 410.4	
2345236002	CWMP010W	Field	
2345236002	CWMP010W	S2540C-11	
2345236002	CWMP010W	S4500HB-11	
2345236002	CWMP010W	SM2130B-2011	
2345236002	CWMP010W	SM2320B-2011	
2345236002	CWMP010W	SW846 6010C	SW846 3015
2345236002	CWMP010W	SW846 8260B	
2345236002	CWMP010W	SW846 9050A	
2345236002	CWMP010W	SW846 9060A	
2345236002	CWMP010W	SW846 9066	420.4/9066
2345236003	CWMP009W	D6919-09	
2345236003	CWMP009W	EPA 300.0	
2345236003	CWMP009W	EPA 410.4	
2345236003	CWMP009W	Field	
2345236003	CWMP009W	S2540C-11	
2345236003	CWMP009W	S4500HB-11	
2345236003	CWMP009W	SM2130B-2011	
2345236003	CWMP009W	SM2320B-2011	
2345236003	CWMP009W	SW846 6010C	SW846 3015
2345236003	CWMP009W	SW846 8260B	
2345236003	CWMP009W	SW846 9050A	
2345236003	CWMP009W	SW846 9060A	
2345236003	CWMP009W	SW846 9066	420.4/9066
2345236004	CWMP008W	D6919-09	
2345236004	CWMP008W	EPA 300.0	
2345236004	CWMP008W	EPA 410.4	
2345236004	CWMP008W	Field	
2345236004	CWMP008W	S2540C-11	
2345236004	CWMP008W	S4500HB-11	
2345236004	CWMP008W	SM2130B-2011	

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 2345236 4TH QTR 2018 CWMP-FORM 19Q

Lab ID	Sample ID	Analysis Method	Prep Method
2345236004	CWMP008W	SM2320B-2011	
2345236004	CWMP008W	SW846 6010C	SW846 3015
2345236004	CWMP008W	SW846 8260B	
2345236004	CWMP008W	SW846 9050A	
2345236004	CWMP008W	SW846 9060A	
2345236004	CWMP008W	SW846 9066	420.4/9066

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**CHAIN OF CUSTODY/
REQUEST FOR ANALYSIS**

COC
ALS

1 of 1

34 Dogwood Lane • Middletown, PA 17057 • 717-944-5541 • Fax: 717-944-1430

Generated by ALS

2 3 4 5 2 3 6 *

Client Name: Lancaster County Solid Waste MA
Address: 1299 Harrisburg Pike, P.O. Box 4424
Lancaster, PA 17604

Container Type: AG AN CG PL PL PL PL
Container Size: 40 ml 500 ml 40 ml 500 ml 500 ml 1 L 500 ml
Preservative: HCl H2SO4 HCl H2SO4 HNO3 None None

Cooler Temp: 1 C Therm ID: 318
No. of Coolers: Y N Initial

Contact: Mark Reider
Phone#: (717) 735-0193
Project Name#: Creswell/GWMP Form 19Q Wells
Bill To: Lancaster County Solid Waste MA

Field Measurements: 8260 VOCs - Form 19Q
Sample Depth for AUX Data: NH3-N, COD
Total Metals: Ca, Fe, Mn, Mg, K, Na
pH, NO3, Cl, F, SPC, SO4, Turb, Alkalinity, HCO3

Courier Tracking #: Sample/COC Comments

TAT Normal-Standard TAT is 10-12 business days.
 Rush-Subject to ALS approval and surcharges.
Date Required: _____ **Approved By:** _____
Email? Y N **email@LCSWMA.com**
Fax? Y N **(717) 397-9973**

Enter Number of Containers Per Sample or Field Results Below:

Custody Seals Present? (If present) Seals Initialed?
Received on ice?
COC Labels Complete/Accurate?
Cont. in Good Cond.?
Correct Containers?
Correct Sample Volumes?
Correct Preservation?
Headspaces/Volatilities?

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	Matrix	Field Measurements	Sample Depth for AUX Data	Total Metals: Ca, Fe, Mn, Mg, K, Na	pH, NO3, Cl, F, SPC, SO4, Turb, Alkalinity, HCO3
1. CWM-POB-GW	10-18-18	1657	G GW	2	1	1	1
2. CWM-POB-GW	13/19						
3. CWM-POB-GW	13/19						
4. CWM-POB-GW	14/25						
5.							
6.							
7.							
8.							
9.							
10.							

Container Type	AG	AN	CG	PL	PL	PL	PL
Container Size	40 ml	500 ml	40 ml	500 ml	500 ml	500 ml	1 L
Preservative	HCl	H2SO4	HCl	H2SO4	HNO3	None	None

ALS Field Services: Pickup Labor
 Composite_Sampling Rental_Equipment
 Other.

Project Comments:

LOGGED BY (signature): _____
REVIEWED BY (signature): _____

Special Processing: USACE Navy USACE
State Samples Collected In: NY NJ PA NC

Requisitioned By / Company Name: _____
Date: 10-18-18
Time: 1651

Received By / Company Name: _____
Date: 10/18/18
Time: 1651

Reportable to PADEP? Yes No
Sample Disposal: Lab Special
PWSID #: _____
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
ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057
Rev 8/04

November 6, 2018

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

Certificate of Analysis

Project Name:	2018-CRESWELL	Workorder:	2345510
Purchase Order:	PO1000127	Workorder ID:	4TH QTR 2018 CWMP-FORM 19Q

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, October 19, 2018.

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.

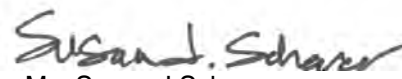
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications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

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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.


Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 2345510 4TH QTR 2018 CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2345510001	CWMP018S	Ground Water	10/19/2018 10:14	10/19/2018 14:34	Mr. Brian G Shade
2345510002	CWMP017S	Ground Water	10/19/2018 10:34	10/19/2018 14:34	Mr. Brian G Shade
2345510003	CWMP012W	Ground Water	10/19/2018 12:01	10/19/2018 14:34	Mr. Brian G Shade
2345510004	Field Blank	Water	10/19/2018 12:58	10/19/2018 14:34	Mr. Brian G Shade
2345510005	Trip Blank	Water	10/19/2018 14:34	10/19/2018 14:34	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2345510 4TH QTR 2018 CWMP-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 performed 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.

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: 2345510 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345510001** Date Collected: 10/19/2018 10:14 Matrix: Ground Water
Sample ID: **CWMP018S** Date Received: 10/19/2018 14:34

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:12	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/23/18 19:12	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/23/18 19:12	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/23/18 19:12	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:12	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:12	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:12	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:12	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/23/18 19:12	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:12	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:12	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/23/18 19:12	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/23/18 19:12	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:12	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/23/18 19:12	TMP	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	77.8		%	62 - 133	SW846 8260B			10/23/18 19:12	TMP	G
4-Bromofluorobenzene (S)	95.9		%	79 - 114	SW846 8260B			10/23/18 19:12	TMP	G
Dibromofluoromethane (S)	84.2		%	78 - 116	SW846 8260B			10/23/18 19:12	TMP	G
Toluene-d8 (S)	83.6		%	76 - 127	SW846 8260B			10/23/18 19:12	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	326		mg/L	5	SM2320B-2011			10/24/18 23:31	MSA	B
Alkalinity, Total	337	2	mg/L	5	SM2320B-2011			10/24/18 23:31	MSA	B
Ammonia-N	0.119		mg/L	0.100	D6919-09			10/25/18 19:27	CMM	A
Chemical Oxygen Demand (COD)	19		mg/L	15	EPA 410.4			10/27/18 16:49	AK	A
Chloride	418		mg/L	5.0	EPA 300.0			10/20/18 10:01	MBW	B
Fluoride	ND		mg/L	0.50	EPA 300.0			10/20/18 10:01	MBW	B
Nitrate-N	18.8		mg/L	0.50	EPA 300.0			10/20/18 10:01	MBW	B
pH	8.36	1	pH_Units		S4500HB-11			10/24/18 23:31	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/24/18 09:04	C_D	10/24/18 06:32	C_D	F
Specific Conductance	1970		umhos/cm	1	SW846 9050A			10/24/18 23:31	MSA	B
Sulfate	34.8		mg/L	5.0	EPA 300.0			10/20/18 10:01	MBW	B
Total Dissolved Solids	1020		mg/L	5	S2540C-11			10/25/18 13:10	CXI	B
Total Organic Carbon (TOC)	8.8		mg/L	0.50	SW846 9060A			11/2/18 00:51	PAG	D
Turbidity	0.34		NTU	0.10	SM2130B-2011			10/20/18 08:32	MSA	B

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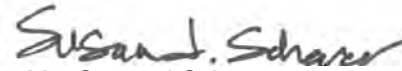
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ANALYTICAL RESULTS

Workorder: 2345510 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345510001** Date Collected: 10/19/2018 10:14 Matrix: Ground Water
Sample ID: **CWMP018S** Date Received: 10/19/2018 14:34

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed By	Cntr
METALS								
Calcium, Total	58.8		mg/L	0.11	SW846 6010C	10/24/18 13:40 BMK	10/25/18 10:53 SRT	J1
Iron, Total	0.10		mg/L	0.067	SW846 6010C	10/24/18 13:40 BMK	10/25/18 10:53 SRT	J1
Magnesium, Total	65.9		mg/L	0.11	SW846 6010C	10/24/18 13:40 BMK	10/25/18 10:53 SRT	J1
Manganese, Total	0.033		mg/L	0.0056	SW846 6010C	10/24/18 13:40 BMK	10/25/18 10:53 SRT	J1
Potassium, Total	14.9		mg/L	0.56	SW846 6010C	10/24/18 13:40 BMK	10/25/18 10:53 SRT	J1
Sodium, Total	199		mg/L	0.56	SW846 6010C	10/24/18 13:40 BMK	10/25/18 10:53 SRT	J1
FIELD PARAMETERS								
Dissolved Oxygen	11.88		mg/L	0.01	Field		10/19/18 10:14 BGS	C
pH, Field (SM4500B)	7.99		pH_Units		Field		10/19/18 10:14 BGS	C
Specific Conductance, Field	1908		umhos/cm	1	Field		10/19/18 10:14 BGS	C
Temperature	9.15		Deg. C		Field		10/19/18 10:14 BGS	C



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Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2345510 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345510002** Date Collected: 10/19/2018 10:34 Matrix: Ground Water
Sample ID: **CWMP017S** Date Received: 10/19/2018 14:34

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:34	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/23/18 19:34	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/23/18 19:34	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/23/18 19:34	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:34	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:34	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:34	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:34	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/23/18 19:34	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:34	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:34	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/23/18 19:34	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/23/18 19:34	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 19:34	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/23/18 19:34	TMP	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	77.9		%	62 - 133	SW846 8260B			10/23/18 19:34	TMP	G
4-Bromofluorobenzene (S)	94.9		%	79 - 114	SW846 8260B			10/23/18 19:34	TMP	G
Dibromofluoromethane (S)	87.7		%	78 - 116	SW846 8260B			10/23/18 19:34	TMP	G
Toluene-d8 (S)	83.6		%	76 - 127	SW846 8260B			10/23/18 19:34	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	384		mg/L	5	SM2320B-2011			10/24/18 23:42	MSA	B
Alkalinity, Total	384	2	mg/L	5	SM2320B-2011			10/24/18 23:42	MSA	B
Ammonia-N	0.133		mg/L	0.100	D6919-09			10/25/18 19:42	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			10/27/18 16:49	AK	A
Chloride	514		mg/L	10.0	EPA 300.0			10/20/18 10:25	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/20/18 10:13	MBW	B
Nitrate-N	21.1		mg/L	1.0	EPA 300.0			10/20/18 10:25	MBW	B
pH	8.17	1	pH_Units		S4500HB-11			10/24/18 23:42	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/24/18 09:04	C_D	10/24/18 06:32	C_D	F
Specific Conductance	2420		umhos/cm	1	SW846 9050A			10/24/18 23:42	MSA	B
Sulfate	51.7		mg/L	2.0	EPA 300.0			10/20/18 10:13	MBW	B
Total Dissolved Solids	1270		mg/L	5	S2540C-11			10/25/18 13:10	CXI	B
Total Organic Carbon (TOC)	3.5		mg/L	0.50	SW846 9060A			11/2/18 00:51	PAG	D
Turbidity	0.95		NTU	0.10	SM2130B-2011			10/20/18 08:32	MSA	B

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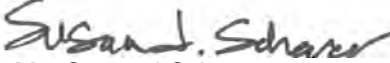
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ANALYTICAL RESULTS

Workorder: 2345510 4TH QTR 2018 CWMP-FORM 19Q

 Lab ID: **2345510002** Date Collected: 10/19/2018 10:34 Matrix: Ground Water
 Sample ID: **CWMP017S** Date Received: 10/19/2018 14:34

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	58.6		mg/L	0.11	SW846 6010C	10/24/18 13:40	BMK	10/25/18 10:57	SRT	J1
Iron, Total	0.34		mg/L	0.067	SW846 6010C	10/24/18 13:40	BMK	10/25/18 10:57	SRT	J1
Magnesium, Total	83.3		mg/L	0.11	SW846 6010C	10/24/18 13:40	BMK	10/25/18 10:57	SRT	J1
Manganese, Total	0.14		mg/L	0.0056	SW846 6010C	10/24/18 13:40	BMK	10/25/18 10:57	SRT	J1
Potassium, Total	13.3		mg/L	0.56	SW846 6010C	10/24/18 13:40	BMK	10/25/18 10:57	SRT	J1
Sodium, Total	257		mg/L	0.56	SW846 6010C	10/24/18 13:40	BMK	10/25/18 10:57	SRT	J1
FIELD PARAMETERS										
Dissolved Oxygen	10.17		mg/L	0.01	Field			10/19/18 10:34	BGS	C
pH, Field (SM4500B)	7.61		pH_Units		Field			10/19/18 10:34	BGS	C
Specific Conductance, Field	2360		umhos/cm	1	Field			10/19/18 10:34	BGS	C
Temperature	12.12		Deg. C		Field			10/19/18 10:34	BGS	C



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Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2345510 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345510003** Date Collected: 10/19/2018 12:01 Matrix: Ground Water
Sample ID: **CWMP012W** Date Received: 10/19/2018 14:34

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/23/18 23:13	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/23/18 23:13	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/23/18 23:13	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/23/18 23:13	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 23:13	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 23:13	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 23:13	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/23/18 23:13	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/23/18 23:13	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 23:13	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/23/18 23:13	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/23/18 23:13	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/23/18 23:13	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 23:13	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/23/18 23:13	PDK	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	89.8		%	62 - 133	SW846 8260B			10/23/18 23:13	PDK	G
4-Bromofluorobenzene (S)	89		%	79 - 114	SW846 8260B			10/23/18 23:13	PDK	G
Dibromofluoromethane (S)	80.7		%	78 - 116	SW846 8260B			10/23/18 23:13	PDK	G
Toluene-d8 (S)	80.4		%	76 - 127	SW846 8260B			10/23/18 23:13	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	75		mg/L	5	SM2320B-2011			10/24/18 23:51	MSA	I
Alkalinity, Total	75	2	mg/L	5	SM2320B-2011			10/24/18 23:51	MSA	I
Ammonia-N	ND		mg/L	0.100	D6919-09			10/29/18 00:30	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			10/27/18 16:49	AK	A
Chloride	36.6		mg/L	2.0	EPA 300.0			10/20/18 10:37	MBW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/20/18 10:37	MBW	B
Nitrate-N	9.3		mg/L	0.20	EPA 300.0			10/20/18 10:37	MBW	B
pH	6.66	1	pH_Units		S4500HB-11			10/24/18 23:51	MSA	I
Phenolics	ND		mg/L	0.005	SW846 9066	10/24/18 09:04	C_D	10/24/18 06:32	C_D	F
Specific Conductance	316		umhos/cm	1	SW846 9050A			10/24/18 23:51	MSA	I
Sulfate	5.2		mg/L	2.0	EPA 300.0			10/20/18 10:37	MBW	B
Total Dissolved Solids	189		mg/L	5	S2540C-11			10/25/18 13:10	CXI	B
Total Organic Carbon (TOC)	2.1		mg/L	0.50	SW846 9060A			11/2/18 00:51	PAG	D
Turbidity	217		NTU	0.10	SM2130B-2011			10/20/18 08:32	MSA	B

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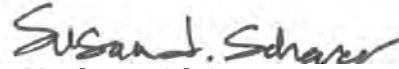
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ANALYTICAL RESULTS

Workorder: 2345510 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345510003** Date Collected: 10/19/2018 12:01 Matrix: Ground Water
Sample ID: **CWMP012W** Date Received: 10/19/2018 14:34

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed By	Cntr
METALS								
Calcium, Total	32.2		mg/L	0.11	SW846 6010C	10/24/18 13:40 BMK	10/25/18 11:08 SRT	J1
Iron, Total	76.3		mg/L	0.067	SW846 6010C	10/24/18 13:40 BMK	10/25/18 11:08 SRT	J1
Magnesium, Total	9.0		mg/L	0.11	SW846 6010C	10/24/18 13:40 BMK	10/25/18 11:08 SRT	J1
Manganese, Total	0.18		mg/L	0.0056	SW846 6010C	10/24/18 13:40 BMK	10/25/18 11:08 SRT	J1
Potassium, Total	1.5		mg/L	0.56	SW846 6010C	10/24/18 13:40 BMK	10/25/18 11:08 SRT	J1
Sodium, Total	13.1		mg/L	0.56	SW846 6010C	10/24/18 13:40 BMK	10/25/18 11:08 SRT	J1
FIELD PARAMETERS								
Depth to Water Level	64.82		Feet		Field		4/24/18 09:35 BGS	C
pH, Field (SM4500B)	5.42		pH_Units		Field		4/24/18 09:35 BGS	C
Specific Conductance, Field	391		umhos/cm	1	Field		4/24/18 09:35 BGS	C
Temperature	12.37		Deg. C		Field		4/24/18 09:35 BGS	C



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ANALYTICAL RESULTS

Workorder: 2345510 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345510004** Date Collected: 10/19/2018 12:58 Matrix: Water
Sample ID: **Field Blank** Date Received: 10/19/2018 14:34

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:24	PDK	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/23/18 21:24	PDK	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/23/18 21:24	PDK	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/23/18 21:24	PDK	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:24	PDK	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:24	PDK	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:24	PDK	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:24	PDK	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/23/18 21:24	PDK	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:24	PDK	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:24	PDK	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/23/18 21:24	PDK	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/23/18 21:24	PDK	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:24	PDK	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/23/18 21:24	PDK	G
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	89.6		%	62 - 133	SW846 8260B			10/23/18 21:24	PDK	G
4-Bromofluorobenzene (S)	92.1		%	79 - 114	SW846 8260B			10/23/18 21:24	PDK	G
Dibromofluoromethane (S)	78.8		%	78 - 116	SW846 8260B			10/23/18 21:24	PDK	G
Toluene-d8 (S)	80.9		%	76 - 127	SW846 8260B			10/23/18 21:24	PDK	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	ND		mg/L	5	SM2320B-2011			10/25/18 00:00	MSA	B
Alkalinity, Total	ND	2	mg/L	5	SM2320B-2011			10/25/18 00:00	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			10/25/18 21:41	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	15	EPA 410.4			10/27/18 16:49	AK	A
Chloride	ND		mg/L	1.0	EPA 300.0			10/20/18 13:04	MBW	B
Fluoride	ND		mg/L	0.10	EPA 300.0			10/20/18 13:04	MBW	B
Nitrate-N	ND		mg/L	0.10	EPA 300.0			10/20/18 13:04	MBW	B
pH	6.52	1	pH_Units		S4500HB-11			10/25/18 00:00	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/24/18 09:04	C_D	10/24/18 06:32	C_D	F
Specific Conductance	1		umhos/cm	1	SW846 9050A			10/26/18 07:14	MSA	B
Sulfate	ND		mg/L	1.0	EPA 300.0			10/20/18 13:04	MBW	B
Total Dissolved Solids	10		mg/L	5	S2540C-11			10/25/18 13:10	CXI	B
Total Organic Carbon (TOC)	ND		mg/L	0.50	SW846 9060A			11/2/18 00:51	PAG	D
Turbidity	ND		NTU	0.10	SM2130B-2011			10/20/18 08:32	MSA	B

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ANALYTICAL RESULTS

Workorder: 2345510 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345510004** Date Collected: 10/19/2018 12:58 Matrix: Water
Sample ID: **Field Blank** Date Received: 10/19/2018 14:34

Parameters	Results	Flag	Units	RDL	Method	Prepared By	Analyzed By	Cntr
METALS								
Calcium, Total	ND		mg/L	0.11	SW846 6010C	10/24/18 13:40 BMK	10/25/18 11:12 SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/24/18 13:40 BMK	10/25/18 11:12 SRT	J1
Magnesium, Total	ND		mg/L	0.11	SW846 6010C	10/24/18 13:40 BMK	10/25/18 11:12 SRT	J1
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	10/24/18 13:40 BMK	10/25/18 11:12 SRT	J1
Potassium, Total	ND		mg/L	0.56	SW846 6010C	10/24/18 13:40 BMK	10/25/18 11:12 SRT	J1
Sodium, Total	ND		mg/L	0.56	SW846 6010C	10/24/18 13:40 BMK	10/25/18 11:12 SRT	J1



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ANALYTICAL RESULTS

Workorder: 2345510 4TH QTR 2018 CWMP-FORM 19Q

Lab ID: **2345510005**

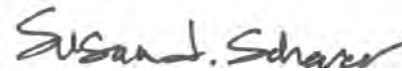
Date Collected: 10/19/2018 14:34

Matrix: Water

Sample ID: **Trip Blank**

Date Received: 10/19/2018 14:34

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:45	PDK	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/23/18 21:45	PDK	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/23/18 21:45	PDK	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/23/18 21:45	PDK	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:45	PDK	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:45	PDK	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:45	PDK	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:45	PDK	A
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/23/18 21:45	PDK	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:45	PDK	A
Toluene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:45	PDK	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/23/18 21:45	PDK	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/23/18 21:45	PDK	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/23/18 21:45	PDK	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/23/18 21:45	PDK	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	86.6		%	62 - 133	SW846 8260B			10/23/18 21:45	PDK	A
4-Bromofluorobenzene (S)	89.3		%	79 - 114	SW846 8260B			10/23/18 21:45	PDK	A
Dibromofluoromethane (S)	79.8		%	78 - 116	SW846 8260B			10/23/18 21:45	PDK	A
Toluene-d8 (S)	80.7		%	76 - 127	SW846 8260B			10/23/18 21:45	PDK	A



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ANALYTICAL RESULTS

Workorder: 2345510 4TH QTR 2018 CWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2345510001	1	CWMP018S	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.				
2345510001	2	CWMP018S	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2345510002	1	CWMP017S	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.				
2345510002	2	CWMP017S	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2345510003	1	CWMP012W	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.				
2345510003	2	CWMP012W	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2345510004	1	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.				
2345510004	2	Field Blank	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 2345510 4TH QTR 2018 CWMP-FORM 19Q

Lab ID	Sample ID	Analysis Method	Prep Method
2345510001	CWMP018S	D6919-09	
2345510001	CWMP018S	EPA 300.0	
2345510001	CWMP018S	EPA 410.4	
2345510001	CWMP018S	Field	
2345510001	CWMP018S	S2540C-11	
2345510001	CWMP018S	S4500HB-11	
2345510001	CWMP018S	SM2130B-2011	
2345510001	CWMP018S	SM2320B-2011	
2345510001	CWMP018S	SW846 6010C	SW846 3015
2345510001	CWMP018S	SW846 8260B	
2345510001	CWMP018S	SW846 9050A	
2345510001	CWMP018S	SW846 9060A	
2345510001	CWMP018S	SW846 9066	420.4/9066
2345510002	CWMP017S	D6919-09	
2345510002	CWMP017S	EPA 300.0	
2345510002	CWMP017S	EPA 410.4	
2345510002	CWMP017S	Field	
2345510002	CWMP017S	S2540C-11	
2345510002	CWMP017S	S4500HB-11	
2345510002	CWMP017S	SM2130B-2011	
2345510002	CWMP017S	SM2320B-2011	
2345510002	CWMP017S	SW846 6010C	SW846 3015
2345510002	CWMP017S	SW846 8260B	
2345510002	CWMP017S	SW846 9050A	
2345510002	CWMP017S	SW846 9060A	
2345510002	CWMP017S	SW846 9066	420.4/9066
2345510003	CWMP012W	D6919-09	
2345510003	CWMP012W	EPA 300.0	
2345510003	CWMP012W	EPA 410.4	
2345510003	CWMP012W	Field	
2345510003	CWMP012W	S2540C-11	
2345510003	CWMP012W	S4500HB-11	
2345510003	CWMP012W	SM2130B-2011	
2345510003	CWMP012W	SM2320B-2011	
2345510003	CWMP012W	SW846 6010C	SW846 3015
2345510003	CWMP012W	SW846 8260B	
2345510003	CWMP012W	SW846 9050A	
2345510003	CWMP012W	SW846 9060A	
2345510003	CWMP012W	SW846 9066	420.4/9066
2345510004	Field Blank	D6919-09	
2345510004	Field Blank	EPA 300.0	
2345510004	Field Blank	EPA 410.4	
2345510004	Field Blank	S2540C-11	
2345510004	Field Blank	S4500HB-11	
2345510004	Field Blank	SM2130B-2011	
2345510004	Field Blank	SM2320B-2011	

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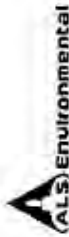
ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 2345510 4TH QTR 2018 CWMP-FORM 19Q

Lab ID	Sample ID	Analysis Method	Prep Method
2345510004	Field Blank	SW846 6010C	SW846 3015
2345510004	Field Blank	SW846 8260B	
2345510004	Field Blank	SW846 9050A	
2345510004	Field Blank	SW846 9060A	
2345510004	Field Blank	SW846 9066	420.4/9066
2345510005	Trip Blank	SW846 8260B	

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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.**

Client Name: Lancaster County Solid Waste MA
Address: 1298 Harrisburg Pike, P.O. Box 4424
 Lancaster, PA 17604
Contact: Mark Reider
Phone#: (717) 735-0193
Project Name#: Creswell/GWMP Form 19Q Wells
Bill To: Lancaster County Solid Waste MA

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

Date Required: _____ **Approved By:** _____
Email? Y mreider@LCSWMA.com
Fax? Y No.: (717) 397-9973

Container Type	AG	AM	CG	PL	PL	PL	PL
Container Size	40 ml	40 ml	40 ml	500 ml	500 ml	1L	500 ml
Preservative	HCl	H2SO4	HCl	H2SO4	HNO3	None	None

ANALYSES/METHOD REQUESTED *(7/18/22)*

TOC	OH	8260 VOCs - Form 19Q	Field Measurements	Sample Depth for AUX Data	MH3-N, COD	Total Metals: Ca, Fe, Mn, Mg, K, Na	pH, NO3, Cl, F, SPC, SO4, Turb.	Alkalinity, HCO3
2	1	2	X	X	1	1	1	1
1	1	1	1	1	1	1	1	1

COC **ALS** **1 of 1**

Receipt Information (Submitting Lab)

Cooler Temp: *3°C* Therm ID: *318*

No. of Coolers: Y N

Custody Seals Present?

Seals Intact?

Received on Ice?

COCLabels Complete/Accurate?

Cont. in Good Cond.?

Correct Containers?

Correct Sample Volumes?

Correct Preservation?

Headspace/Volities?

Counter/Tracking #: _____

Sample/COC Comments

Project Comments:	LOGGED BY (signature):		REVIEWED BY (signature):	
	Date	Time	Date	Time
1. GWMP0188	10/19/18	1014		
2. GWMP0175	10/31	1034		
3. GWMP012W	12/01	1201		
4. Field Blank	12/29	1229		
5. Trip Blank	11/34	1134		
6.				
7.				
8.				
9.				
10.				

ALS Field Services: Pickup Labor
 Composite_Sampling Rental_Equipment
 Other:

Special Processing
 USACE Navy
 State Samples Collected In: NY NJ PA NC

Deliverables
 Standard CLP-like USACE

Reportable to PADEP?
 Yes No

Sample Disposal
 Lab Special

PWSID # _____ **EDDS: Formet Type** _____

Relinquished By / Company Name
(Signature) **ALS**

Date 10-19-18 **Time** 1434 **Received By / Company Name**
(Signature)

Matrix - A=Air; DW=Drinking Water; GW=Groundwater; OL=Oil; Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
ALS ENVIRONMENTAL SHIPPING ADDRESS: 34 DOGWOOD LANE, MIDDLETOWN, PA 17057



Lancaster County Solid Waste Management Authority
Creswell Landfill

Exceedence Report

<i>Parameter Name</i>	<i>Units</i>	<i>Concentration</i>	<i>Criteria Conc</i>	<i>Qualifiers</i>	<i>Criteria</i>
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP001W	2344348002	10/15/2018	GW		
NITRATE-NITROGEN	mg/l	18.60	10.00	EPA-MCL	
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP003W	2344533003	10/16/2018	GW		
NITRATE-NITROGEN	mg/l	10.60	10.00	EPA-MCL	
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP007W	2344348001	10/15/2018	GW		
NITRATE-NITROGEN	mg/l	10.30	10.00	EPA-MCL	
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP017S	2345510002	10/19/2018	GW		
NITRATE-NITROGEN	mg/l	21.10	10.00	EPA-MCL	
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP018S	2345510001	10/19/2018	GW		
NITRATE-NITROGEN	mg/l	18.80	10.00	EPA-MCL	

Lancaster County Solid Waste Management Authority
Creswell Landfill

Exceedence Report

<i>Parameter Name</i>	<i>Units</i>	<i>Concentration</i>	<i>Criteria Conc</i>	<i>Qualifiers</i>	<i>Criteria</i>
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP001W	2344348002	10/15/2018	GW		
IRON, TOTAL	mg/l	2.10	0.30		EPA-SMCL
MANGANESE, TOTAL	mg/l	0.09	0.05		EPA-SMCL
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP002W	2344533001	10/16/2018	GW		
MANGANESE, TOTAL	mg/l	1.20	0.05		EPA-SMCL
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP005W	2344348003	10/15/2018	GW		
MANGANESE, TOTAL	mg/l	0.05	0.05		EPA-SMCL
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP008W	2345236004	10/18/2018	GW		
IRON, TOTAL	mg/l	30.10	0.30		EPA-SMCL
MANGANESE, TOTAL	mg/l	17.00	0.05		EPA-SMCL
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP009W	2345236003	10/18/2018	GW		
CHLORIDE	mg/l	529.00	250.00		EPA-SMCL
IRON, TOTAL	mg/l	34.90	0.30		EPA-SMCL
MANGANESE, TOTAL	mg/l	12.10	0.05		EPA-SMCL
TDS (TOTAL DISSOLVED SOLIDS)	mg/l	1,320.00	500.00		EPA-SMCL
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP010W	2345236002	10/18/2018	GW		
IRON, TOTAL	mg/l	0.39	0.30		EPA-SMCL
MANGANESE, TOTAL	mg/l	0.23	0.05		EPA-SMCL
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP012W	2345510003	10/19/2018	GW		
IRON, TOTAL	mg/l	76.30	0.30		EPA-SMCL
MANGANESE, TOTAL	mg/l	0.18	0.05		EPA-SMCL

<i>Parameter Name</i>	<i>Units</i>	<i>Concentration</i>	<i>Criteria Conc</i>	<i>Qualifiers</i>	<i>Criteria</i>
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP016W	2345236001	10/18/2018	GW		
IRON, TOTAL	mg/l	0.31	0.30	EPA-SMCL	
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP017S	2345510002	10/19/2018	GW		
CHLORIDE	mg/l	514.00	250.00	EPA-SMCL	
IRON, TOTAL	mg/l	0.34	0.30	EPA-SMCL	
MANGANESE, TOTAL	mg/l	0.14	0.05	EPA-SMCL	
TDS (TOTAL DISSOLVED SOLIDS)	mg/l	1,270.00	500.00	EPA-SMCL	
<i>Location ID</i>	<i>Sample Number</i>	<i>Sample Date</i>	<i>Sample Type</i>	<i>Sample Depth</i>	
CWMP018S	2345510001	10/19/2018	GW		
CHLORIDE	mg/l	418.00	250.00	EPA-SMCL	
TDS (TOTAL DISSOLVED SOLIDS)	mg/l	1,020.00	500.00	EPA-SMCL	