

December 12, 2017

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 2017

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 and nitrate-nitrogen related to surface influences and Turkey Hill discharge. Wells 9 and 10 had elevated TDS and chlorides which shows surface influence of Mann's Run. Wells 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 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 mreider@lcswma.org.

Respectfully Submitted,



Mark D. Reider
Director of Environmental Compliance

Enclosures

cc: Bob Zorbaugh; Daniel Brown; Bob Eshbach
Randy Weiss (PA DEP)



Date Prepared/Revised
12/05/2017

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: CWMP007W X Well ___ Spring ___ Stream ___ Other

 Upgradient/Upstream X 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:	8.87	ft	Measured from:	Land Surface	X	TOC
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Casing Stickup: 1.50 ft Elevation of Water Level: 444.53 ft./MSL

Sampling Depth:	33 ft	Volume of Water Column:	40.58 gal
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Total Well Depth: 36.5 ft Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No Well Volumes Purged: 2.4

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 10/16/2017 Sample Collection Time: 11:25

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

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): 2269415001 Final Lab Analysis CompletionDate: 10/30/2017

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments:

I.D. No 100008

Monitoring Point No. CWMP007W

Sample Date 10/16/2017

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	12	SM18-2321
CALCIUM, TOTAL	19.2	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	8	EPA 410.4
CHLORIDE	67.8	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	9.4	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	6.6	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	10.6	EPA 300.0
pH-FIELD (SU)	5.27	FIELD
pH-LAB (SU)	5.81	EPA 150.1
POTASSIUM, TOTAL	2.2	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	32.4	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	420	FIELD
SPEC. COND., LAB (umhos/cm)	334	EPA 120.1
SULFATE	14.6	EPA 300.0
ALKALINITY	12	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	259	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	1.1	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 10/16/2017

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
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: CWMP001W

X	Well	Spring	Stream	Other
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X 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: 30.67 ft

Measured from: Land Surface X TOC

Casing Stickup: 1.23 ft

Elevation of Water Level: 484.46 ft./MSL

Sampling Depth: 57 ft

Volume of Water Column:	52.33	gal
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Total Well Depth: 66.3 ft

Sampling Method: X Pumped Bailed Grab

Well Purged: X Yes No

Well Volumes Purged: 1.0

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 10/16/2017

Sample Collection Time: 12:44

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

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): 2269415002 Final Lab Analysis CompletionDate: 10/30/2017

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments:

I.D. No 100008

Monitoring Point No. CWMP001W

Sample Date 10/16/2017

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	6	SM18-2321
CALCIUM, TOTAL	17	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	32.6	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	760	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	11.2	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	67	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	20.9	EPA 300.0
pH-FIELD (SU)	5.16	FIELD
pH-LAB (SU)	5.58	EPA 150.1
POTASSIUM, TOTAL	2.3	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	15.1	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	329	FIELD
SPEC. COND., LAB (umhos/cm)	259	EPA 120.1
SULFATE	2	EPA 300.0
ALKALINITY	6	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	200	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	1.1	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	35.7	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 10/16/2017

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 LAND RECYCLING AND WASTE



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Federal Regulations, Subtitle D: 258.54 and Appendix I to Part 258.

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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: 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: 90.92 ft Measured from: ☐ Land Surface ☒ TOC

Casing Stickup: -1.19 ft Elevation of Water Level: 434.89 ft./MSL

Sampling Depth: 85 ft Volume of Water Column: 13.34 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): 10/18/2017 Sample Collection Time: 11:28

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

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): 2270105001 Final Lab Analysis Completion Date: 11/1/2017

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP002W

Sample Date 10/18/2017

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	0.199	EPA 350.3
BICARBONATE	64	SM18-2321
CALCIUM, TOTAL	52.2	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	12	EPA 410.4
CHLORIDE	106	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	15.2	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	1100	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	3.4	EPA 300.0
pH-FIELD (SU)	5.77	FIELD
pH-LAB (SU)	5.96	EPA 150.1
POTASSIUM, TOTAL	2.6	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	20.6	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	603	FIELD
SPEC. COND., LAB (umhos/cm)	536	EPA 120.1
SULFATE	24.6	EPA 300.0
ALKALINITY	64	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	299	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	3	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.57	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. CWMP002W

Sample Date 10/18/2017

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	8.6	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	1.1	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

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



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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: 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: 95.19 ft Measured from: ☐ Land Surface ☒ TOC

Casing Stickup: -1.29 ft Elevation of Water Level: 429.02 ft./MSL

Sampling Depth: 100 ft Volume of Water Column: -29.65 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): 10/18/2017 Sample Collection Time: 12:34

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

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): 2270105002 Final Lab Analysis Completion Date: 11/1/2017

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP003W

Sample Date 10/18/2017

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	22	SM18-2321
CALCIUM, TOTAL	30.8	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	80.1	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	10.2	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	7	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	8.6	EPA 300.0
pH-FIELD (SU)	5.65	FIELD
pH-LAB (SU)	5.91	EPA 150.1
POTASSIUM, TOTAL	1.6	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	19.9	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	432	FIELD
SPEC. COND., LAB (umhos/cm)	349	EPA 120.1
SULFATE	5.7	EPA 300.0
ALKALINITY	22	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	161	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.67	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.

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Sample Date 10/18/2017

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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	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.

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SECTION B. FACILITY INFORMATION

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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: 104.76 ft Measured from: ☐ Land Surface ☒ TOC

Casing Stickup: -1.37 ft Elevation of Water Level: 424.77 ft./MSL

Sampling Depth: 130 ft Volume of Water Column: 51.76 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): 10/18/2017 Sample Collection Time: 12:47

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

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): 2270105003 Final Lab Analysis Completion Date: 11/1/2017

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP004W

Sample Date 10/18/2017

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	26	SM18-2321
CALCIUM, TOTAL	21.8	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	43.4	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	6.5	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	9.8	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	7.1	EPA 300.0
pH-FIELD (SU)	5.84	FIELD
pH-LAB (SU)	6.1	EPA 150.1
POTASSIUM, TOTAL	1.3	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	14.7	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	295	FIELD
SPEC. COND., LAB (umhos/cm)	235	EPA 120.1
SULFATE	6.1	EPA 300.0
ALKALINITY	26	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	106	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.68	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.3	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 10/18/2017

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	1.1	SW846 8260B
1,1-DICHLOROETHENE	1 ND	SW846 8260B
1,2-DICHLOROETHANE	1 ND	SW846 8260B
cis 1,2-DICHLOROETHENE	1 ND	SW846 8260B
trans 1,2-DICHLOROETHENE	1 ND	SW846 8260B
ETHYLBENZENE	1 ND	SW846 8260B
METHYLENE CHLORIDE	1 ND	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

^T Please indicate detection limit if analyte is not detected.

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



Date Prepared/Revised
12/05/2017

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: 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: 46.4 ft

Measured from: ☐ Land Surface ☒ TOC

Casing Stickup: -0.37 ft

Elevation of Water Level: 467.03 ft./MSL

Sampling Depth: 130 ft

Volume of Water Column: 137.47 gal

Total Well Depth: 140 ft

Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: ☒ Yes ☐ No

Well Volumes Purged: 1.0

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

Spring Flow Rate: ☐ gpm

Sample Date (mm/dd/yy): 10/17/2017

Sample Collection Time: 10:04

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

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): 2270132001 Final Lab Analysis Completion Date: 11/1/2017

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments:

I.D. No 100008

Monitoring Point No. CWMP005W

Sample Date 10/17/2017

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	20.3	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	94.4	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	10.3	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	69	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	10.8	EPA 300.0
pH-FIELD (SU)	5.07	FIELD
pH-LAB (SU)	5.86	EPA 150.1
POTASSIUM, TOTAL	2.6	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	42.1	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	499	FIELD
SPEC. COND., LAB (umhos/cm)	431	EPA 120.1
SULFATE	2.5	EPA 300.0
ALKALINITY	17	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	225	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.56	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. CWMP005W

Sample Date 10/17/2017

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	2.3 R	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

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



Date Prepared/Revised
12/05/2017

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: 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): 10/19/2017 Sample Collection Time: 12:02

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

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): 2270432001 Final Lab Analysis Completion Date: 10/31/2017

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP018S

Sample Date 10/19/2017

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	391	SM18-2321
CALCIUM, TOTAL	79.3	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	21	EPA 410.4
CHLORIDE	719	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	91	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	5.6 ND	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	16.7	EPA 300.0
pH-FIELD (SU)	7.7	FIELD
pH-LAB (SU)	8.39	EPA 150.1
POTASSIUM, TOTAL	19	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	360	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	3282	FIELD
SPEC. COND., LAB (umhos/cm)	2920	EPA 120.1
SULFATE	38	EPA 300.0
ALKALINITY	409	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	1530	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	7.4	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.26	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.

T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).

Remaining quarterly samples only require total metals analysis.

I.D. No 100008

Monitoring Point No. CWMP018S

Sample Date 10/19/2017

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 LAND RECYCLING AND WASTE



Date Prepared/Revised
12/05/2017

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: 14.44 ft Measured from: ☐ Land Surface ☒ TOC

Casing Stickup: 2.53 ft Elevation of Water Level: 297.53 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: 1.7

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 10/19/2017 Sample Collection Time: 11:39

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

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): 2270432002 Final Lab Analysis Completion Date: 10/31/2017

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP016W

Sample Date 10/19/2017

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	5.4	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	3.1	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	760	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	1.2	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	5.6 ND	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	0.66	EPA 300.0
pH-FIELD (SU)	5.37	FIELD
pH-LAB (SU)	6.53	EPA 150.1
POTASSIUM, TOTAL	0.56 ND	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	3.5	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	69	FIELD
SPEC. COND., LAB (umhos/cm)	55	EPA 120.1
SULFATE	10.6	EPA 300.0
ALKALINITY	13	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	33	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	0.63	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	4.73	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 10/19/2017

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	1.1 R	SW846 8260B
TETRACHLOROETHENE	1 ND	SW846 8260B
TOLUENE	1 ND	SW846 8260B
1,1,1-TRICHLOROETHANE	1 ND	SW846 8260B
TRICHLOROETHENE	1 ND	SW846 8260B
VINYL CHLORIDE	1 ND	SW846 8260B
XYLENES (TOTAL)	3 ND	SW846 8260B

T Please indicate detection limit if analyte is not detected.

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



Date Prepared/Revised
12/05/2017

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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° 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): 10/19/2017 Sample Collection Time: 12:23

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

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): 2270432003 Final Lab Analysis Completion Date: 10/31/2017

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP017S

Sample Date 10/19/2017

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	419	SM18-2321
CALCIUM, TOTAL	67.5	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	12	EPA 410.4
CHLORIDE	673	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	140	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	86.2	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	85	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	17.4	EPA 300.0
pH-FIELD (SU)	7.6	FIELD
pH-LAB (SU)	8.03	EPA 150.1
POTASSIUM, TOTAL	16.4	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	343	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	3524	FIELD
SPEC. COND., LAB (umhos/cm)	2750	EPA 120.1
SULFATE	35.8	EPA 300.0
ALKALINITY	419	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	1420	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	4	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.62	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 10/19/2017

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.



Date Prepared/Revised
12/05/2017

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 X Well ___ Spring ___ Stream ___ Other

 Upgradient/Upstream X 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: 9 ft Measured from: Land Surface X TOC

Casing Stickup: 2.10 ft Elevation of Water Level: 351.9 ft./MSL

Sampling Depth:	17 ft	Volume of Water Column:	6.92 gal
-----------------	-------	-------------------------	----------

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

Well Purged: X Yes No Well Volumes Purged: 1.0

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 10/19/2017 Sample Collection Time: 13:42

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

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): 2270432004 Final Lab Analysis CompletionDate: 10/31/2017

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments:

I.D. No 100008

Monitoring Point No. CWMP010W

Sample Date 10/19/2017

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	0.136	EPA 350.3
BICARBONATE	406	SM18-2321
CALCIUM, TOTAL	107	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	51	EPA 410.4
CHLORIDE	640	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	410	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	71.3	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	2500	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	6.1	EPA 300.0
pH-FIELD (SU)	6.5	FIELD
pH-LAB (SU)	7.13	EPA 150.1
POTASSIUM, TOTAL	26	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	305	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	848	FIELD
SPEC. COND., LAB (umhos/cm)	2680	EPA 120.1
SULFATE	33	EPA 300.0
ALKALINITY	406	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	1490	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	17.5	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	3.11	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 10/19/2017

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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12/05/2017

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FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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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: CWMP009W X Well ___ Spring ___ Stream ___ Other

 Upgradient/Upstream X 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:	9.51	ft	Measured from:	Land Surface	X	TOC
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Casing Stickup: 2.70 ft Elevation of Water Level: 394.69 ft./MSL

Sampling Depth:	16 ft	Volume of Water Column:	6.65 gal
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Total Well Depth: 19.7 ft Sampling Method: ☒ Pumped ☐ Bailed ☐ Grab

Well Purged: X Yes No Well Volumes Purged: 4.3

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 10/19/2017 Sample Collection Time: 14:06

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

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): 2270432005 Final Lab Analysis CompletionDate: 10/31/2017

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments:

I.D. No 100008

Monitoring Point No. CWMP009W

Sample Date 10/19/2017

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	29.8	EPA 350.3
BICARBONATE	532	SM18-2321
CALCIUM, TOTAL	164	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	127	EPA 410.4
CHLORIDE	618	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	37900	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	76.4	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	13300	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	0.2 ND	EPA 300.0
pH-FIELD (SU)	6.44	FIELD
pH-LAB (SU)	6.41	EPA 150.1
POTASSIUM, TOTAL	35.1	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	161	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	3092	FIELD
SPEC. COND., LAB (umhos/cm)	2720	EPA 120.1
SULFATE	5.5	EPA 300.0
ALKALINITY	532	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	1610	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	33.4	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	34.8	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.

^T Please indicate detection limit if analyte is not detected.

** Total and dissolved analysis required only in conjunction with additional annual metals sampling (see page 4).

Remaining quarterly samples only require total metals analysis.

I.D. No 100008

Monitoring Point No. CWMP009W

Sample Date 10/19/2017

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	2.1	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	1.6 R	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.



Date Prepared/Revised
12/05/2017

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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° MM' SS.S")

Monitoring Point Number: CWMP008W X Well ___ Spring ___ Stream ___ Other

 Upgradient/Upstream X 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:	3.98	ft	Measured from:	Land Surface	X	TOC
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Casing Stickup: 2.80 ft Elevation of Water Level: 418.32 ft./MSL

Sampling Depth:	19 ft	Volume of Water Column:	3.07 gal
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Total Well Depth: 22.8 ft Sampling Method: X Pumped ___ Bailed ___ Grab

Well Purged: X Yes No Well Volumes Purged: 7.8

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

Spring Flow Rate: _____ gpm

Sample Date (mm/dd/yy): 10/19/2017 Sample Collection Time: 14:42

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

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): 2270432006 Final Lab Analysis CompletionDate: 10/31/2017

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments:

I.D. No 100008

Monitoring Point No. CWMP008W

Sample Date 10/19/2017

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	7.27	EPA 350.3
BICARBONATE	475	SM18-2321
CALCIUM, TOTAL	78.2	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	42	EPA 410.4
CHLORIDE	71.6	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	26400	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	35.9	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	16000	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	0.2 ND	EPA 300.0
pH-FIELD (SU)	6.2	FIELD
pH-LAB (SU)	6.45	EPA 150.1
POTASSIUM, TOTAL	9.5	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	61.1	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	1207	FIELD
SPEC. COND., LAB (umhos/cm)	1060	EPA 120.1
SULFATE	6	EPA 300.0
ALKALINITY	475	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	526	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	16.2	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	18.3	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 10/19/2017

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

ANALYTE	VALUE^T	ANALYSIS METHOD NUMBER
BENZENE	1.4	SW846 8260B
1,2-DIBROMOETHANE (EDB) (ETHYLENE D	1 ND	SW846 8260B
1,1-DICHLOROETHANE	3.5	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.

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



Date Prepared/Revised
12/05/2017

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FORM 19
MUNICIPAL WASTE LANDFILL
QUARTERLY AND ANNUAL WATER QUALITY ANALYSES

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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: 19.21 ft Measured from: ☐ Land Surface ☒ TOC

Casing Stickup: 1.90 ft Elevation of Water Level: 363.49 ft./MSL

Sampling Depth: 0 ft Volume of Water Column: 121.44 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): 10/20/2017 Sample Collection Time: 11:29

Sample Collector's Name: Mr. Brian G Shade

Sample Collector's Affiliation: ALS Environmental

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): 2270903001 Final Lab Analysis Completion Date: 11/7/2017

Name/Affiliation of Person who Filled Out Form: Mark D. Reider

Comments: _____

I.D. No 100008

Monitoring Point No. CWMP012W

Sample Date 10/20/2017

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	0.231	EPA 350.3
BICARBONATE	68	SM18-2321
CALCIUM, TOTAL	33.3	SW846 6010B
CALCIUM, DISSOLVED		SW 8466010B
COD (CHEMICAL OXYGEN DEMAND)	7 ND	EPA 410.4
CHLORIDE	36.2	EPA 300.0
FLUORIDE	0.2 ND	EPA 300.0
IRON, TOTAL (ug/l)	1200	SW846 6010B
IRON, DISSOLVED (ug/l)		SW846 6010B
MAGNESIUM, TOTAL	9.3	SW846 6010B
MAGNESIUM, DISSOLVED		SW846 6010B
MANGANESE, TOTAL (ug/l)	93	SW846 6010B
MANGANESE, DISSOLVED (ug/l)		SW846 6010B
NITRATE-NITROGEN	10.2	EPA 300.0
pH-FIELD (SU)	4.78	FIELD
pH-LAB (SU)	6.17	EPA 150.1
POTASSIUM, TOTAL	1.5	SW846 6010B
POTASSIUM, DISSOLVED		SW846 6010B
SODIUM, TOTAL	12.9	SW846 6010B
SODIUM, DISSOLVED		SW846 6010B
SPEC. COND., FIELD (umhos/cm)	388	FIELD
SPEC. COND., LAB (umhos/cm)	309	EPA 120.1
SULFATE	8.4	EPA 300.0
ALKALINITY	68	SM18-2320B
TDS (TOTAL DISSOLVED SOLIDS)	111	SM18-2540C
TOC (TOTAL ORGANIC CARBON)	1.4	SM18-5310B
TOTAL PHENOLICS (ug/l)	5 ND	SW846 9066
TURBIDITY (N.T.U.)	0.76	SM 2130B

* Indicator Analyte - For comparison with detection zone analytes.

^T Please indicate detection limit if analyte is not detected.

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I.D. No 100008

Monitoring Point No. CWMP012W

Sample Date 10/20/2017

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	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.

October 31, 2017

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

Certificate of Analysis

Project Name: 2017-CRESWELL	Workorder: 2269415
Purchase Order:	Workorder ID: QUARTERLY CWMP-FORM 19Q

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Monday, October 16, 2017.

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.

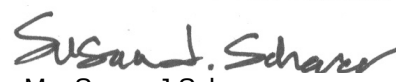
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications 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: Ms. Jordan Gallagher , Mr. Mark Reider , 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: 2269415 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2269415001	CWMP007W	Ground Water	10/16/2017 11:25	10/16/2017 17:26	Mr. Brian G Shade
2269415002	CWMP001W	Ground Water	10/16/2017 12:44	10/16/2017 17:26	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2269415 QUARTERLY 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: 2269415 QUARTERLY CWMP-FORM 19Q

Lab ID: **2269415001**
Sample ID: **CWMP007W**

Date Collected: 10/16/2017 11:25 Matrix: Ground Water
Date Received: 10/16/2017 17:26

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:24	DD	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:24	DD	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:24	DD	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:24	DD	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:24	DD	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:24	DD	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:24	DD	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:24	DD	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 17:24	DD	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:24	DD	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:24	DD	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/20/17 17:24	DD	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:24	DD	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:24	DD	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 17:24	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>
1,2-Dichloroethane-d4 (S)	125		%	62 - 133	SW846 8260B			10/20/17 17:24	DD	G
4-Bromofluorobenzene (S)	91.6		%	79 - 114	SW846 8260B			10/20/17 17:24	DD	G
Dibromofluoromethane (S)	105		%	78 - 116	SW846 8260B			10/20/17 17:24	DD	G
Toluene-d8 (S)	85.1		%	76 - 127	SW846 8260B			10/20/17 17:24	DD	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	12		mg/L	5	S2320B-97			10/18/17 01:23	MSA	B
Alkalinity, Total	12	2	mg/L	5	S2320B-97			10/18/17 01:23	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			10/26/17 10:57	NJA	A
Chemical Oxygen Demand (COD)	8		mg/L	7	EPA 410.4			10/22/17 21:06	AK	A
Chloride	67.8		mg/L	2.0	EPA 300.0			10/17/17 19:13	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/17/17 19:13	CHW	B
Nitrate-N	10.6		mg/L	0.20	EPA 300.0			10/17/17 19:13	CHW	B
pH	5.81	1	pH_Units		S4500HB-11			10/18/17 01:23	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/30/17 00:00	JLG	10/30/17 10:08	JLG	F
Specific Conductance	334		umhos/cm	1	SW846 9050A			10/18/17 01:23	MSA	B
Sulfate	14.6		mg/L	2.0	EPA 300.0			10/17/17 19:13	CHW	B
Total Dissolved Solids	259		mg/L	5	S2540C-11			10/20/17 13:47	BMK	B
Total Organic Carbon (TOC)	1.1		mg/L	0.50	SW846 9060A			10/23/17 10:28	PAG	D
Turbidity	ND		NTU	0.10	S2130B-01			10/18/17 02:55	MSA	B

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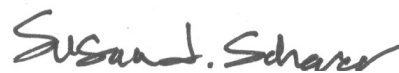
ANALYTICAL RESULTS

Workorder: 2269415 QUARTERLY CWMP-FORM 19Q

Lab ID: **2269415001**
Sample ID: **CWMP007W**

Date Collected: 10/16/2017 11:25 Matrix: Ground Water
Date Received: 10/16/2017 17:26

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	19.2		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 13:40	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/23/17 04:30	SRT	10/23/17 13:40	SRT	J1
Magnesium, Total	9.4		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 13:40	SRT	J1
Manganese, Total	0.0066		mg/L	0.0056	SW846 6010C	10/23/17 04:30	SRT	10/23/17 13:40	SRT	J1
Potassium, Total	2.2		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 13:40	SRT	J1
Sodium, Total	32.4		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 13:40	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	8.870		Feet		Field			10/16/17 11:25	CLT	C
Elev Top MW Casing above MSL	453.40		Feet		Field			10/16/17 11:25	CLT	C
Flow Rate	1.64		gal/min		Field			10/16/17 11:25	CLT	C
Ground Water Elevation	444.530		ft/MSL		Field			10/16/17 11:25	CLT	C
pH, Field (SM4500B)	5.270		pH_Units		Field			10/16/17 11:25	CLT	C
Sample Depth	33.000		Feet		Field			10/16/17 11:25	CLT	C
Specific Conductance, Field	420		umhos/cm	1	Field			10/16/17 11:25	CLT	C
Temperature	11.64		Deg. C		Field			10/16/17 11:25	CLT	C
Total Well Depth	36.500		Feet		Field			10/16/17 11:25	CLT	C
Volume in Water Column	40.616		Gallons		Field			10/16/17 11:25	CLT	C
Water Level After Purge	9.390		Feet		Field			10/16/17 11:25	CLT	C
Well Volumes Purged	2.42		Vol		Field			10/16/17 11:25	CLT	C



Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2269415 QUARTERLY CWMP-FORM 19Q

Lab ID: **2269415002**
Sample ID: **CWMP001W**

Date Collected: 10/16/2017 12:44 Matrix: Ground Water
Date Received: 10/16/2017 17:26

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:45	DD	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:45	DD	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:45	DD	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:45	DD	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:45	DD	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:45	DD	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:45	DD	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:45	DD	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 17:45	DD	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:45	DD	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:45	DD	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/20/17 17:45	DD	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:45	DD	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:45	DD	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 17:45	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>
1,2-Dichloroethane-d4 (S)	122		%	62 - 133	SW846 8260B			10/20/17 17:45	DD	G
4-Bromofluorobenzene (S)	92.1		%	79 - 114	SW846 8260B			10/20/17 17:45	DD	G
Dibromofluoromethane (S)	107		%	78 - 116	SW846 8260B			10/20/17 17:45	DD	G
Toluene-d8 (S)	85.9		%	76 - 127	SW846 8260B			10/20/17 17:45	DD	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	6		mg/L	5	S2320B-97			10/18/17 01:32	MSA	B
Alkalinity, Total	6	2	mg/L	5	S2320B-97			10/18/17 01:32	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			10/26/17 11:11	NJA	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			10/24/17 21:14	AK	A
Chloride	32.6		mg/L	2.0	EPA 300.0			10/17/17 19:26	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/17/17 19:26	CHW	B
Nitrate-N	20.9		mg/L	1.0	EPA 300.0			10/17/17 19:39	CHW	B
pH	5.58	1	pH_Units		S4500HB-11			10/18/17 01:32	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/30/17 00:00	JLG	10/30/17 10:08	JLG	F
Specific Conductance	259		umhos/cm	1	SW846 9050A			10/18/17 01:32	MSA	B
Sulfate	2.0		mg/L	2.0	EPA 300.0			10/17/17 19:26	CHW	B
Total Dissolved Solids	200		mg/L	5	S2540C-11			10/20/17 13:47	BMK	B
Total Organic Carbon (TOC)	1.1		mg/L	0.50	SW846 9060A			10/23/17 10:28	PAG	D
Turbidity	35.7		NTU	0.10	S2130B-01			10/18/17 02:55	MSA	B

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ANALYTICAL RESULTS

Workorder: 2269415 QUARTERLY CWMP-FORM 19Q

Lab ID: **2269415002**
Sample ID: **CWMP001W**

Date Collected: 10/16/2017 12:44 Matrix: Ground Water
Date Received: 10/16/2017 17:26

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	17.0		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 13:44	SRT	J1
Iron, Total	0.76		mg/L	0.067	SW846 6010C	10/23/17 04:30	SRT	10/23/17 13:44	SRT	J1
Magnesium, Total	11.2		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 13:44	SRT	J1
Manganese, Total	0.067		mg/L	0.0056	SW846 6010C	10/23/17 04:30	SRT	10/23/17 13:44	SRT	J1
Potassium, Total	2.3		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 13:44	SRT	J1
Sodium, Total	15.1		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 13:44	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	30.670		Feet		Field			10/16/17 12:44	CLT	C
Elev Top MW Casing above MSL	515.13		Feet		Field			10/16/17 12:44	CLT	C
Flow Rate	1.90		gal/min		Field			10/16/17 12:44	CLT	C
Ground Water Elevation	484.460		ft/MSL		Field			10/16/17 12:44	CLT	C
pH, Field (SM4500B)	5.160		pH_Units		Field			10/16/17 12:44	CLT	C
Sample Depth	57.000		Feet		Field			10/16/17 12:44	CLT	C
Specific Conductance, Field	329		umhos/cm	1	Field			10/16/17 12:44	CLT	C
Temperature	11.60		Deg. C		Field			10/16/17 12:44	CLT	C
Total Well Depth	66.300		Feet		Field			10/16/17 12:44	CLT	C
Volume in Water Column	52.376		Gallons		Field			10/16/17 12:44	CLT	C
Water Level After Purge	53.390		Feet		Field			10/16/17 12:44	CLT	C
Well Volumes Purged	0.98		Vol		Field			10/16/17 12:44	CLT	C



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Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2269415 QUARTERLY CWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2269415001	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.				
2269415001	2	CWMP007W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2269415002	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.				
2269415002	2	CWMP001W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

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



CHAIN OF CUSTODY/
REQUEST FOR ANALYSIS
ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT /
SAMPLER. INSTRUCTIONS ON THE BACK.

Generated by ALS

COC
ALS



1 of 1

Client Name: Lancaster County Solid Waste MA		Container Type	AG	AN	CG	PL	PL	PL	PL
Address: 1299 Harrisburg Pike, P.O. Box 4424		Container Size	40 ml	500 ml	40 ml	500 ml	500 ml	1 L	500 ml
Lancaster, PA 17604		Preservative	HCl	H2SO4	HCl	H2SO4	HNO3	None	None
Contact: Mark Reider		ANALYSES/METHOD REQUESTED							
Phone: (717) 735-0193		Field Measurements							
Project Name: Creswell Form 19Q Wells		Sample Depth for AUX Data							
Bill To: Lancaster County Solid Waste MA		8260 - Form 19Q							
TAT ☒ Normal-Standard TAT is 10-12 business days.		O-OH							
Rush-Subject to ALS approval and surcharges.		TOC							
Date Required: _____ Approved By: _____		Enter Number of Containers Per Sample or Field Results Below.							
Email: ☒ X-Y mreider@LCSWMA.com		Total Metals: Ca, Fe, Mn, Mg, K, Na							
Fax: ☒ X-Y No: (717) 397-9973		pH, NO3, Cl, F, SPC, SO4, Turb.							
Sample Description/Location (as it will appear on the lab report)		Sample Date		Time		Alkalinity, HCO3			
1. CUMPOOW		10/16/17		11:25		1			
2. CUMPOOW		10/16/17		12:44		1			
3.						1			
4.						1			
5.						1			
6.						1			
7.						1			
8.						1			
9.						1			
10.						1			
Project Comments:		LOGGED BY (signature):		DATE		TIME			
Relinquished By / Company Name		Date		Time		Received By / Company Name			
1. X-S-S-W		10/16/17		12:26		2. J. Anderson			
3.						4.			
5.						6.			
7.						8.			
9.						10.			
State Samples Collected In		Standard		CLP-like		USACE		Navy	
Special Processing		USACE		Navy		USACE		Navy	
ALS Field Services: ☐ Pickup ☐ Labor ☐ Composite Sampling ☐ Rental Equipment ☐ Other:		Reportable to PADEP?		Yes ☐ No ☐		Sample Disposal		Lab ☒ Special ☐	
PWSID #		EDDS: Formal Type		PA		NC		NC	

November 8, 2017

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

Certificate of Analysis

Project Name: 2017-CRESWELL	Workorder: 2270105
Purchase Order:	Workorder ID: QUARTERLY CWMP-FORM 19Q

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, October 18, 2017.

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.

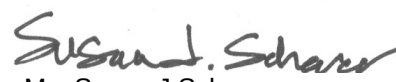
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications 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: Ms. Jordan Gallagher , Mr. Mark Reider , 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: 2270105 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2270105001	CWMP002W	Ground Water	10/18/2017 11:28	10/18/2017 14:29	Mr. Brian G Shade
2270105002	CWMP003W	Ground Water	10/18/2017 12:34	10/18/2017 14:29	Mr. Brian G Shade
2270105003	CWMP004W	Ground Water	10/18/2017 12:47	10/18/2017 14:29	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2270105 QUARTERLY 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: 2270105 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270105001**
Sample ID: **CWMP002W**

Date Collected: 10/18/2017 11:28 Matrix: Ground Water
Date Received: 10/18/2017 14:29

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Bromoform	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Bromomethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Chloroethane	2.9		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Chloroform	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Chloromethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
1,1-Dichloroethane	8.6		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			10/20/17 17:48	TMP	E
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Styrene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Toluene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/20/17 17:48	TMP	E
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			10/20/17 17:48	TMP	E
1,1,1-Trichloroethane	1.1		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			10/20/17 17:48	TMP	E
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 17:48	TMP	E
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr

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ANALYTICAL RESULTS

Workorder: 2270105 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270105001**
Sample ID: **CWMP002W**

Date Collected: 10/18/2017 11:28 Matrix: Ground Water
Date Received: 10/18/2017 14:29

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	91.3		%	62 - 133	SW846 8260B			10/20/17 17:48	TMP	E
4-Bromofluorobenzene (S)	91.9		%	79 - 114	SW846 8260B			10/20/17 17:48	TMP	E
Dibromofluoromethane (S)	93.9		%	78 - 116	SW846 8260B			10/20/17 17:48	TMP	E
Toluene-d8 (S)	91.8		%	76 - 127	SW846 8260B			10/20/17 17:48	TMP	E
WET CHEMISTRY										
Alkalinity, Bicarbonate	64		mg/L	5	S2320B-97			10/20/17 02:24	MSA	C
Alkalinity, Total	64	1	mg/L	5	S2320B-97			10/20/17 02:24	MSA	C
Ammonia-N	0.199		mg/L	0.100	D6919-09			11/1/17 20:14	CMM	A
Chemical Oxygen Demand (COD)	12		mg/L	7	EPA 410.4			10/22/17 21:06	AK	A
Chloride	106		mg/L	2.0	EPA 300.0			10/19/17 11:23	CHW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			10/19/17 11:23	CHW	C
Nitrate-N	3.4		mg/L	0.20	EPA 300.0			10/19/17 11:23	CHW	C
pH	5.96	2	pH_Units		S4500HB-11			10/20/17 02:24	MSA	C
Phenolics	ND		mg/L	0.005	SW846 9066	11/1/17 00:00	JLG	11/1/17 10:17	JLG	I
Specific Conductance	536		umhos/cm	1	S2510B-97			10/20/17 02:24	MSA	C
Sulfate	24.6		mg/L	2.0	EPA 300.0			10/19/17 11:23	CHW	C
Total Dissolved Solids	299		mg/L	5	S2540C-11			10/24/17 14:29	BMK	C
Total Organic Carbon (TOC)	3.0		mg/L	0.50	S5310B-00			10/25/17 13:13	PAG	G
Turbidity	0.57		NTU	0.10	S2130B-01			10/20/17 00:44	MSA	C
METALS										
Calcium, Total	52.2		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:04	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:04	SRT	J1
Magnesium, Total	15.2		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:04	SRT	J1
Manganese, Total	1.1		mg/L	0.0056	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:04	SRT	J1
Potassium, Total	2.6		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:04	SRT	J1
Sodium, Total	20.6		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:04	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	90.920		Feet		Field			10/18/17 11:52	CLT	B
Elev Top MW Casing above MSL	525.81		Feet		Field			10/18/17 11:52	CLT	B
Ground Water Elevation	434.890		ft/MSL		Field			10/18/17 11:52	CLT	B
pH, Field (SM4500B)	5.770		pH_Units		Field			10/18/17 11:52	CLT	B
Sample Depth	85.000		Feet		Field			10/18/17 11:52	CLT	B
Specific Conductance, Field	603		umhos/cm	1	Field			10/18/17 11:52	CLT	B
Temperature	12.31		Deg. C		Field			10/18/17 11:52	CLT	B
Total Well Depth	100.000		Feet		Field			10/18/17 11:52	CLT	B

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ANALYTICAL RESULTS

Workorder: 2270105 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270105001**
Sample ID: **CWMP002W**

Date Collected: 10/18/2017 11:28 Matrix: Ground Water
Date Received: 10/18/2017 14:29

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

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ANALYTICAL RESULTS

Workorder: 2270105 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270105002**
Sample ID: **CWMP003W**

Date Collected: 10/18/2017 12:34 Matrix: Ground Water
Date Received: 10/18/2017 14:29

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Bromoform	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Bromomethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Chloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Chloroform	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Chloromethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
1,1-Dichloroethane	2.6		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			10/20/17 18:06	TMP	E
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Styrene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Toluene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/20/17 18:06	TMP	E
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			10/20/17 18:06	TMP	E
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			10/20/17 18:06	TMP	E
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 18:06	TMP	E
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr

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ANALYTICAL RESULTS

Workorder: 2270105 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270105002**
Sample ID: **CWMP003W**

Date Collected: 10/18/2017 12:34 Matrix: Ground Water
Date Received: 10/18/2017 14:29

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	91.9		%	62 - 133	SW846 8260B			10/20/17 18:06	TMP	E
4-Bromofluorobenzene (S)	93.9		%	79 - 114	SW846 8260B			10/20/17 18:06	TMP	E
Dibromofluoromethane (S)	96.1		%	78 - 116	SW846 8260B			10/20/17 18:06	TMP	E
Toluene-d8 (S)	93.8		%	76 - 127	SW846 8260B			10/20/17 18:06	TMP	E
WET CHEMISTRY										
Alkalinity, Bicarbonate	22		mg/L	5	S2320B-97			10/20/17 03:16	MSA	C
Alkalinity, Total	22	1	mg/L	5	S2320B-97			10/20/17 03:16	MSA	C
Ammonia-N	ND		mg/L	0.100	D6919-09			10/28/17 01:12	JAM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			10/22/17 21:06	AK	A
Chloride	80.1		mg/L	2.0	EPA 300.0			10/19/17 11:41	CHW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			10/19/17 11:41	CHW	C
Nitrate-N	8.6		mg/L	0.20	EPA 300.0			10/19/17 11:41	CHW	C
pH	5.91	2	pH_Units		S4500HB-11			10/20/17 03:16	MSA	C
Phenolics	ND		mg/L	0.005	SW846 9066	11/1/17 00:00	JLG	11/1/17 10:17	JLG	I
Specific Conductance	349		umhos/cm	1	S2510B-97			10/20/17 03:16	MSA	C
Sulfate	5.7		mg/L	2.0	EPA 300.0			10/19/17 11:41	CHW	C
Total Dissolved Solids	161		mg/L	5	S2540C-11			10/24/17 14:29	BMK	C
Total Organic Carbon (TOC)	0.67		mg/L	0.50	S5310B-00			10/25/17 13:13	PAG	G
Turbidity	0.12		NTU	0.10	S2130B-01			10/20/17 00:44	MSA	C
METALS										
Calcium, Total	30.8		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:07	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:07	SRT	J1
Magnesium, Total	10.2		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:07	SRT	J1
Manganese, Total	0.0070		mg/L	0.0056	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:07	SRT	J1
Potassium, Total	1.6		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:07	SRT	J1
Sodium, Total	19.9		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:07	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	95.190		Feet		Field			10/18/17 12:34	CLT	B
Elev Top MW Casing above MSL	524.21		Feet		Field			10/18/17 12:34	CLT	B
Ground Water Elevation	429.020		ft/MSL		Field			10/18/17 12:34	CLT	B
pH, Field (SM4500B)	5.650		pH_Units		Field			10/18/17 12:34	CLT	B
Sample Depth	100.000		Feet		Field			10/18/17 12:34	CLT	B
Specific Conductance, Field	432		umhos/cm	1	Field			10/18/17 12:34	CLT	B
Temperature	12.97		Deg. C		Field			10/18/17 12:34	CLT	B
Total Well Depth	140.000		Feet		Field			10/18/17 12:34	CLT	B

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ANALYTICAL RESULTS

Workorder: 2270105 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270105002**
Sample ID: **CWMP003W**

Date Collected: 10/18/2017 12:34 Matrix: Ground Water
Date Received: 10/18/2017 14:29

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

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ANALYTICAL RESULTS

Workorder: 2270105 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270105003**
Sample ID: **CWMP004W**

Date Collected: 10/18/2017 12:47 Matrix: Ground Water
Date Received: 10/18/2017 14:29

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Bromodichloromethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Bromoform	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Bromomethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Carbon Tetrachloride	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Chlorobenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Chlorodibromomethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Chloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Chloroform	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Chloromethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
1,2-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
1,3-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
1,4-Dichlorobenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
1,1-Dichloroethane	1.1		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
1,2-Dichloropropane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
1,3-Dichloropropene, Total	ND		ug/L	2.0	SW846 8260B			10/20/17 18:25	TMP	E
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Styrene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Toluene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/20/17 18:25	TMP	E
1,2,4-Trichlorobenzene	ND		ug/L	2.0	SW846 8260B			10/20/17 18:25	TMP	E
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
1,1,2-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Trichlorofluoromethane	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
1,2,3-Trichloropropane	ND		ug/L	2.0	SW846 8260B			10/20/17 18:25	TMP	E
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 18:25	TMP	E
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr

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ANALYTICAL RESULTS

Workorder: 2270105 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270105003**
Sample ID: **CWMP004W**

Date Collected: 10/18/2017 12:47 Matrix: Ground Water
Date Received: 10/18/2017 14:29

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	93		%	62 - 133	SW846 8260B			10/20/17 18:25	TMP	E
4-Bromofluorobenzene (S)	99.7		%	79 - 114	SW846 8260B			10/20/17 18:25	TMP	E
Dibromofluoromethane (S)	97.6		%	78 - 116	SW846 8260B			10/20/17 18:25	TMP	E
Toluene-d8 (S)	95.5		%	76 - 127	SW846 8260B			10/20/17 18:25	TMP	E
WET CHEMISTRY										
Alkalinity, Bicarbonate	26		mg/L	5	S2320B-97			10/20/17 03:25	MSA	C
Alkalinity, Total	26	1	mg/L	5	S2320B-97			10/20/17 03:25	MSA	C
Ammonia-N	ND		mg/L	0.100	D6919-09			10/28/17 01:26	JAM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			10/25/17 21:44	AK	A
Chloride	43.4		mg/L	2.0	EPA 300.0			10/19/17 12:00	CHW	C
Fluoride	ND		mg/L	0.20	EPA 300.0			10/19/17 12:00	CHW	C
Nitrate-N	7.1		mg/L	0.20	EPA 300.0			10/19/17 12:00	CHW	C
pH	6.10	2	pH_Units		S4500HB-11			10/20/17 03:25	MSA	C
Phenolics	ND		mg/L	0.005	SW846 9066	11/1/17 00:00	JLG	11/1/17 10:17	JLG	I
Specific Conductance	235		umhos/cm	1	S2510B-97			10/20/17 03:25	MSA	C
Sulfate	6.1		mg/L	2.0	EPA 300.0			10/19/17 12:00	CHW	C
Total Dissolved Solids	106	3	mg/L	5	S2540C-11			10/24/17 14:29	BMK	C
Total Organic Carbon (TOC)	0.68		mg/L	0.50	S5310B-00			10/25/17 13:13	PAG	G
Turbidity	0.30		NTU	0.10	S2130B-01			10/20/17 00:44	MSA	C
METALS										
Calcium, Total	21.8		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:11	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:11	SRT	J1
Magnesium, Total	6.5		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:11	SRT	J1
Manganese, Total	0.0098		mg/L	0.0056	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:11	SRT	J1
Potassium, Total	1.3		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:11	SRT	J1
Sodium, Total	14.7		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:11	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	104.760		Feet		Field			10/18/17 12:47	CLT	B
Elev Top MW Casing above MSL	529.53		Feet		Field			10/18/17 12:47	CLT	B
Ground Water Elevation	424.770		ft/MSL		Field			10/18/17 12:47	CLT	B
pH, Field (SM4500B)	5.840		pH_Units		Field			10/18/17 12:47	CLT	B
Sample Depth	130.000		Feet		Field			10/18/17 12:47	CLT	B
Specific Conductance, Field	295		umhos/cm	1	Field			10/18/17 12:47	CLT	B
Temperature	12.34		Deg. C		Field			10/18/17 12:47	CLT	B
Total Well Depth	140.000		Feet		Field			10/18/17 12:47	CLT	B

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ANALYTICAL RESULTS

Workorder: 2270105 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270105003**
Sample ID: **CWMP004W**

Date Collected: 10/18/2017 12:47 Matrix: Ground Water
Date Received: 10/18/2017 14:29

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

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ANALYTICAL RESULTS

Workorder: 2270105 QUARTERLY CWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2270105001	1	CWMP002W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2270105001	2	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.				
2270105002	1	CWMP003W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2270105002	2	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.				
2270105003	1	CWMP004W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2270105003	2	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.				
2270105003	3	CWMP004W	S2540C-11	Total Dissolved Solids
The RPD associated with this sample was recovered at 20%. The RPD is outside method acceptance limits of 0-5%. The results used to calculate the RPD were 106 and 129.				

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CHAIN OF CUSTODY/

REQUEST FOR ANALYSIS

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

CO of 1

AL

Barcode: 2270105

Client Name: Lancaster County Solid Waste MA		Container Type: 40 ml	AG	AN	CG	PL	PL	PL	PL	PL
Address: 1299 Harrisburg Pike, P.O. Box 4424		Container Size: 40 ml	500 ml	500 ml	500 ml	500 ml	500 ml	500 ml	500 ml	500 ml
Lancaster, PA 17604		Preservative: HCl	H2SO4	HCl	H2SO4	HNO3	HNO3	HNO3	HNO3	HNO3
Contact: Mark Reider		ANALYSIS/METHOD REQUESTED								
Phone#: (717) 735-0193		Field Measurements								
Project Name#: Creswell Form 19Q Wells		Sample Depth for AUX Data								
Bill To: Lancaster County Solid Waste MA		Total Metals: Ca, Fe, Mg, Mn, K, Na								
TAT ☒ Normal-Standard TAT is 10-12 business days.		PH, NO3, Cl, F, SPC, SO4, Turb.								
Date Required: Rush-Subject to ALS approval and surcharges.		Alkalinity, HCO3								
Email? ☒ Y mreider@LCSWMA.com		TDS								
Fax? ☒ Y No.: (717) 397-9973		NH3-N, COD								
Sample Description/Location (as it will appear on the lab report)		Enter Number of Containers Per Sample or Field Results Below:								
1. CWMR002W		10/18/17	1128	2	1	2	X	X	1	1
2. CWMR003W		1234	1	1	1	1	1	1	1	1
3. CWMR004W		1237	1	1	1	1	1	1	1	1
4.										
5.										
6.										
7.										
8.										
9.										
10.										
Project Comments:		ALS Field Services: ☐ Pickup ☐ Labor ☐ Composite_Sampling ☐ Rental_Equipment ☐ Other:								
Relinquished By / Company Name		Data Deliverables								
1. 1305 Shady St. ALS		Standard ☐ CLP-like ☐ USACE ☐ Navy ☐ USACE ☐								
3.		Reportable to PADEP? ☐ Yes ☐ No ☐ PWSID # ☐								
5.		Sample Disposal ☐ Lab ☒ X ☐ PA ☐ NC ☐								
7.		Special Processing ☐ USACE ☐ Navy ☐ USACE ☐								
9.		State Samples Collected In ☐ NY ☐ NJ ☒ PA ☐ NC ☐								
EDDS: Formal Type		Cooler Temp: 73C Therm ID: 304								
		No. of Coolers: Y N Initial								
		Custody Seals Present? (if present) Seals Intact? ☒								
		Received on Ice? ☒								
		COC/Labels Complete/Accurate? ☒								
		Cont. in Good Cond.? ☒								
		Correct Containers? ☒								
		Correct Sample Volumes? ☒								
		Correct Preservation? ☒								
		Headspace/Volatiles? ☒								
		Courier/Tracking #:								

November 8, 2017

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

Certificate of Analysis

Project Name: 2017-CRESWELL	Workorder: 2270132
Purchase Order:	Workorder ID: QUARTERLY CWMP-FORM 19Q

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, October 17, 2017.

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.

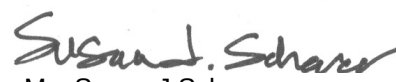
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications 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: Ms. Jordan Gallagher , Mr. Mark Reider , 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: 2270132 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2270132001	CWMP005W	Ground Water	10/17/2017 10:04	10/17/2017 16:13	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2270132 QUARTERLY 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: 2270132 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270132001**
Sample ID: **CWMP005W**

Date Collected: 10/17/2017 10:04 Matrix: Ground Water
Date Received: 10/17/2017 16:13

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:30	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:30	TMP	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:30	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:30	TMP	G
1,1-Dichloroethene	ND	2	ug/L	1.0	SW846 8260B			10/20/17 17:30	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:30	TMP	G
trans-1,2-Dichloroethene	ND	3,4	ug/L	1.0	SW846 8260B			10/20/17 17:30	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:30	TMP	G
Methylene Chloride	2.3		ug/L	1.0	SW846 8260B			10/20/17 17:30	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:30	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:30	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/20/17 17:30	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 17:30	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 17:30	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 17:30	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)	93.8		%	62 - 133	SW846 8260B			10/20/17 17:30	TMP	G
4-Bromofluorobenzene (S)	95.7		%	79 - 114	SW846 8260B			10/20/17 17:30	TMP	G
Dibromofluoromethane (S)	96.5		%	78 - 116	SW846 8260B			10/20/17 17:30	TMP	G
Toluene-d8 (S)	92.9		%	76 - 127	SW846 8260B			10/20/17 17:30	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	17		mg/L	5	S2320B-97			10/20/17 04:47	MSA	B
Alkalinity, Total	17	5	mg/L	5	S2320B-97			10/20/17 04:47	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			10/30/17 15:53	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			10/27/17 21:51	AK	A
Chloride	94.4		mg/L	2.0	EPA 300.0			10/18/17 21:10	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/18/17 21:10	CHW	B
Nitrate-N	10.8		mg/L	0.20	EPA 300.0			10/18/17 21:10	CHW	B
pH	5.86	1	pH_Units		S4500HB-11			10/20/17 04:47	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	11/1/17 00:00	JLG	11/1/17 10:17	JLG	F
Specific Conductance	431		umhos/cm	1	SW846 9050A			10/20/17 04:47	MSA	B
Sulfate	2.5		mg/L	2.0	EPA 300.0			10/18/17 21:10	CHW	B
Total Dissolved Solids	225		mg/L	5	S2540C-11			10/24/17 14:29	BMK	B
Total Organic Carbon (TOC)	0.56		mg/L	0.50	SW846 9060A			10/25/17 13:13	PAG	D
Turbidity	ND		NTU	0.10	S2130B-01			10/19/17 04:04	MSA	B

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ANALYTICAL RESULTS

Workorder: 2270132 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270132001**
Sample ID: **CWMP005W**

Date Collected: 10/17/2017 10:04 Matrix: Ground Water
Date Received: 10/17/2017 16:13

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	20.3		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 14:16	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/23/17 04:30	SRT	10/23/17 14:16	SRT	J1
Magnesium, Total	10.3		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 14:16	SRT	J1
Manganese, Total	0.069		mg/L	0.0056	SW846 6010C	10/23/17 04:30	SRT	10/23/17 14:16	SRT	J1
Potassium, Total	2.6		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 14:16	SRT	J1
Sodium, Total	42.1		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 14:16	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	46.400		Feet		Field			10/17/17 11:52	CLT	C
Elev Top MW Casing above MSL	513.43		Feet		Field			10/17/17 11:52	CLT	C
Flow Rate	4.00		gal/min		Field			10/17/17 11:52	CLT	C
Ground Water Elevation	467.030		ft/MSL		Field			10/17/17 11:52	CLT	C
pH, Field (SM4500B)	5.070		pH_Units		Field			10/17/17 11:52	CLT	C
Sample Depth	130.000		Feet		Field			10/17/17 11:52	CLT	C
Specific Conductance, Field	499		umhos/cm	1	Field			10/17/17 11:52	CLT	C
Temperature	10.95		Deg. C		Field			10/17/17 11:52	CLT	C
Total Well Depth	138.920		Feet		Field			10/17/17 11:52	CLT	C
Volume in Water Column	136.004		Gallons		Field			10/17/17 11:52	CLT	C
Water Level After Purge	49.240		Feet		Field			10/17/17 11:52	CLT	C
Well Volumes Purged	1.00		Vol		Field			10/17/17 11:52	CLT	C



Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2270132 QUARTERLY CWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2270132001	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.				
2270132001	2	CWMP005W	SW846 8260B	1,1-Dichloroethene
The QC sample type MSD for method SW846 8260B was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 130 and the control limits were 63 to 128.				
2270132001	3	CWMP005W	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type MS for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 123 and the control limits were 71 to 122.				
2270132001	4	CWMP005W	SW846 8260B	trans-1,2-Dichloroethene
The QC sample type MSD for method SW846 8260B was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 126 and the control limits were 71 to 122.				
2270132001	5	CWMP005W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				

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November 2, 2017

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

Certificate of Analysis

Project Name: 2017-CRESWELL	Workorder: 2270432
Purchase Order:	Workorder ID: QUARTERLY CWMP-FORM 19Q

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Thursday, October 19, 2017.

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.

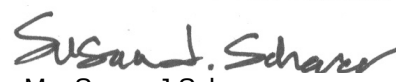
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications 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: Ms. Jordan Gallagher , Mr. Mark Reider , 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: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2270432001	CWMP018S	Ground Water	10/19/2017 12:02	10/19/2017 16:16	Mr. Brian G Shade
2270432002	CWMP016W	Ground Water	10/19/2017 11:39	10/19/2017 16:16	Mr. Brian G Shade
2270432003	CWMP017S	Ground Water	10/19/2017 12:23	10/19/2017 16:16	Mr. Brian G Shade
2270432004	CWMP010W	Ground Water	10/19/2017 13:42	10/19/2017 16:16	Mr. Brian G Shade
2270432005	CWMP009W	Ground Water	10/19/2017 14:06	10/19/2017 16:16	Mr. Brian G Shade
2270432006	CWMP008W	Ground Water	10/19/2017 14:42	10/19/2017 16:16	Mr. Brian G Shade
2270432007	Field Blank	Water	10/19/2017 15:17	10/19/2017 16:16	Mr. Brian G Shade
2270432008	Trip Blank	Water	10/19/2017 16:16	10/19/2017 16:16	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2270432 QUARTERLY 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: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270432001**
Sample ID: **CWMP018S**

Date Collected: 10/19/2017 12:02 Matrix: Ground Water
Date Received: 10/19/2017 16:16

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/20/17 22:46	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/20/17 22:46	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 22:46	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 22:46	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 22:46	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 22:46	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 22:46	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 22:46	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 22:46	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 22:46	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/20/17 22:46	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/20/17 22:46	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 22:46	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 22:46	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 22:46	CJG	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)	101		%	62 - 133	SW846 8260B			10/20/17 22:46	CJG	G
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			10/20/17 22:46	CJG	G
Dibromofluoromethane (S)	89.1		%	78 - 116	SW846 8260B			10/20/17 22:46	CJG	G
Toluene-d8 (S)	89		%	76 - 127	SW846 8260B			10/20/17 22:46	CJG	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	391		mg/L	5	S2320B-97			10/20/17 13:29	MSA	B
Alkalinity, Total	409	2	mg/L	5	S2320B-97			10/20/17 13:29	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			10/28/17 17:56	JAM	A
Chemical Oxygen Demand (COD)	21		mg/L	7	EPA 410.4			10/25/17 21:44	AK	A
Chloride	719		mg/L	25.0	EPA 300.0			10/20/17 15:43	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/20/17 15:31	CHW	B
Nitrate-N	16.7		mg/L	0.20	EPA 300.0			10/20/17 15:31	CHW	B
pH	8.39	1	pH_Units		S4500HB-11			10/20/17 13:29	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/31/17 00:00	JLG	10/31/17 13:37	JLG	F
Specific Conductance	2920		umhos/cm	1	SW846 9050A			10/20/17 13:29	MSA	B
Sulfate	38.0		mg/L	2.0	EPA 300.0			10/20/17 15:31	CHW	B
Total Dissolved Solids	1530		mg/L	5	S2540C-11			10/25/17 12:00	BMK	B
Total Organic Carbon (TOC)	7.4		mg/L	0.50	SW846 9060A			10/25/17 13:13	PAG	D
Turbidity	0.26		NTU	0.10	S2130B-01			10/20/17 04:05	MSA	B

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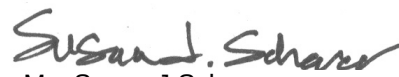
ANALYTICAL RESULTS

Workorder: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270432001**
Sample ID: **CWMP018S**

Date Collected: 10/19/2017 12:02 Matrix: Ground Water
Date Received: 10/19/2017 16:16

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	79.3		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:44	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:44	SRT	J1
Magnesium, Total	91.0		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:44	SRT	J1
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:44	SRT	J1
Potassium, Total	19.0		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:44	SRT	J1
Sodium, Total	360		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:44	SRT	J1
FIELD PARAMETERS										
Dissolved Oxygen	10.510		mg/L	0.010	Field			10/19/17 12:02	BGS	C
Flow Rate	218.80		gal/min		Field			10/19/17 12:02	BGS	C
pH, Field (SM4500B)	7.700		pH_Units		Field			10/19/17 12:02	BGS	C
Specific Conductance, Field	3282		umhos/cm	1	Field			10/19/17 12:02	BGS	C
Temperature	11.56		Deg. C		Field			10/19/17 12:02	BGS	C


Ms. Susan J Scherer
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ANALYTICAL RESULTS

Workorder: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270432002**
Sample ID: **CWMP016W**

Date Collected: 10/19/2017 11:39 Matrix: Ground Water
Date Received: 10/19/2017 16:16

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:09	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/20/17 23:09	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 23:09	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 23:09	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:09	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:09	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:09	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:09	CJG	G
Methylene Chloride	1.1		ug/L	1.0	SW846 8260B			10/20/17 23:09	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:09	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:09	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/20/17 23:09	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 23:09	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:09	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 23:09	CJG	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)	101		%	62 - 133	SW846 8260B			10/20/17 23:09	CJG	G
4-Bromofluorobenzene (S)	101		%	79 - 114	SW846 8260B			10/20/17 23:09	CJG	G
Dibromofluoromethane (S)	88.2		%	78 - 116	SW846 8260B			10/20/17 23:09	CJG	G
Toluene-d8 (S)	97.6		%	76 - 127	SW846 8260B			10/20/17 23:09	CJG	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	13		mg/L	5	S2320B-97			10/20/17 13:37	MSA	B
Alkalinity, Total	13	2	mg/L	5	S2320B-97			10/20/17 13:37	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			10/28/17 18:10	JAM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			10/25/17 21:44	AK	A
Chloride	3.1		mg/L	2.0	EPA 300.0			10/20/17 14:18	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/20/17 14:18	CHW	B
Nitrate-N	0.66		mg/L	0.20	EPA 300.0			10/20/17 14:18	CHW	B
pH	6.53	1	pH_Units		S4500HB-11			10/20/17 13:37	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/31/17 00:00	JLG	10/31/17 13:37	JLG	F
Specific Conductance	55		umhos/cm	1	SW846 9050A			10/20/17 13:37	MSA	B
Sulfate	10.6		mg/L	2.0	EPA 300.0			10/20/17 14:18	CHW	B
Total Dissolved Solids	33		mg/L	5	S2540C-11			10/25/17 12:00	BMK	B
Total Organic Carbon (TOC)	0.63		mg/L	0.50	SW846 9060A			10/25/17 13:13	PAG	D
Turbidity	4.73		NTU	0.10	S2130B-01			10/20/17 04:05	MSA	B

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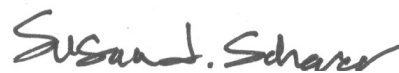
ANALYTICAL RESULTS

Workorder: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270432002**
Sample ID: **CWMP016W**

Date Collected: 10/19/2017 11:39 Matrix: Ground Water
Date Received: 10/19/2017 16:16

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	5.4		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:48	SRT	J1
Iron, Total	0.76		mg/L	0.067	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:48	SRT	J1
Magnesium, Total	1.2		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:48	SRT	J1
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:48	SRT	J1
Potassium, Total	ND		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:48	SRT	J1
Sodium, Total	3.5		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:48	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	14.440		Feet		Field			10/19/17 11:39	CLT	C
Elev Top MW Casing above MSL	311.97		Feet		Field			10/19/17 11:39	CLT	C
Flow Rate	2.46		gal/min		Field			10/19/17 11:39	CLT	C
Ground Water Elevation	297.530		ft/MSL		Field			10/19/17 11:39	CLT	C
pH, Field (SM4500B)	5.370		pH_Units		Field			10/19/17 11:39	CLT	C
Sample Depth	71.000		Feet		Field			10/19/17 11:39	CLT	C
Specific Conductance, Field	69		umhos/cm	1	Field			10/19/17 11:39	CLT	C
Temperature	10.42		Deg. C		Field			10/19/17 11:39	CLT	C
Total Well Depth	73.520		Feet		Field			10/19/17 11:39	CLT	C
Volume in Water Column	86.848		Gallons		Field			10/19/17 11:39	CLT	C
Water Level After Purge	22.790		Feet		Field			10/19/17 11:39	CLT	C
Well Volumes Purged	1.70		Vol		Field			10/19/17 11:39	CLT	C



Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270432003**
Sample ID: **CWMP017S**

Date Collected: 10/19/2017 12:23 Matrix: Ground Water
Date Received: 10/19/2017 16:16

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:31	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/20/17 23:31	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 23:31	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 23:31	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:31	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:31	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:31	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:31	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 23:31	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:31	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:31	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/20/17 23:31	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 23:31	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:31	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 23:31	CJG	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)	100		%	62 - 133	SW846 8260B			10/20/17 23:31	CJG	G
4-Bromofluorobenzene (S)	101		%	79 - 114	SW846 8260B			10/20/17 23:31	CJG	G
Dibromofluoromethane (S)	89.3		%	78 - 116	SW846 8260B			10/20/17 23:31	CJG	G
Toluene-d8 (S)	97.2		%	76 - 127	SW846 8260B			10/20/17 23:31	CJG	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	419		mg/L	5	S2320B-97			10/20/17 13:49	MSA	B
Alkalinity, Total	419	2	mg/L	5	S2320B-97			10/20/17 13:49	MSA	B
Ammonia-N	ND		mg/L	0.100	D6919-09			10/28/17 18:52	JAM	A
Chemical Oxygen Demand (COD)	12		mg/L	7	EPA 410.4			10/25/17 21:44	AK	A
Chloride	673		mg/L	25.0	EPA 300.0			10/20/17 16:07	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/20/17 15:55	CHW	B
Nitrate-N	17.4		mg/L	0.20	EPA 300.0			10/20/17 15:55	CHW	B
pH	8.03	1	pH_Units		S4500HB-11			10/20/17 13:49	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/31/17 00:00	JLG	10/31/17 13:37	JLG	F
Specific Conductance	2750		umhos/cm	1	SW846 9050A			10/20/17 13:49	MSA	B
Sulfate	35.8		mg/L	2.0	EPA 300.0			10/20/17 15:55	CHW	B
Total Dissolved Solids	1420		mg/L	5	S2540C-11			10/25/17 12:00	BMK	B
Total Organic Carbon (TOC)	4.0		mg/L	0.50	SW846 9060A			10/25/17 13:13	PAG	D
Turbidity	0.62		NTU	0.10	S2130B-01			10/20/17 04:05	MSA	B

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ANALYTICAL RESULTS

Workorder: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270432003**
Sample ID: **CWMP017S**

Date Collected: 10/19/2017 12:23 Matrix: Ground Water
Date Received: 10/19/2017 16:16

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	67.5		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:51	SRT	J1
Iron, Total	0.14		mg/L	0.067	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:51	SRT	J1
Magnesium, Total	86.2		mg/L	0.11	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:51	SRT	J1
Manganese, Total	0.085		mg/L	0.0056	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:51	SRT	J1
Potassium, Total	16.4		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:51	SRT	J1
Sodium, Total	343		mg/L	0.56	SW846 6010C	10/23/17 04:30	SRT	10/23/17 15:51	SRT	J1
FIELD PARAMETERS										
Dissolved Oxygen	8.700		mg/L	0.010	Field			10/19/17 12:23	BGS	C
Flow Rate	110.60		gal/min		Field			10/19/17 12:23	BGS	C
pH, Field (SM4500B)	7.600		pH_Units		Field			10/19/17 12:23	BGS	C
Specific Conductance, Field	3524		umhos/cm	1	Field			10/19/17 12:23	BGS	C
Temperature	16.70		Deg. C		Field			10/19/17 12:23	BGS	C


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ANALYTICAL RESULTS

Workorder: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270432004**
Sample ID: **CWMP010W**

Date Collected: 10/19/2017 13:42 Matrix: Ground Water
Date Received: 10/19/2017 16:16

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:54	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/20/17 23:54	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 23:54	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 23:54	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:54	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:54	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:54	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:54	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 23:54	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:54	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:54	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/20/17 23:54	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/20/17 23:54	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/20/17 23:54	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/20/17 23:54	CJG	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)	102		%	62 - 133	SW846 8260B			10/20/17 23:54	CJG	G
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			10/20/17 23:54	CJG	G
Dibromofluoromethane (S)	90.3		%	78 - 116	SW846 8260B			10/20/17 23:54	CJG	G
Toluene-d8 (S)	98.4		%	76 - 127	SW846 8260B			10/20/17 23:54	CJG	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	406		mg/L	5	S2320B-97			10/20/17 14:00	MSA	B
Alkalinity, Total	406	2	mg/L	5	S2320B-97			10/20/17 14:00	MSA	B
Ammonia-N	0.136		mg/L	0.100	D6919-09			10/28/17 19:07	JAM	A
Chemical Oxygen Demand (COD)	51		mg/L	7	EPA 410.4			10/25/17 21:44	AK	A
Chloride	640		mg/L	10.0	EPA 300.0			10/20/17 16:31	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/20/17 16:19	CHW	B
Nitrate-N	6.1		mg/L	0.20	EPA 300.0			10/20/17 16:19	CHW	B
pH	7.13	1	pH_Units		S4500HB-11			10/20/17 14:00	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/31/17 00:00	JLG	10/31/17 13:37	JLG	F
Specific Conductance	2680		umhos/cm	1	SW846 9050A			10/20/17 14:00	MSA	B
Sulfate	33.0		mg/L	2.0	EPA 300.0			10/20/17 16:19	CHW	B
Total Dissolved Solids	1490		mg/L	5	S2540C-11			10/25/17 12:00	BMK	B
Total Organic Carbon (TOC)	17.5		mg/L	1.0	SW846 9060A			10/28/17 02:52	PAG	D
Turbidity	3.11		NTU	0.10	S2130B-01			10/20/17 04:05	MSA	B

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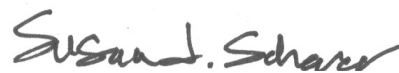
ANALYTICAL RESULTS

Workorder: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270432004**
Sample ID: **CWMP010W**

Date Collected: 10/19/2017 13:42 Matrix: Ground Water
Date Received: 10/19/2017 16:16

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	107		mg/L	0.11	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:18	SRT	J1
Iron, Total	0.41		mg/L	0.067	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:18	SRT	J1
Magnesium, Total	71.3		mg/L	0.11	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:18	SRT	J1
Manganese, Total	2.5		mg/L	0.0056	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:18	SRT	J1
Potassium, Total	26.0		mg/L	0.56	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:18	SRT	J1
Sodium, Total	305		mg/L	0.56	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:18	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	9.000		Feet		Field			10/19/17 13:42	CLT	C
Elev Top MW Casing above MSL	360.90		Feet		Field			10/19/17 13:42	CLT	C
Flow Rate	1.03		gal/min		Field			10/19/17 13:42	CLT	C
Ground Water Elevation	351.900		ft/MSL		Field			10/19/17 13:42	CLT	C
pH, Field (SM4500B)	6.500		pH_Units		Field			10/19/17 13:42	CLT	C
Sample Depth	17.000		Feet		Field			10/19/17 13:42	CLT	C
Specific Conductance, Field	848		umhos/cm	1	Field			10/19/17 13:42	CLT	C
Temperature	14.09		Deg. C		Field			10/19/17 13:42	CLT	C
Total Well Depth	19.600		Feet		Field			10/19/17 13:42	CLT	C
Volume in Water Column	6.890		Gallons		Field			10/19/17 13:42	CLT	C
Water Level After Purge	16.410		Feet		Field			10/19/17 13:42	CLT	C
Well Volumes Purged	1.04		Vol		Field			10/19/17 13:42	CLT	C



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ANALYTICAL RESULTS

Workorder: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270432005**
Sample ID: **CWMP009W**

Date Collected: 10/19/2017 14:06 Matrix: Ground Water
Date Received: 10/19/2017 16:16

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	2.1		ug/L	1.0	SW846 8260B			10/21/17 00:17	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/21/17 00:17	CJG	G
1,1-Dichloroethane	2.6		ug/L	1.0	SW846 8260B			10/21/17 00:17	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/21/17 00:17	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 00:17	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 00:17	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 00:17	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/21/17 00:17	CJG	G
Methylene Chloride	1.6		ug/L	1.0	SW846 8260B			10/21/17 00:17	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 00:17	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/21/17 00:17	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/21/17 00:17	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/21/17 00:17	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 00:17	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/21/17 00:17	CJG	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)	102		%	62 - 133	SW846 8260B			10/21/17 00:17	CJG	G
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			10/21/17 00:17	CJG	G
Dibromofluoromethane (S)	90.5		%	78 - 116	SW846 8260B			10/21/17 00:17	CJG	G
Toluene-d8 (S)	98.2		%	76 - 127	SW846 8260B			10/21/17 00:17	CJG	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	532		mg/L	5	S2320B-97			10/20/17 14:12	MSA	B
Alkalinity, Total	532	2	mg/L	5	S2320B-97			10/20/17 14:12	MSA	B
Ammonia-N	29.8		mg/L	0.100	D6919-09			10/28/17 20:03	JAM	A
Chemical Oxygen Demand (COD)	127		mg/L	7	EPA 410.4			10/25/17 21:44	AK	A
Chloride	618		mg/L	10.0	EPA 300.0			10/20/17 16:56	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/20/17 16:44	CHW	B
Nitrate-N	ND		mg/L	0.20	EPA 300.0			10/20/17 16:44	CHW	B
pH	6.41	1	pH_Units		S4500HB-11			10/20/17 14:12	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/31/17 00:00	JLG	10/31/17 13:37	JLG	F
Specific Conductance	2720		umhos/cm	1	SW846 9050A			10/20/17 14:12	MSA	B
Sulfate	5.5		mg/L	2.0	EPA 300.0			10/20/17 16:44	CHW	B
Total Dissolved Solids	1610		mg/L	5	S2540C-11			10/25/17 12:00	BMK	B
Total Organic Carbon (TOC)	33.4		mg/L	2.5	SW846 9060A			10/28/17 02:52	PAG	D
Turbidity	34.8		NTU	0.10	S2130B-01			10/20/17 04:05	MSA	B

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ANALYTICAL RESULTS

Workorder: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270432005**
Sample ID: **CWMP009W**

Date Collected: 10/19/2017 14:06 Matrix: Ground Water
Date Received: 10/19/2017 16:16

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	164		mg/L	0.11	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:22	SRT	J1
Iron, Total	37.9		mg/L	0.067	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:22	SRT	J1
Magnesium, Total	76.4		mg/L	0.11	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:22	SRT	J1
Manganese, Total	13.3		mg/L	0.0056	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:22	SRT	J1
Potassium, Total	35.1		mg/L	0.56	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:22	SRT	J1
Sodium, Total	161		mg/L	0.56	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:22	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	9.510		Feet		Field			10/19/17 14:06	CLT	C
Elev Top MW Casing above MSL	404.20		Feet		Field			10/19/17 14:06	CLT	C
Flow Rate	1.77		gal/min		Field			10/19/17 14:06	CLT	C
Ground Water Elevation	394.690		ft/MSL		Field			10/19/17 14:06	CLT	C
pH, Field (SM4500B)	6.440		pH_Units		Field			10/19/17 14:06	CLT	C
Sample Depth	16.000		Feet		Field			10/19/17 14:06	CLT	C
Specific Conductance, Field	3092		umhos/cm	1	Field			10/19/17 14:06	CLT	C
Temperature	13.63		Deg. C		Field			10/19/17 14:06	CLT	C
Total Well Depth	19.700		Feet		Field			10/19/17 14:06	CLT	C
Volume in Water Column	6.624		Gallons		Field			10/19/17 14:06	CLT	C
Water Level After Purge	11.070		Feet		Field			10/19/17 14:06	CLT	C
Well Volumes Purged	4.27		Vol		Field			10/19/17 14:06	CLT	C



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ANALYTICAL RESULTS

Workorder: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270432006**
Sample ID: **CWMP008W**

Date Collected: 10/19/2017 14:42 Matrix: Ground Water
Date Received: 10/19/2017 16:16

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	1.4		ug/L	1.0	SW846 8260B			10/21/17 00:39	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/21/17 00:39	CJG	G
1,1-Dichloroethane	3.5		ug/L	1.0	SW846 8260B			10/21/17 00:39	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/21/17 00:39	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 00:39	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 00:39	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 00:39	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/21/17 00:39	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/21/17 00:39	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 00:39	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/21/17 00:39	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/21/17 00:39	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/21/17 00:39	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 00:39	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/21/17 00:39	CJG	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)	102		%	62 - 133	SW846 8260B			10/21/17 00:39	CJG	G
4-Bromofluorobenzene (S)	104		%	79 - 114	SW846 8260B			10/21/17 00:39	CJG	G
Dibromofluoromethane (S)	90.9		%	78 - 116	SW846 8260B			10/21/17 00:39	CJG	G
Toluene-d8 (S)	98.8		%	76 - 127	SW846 8260B			10/21/17 00:39	CJG	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	475		mg/L	5	S2320B-97			10/20/17 15:03	MSA	B
Alkalinity, Total	475	2	mg/L	5	S2320B-97			10/20/17 15:03	MSA	B
Ammonia-N	7.27		mg/L	0.100	D6919-09			10/28/17 20:17	JAM	A
Chemical Oxygen Demand (COD)	42		mg/L	7	EPA 410.4			10/25/17 21:44	AK	A
Chloride	71.6		mg/L	2.0	EPA 300.0			10/20/17 17:08	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/20/17 17:08	CHW	B
Nitrate-N	ND		mg/L	0.20	EPA 300.0			10/20/17 17:08	CHW	B
pH	6.45	1	pH_Units		S4500HB-11			10/20/17 15:03	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/31/17 00:00	JLG	10/31/17 13:37	JLG	F
Specific Conductance	1060		umhos/cm	1	SW846 9050A			10/20/17 15:03	MSA	B
Sulfate	6.0		mg/L	2.0	EPA 300.0			10/20/17 17:08	CHW	B
Total Dissolved Solids	526		mg/L	5	S2540C-11			10/25/17 12:00	BMK	B
Total Organic Carbon (TOC)	16.2		mg/L	2.5	SW846 9060A			10/28/17 02:52	PAG	D
Turbidity	18.3		NTU	0.10	S2130B-01			10/20/17 04:05	MSA	B

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ANALYTICAL RESULTS

Workorder: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270432006**
Sample ID: **CWMP008W**

Date Collected: 10/19/2017 14:42 Matrix: Ground Water
Date Received: 10/19/2017 16:16

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	78.2		mg/L	0.11	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:25	SRT	J1
Iron, Total	26.4		mg/L	0.067	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:25	SRT	J1
Magnesium, Total	35.9		mg/L	0.11	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:25	SRT	J1
Manganese, Total	16.0		mg/L	0.0056	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:25	SRT	J1
Potassium, Total	9.5		mg/L	0.56	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:25	SRT	J1
Sodium, Total	61.1		mg/L	0.56	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:25	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	3.980		Feet		Field			10/19/17 14:42	CLT	C
Elev Top MW Casing above MSL	422.30		Feet		Field			10/19/17 14:42	CLT	C
Flow Rate	1.17		gal/min		Field			10/19/17 14:42	CLT	C
Ground Water Elevation	418.320		ft/MSL		Field			10/19/17 14:42	CLT	C
pH, Field (SM4500B)	6.200		pH_Units		Field			10/19/17 14:42	CLT	C
Sample Depth	19.000		Feet		Field			10/19/17 14:42	CLT	C
Specific Conductance, Field	1207		umhos/cm	1	Field			10/19/17 14:42	CLT	C
Temperature	14.17		Deg. C		Field			10/19/17 14:42	CLT	C
Total Well Depth	22.800		Feet		Field			10/19/17 14:42	CLT	C
Volume in Water Column	3.011		Gallons		Field			10/19/17 14:42	CLT	C
Water Level After Purge	12.900		Feet		Field			10/19/17 14:42	CLT	C
Well Volumes Purged	7.78		Vol		Field			10/19/17 14:42	CLT	C



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Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270432007**

Date Collected: 10/19/2017 15:17

Matrix: Water

Sample ID: **Field Blank**

Date Received: 10/19/2017 16:16

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:12	CJG	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/21/17 05:12	CJG	G
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/21/17 05:12	CJG	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/21/17 05:12	CJG	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:12	CJG	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:12	CJG	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:12	CJG	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:12	CJG	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/21/17 05:12	CJG	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:12	CJG	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:12	CJG	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/21/17 05:12	CJG	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/21/17 05:12	CJG	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:12	CJG	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/21/17 05:12	CJG	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)	101		%	62 - 133	SW846 8260B			10/21/17 05:12	CJG	G
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			10/21/17 05:12	CJG	G
Dibromofluoromethane (S)	89.7		%	78 - 116	SW846 8260B			10/21/17 05:12	CJG	G
Toluene-d8 (S)	97.4		%	76 - 127	SW846 8260B			10/21/17 05:12	CJG	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	ND		mg/L	5	S2320B-97			10/20/17 15:13	MSA	B
Alkalinity, Total	ND	2	mg/L	5	S2320B-97			10/20/17 15:13	MSA	B
Ammonia-N	ND		mg/L	0.010	D6919-09			10/28/17 20:31	JAM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			10/25/17 21:44	AK	A
Chloride	ND		mg/L	1.0	EPA 300.0			10/20/17 15:07	CHW	B
Fluoride	ND		mg/L	0.10	EPA 300.0			10/20/17 15:07	CHW	B
Nitrate-N	ND		mg/L	0.10	EPA 300.0			10/20/17 15:07	CHW	B
pH	6.31	1	pH_Units		S4500HB-11			10/20/17 15:13	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	10/31/17 00:00	JLG	10/31/17 13:37	JLG	F
Specific Conductance	ND		umhos/cm	1	SW846 9050A			10/23/17 02:19	MSA	B
Sulfate	ND		mg/L	1.0	EPA 300.0			10/20/17 15:07	CHW	B
Total Dissolved Solids	11		mg/L	5	S2540C-11			10/25/17 12:00	BMK	B
Total Organic Carbon (TOC)	0.61		mg/L	0.50	SW846 9060A			10/25/17 13:13	PAG	D
Turbidity	ND		NTU	0.10	S2130B-01			10/20/17 04:05	MSA	B

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ANALYTICAL RESULTS

Workorder: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270432007**

Date Collected: 10/19/2017 15:17

Matrix: Water

Sample ID: **Field Blank**

Date Received: 10/19/2017 16:16

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	ND		mg/L	0.11	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:29	SRT	J1
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:29	SRT	J1
Magnesium, Total	ND		mg/L	0.11	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:29	SRT	J1
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:29	SRT	J1
Potassium, Total	ND		mg/L	0.56	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:29	SRT	J1
Sodium, Total	ND		mg/L	0.56	SW846 6010C	10/26/17 05:51	SRT	10/26/17 15:29	SRT	J1



Ms. Susan J Scherer

Project Coordinator

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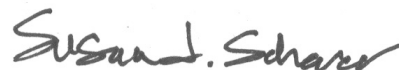
ANALYTICAL RESULTS

Workorder: 2270432 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270432008**
Sample ID: **Trip Blank**

Date Collected: 10/19/2017 16:16 Matrix: Water
Date Received: 10/19/2017 16:16

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:35	CJG	A
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/21/17 05:35	CJG	A
1,1-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/21/17 05:35	CJG	A
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/21/17 05:35	CJG	A
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:35	CJG	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:35	CJG	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:35	CJG	A
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:35	CJG	A
Methylene Chloride	1.5		ug/L	1.0	SW846 8260B			10/21/17 05:35	CJG	A
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:35	CJG	A
Toluene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:35	CJG	A
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/21/17 05:35	CJG	A
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/21/17 05:35	CJG	A
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/21/17 05:35	CJG	A
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/21/17 05:35	CJG	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)	101		%	62 - 133	SW846 8260B			10/21/17 05:35	CJG	A
4-Bromofluorobenzene (S)	103		%	79 - 114	SW846 8260B			10/21/17 05:35	CJG	A
Dibromofluoromethane (S)	90.2		%	78 - 116	SW846 8260B			10/21/17 05:35	CJG	A
Toluene-d8 (S)	96.7		%	76 - 127	SW846 8260B			10/21/17 05:35	CJG	A



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ANALYTICAL RESULTS

Workorder: 2270432 QUARTERLY CWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2270432001	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.				
2270432001	2	CWMP018S	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2270432002	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.				
2270432002	2	CWMP016W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2270432003	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.				
2270432003	2	CWMP017S	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2270432004	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.				
2270432004	2	CWMP010W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2270432005	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.				
2270432005	2	CWMP009W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2270432006	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.				
2270432006	2	CWMP008W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2270432007	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.				
2270432007	2	Field Blank	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				

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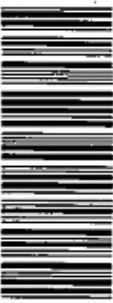
CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

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

Generated by ALS

COC #:

ALS Qu



* 2 2 7 0 4 3 2 *

Client Name: Lancaster County Solid Waste MA		Container Type	AG	AN	CG	PL	PL	PL	PL	PL	PL
Address: 1299 Harrisburg Pike, P.O. Box 4424		Container Size	40 ml	500 ml	40 ml	500 ml	500 ml	500 ml	1 L	500 ml	500 ml
Lancaster, PA 17604		Preservative	HCl	H2SO4	HCl	H2SO4	HNO3	HNO3	None	None	None
Contact: Mark Reider		ANALYSIS/METHOD REQUESTED									
Phone#: (717) 735-0193		Field Measurements									
Project Name#: Creswell Form 19Q Wells		Sample Depth for AUX Data									
Bill To: Lancaster County Solid Waste MA		8260 - Form 19Q									
TAT ☒ Normal-Standard TAT is 10-12 business days.		TOC									
Rush-Subject to ALS approval and surcharges.		NH3-N, COD									
Date Required: _____ Approved By: _____		Total Metals: Ca, Fe, Mn, Mg, K, Na									
Email? ☒ Y mreider@LCSWMA.com		PH, NO3, Cl, F, SPC, SO4, Turb.									
Fax? ☒ Y No.: (717) 397-9973		Alkalinity, HCO3									
Sample Description/Location (as it will appear on the lab report)		Sample Date		Time		Enter Number of Containers Per Sample or Field Results Below.					
1. CWMP018S		10/19/17		12:02		G GW 2 1 2 X X 1 1 1 1					
2. CWMP016W		11/30/17		11:30		G GW 2 1 2 X X 1 1 1 1					
3. CWMP017S		12/23/17		13:42		G GW 2 1 2 X X 1 1 1 1					
4. CWMP010W		13/42		14:06		G GW 2 1 2 X X 1 1 1 1					
5. CWMP009W		14/42		15:17		G GW 2 1 2 X X 1 1 1 1					
6. CWMP008W		15/17		16:10		G GW 2 1 2 X X 1 1 1 1					
7. Field Blank		16/10				G GW 2 1 2 X X 1 1 1 1					
8. Trip Blank						G GW 2 1 2 X X 1 1 1 1					
9.						G GW 2 1 2 X X 1 1 1 1					
10.						G GW 2 1 2 X X 1 1 1 1					
Project Comments:		LOGGED BY (signature):		DATE: 10/19/17		RECEIVED BY / Company Name:		DATE: 10/19/17		TIME: 16:10	
Reviewed By (signature):		DATE: 10/19/17		TIME: 16:10		DATE: 10/19/17		TIME: 16:10		TIME: 16:10	
Refined By / Company Name		Date		Time		Received By / Company Name		Date		Time	
1. [Signature] ALS		10/19/17		16:10		[Signature] ALS		10/19/17		16:10	
3.											
5.											
7.											
9.											
State Samples Collected In		Standard		CLP-like		USACE		Navy		NY	
Special Processing		USACE		Navy		USACE		Navy		NY	
Sample Disposal		Reportable to PADEP?		Yes		PWSID #		EDDS: Format Type		Special	
ALS Field Services: ☐ Pickup ☐ Labor		☐ Composite Sampling ☐ Rental Equipment		☐ Other:							
Cooler Temp: 2°C		Therm ID: 309		No. of Coolers: Y N		Custody Seats Present? (if present) Seats Intact?		Received on Ice?		COC Labels Complete/Accurate?	
Correct Containers?		Correct Sample Volumes?		Correct Preservation?		Headspace/Volatilities?		Courier/Tracking #:		Sample/COC Comments	

* G=Grab; C=Composite **Matrix - Air=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

ALS

November 8, 2017

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

Certificate of Analysis

Project Name: 2017-CRESWELL	Workorder: 2270903
Purchase Order:	Workorder ID: QUARTERLY CWMP-FORM 19Q

Dear Mr. Brown:

Enclosed are the analytical results for samples received by the laboratory on Friday, October 20, 2017.

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.

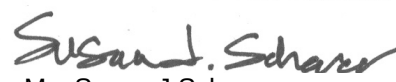
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications 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: Ms. Jordan Gallagher , Mr. Mark Reider , 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: 2270903 QUARTERLY CWMP-FORM 19Q

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2270903001	CWMP012W	Ground Water	10/20/2017 11:29	10/20/2017 15:06	Mr. Brian G Shade

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SAMPLE SUMMARY

Workorder: 2270903 QUARTERLY 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: 2270903 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270903001**
Sample ID: **CWMP012W**

Date Collected: 10/20/2017 11:29 Matrix: Ground Water
Date Received: 10/20/2017 15:06

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Benzene	ND		ug/L	1.0	SW846 8260B			10/25/17 16:23	TMP	G
1,2-Dibromoethane	ND		ug/L	1.0	SW846 8260B			10/25/17 16:23	TMP	G
1,1-Dichloroethane	1.0		ug/L	1.0	SW846 8260B			10/25/17 16:23	TMP	G
1,2-Dichloroethane	ND		ug/L	1.0	SW846 8260B			10/25/17 16:23	TMP	G
1,1-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/25/17 16:23	TMP	G
cis-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/25/17 16:23	TMP	G
trans-1,2-Dichloroethene	ND		ug/L	1.0	SW846 8260B			10/25/17 16:23	TMP	G
Ethylbenzene	ND		ug/L	1.0	SW846 8260B			10/25/17 16:23	TMP	G
Methylene Chloride	ND		ug/L	1.0	SW846 8260B			10/25/17 16:23	TMP	G
Tetrachloroethene	ND		ug/L	1.0	SW846 8260B			10/25/17 16:23	TMP	G
Toluene	ND		ug/L	1.0	SW846 8260B			10/25/17 16:23	TMP	G
Total Xylenes	ND		ug/L	3.0	SW846 8260B			10/25/17 16:23	TMP	G
1,1,1-Trichloroethane	ND		ug/L	1.0	SW846 8260B			10/25/17 16:23	TMP	G
Trichloroethene	ND		ug/L	1.0	SW846 8260B			10/25/17 16:23	TMP	G
Vinyl Chloride	ND		ug/L	1.0	SW846 8260B			10/25/17 16:23	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)	87.1		%	62 - 133	SW846 8260B			10/25/17 16:23	TMP	G
4-Bromofluorobenzene (S)	111		%	79 - 114	SW846 8260B			10/25/17 16:23	TMP	G
Dibromofluoromethane (S)	82.5		%	78 - 116	SW846 8260B			10/25/17 16:23	TMP	G
Toluene-d8 (S)	88		%	76 - 127	SW846 8260B			10/25/17 16:23	TMP	G
WET CHEMISTRY										
Alkalinity, Bicarbonate	68		mg/L	5	S2320B-97			10/24/17 10:04	MSA	B
Alkalinity, Total	68	2	mg/L	5	S2320B-97			10/24/17 10:04	MSA	B
Ammonia-N	0.231		mg/L	0.100	D6919-09			11/1/17 17:02	CMM	A
Chemical Oxygen Demand (COD)	ND		mg/L	7	EPA 410.4			10/25/17 21:44	AK	A
Chloride	36.2		mg/L	2.0	EPA 300.0			10/21/17 13:04	CHW	B
Fluoride	ND		mg/L	0.20	EPA 300.0			10/21/17 13:04	CHW	B
Nitrate-N	10.2		mg/L	0.20	EPA 300.0			10/21/17 13:04	CHW	B
pH	6.17	1	pH_Units		S4500HB-11			10/24/17 10:04	MSA	B
Phenolics	ND		mg/L	0.005	SW846 9066	11/2/12 00:00	JLG	11/7/17 09:42	JLG	F
Specific Conductance	309		umhos/cm	1	SW846 9050A			10/24/17 10:04	MSA	B
Sulfate	8.4		mg/L	2.0	EPA 300.0			10/21/17 13:04	CHW	B
Total Dissolved Solids	111		mg/L	5	S2540C-11			10/26/17 12:08	BMK	B
Total Organic Carbon (TOC)	1.4		mg/L	0.50	SW846 9060A			10/26/17 22:05	PAG	D
Turbidity	0.76		NTU	0.10	S2130B-01			10/21/17 06:55	MBW	B

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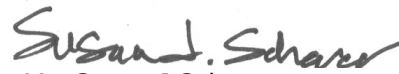
ANALYTICAL RESULTS

Workorder: 2270903 QUARTERLY CWMP-FORM 19Q

Lab ID: **2270903001**
Sample ID: **CWMP012W**

Date Collected: 10/20/2017 11:29 Matrix: Ground Water
Date Received: 10/20/2017 15:06

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
METALS										
Calcium, Total	33.3		mg/L	0.11	SW846 6010C	10/27/17 03:20	LXC	10/31/17 09:20	SRT	J1
Iron, Total	1.2		mg/L	0.067	SW846 6010C	10/27/17 03:20	LXC	10/31/17 09:20	SRT	J1
Magnesium, Total	9.3		mg/L	0.11	SW846 6010C	10/27/17 03:20	LXC	10/31/17 09:20	SRT	J1
Manganese, Total	0.093		mg/L	0.0056	SW846 6010C	10/27/17 03:20	LXC	10/31/17 09:20	SRT	J1
Potassium, Total	1.5		mg/L	0.56	SW846 6010C	10/27/17 03:20	LXC	10/31/17 09:20	SRT	J1
Sodium, Total	12.9		mg/L	0.56	SW846 6010C	10/27/17 03:20	LXC	10/31/17 09:20	SRT	J1
FIELD PARAMETERS										
Depth to Water Level	19.210		Feet		Field			10/20/17 11:29	CLT	C
pH, Field (SM4500B)	4.780		pH_Units		Field			10/20/17 11:29	CLT	C
Specific Conductance, Field	388		umhos/cm	1	Field			10/20/17 11:29	CLT	C
Temperature	11.73		Deg. C		Field			10/20/17 11:29	CLT	C


Ms. Susan J Scherer
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2270903 QUARTERLY CWMP-FORM 19Q

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2270903001	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.				
2270903001	2	CWMP012W	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				

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

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 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)

1. CWMW 012W 10/29/15 1129

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

Project Comments:

Relinquished By / Company Name

1. _____ 10/29/15 1500

3. _____

5. _____

7. _____

Container Type

Container Size

Preservative

AG

AN

CG

PL

PL

PL

PL

PL

PL

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ANALYSIS METHOD REQUESTED

Field Measurements	8260 - Form 19Q	O-OH	TOC	Sample Depth for AUX Data	NH ₃ -N, COD	Total Metals: Ca, Fe, Mn, Mg, K, Na	PH, NO ₃ , Cl, F, SPC, SO ₄ , Turb.	TDS	Alkalinity, HCO ₃
Enter Number of Containers Per Sample or Field Results Below.									
1	2	1	2	X	1	1	1	1	1
2									
3									
4									
5									
6									
7									
8									
9									
10									

Courier/Tracking #:

Sample/COC Comments

ALS Field Services: ☐ Pickup ☐ Labor

☐ Composite Sampling ☐ Rental Equipment

☐ Other:

Standard

CLP-like

USACE

Deliverables

USACE

Navy

State Samples Collected In

NY

NJ

PA

NC

Special Processing

USACE

Sample Disposal

Lab

Special

Reportable to PADEP?

Yes

PWSID #

EDDS: Format Type

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

* G=Grab; C=Composite

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