ARCADIS Design & Consultancy for natural and built assets

Payson Long
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Subject:
November 2019 Monthly Report
Fort Edward Landfill
NYSDEC Site No. 558001
Contract No. D007618-39

Date:
January 6, 2019

Contact:
Andy Vitolins

Phone:
518.250.7300

Email:
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Our ref:
30001370 (00266434.0000)

Dear Mr. Long:

Arcadis CE, Inc. (Arcadis) has prepared this letter report to summarize the leachate collection and treatment system operation, maintenance, and monitoring (OM&M) activities completed during the November 2019 reporting period at the above-referenced site.

Leachate Collection and Treatment System Operation and Maintenance

The leachate collection system operated with minimal downtime during the November 2019 operating period. A total of 768,485 gallons of leachate were collected and treated through the system during November 2019. The corresponding average leachate recovery rate for the month was approximately 17.8 gallons per minute (gpm).

The following activities were completed during the November 2019 operating period:

- Arcadis replaced the existing pressure transducers at extraction wells EW-1, EW-2, and EW-4.
- On November 20, 2019, Arcadis installed a crushed stone base downgradient of extraction well EW-2 to facilitate upcoming drilling activities.
- Arcadis reduced the combined influent header piping from four-inch schedule (SCH) 80 poly-vinyl chloride (PVC) to two-inch SCH 80 PVC. This reduction was performed in order to optimize the chemical dosing with the newly installed flowmeter.

- On November 6 and 20, 2019, Arcadis performed Phase 1 sampling at 24 hour and two-week intervals, respectively. Results of the sampling events will be provided under separate cover.
- On November 25 and 26, Arcadis provided oversight of the Phase 3 geoprobe work completed by Parratt-Wolff. In addition, soil samples were collected at each soil boring. Results of the sampling event will be provided under separate cover.
- The annual landfill inspection was performed on November 25, 2019. The results of the inspection will be provided to NYSDEC under separate cover.
- Iron and solids sludge processing was performed throughout the month. One 55-gallon drum of sludge was generated during November 2019.

System Sampling

Water samples were collected on November 26, 2019 from the following treatment system locations:

- Influent (i.e. combined flow from extraction wells EW-1, EW-2, EW-3, and EW-4);
- Clarifier Catch Tank discharge;
- Cell 3 Bypass (i.e. treatment Cell 3 discharge into the Cell 2/3 bypass pipe);
- Cell 2 Chamber (i.e. treatment Cell 2 discharge into the effluent collection chamber); and
- Polishing Pond Effluent.

Samples were also collected from extraction wells EW-1, EW-2, EW-3, leachate collection well EW-4, and Cell 1 Chamber (treatment Cell 1 discharge into the effluent collection chamber). Samples from these locations are collected on a quarterly basis and will be sampled again in the second quarter of 2019.

The monthly and quarterly samples were submitted to Eurofins TestAmerica for analysis of volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), metals, total dissolved solids (TDS), and total suspended solids (TSS).

The analytical results are discussed in the sections below and have been summarized in Table 1. The laboratory analytical data will be submitted to NYSDEC's EIMS Administrator in the required EQuIS EDD format.

Analytical Results

VOCs

As shown in Table 1, VOCs were detected in the EW-1, EW-2, EW-3, Influent, and Clarifier Catch Tank samples at concentrations that exceeded the corresponding NYSDEC Class GA Standards. The highest concentrations of VOCs were reported in the samples from EW-1. As shown in Table 1, VOCs were detected in the EW-4, Cell 3 Bypass, and Polishing Pond Effluent samples but did not exceed the corresponding NYSDEC Class GA Standards.

PCBs

PCB Aroclor 1221 and PCB Aroclor were detected in the EW-1, EW-3, EW-4, Influent, and Clarifier Catch Tank samples at concentrations greater than the respective NYSDEC GA Standard. PCBs were not detected in the EW-2, Cell 2 Effluent, Cell 1 Effluent or Polishing Pond Effluent samples during the November 2019 sampling event (Table 1).

Metals

Iron and manganese were detected at one or more of the treatment system samples at concentrations greater than the corresponding NYSDEC Standards of 0.3 milligrams per liter (mg/L) and 0.6 mg/L, respectively. Iron concentrations ranged from a maximum of 60.1 mg/L (EW-1) to a minimum of 0.0784 J mg/L (Cell 3 Bypass). Manganese concentrations ranged from a maximum of 1.92 mg/L (Influent) to a minimum of 0.167 mg/L (Polishing Pond Effluent), which are consistent with previous data. Magnesium was also detected above the NYSDEC Standard of 35 mg/L. Magnesium concentrations ranged from a maximum of 62.1 mg/L (EW-1) to a minimum of 13.6 mg/L (Cell 1 Effluent).

TDS and TSS

The concentrations of TDS and TSS continue to fluctuate between sampling events. During the November sampling event, TDS concentrations ranged between 427 mg/L and 1,510 mg/L; TSS concentrations ranged from non-detect and 226 mg/L. These data are consistent with the results from previous sampling events. Since September 2016, TDS and TSS have ranged from 210 to 4,900 mg/L and non-detect (ND) to 226 mg/L, respectively.

Next Reporting Period Planned Activities

The following activities are anticipated for December 2019:

- Continuation of iron and solids treatment and processing;
- Phase 3 Drilling work and soil boring sampling;
- Survey of newly installed site features; and
- Routine monthly system sampling.

If you have any questions, please do not hesitate to contact me or Jeremy Wyckoff.

Sincerely,

Arcadis CE, Inc.

Andy Vitolins, P.G.
Vice President

Copies:
Jeremy Wyckoff, Arcadis
File

Enclosures:
Table 1 – November 2019 Treatment System Analytical Data

Table 1. March 2019 Treatment System Analytical Data, Fort Edward Landfill
Fort Edward, New York. NYSDEC Site No. 558001

ARCADIS Design & Consultancy for natural and built assets

Chemical Name	NYSDEC Class GA GW Standard	NYSDEC Class GA GW Effluent Limitation	EW-1 11/26/2019	EW-2 11/26/2019	EW-3 11/26/2019	EW-4 11/26/2019	INFLUENT 11/26/2019	CLARIFIER CATCH 11/26/2019	CELL 3 11/26/2019	CELL 2 11/26/2019	CELL 1 11/26/2019	EFFLUENT 11/26/2019
Volatile Organic Compounds (ug/L)												
ACETONE	50	50	23	5.0 U	15	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0
BENZENE	1	1	**7.7**	**5.2**	**2.3**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
BROMODICHLOROMETHANE	50	50	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.87 J	1.0 U	1.0 U	1.0 U	1.0 U
BROMOFORM	50	50	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
BROMOMETHANE	5	5	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-BUTANONE (MEK)	50	50	10 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
CARBON DISULFIDE	60	60	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CARBON TETRACHLORIDE	5	5	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CHLOROBENZENE	5	5	**5.6**	1.2	**18**	1.0 U	1.0 U	0.51 J	1.0 U	1.0 U	1.0 U	1.0 U
CHLORODIBROMOMETHANE	50	--	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CHLOROETHANE	5	5	2.0 U	1.0 U	0.7 J	0.34 J	0.48 J	0.35 J	1.0 U	1.0 U	1.0 U	1.0 U
CHLOROFORM	7		2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0	0.5 J	1.0 U	1.0 U	1.0 U
CHLOROMETHANE	5		2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CYCLOHEXANE	--	--	2.0 U	1.0 U	0.5 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-DIBROMO-3-CHLOROPROPANE	0.04	0.04	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	0.0006	0.0006	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-DICHLOROBENZENE	3	3	2.0 U	1.0 U	0.46 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-DICHLOROBENZENE	3	3	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-DICHLOROBENZENE	3	3	0.72 J	1.0 U	**5.1**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
DICHLORODIFLUOROMETHANE	5	5	4.2	1.0 U	1.0 U	1.0 U	1.0 U	0.87 J	1.0 U	1.0 U	1.0 U	1.0 U
1,1-DICHLOROETHANE	5	5	2.0 U	0.91 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CIS-1,2-DICHLOROETHYLENE	5	5	**450**	0.36 J	1.0 U	0.29 J	1.7	**6.5**	0.92 J	1.0 U	1.0 U	1.0 U
TRANS-1,2-DICHLOROETHYLENE	5	5	4.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-DICHLOROETHANE	0.6	0.6	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-DICHLOROETHYLENE	5	5	3.2	0.91 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-DICHLOROPROPANE	1	1	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CIS-1,3-DICHLOROPROPENE	0.4	0.4	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TRANS-1,3-DICHLOROPROPENE	0.4	0.4	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
ETHYLBENZENE	5	5	2.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-HEXANONE	50	50	10 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
ISOPROPYLBENZENE (CUMENE)	5	5	1.4 J	1.0 U	0.62 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
METHYL ACETATE	--	--	10 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
METHYL TERT-BUTYL ETHER (MTBE)	10	10	2.0 U	0.77 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
METHYL CYCLOHEXANE	--	--	0.59 J	1.0 U	0.38 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
METHYLENE CHLORIDE	5	5	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	--	--	43	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
STYRENE	5	930	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,1,2-TETRACHLOROETHANE	5	5	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TETRACHLOROETHYLENE (PCE)	5	5	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOLUENE	5	5	**9.2**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-TRICHLOROBENZENE	5	5	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,1-TRICHLOROETHANE	5	5	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-TRICHLOROETHANE	1	1	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TRICHLOROETHYLENE (TCE)	5	5	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TRICHLOROFLUOROMETHANE	5	5	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	5	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
VINYL CHLORIDE	2	2	**630**	0.41 J	1.0 U	1.0 U	**2.3**	**7.3**	0.65 J	1.0 U	1.0 U	1.0 U
XYLENES, TOTAL	5	5	**30**	1.4 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U

Notes:

Constitutents detected above the NYSDEC Class GA GW Standard are in **bold**.

Constitutents detected above the NYSDEC Class GA GW Effluent Limitation are highlighted in yellow.

NYSDEC Class GA GW Standard - New York State Department of Environmental Conservation Groundwater Standard and Guidance Value.

NYSDEC Class GA GW Effluent Limitation - New York State Department of Environmental Conservation Effluent Limitation.

U - The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

J - The concentration is an approximate value.

ug/L - micrograms per liter

mg/L - milligrams per liter

Table 1. March 2019 Treatment System Analytical Data, Fort Edward Landfill
Fort Edward, New York. NYSDEC Site No. 558001

ARCADIS Design & Consultancy for natural and built assets

Chemical Name	NYSDEC Class GA GW Standard	NYSDEC Class GA GW Effluent Limitation	EW-1	EW-2	EW-3	EW-4	INFLUENT	CLARIFIER CATCH	CELL 3	CELL 2	CELL 1	EFFLUENT
			11/26/2019	11/26/2019	11/26/2019	11/26/2019	11/26/2019	11/26/2019	11/26/2019	11/26/2019	11/26/2019	11/26/2019
Polychlorinated Biphenyls (ug/L)												
PCB-1016 (AROCLOR 1016)	*	*	40 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
PCB-1221 (AROCLOR 1221)	*	*	40 U	0.8 U	**1.7**	**2.0**	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
PCB-1232 (AROCLOR 1232)	*	*	**450**	0.8 U	0.8 U	0.8 U	**8.4**	**7.2**	0.8 U	0.8 U	0.8 U	0.8 U
PCB-1242 (AROCLOR 1242)	*	*	40 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
PCB-1248 (AROCLOR 1248)	*	*	40 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
PCB-1254 (AROCLOR 1254)	*	*	40 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
PCB-1260 (AROCLOR 1260)	*	*	40 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
PCB-1262 (AROCLOR 1262)	*	*	40 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
PCB-1268 (AROCLOR 1268)	*	*	40 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
Metals (mg/L)												
ALUMINUM	--	2.0	0.0296 J	0.049 J	0.394	0.2 U	0.092 J	0.331	0.132 J	0.2 U	0.157 J	0.313
ANTIMONY	0.003	0.006	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.0032 J
ARSENIC	0.03	0.05	0.0051 J	0.0243	0.0135 J	0.0109 J	0.008 J	0.0071 J	0.015 U	0.015 U	0.0034 J	0.015 U
BARIUM	1.0	2.0	0.392	0.124 J	0.222	0.0475 J	0.0468 J	0.0417 J	0.0337 J	0.0451 J	0.046 J	0.038 J
BERYLLIUM	0.003	0.003	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
CADMIUM	0.005	0.01	0.002 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
CALCIUM	--	--	161	116	72.6	79.5	85.2	83.1	88.3	86.2	100	81.6
CHROMIUM, TOTAL	0.05	0.10	0.0036 J	0.003 J	0.0046 J	0.0027 J	0.0019 J	0.0015 J	0.0013 J	0.0015 J	0.0024 J	0.0022 J
COBALT	--	--	0.0072 J	0.005 U	0.0099 J	0.0024 J	0.0027 J	0.0028 J	0.05 U	0.002 J	0.0026 J	0.05 U
COPPER	0.2	1.0	0.025 U	0.0139 J	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.007 J	0.0123 J	0.0055 J
IRON	0.3	0.6	**60.1**	**20.9**	**51.6**	**22.4**	**11**	**1.38**	0.0794 J	**0.928**	**0.717**	**0.714**
LEAD	0.03	0.05	0.0198	0.0041 J	0.0068 J	0.0035 J	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
MAGNESIUM	35	35	**62.1**	**38.7**	34.3	19.0	20.7	20.9	17.4	15.7	13.6	15.7
MANGANESE	0.3	0.6	**0.847**	**0.721**	0.237	**1.83**	**1.92**	**1.68**	0.23	0.242	**0.352**	0.167
MERCURY	0.0007	0.0014	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
NICKEL	0.1	0.2	0.0256 J	0.01 J	0.0087 J	0.04 U	0.01 U	0.0061 J	0.0023 J	0.0048 J	0.0081 J	0.0044 J
POTASSIUM	--	--	45.9	2.9 J	29.7	2.75 J	3.29 J	3.85 J	7.55	4.22 J	1.07 J	3.7 J
SELENIUM	0.01	0.02	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
SILVER	0.05	0.1	0.01 U	0.01 U	0.010 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	0.01 U
SODIUM	20	--	**230**	**94.6**	**60.6**	**43.6**	**47.4**	**56.8**	**47.9**	**41**	15.9	**33.8**
THALLIUM	0.0005	0.0005	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
VANADIUM	--	--	0.0039 J	0.05 U	0.006 J	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
ZINC	2	5	0.0203 J	0.616	0.0244 J	0.03 U	0.0213 J	0.014 J	0.0073 J	0.0047 J	0.0069 J	0.0047 J
Conventional Chemistry (mg/L)												
TOTAL DISSOLVED SOLIDS	--	--	1510	748	592	446	432	502	486	450	434	427
TOTAL SUSPENDED SOLIDS	--	--	125	66.5	226	31	18.8	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U

Notes:

Constitutents detected above the NYSDEC Class GA GW Standard are in **bold**.

Constitutents detected above the NYSDEC Class GA GW Effluent Limitation are highlighted in yellow.

* The NYSDEC Class GA GW Standard and Effluent Limitation for PCBs is 0.09 ug/L.

NYSDEC Class GA GW Standard - New York State Department of Environmental Conservation Groundwater Standard and Guidance Value.

NYSDEC Class GA GW Effluent Limitation - New York State Department of Environmental Conservation Effluent Limitation.

U - The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

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mg/L - milligrams per liter

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