ARCADIS Design & Consultancy for natural and built assets

Payson Long
New York State Department of Environmental Conservation (NYSDEC)
Division of Environmental Remediation
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Subject:
October 2018 Monthly Report
Fort Edward Landfill
NYSDEC Site No. 558001
Contract No. D007618-39

Date:
December 11, 2018

Contact:
Andy Vitolins

Phone:
518.250.7300

Email:
andy.vitolins@arcadis.com

Our ref:
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 October 2018 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 October 2018 operating period. A total of 416,527 gallons of leachate were collected and treated through the system during October 2018. The corresponding average leachate recovery rate for the month was approximately 9.3 gallons per minute (gpm).

The following operation and maintenance (O&M) activities were completed during the October 2018 operating period:

- Arcadis continued treatment system upgrades and testing of the new programmable logic controller (PLC).
- Hour Electric was onsite to finish install and testing of the step transformer and all ancillary equipment required to increase the voltage (208 to 480) from the existing electrical power panel to the EW-4 pump station. All electrical connections/terminations were also performed Hour Electric. The extraction well EW-4 electrical power service was upgraded to accommodate a higher leachate flow demand.

- Brush cutting was performed in select areas of the landfill for access to groundwater monitoring well locations.
- Locks on all groundwater monitoring wells and site access gates were inspected and replaced as part of the routine O&M.
- Iron and solids sludge processing was performed throughout the month. In total, four 55-gallon drums of sludge were generated during October 2018.

System Sampling

The monthly samples were collected on October 22, 2018 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 first quarter of 2019. The annual groundwater sampling event was conducted the week of October 22, 2018 and included groundwater, surface water, and sediment locations identified in the site management plan (SMP) and as discussed with the NYSDEC.

The monthly, quarterly, and annual samples were submitted to Con-Test Analytical 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 analytical results will also be presented in the 2018 Groundwater Annual report. 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, and EW-3 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 Clarifier Catch Tank and Cell 3 Bypass samples but did not exceed the corresponding NYSDEC Class GA Standards.

Based on data collected in 2017, Arcadis has temporarily ceased pumping from extraction well EW-1 (the primary contributor of VOCs and PCBs to the treatment plant). EW-1 will remain off until recommendations presented in the January 31, 2018 Remedial System Optimization Report (RSO) can be implemented and evaluated. These recommendations include VOC removal within the Inclined Plate Clarifier (IPC). Air diffusers placed in the IPC, for example, may volatize VOCs before they are discharged to the CWTS. This would reduce contaminant loading of the CWTS and the potential for VOCs impacts to the Polishing Pond.

PCBs

PCB Aroclor 1016 was detected in the EW-1, EW-4, Influent, Clarifier Catch Tank, and Cell 3 Bypass samples at concentrations greater than the respective NYSDEC GA Standards. PCBs were not detected in the EW-2, EW-3, Cell 2 Effluent, Cell 1 Effluent, and Polishing Pond Effluent samples during the October 2018 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 concentration ranged from a maximum 53 mg/L (EW-1) to 0.74 mg/L (Polishing Pond Effluent). Manganese concentrations ranged from a maximum of 1.8 mg/L (EW-1) to 0.32 mg/L (Polishing Pond Effluent), which are consistent with previous data.

TDS and TSS

The concentrations of TDS and TSS continue to fluctuate between sampling events. During the October sampling event, TDS concentrations ranged between 370 mg/L and 750 mg/L; TSS concentrations ranged from 5.0 mg/L and 110 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 200 mg/L, respectively.

Next Reporting Period Planned Activities

The following activities are anticipated for November 2018:

- Upgrades to the treatment system equipment and PLC;
- Continuation of iron and solids treatment and processing; 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.
Associate Vice President

Copies:
Jeremy Wyckoff, Arcadis
File

Enclosures:

Table 1 – October 2018 Treatment System Analytical Data

Table 1. October 2018 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 10/22/2018	EW-2 10/22/2018	EW-3 10/22/2018	EW-4 10/22/2018	INFLUENT 10/22/2018	CLARIFIER CATCH 10/22/2018	CELL 3 10/22/2018	CELL 2 10/22/2018	CELL 1 10/22/2018	EFFLUENT 10/22/2018
Volatile Organic Compounds (ug/L)												
ACETONE	50	50	500 U	50 U	23 J	50 U	50 U	50 U	50 U	50 U	50 U	50 U
BENZENE	1	1	**3.1 J**	**5.7**	**3.0**	1.0 U	1.0 U	0.17 J	1.0 U	1.0 U	1.0 U	1.0 U
BROMOCHLOROMETHANE	5	5	10 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
BROMODICHLOROMETHANE	50	50	5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMOFORM	50	50	10 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	20 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2-BUTANONE (MEK)	50	50	**100 J**	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
CARBON DISULFIDE	60	60	40 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
CARBON TETRACHLORIDE	5	5	50 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
CHLOROBENZENE	5	5	2.1 J	1.2	**17**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CHLORODIBROMOMETHANE	50	--	5.0 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROETHANE	5	5	20 U	2.0 U	0.64 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
CYCLOHEXANE	--	--	9.9 J	5.0 U	1.0 J	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-DIBROMO-3-CHLOROPROPANE	0.04	0.04	50 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
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	0.0006	0.0006	5.0 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	3	3	10 U	1.0 U	0.45 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	10 U	1.0 U	0.34 J	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	10 U	0.32 J	**5.3**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
DICHLORODIFLUOROMETHANE	5	5	20 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1-DICHLOROETHANE	5	5	10 U	1.1	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	**970**	0.78 J	0.5 U	1.0 U	1.0 U	1.0 U	0.15 J	1.0 U	1.0 U	1.0 U
TRANS-1,2-DICHLOROETHYLENE	5	5	**7.2 J**	1.0 U	0.5 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	10 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	4.7 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	1.0 U
1,2-DICHLOROPROPANE	1	1	10 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	5.0 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,3-DICHLOROPROPENE	0.4	0.4	5.0 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-DIOXANE	--	--	1000 U	53 J	59 J	100 U	100 U	100 U	100 U	100 U	100 U	100 U
ETHYLBENZENE	5	5	2.5 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	1.0 U
2-HEXANONE	50	50	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ISOPROPYLBENZENE (CUMENE)	5	5	10 U	0.35 J	0.74 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	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 TERT-BUTYL ETHER (MTBE)	10	10	10 U	0.91 J	0.49 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
METHYL CYCLOHEXANE	--	--	10 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
METHYLENE CHLORIDE	5	5	50 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 ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	--	--	100 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
STYRENE	5	930	10 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	10 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	10 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	2.8 J	1.0 U	0.19 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,3-TRICHLOROBENZENE	5	5	50 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
1,2,4-TRICHLOROBENZENE	5	5	20 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1,1-TRICHLOROETHANE	5	5	10 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	10 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	10 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	20 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	5	10 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	**1400**	0.43 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
M,P-XYLENES	5	5	**9.8 J**	1.6 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
O-XYLENE (1,2-DIMETHYLBENZENE)	5	5	1.6 J	0.2 J	0.2 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
XYLENES, TOTAL	5	5	30 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 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. October 2018 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 10/22/2018	EW-2 10/22/2018	EW-3 10/22/2018	EW-4 10/22/2018	INFLUENT 10/22/2018	CLARIFIER CATCH 10/22/2018	CELL 3 10/22/2018	CELL 2 10/22/2018	CELL 1 10/22/2018	EFFLUENT 10/22/2018
Polychlorinated Biphenyls (ug/L)												
PCB-1016 (AROCLOR 1016)	*	*	**4,400**	0.2 U	0.2 U	**0.28**	**1.5**	**0.54**	**0.36**	0.2 U	0.2 U	0.2 U
PCB-1221 (AROCLOR 1221)	*	*	500 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCB-1232 (AROCLOR 1232)	*	*	500 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCB-1242 (AROCLOR 1242)	*	*	500 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCB-1248 (AROCLOR 1248)	*	*	500 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCB-1254 (AROCLOR 1254)	*	*	500 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCB-1260 (AROCLOR 1260)	*	*	500 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCB-1262 (AROCLOR 1262)	*	*	500 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCB-1268 (AROCLOR 1268)	*	*	500 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Metals (mg/L)												
ALUMINUM	--	2	0.1	0.05 U	0.062	0.11	0.05 U	0.48	0.05 U	0.05 U	0.073	0.05 U
ANTIMONY	0.003	0.006	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
ARSENIC	0.025	0.05	0.01 U	**0.045**	0.010 U	0.01 U	0.010 U	0.010 U	0.010 U	0.010 U	0.012	0.010 U
BARIUM	1	2	0.47	0.17	0.23	0.051	0.05 U	0.05 U	0.05 U	0.059	0.092	0.050 U
BERYLLIUM	0.003	0.003	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	0.004 U
CADMIUM	0.005	0.01	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	0.004 U
CALCIUM	--	--	150	120	82	86	84	84	110	110	150	96
CHROMIUM, TOTAL	0.05	0.1	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
COBALT	--	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.01 U	0.05 U
COPPER	0.2	1	0.017	0.029	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.010 U	0.01 U
IRON	0.3	0.6	**53**	**34**	**38**	**24**	**4.1**	**3.2**	**4.2**	**5.8**	**8.5**	**0.74**
LEAD	0.025	0.05	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
MAGNESIUM	35	35	**43**	**42**	**37**	20	19	19	21	19	21	21
MANGANESE	0.3	0.6	**1.8**	**0.98**	**0.33**	**1.6**	**1.5**	**1.6**	**1.5**	**1.1**	**0.66**	**0.32**
MERCURY	0.0007	0.0014	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U
NICKEL	0.1	0.2	0.01 U	0.01	0.01 U	0.01 U	0.01 U	0.031	0.01 U	0.01 U	0.010 U	0.01 U
POTASSIUM	--	--	11	2.6	37	2.5	2.4	2.4	2.0	3.2	2.0 U	4.7
SELENIUM	0.01	0.02	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
SILVER	0.05	0.1	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SODIUM	20	--	**92**	**110**	**75**	**48**	**49**	**50**	**55**	**51**	**53**	**46**
THALLIUM	0.0005	0.0005	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
VANADIUM	--	--	0.012	0.011	0.013	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
ZINC	2	5	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.035	0.02 U	0.02 U	0.02 U	0.02 U
Conventional Chemistry (mg/L)												
TOTAL DISSOLVED SOLIDS	--	--	750	740	540	380	370	490	480	430	560	410
TOTAL SUSPENDED SOLIDS	--	--	110	140	80	26	9.0	8.3	11	6.5	26	5.0

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.

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