ARCADIS Design & Consultancy for natural and built assets

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

Date:
June 22, 2018

Contact:
Andy Vitolins

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518.250.7300

Email:
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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 March 2018 reporting period.

Leachate Collection and Treatment System Operation and Maintenance

The leachate collection system operated with minimal downtime during the March 2018 operating period. A total of 751,727 gallons of leachate were collected and treated through the system during March 2018. The corresponding average leachate recovery rate for the month was approximately 17 gallons per minute (gpm).

The following O&M activities were completed during the March 2018 operating period:

- Extraction well EW-1 was shutdown to address the high concentrations of volatiles organic compounds and polychlorinated biphenyls pumped from the well daily.
- Extraction well EW-3 was reset after a power failure tripped the alarm.
- The pump in leachate collection well EW-4 was cleaned and replaced due to declining flow rates from iron fouling.
- The discharge pump(s) for the clarifier catch tank was being called to run, but the return signal indicating the pump was running, was intermittently not being received by the PLC.

- Iron and solids sludge processing was performed throughout the month. In total, three 55-gallon drums of sludge were generated during March 2018.

System Sampling

The monthly samples were collected on March 26, 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 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 2018.

The monthly 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 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-3, and the Effluent samples at concentrations that exceeded the corresponding NYSDEC Class GA Standards. The highest concentrations of VOCs were reported in the samples from EW-1. Acetone was detected in the Effluent sample but not from the other sample locations. Table 1 shows that VOCs were detected in the EW-2, EW-4, Influent, Clarifier Catch Tank, Cell 3 Bypass, and Cell 2 Effluent sample, but did not exceed the corresponding NYSDEC Class GA Standards.

Based on these data, Arcadis has turned off extraction well EW-1 (the primary contributor of VOCs and PCBs to the treatment plant) and will remain off until the recommendations presented in the January 31, 2018 Remedial System Optimization Report (RSO) can be implemented and evaluated.

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 March 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 180 mg/L (EW-3) to 0.16 mg/L (Cell 3 Bypass). Manganese concentrations ranged from a maximum of 1.8 mg/L (EW-1) to 0.14 mg/L (Cell 1 effluent).

TDS and TSS

The concentrations of TDS and TSS continue to fluctuate between sampling events. During the March sampling event, TDS concentrations ranged between 280 mg/L and 970 mg/L; TSS concentrations ranged from non-detect and 180 mg/L. These data are consistent with the results from previous sampling events. Since September 2016, TDS and TSS have ranged from 210 to 1,300 mg/L and non-detect (ND) to 180 mg/L, respectively.

Next Reporting Period Planned Activities

The following activities are anticipated for April 2018:

- Continuation of iron and solids treatment and processing;

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 – March 2018 Treatment System Analytical Data

Table 1. March 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	EW-2	EW-3	EW-4	INFLUENT	CLARIFIER CATCH	CELL 3	CELL 2	CELL 1	EFFLUENT
			3/26/2018	3/26/2018	3/26/2018	3/26/2018	3/26/2018	3/26/2018	3/26/2018	3/26/2018	3/26/2018	3/26/2018
Volatile Organic Compounds (ug/L)												
ACETONE	50	50	500 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	**240**
BENZENE	1	1	**6.5 J**	4.7	2.6	1.0 U	0.13 J	0.13 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	5.0 U	0.5 U	0.5 U	0.5 U	0.5 U	0.71	0.5 U	0.5 U	0.5 U	0.5 U
BROMOFORM	50	50	20 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	200 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	22
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	**8.8 J**	1.3	**18**	0.17 J	0.32 J	0.28 J	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	0.38 J	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROETHANE	5	5	20 U	0.33 J	0.79 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
CYCLOHEXANE	--	--	50 U	0.69 J	1.2 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	0.46 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	10 U	1.0 U	0.35 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	0.37 J	**5.4**	1.0 U	0.16 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
DICHLORODIFLUOROMETHANE	5	5	20 U	0.32 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
1,1-DICHLOROETHANE	5	5	10 U	1.0	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	**1200**	0.65 J	1.0 U	0.28 J	0.16 J	0.15 J	0.29 J	0.64 J	1.0 U	1.0 U
TRANS-1,2-DICHLOROETHYLENE	5	5	**18**	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	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	**8.0 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	--	--	500 U	49 J	53	50 U	50 U	50 U	50 U	50 U	50 U	50 U
ETHYLBENZENE	5	5	2.7 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
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	20 U	0.34 J	0.61 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 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	0.81 J	0.44 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	3.0 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
1,2,3-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	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-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	**1500**	0.36 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	**10 J**	1.3 J	0.18 J	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	10 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	1.0 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. March 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	EW-2	EW-3	EW-4	INFLUENT	CLARIFIER CATCH	CELL 3	CELL 2	CELL 1	EFFLUENT
			3/26/2018	3/26/2018	3/26/2018	3/26/2018	3/26/2018	3/26/2018	3/26/2018	3/26/2018	3/26/2018	3/26/2018
Polychlorinated Biphenyls (ug/L)												
PCB-1016 (AROCLOR 1016)	*	*	**2,500**	0.2 U	0.22 U	**0.29**	**1.3**	**0.91**	**0.55**	0.2 U	0.2 U	0.2 U
PCB-1221 (AROCLOR 1221)	*	*	400 U	0.2 U	0.22 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)	*	*	400 U	0.2 U	0.22 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)	*	*	400 U	0.2 U	0.22 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)	*	*	400 U	0.2 U	0.22 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)	*	*	400 U	0.2 U	0.22 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)	*	*	400 U	0.2 U	0.22 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)	*	*	400 U	0.2 U	0.22 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)	*	*	400 U	0.2 U	0.22 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	0.05 U	0.05 U	0.078	0.05 U	0.05 U	0.46	0.11	0.057	0.082	0.05 U
ANTIMONY	0.003	0.006	0.05 U	0.05 U	0.05 U	0.05 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
ARSENIC	0.025	0.05	0.01 U	**0.057**	**0.045**	0.01 U	0.013	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
BARIUM	1	2	0.6	0.21	0.77	0.05 U	0.1	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
BERYLLIUM	0.003	0.003	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
CADMIUM	0.005	0.01	0.004 U	0.004 U	0.004 U	0.004 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
CALCIUM	--	--	180	120	78	80	87	84	90	91	120	85
CHROMIUM, TOTAL	0.05	0.1	0.01 U	0.01 U	0.01 U	0.01 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
COBALT	--	--	0.05 U	0.05 U	0.05 U	0.05 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
COPPER	0.2	1	0.012	0.012	0.01 U	0.01 U	0.025 U	0.025 U	0.025 U	0.025 U	0.013	0.025 U
IRON	0.3	0.6	**120**	**57**	**180**	**11**	**98**	**2.3**	**0.16**	**2.1**	**0.64**	**0.55**
LEAD	0.025	0.05	0.01 U	0.01 U	0.01 U	0.01 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
MAGNESIUM	35	35	**55**	**45**	**36**	19	20	19	19	17	15	19
MANGANESE	0.3	0.6	**1.8**	**1.0**	0.25	**1.4**	**1.6**	**1.3**	**0.51**	**0.38**	0.14	0.21
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	0.011	0.01 U	0.01 U	0.025 U	0.025 U	0.025 U	0.025 U	0.021	0.025 U
POTASSIUM	--	--	17	2.3	32	2.2	2.7	2.6	3.0	2.5	2.0 U	2.8
SELENIUM	0.01	0.02	0.05 U	0.05 U	0.05 U	0.05 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
SILVER	0.05	0.1	0.005 U	0.005 U	0.005 U	0.005 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
SODIUM	20	--	**130**	**97**	**66**	**40**	**42**	**49**	**43**	**41**	14	**40**
THALLIUM	0.0005	0.0005	0.05 U	0.05 U	0.05 U	0.05 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
VANADIUM	--	--	0.016	0.013	0.035	0.01 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
ZINC	2	5	0.02 U	0.02 U	0.098	0.02 U	0.05 U	0.05 U	0.05 U	0.023	0.02 U	0.05 U
Conventional Chemistry (mg/L)												
TOTAL DISSOLVED SOLIDS	--	--	970	720	570	390	440	280	460	430	430	450
TOTAL SUSPENDED SOLIDS	--	--	8.0	110	68	12	180	6.4	2.0 U	2.8	2.8	5.2

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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