ARCADIS Design & Consultancy for natural and built assets

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Subject:
April 2017 Monthly Report
Site Management/RSO
Fort Edward Landfill
NYSDEC Site No. 558001
Contract No. D007618-39

Date:
May 31, 2017

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Dan Lang

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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 April 2017 reporting period. A summary of the analytical results of the April 2017 monthly system samples is also provided.

Leachate Collection and Treatment System Operation and Maintenance

The leachate collection system operated with minimal downtime during this period. Approximately 334,928 gallons of leachate were collected and treated through the system during April 2017. The corresponding average leachate recovery rate for the month was approximately 7.8 gallons per minute (gpm). The following O&M activities were completed during the April 2017 operating period:

- Iron and solids sludge processing. A temporary, substitute, hydraulic ram for the filter press allowed for sludge processing. The parts to repair the hydraulic ram were on order.
- Removal, cleaning, and installation of the submersible pump in Extraction Well EW-4. The pump was removed and cleaned due to reduced flow from this well.

System Optimization

Arcadis is currently in the process of upgrading the treatment system as described in the Fort Edward WA 2015 Work Scope, and as outlined in the Remedial System Optimization (HRP, 2015). The first and second phases of upgrades have been completed. These elements were summarized in the previous Monthly Reports (Arcadis 2016 and 2017), respectively. The third phase of remedial system optimization upgrades completed in April 2017 included the following:

- Survey of landfill site features on April 10 and 11, 2017 by Darrah Land Surveyors. The survey data will be used to generate revised site maps and as-built drawings.
- Herbicide application on April 11, 2017 to control Wild Parsnip on select areas of the landfill cap.
- Video inspection of Extraction Well EW-1 to evaluate well construction details and assess the condition of the well screen prior to bringing the pump online.

System Sampling

The monthly samples were collected on April 27 and April 28, 2017, from Extraction Wells EW-2 and EW-4, combined treatment system influent (EW-2 and EW-4), after chemical introduction in the Inclined Plate Clarifier (Post-IPC), Clarifier Catch tank, treatment cell discharge in the effluent collection chambers (Cell 1, Cell 2, and Cell 3), and the Polishing Pond effluent. The Post-IPC sample was added to the system sampling program this month to evaluate the iron reduction within the IPC. The samples were collected in the IPC following the point where treatment system chemicals are introduced into the treatment processes.

During the April sampling event, Treatment Cell 1 was offline. However, water was flowing from the Treatment Cell 1 discharge pipe in the collection chamber. This was likely the result of the combination of snow and ice melt, precipitation, and/or groundwater seepage into the cell. Therefore, samples were collected from the Treatment Cell 1 discharge piping to evaluate contaminant loading from Treatment Cell 1 to the polishing pond.

During the month of April, the bypass pipe installed between Cell 2 and Cell 3 had thawed and water flow between the cells was restored. Therefore, treatment system water was being discharged into Treatment Cell 3, passing through the bypass pipe, and discharging from the Treatment Cell 2 discharge piping in the collection chamber. Due to the combination of melting snow, precipitation, and treatment system flow, water was also discharging from the Treatment Cell 3 discharge piping in the collection chamber. Therefore, samples were collected from the discharge piping in the collection chambers at Treatment Cell 2 and Cell 3.

The routine 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 Post-IPC sample was analyzed for metals, TDS, and TSS only.

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, estimated concentrations of acetone were reported in five of the eight samples analyzed for VOCs, however these detections are most likely attributable to laboratory contamination. As indicated above, Extraction Well EW-2 was brought online on March 30, 2017. The sample from EW-2 contained estimated concentrations of 1,1-dichloroethane, benzene, chlorobenzene, isopropylbenzene (cumene), m,p-xylenes, and methyl tert-butyl ether (MTBE). Chlorobenzene and cis-1,2-dichloroethylene were also reported at estimated concentrations in the samples collected from EW-4 and the Influent. Benzene was also detected at an estimated concentration in the Influent sample. Bromodichloromethane and an estimated concentration of benzene, chlorobenzene, cis-1,2-dichloroethylene, and 2-butanone (MEK) were reported in the Clarifier Catch sample. These were the only VOCs reported during the April 2017 sampling event. VOC concentrations were consistent with previous monthly data with the exception of the estimated concentrations of 1,1-dichloroethane, m,p-xylenes, and MTBE, which had not been detected in previous sampling events.

PCBs

PCB-1016 was the only PCB Aroclor detected in the samples collected from EW-4, Influent, and the Clarifier Catch tank. PCBs were not detected in the treatment cell samples or the Polishing Pond effluent sample during the April 2017 sampling event (Table 1). During monthly sampling events since July 2016, PCB Aroclor 1221, 1232, or 1242 had generally been detected in the influent or Clarifier Catch samples.

Metals

In September 2016, aluminum, barium, calcium, cobalt, magnesium, manganese, potassium, sodium, and vanadium were added to the metals analyses sampling program in accordance with the requirements of the Work Assignment. Barium, calcium, iron, magnesium, manganese, potassium, and sodium were all detected in the EW-2, EW-4, and Influent samples as well as three or more of the post-treatment locations (e.g., Post-IPC, Clarifier Catch, Cell 3, Cell 2, and Cell 1) and Effluent samples. Aluminum was the only metal detected in the POST-IPC, Clarifier Catch, and Cell 2 samples, but not in the EW-2, EW-4, and Influent samples. The detected aluminum concentration ranged from 0.17 to 2 milligrams per liter (mg/L), higher than the laboratory reporting limit of 0.05 mg/L. Arsenic, copper and nickel were the only metals detected in the EW-2 sample that were not detected in any other sample locations during the April 2017 sampling event.

TDS and TSS

The concentrations of TDS and TSS continue to fluctuate between sampling events. During the April sampling event, TDS concentrations ranged between 200 mg/L and 540 mg/L; TSS concentrations ranged between 14 mg/L and 91 mg/L. These data are consistent with the results from previous sampling events. Since September 2016, TDS and TSS have ranged from 210 to 920 mg/L and 0 to 120 mg/L, respectively.

Next Reporting Period Planned Activities

During May, the following activities are anticipated:

- Substantial completion of programmable logic controller programming;
- Brush cutting and clearing along the landfill drainage swales, the perimeter of the treatment cells, and near well vaults and other structures;
- Evaluate extraction wells EW-1 and EW-3, and procure replacement components, as needed, to bring these wells on line;
- Procure replacement parts and rebuild the hydraulic ram for the sludge filter press; and
- 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.

Daniel Lang
Associate Vice President

Copies:
Jeremy Wyckoff, Arcadis
File

Enclosures:
Table
1 April Treatment System Analytical Data

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

		EW-2	EW-4	INFLUENT	POST-IPC	CLARIFIER CATCH	CELL 3	CELL 2	CELL 1	EFFLUENT
Chemical Name	**Units**	**4/28/2017**	**4/27/2017**	**4/27/2017**	**4/27/2017**	**4/27/2017**	**4/27/2017**	**4/27/2017**	**4/27/2017**	**4/27/2017**
VOCs										
1,1,1-TRICHLOROETHANE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-TRICHLOROETHANE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-DICHLOROETHANE	ug/L	0.44 J	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-TRICHLOROBENZENE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	5.0 U	5.0 U	5.0 U	NS	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	ug/L	0.5 U	0.5 U	0.5 U	NS	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-DICHLOROETHANE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-DICHLOROETHYLENE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-DICHLOROPROPANE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-DICHLOROBENZENE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-DICHLOROBENZENE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-HEXANONE	ug/L	10 U	10 U	10 U	NS	10 U	10 U	10 U	10 U	10 U
ACETONE	ug/L	17 J	50 U	50 U	NS	12 J	6.9 J	50 U	6.6 J	5.4 J
BENZENE	ug/L	0.63 J	1.0 U	0.27 J	NS	0.24 J	1.0 U	1.0 U	1.0 U	1.0 U
BROMOCHLOROMETHANE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
BROMODICHLOROMETHANE	ug/L	0.5 U	0.5 U	0.5 U	NS	0.61	0.5 U	0.5 U	0.5 U	0.5 U
BROMOFORM	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
BROMOMETHANE	ug/L	2.0 U	2.0 U	2.0 U	NS	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
2-BUTANONE (MEK)	ug/L	20 U	20 U	20 U	NS	7.7 J	20 U	20 U	20 U	20 U
CARBON DISULFIDE	ug/L	4.0 U	4.0 U	4.0 U	NS	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
CARBON TETRACHLORIDE	ug/L	5.0 U	5.0 U	5.0 U	NS	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
CHLOROBENZENE	ug/L	0.26 J	0.28 J	0.29 J	NS	0.27 J	1.0 U	1.0 U	1.0 U	1.0 U
CHLORODIBROMOMETHANE	ug/L	0.5 U	0.5 U	0.5 U	NS	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROETHANE	ug/L	2.0 U	2.0 U	2.0 U	NS	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
CIS-1,2-DICHLOROETHYLENE	ug/L	1.0 U	0.44 J	0.4 J	NS	0.3 J	1.0 U	1.0 U	1.0 U	1.0 U
TRANS-1,2-DICHLOROETHYLENE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CIS-1,3-DICHLOROPROPENE	ug/L	0.5 U	0.5 U	0.5 U	NS	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CYCLOHEXANE	ug/L	5.0 U	5.0 U	5.0 U	NS	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
DICHLORODIFLUOROMETHANE	ug/L	2.0 U	2.0 U	2.0 U	NS	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
ETHYLBENZENE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
ISOPROPYLBENZENE (CUMENE)	ug/L	0.12 J	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
M,P-XYLENES	ug/L	0.27 J	2.0 U	2.0 U	NS	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
METHYL ACETATE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
METHYL TERT-BUTYL ETHER (MTBE)	ug/L	0.5 J	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ug/L	10 U	10 U	10 U	NS	10 U	10 U	10 U	10 U	10 U
METHYLCYCLOHEXANE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
METHYLENE CHLORIDE	ug/L	5.0 U	5.0 U	5.0 U	NS	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
STYRENE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TETRACHLOROETHYLENE(PCE)	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOLUENE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,3-TRICHLOROBENZENE	ug/L	5.0 U	5.0 U	5.0 U	NS	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
TRANS-1,3-DICHLOROPROPENE	ug/L	0.5 U	0.5 U	0.5 U	NS	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-DIOXANE	ug/L	50 U	50 U	50 U	NS	50 U	50 U	50 U	50 U	50 U
TRICHLOROETHYLENE (TCE)	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TRICHLOROFLUOROMETHANE	ug/L	2.0 U	2.0 U	2.0 U	NS	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
VINYL CHLORIDE	ug/L	2.0 U	2.0 U	2.0 U	NS	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
XYLENES, TOTAL	ug/L	3.0 U	3.0 U	3.0 U	NS	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
1,1,1,2- TETRACHLOROETHANE	ug/L	1.0 U	1.0 U	1.0 U	NS	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Notes:
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mg/L - milligrams per liter
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Table 1. April Treatment System Analytical Data, Fort Edward Landfill
Fort Edward, New York. NYSDEC Site No. 558001

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Chemical Name	**Units**	**4/28/2017**	**4/27/2017**	**4/27/2017**	**4/27/2017**	**4/27/2017**	**4/27/2017**	**4/27/2017**	**4/27/2017**	**4/27/2017**
PCBs										
PCB-1016 (AROCLOR 1016)	ug/L	0.20 U	0.40	0.34	NS	0.34	0.20 U	0.20 U	0.20 U	0.20 U
PCB-1221 (AROCLOR 1221)	ug/L	0.2 U	0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCB-1232 (AROCLOR 1232)	ug/L	0.2 U	0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCB-1242 (AROCLOR 1242)	ug/L	0.2 U	0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCB-1248 (AROCLOR 1248)	ug/L	0.2 U	0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCB-1254 (AROCLOR 1254)	ug/L	0.2 U	0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCB-1260 (AROCLOR 1260)	ug/L	0.2 U	0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCB-1262 (AROCLOR 1262)	ug/L	0.2 U	0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
PCB-1268 (AROCLOR 1268)	ug/L	0.2 U	0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
METALS										
ALUMINUM	mg/L	0.05 U	0.05 U	0.05 U	2.00	1.90	0.05 U	0.17	0.05 U	0.05 U
ANTIMONY	mg/L	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	mg/L	0.041	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
BARIUM	mg/L	0.150	0.063	0.050	0.050 U	0.050 U	0.071	0.120	0.100	0.050 U
BERYLLIUM	mg/L	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	mg/L	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	mg/L	120	82	81	82	83	40	62	74	64
CHROMIUM, TOTAL	mg/L	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	mg/L	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
COPPER	mg/L	0.011	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
IRON	mg/L	29.00	32.00	15.00	8.30	7.10	0.05 U	0.39	0.05 U	1.40
LEAD	mg/L	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	mg/L	42	23	22	23	23	11	20	30	15
MANGANESE	mg/L	0.850	1.700	1.600	1.600	1.600	0.053	2.600	0.054	0.840
MERCURY	mg/L	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	mg/L	0.017	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
POTASSIUM	mg/L	3.5	3.3	3.1	3.2	3.2	2.0 U	2.0 U	3.3	2.2
SELENIUM	mg/L	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	mg/L	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	mg/L	120	48	48	58	59	13	47	18	16
THALLIUM	mg/L	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	mg/L	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
ZINC	mg/L	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
Other										
TOTAL DISSOLVED SOLIDS	mg/L	540	370	270	330	440	420	250	200	280
TOTAL SUSPENDED SOLIDS	mg/L	65	47	31	23	32	20	19	91	14

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