ARCADIS Design & Consultancy for natural and built assets

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

Date:
January 7, 2019

Contact:
Andy Vitolins

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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 December 2019 reporting period at the above-referenced site.

**Leachate Collection and Treatment System Operation and Maintenance**

The leachate collection system shut down on numerous occasions in December 2019 due to pump failure alarms at extraction well EW-4 and power loss alarms at the treatment system. The issues were resolved each time by resetting the PLC.

A total of 847,904 gallons of leachate were collected and treated through the system during December 2019. The corresponding average leachate recovery rate for the month was approximately 19.0 gallons per minute (gpm).

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

- On December 3, 2019, Arcadis rented a track loader and plowed the access road to the treatment system building. Snow was also cleared to provide access to the constructed wetland treatment system (CWTS) and Polishing Pond sampling locations.
- From December 3 to December 12, 2019, Arcadis provided oversight of the Phase 3 drilling work completed by Aztech Environmental

Technologies. In addition, soil samples were collected at each soil boring. Results of the sampling event will be provided under separate cover.

- On December 12, 2019, Darrah Land Surveyors completed a survey of the newly installed monitoring wells, storage container, and electrical conduit between extraction wells EW-2 and EW-4. The survey data will be used to generate revised site maps and as-built drawings.
- On December 16 and December 18, 2019, Arcadis developed all newly installed monitoring wells in preparation of the one-month and two-month groundwater sampling events.
- Iron and solids sludge processing was performed throughout the month. Three 55-gallon drums of sludge were generated during December 2019.

**System Sampling**

Water samples were collected on December 17, 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.

No samples were collected from extraction wells EW-1, EW-2, EW-3, leachate collection well EW-4, or 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 2020.

The monthly 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 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 the Influent. As shown in Table 1, VOCs were detected in the Cell 3 Bypass, Cell 2 Effluent, and Polishing Pond Effluent samples but did not exceed the corresponding NYSDEC Class GA Standards.

Based on data collected in 2019, 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 1232 was detected in the Influent and Clarifier Catch Tank samples at concentrations greater than the respective NYSDEC GA Standard. PCBs were not detected in the Cell 3 Bypass, Cell 2 Effluent, or Polishing Pond Effluent samples during the December 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 9.82 mg/L (Influent) to a minimum of non-detect (Cell 3 Bypass). Manganese concentrations ranged from a maximum of 1.8 mg/L (Influent) to a minimum of 0.0417 mg/L (Polishing Pond Effluent), which are consistent with previous data. Aluminum was also detected above the NYSDEC Effluent Limitation of 20 mg/L. Aluminum concentrations ranged from a maximum of 2.37 mg/L (Clarifier Catch) to a minimum of non-detect at all other sampling locations.

**TDS and TSS**

The concentrations of TDS and TSS continue to fluctuate between sampling events. During the December sampling event, TDS concentrations ranged between 440 mg/L and 570 mg/L; TSS concentrations ranged from non-detect and 26 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 January 2020:

- 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.
Vice President

Copies:
Jeremy Wyckoff, Arcadis
Jasmine Mullins, Arcadis
File

Enclosures:
**Table 1 –** December 2019 Treatment System Analytical Data

## Table 1. December 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 | INFLUENT 12/17/2019 | CLARIFIER CATCH 12/17/2019 | CELL 3 12/17/2019 | CELL 2 12/17/2019 | EFFLUENT 12/17/2019 |
|---|---|---|---|---|---|---|---|
| **Volatile Organic Compounds (ug/L)** | | | | | | | |
| ACETONE | 50 | 50 | 5.0 U | 5.0 | 5.0 U | 5.0 U | 5.0 U |
| BENZENE | 1 | 1 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| BROMODICHLOROMETHANE | 50 | 50 | 1.0 U | 0.79 J | 1.0 U | 1.0 U | 1.0 U |
| BROMOFORM | 50 | 50 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| BROMOMETHANE | 5 | 5 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 2-BUTANONE (MEK) | 50 | 50 | 5.0 U | 5.0 U | 5.0 U | 5.0 U | 5.0 U |
| CARBON DISULFIDE | 60 | 60 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| CARBON TETRACHLORIDE | 5 | 5 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| CHLOROBENZENE | 5 | 5 | 0.72 J | 0.69 J | 1.0 U | 1.0 U | 1.0 U |
| CHLORODIBROMOMETHANE | 50 | -- | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| CHLOROETHANE | 5 | 5 | 0.65 J | 0.38 J | 1.0 U | 1.0 U | 1.0 U |
| CHLOROFORM | 7 | | 1.0 U | 2.4 | 0.63 J | 1.0 U | 1.0 U |
| CHLOROMETHANE | 5 | | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| CYCLOHEXANE | -- | -- | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 1,2-DIBROMO-3-CHLOROPROPANE | 0.04 | 0.04 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE) | 0.0006 | 0.0006 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 1,2-DICHLOROBENZENE | 3 | 3 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 1,3-DICHLOROBENZENE | 3 | 3 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 1,4-DICHLOROBENZENE | 3 | 3 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| DICHLORODIFLUOROMETHANE | 5 | 5 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 1,1-DICHLOROETHANE | 5 | 5 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| CIS-1,2-DICHLOROETHYLENE | 5 | 5 | **7.9** | **8.3** | 0.59 J | 0.42 J | 0.32 J |
| TRANS-1,2-DICHLOROETHYLENE | 5 | 5 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 1,2-DICHLOROETHANE | 0.6 | 0.6 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 1,1-DICHLOROETHYLENE | 5 | 5 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 1,2-DICHLOROPROPANE | 1 | 1 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| CIS-1,3-DICHLOROPROPENE | 0.4 | 0.4 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| TRANS-1,3-DICHLOROPROPENE | 0.4 | 0.4 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| ETHYLBENZENE | 5 | 5 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 2-HEXANONE | 50 | 50 | 5.0 U | 5.0 U | 5.0 U | 5.0 U | 5.0 U |
| ISOPROPYLBENZENE (CUMENE) | 5 | 5 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| METHYL ACETATE | -- | -- | 5.0 U | 5.0 U | 5.0 U | 5.0 U | 5.0 U |
| METHYL TERT-BUTYL ETHER (MTBE) | 10 | 10 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| METHYL CYCLOHEXANE | -- | -- | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| METHYLENE CHLORIDE | 5 | 5 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE | -- | -- | 5.0 U | 5.0 U | 5.0 U | 5.0 U | 5.0 U |
| STYRENE | 5 | 930 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 1,1,1,2-TETRACHLOROETHANE | 5 | 5 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| TETRACHLOROETHYLENE (PCE) | 5 | 5 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| TOLUENE | 5 | 5 | 0.4 J | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 1,2,4-TRICHLOROBENZENE | 5 | 5 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 1,1,1-TRICHLOROETHANE | 5 | 5 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| 1,1,2-TRICHLOROETHANE | 1 | 1 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| TRICHLOROETHYLENE (TCE) | 5 | 5 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| TRICHLOROFLUOROMETHANE | 5 | 5 | 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 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| VINYL CHLORIDE | 2 | 2 | **10** | **7.6** | 1.0 U | 1.0 U | 1.0 U |
| XYLENES, TOTAL | 5 | 5 | 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. December 2019 Treatment System Analytical Data, Fort Edward Landfill
## Fort Edward, New York. NYSDEC Site No. 558001

| Chemical Name | NYSDEC Class GA GW Standard | NYSDEC Class GA GW Effluent Limitation | INFLUENT 12/17/2019 | CLARIFIER CATCH 12/17/2019 | CELL 3 12/17/2019 | CELL 2 12/17/2019 | EFFLUENT 12/17/2019 |
|---|---|---|---|---|---|---|---|
| **Polychlorinated Biphenyls (ug/L)** | | | | | | | |
| PCB-1016 (AROCLOR 1016) | * | * | 0.8 U | 0.8 U | 0.4 U | 0.4 U | 0.4 U |
| PCB-1221 (AROCLOR 1221) | * | * | 0.8 U | 0.8 U | 0.4 U | 0.4 U | 0.4 U |
| PCB-1232 (AROCLOR 1232) | * | * | **7.9** | **7.7** | 0.4 U | 0.4 U | 0.4 U |
| PCB-1242 (AROCLOR 1242) | * | * | 0.8 U | 0.8 U | 0.4 U | 0.4 U | 0.4 U |
| PCB-1248 (AROCLOR 1248) | * | * | 0.8 U | 0.8 U | 0.4 U | 0.4 U | 0.4 U |
| PCB-1254 (AROCLOR 1254) | * | * | 0.8 U | 0.8 U | 0.4 U | 0.4 U | 0.4 U |
| PCB-1260 (AROCLOR 1260) | * | * | 0.8 U | 0.8 U | 0.4 U | 0.4 U | 0.4 U |
| PCB-1262 (AROCLOR 1262) | * | * | 0.8 U | 0.8 U | 0.4 U | 0.4 U | 0.4 U |
| PCB-1268 (AROCLOR 1268) | * | * | 0.8 U | 0.8 U | 0.4 U | 0.4 U | 0.4 U |
| **Metals (mg/L)** | | | | | | | |
| ALUMINUM | -- | 2.0 | 0.2 U | 2.37 | 0.2 U | 0.2 U | 0.087 J |
| ANTIMONY | 0.003 | 0.006 | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| ARSENIC | 0.03 | 0.05 | 0.0047 J | 0.0044 J | 0.015 U | 0.015 U | 0.015 U |
| BARIUM | 1.0 | 2.0 | 0.0497 J | 0.0452 J | 0.0323 J | 0.0441 J | 0.0373 J |
| BERYLLIUM | 0.003 | 0.003 | 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 | 0.004 U |
| CALCIUM | -- | -- | 85.3 | 83.4 | 104 | 87.2 | 91.8 |
| CHROMIUM, TOTAL | 0.05 | 0.10 | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| COBALT | -- | -- | 0.0028 J | 0.0026 J | 0.05 U | 0.05 U | 0.05 U |
| COPPER | 0.2 | 1.0 | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U |
| IRON | 0.3 | 0.6 | **9.82** | **7.9** | 0.15 U | **0.899** | **0.331** |
| LEAD | 0.03 | 0.05 | 0.0028 J | 0.0029 J | 0.01 U | 0.01 U | 0.01 U |
| MAGNESIUM | 35 | 35 | 21.3 J | 20.3 | 19.4 | 15.6 | 16.9 |
| MANGANESE | 0.3 | 0.6 | **1.8** | **1.79** | 0.0726 | 0.221 | 0.0417 |
| MERCURY | 0.0007 | 0.0014 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U |
| NICKEL | 0.1 | 0.2 | 0.0041 J | 0.0147 J | 0.0051 J | 0.0054 J | 0.0043 J |
| POTASSIUM | -- | -- | 4.67 J | 4.05 J | 4.81 J | 3.97 J | 3.97 J |
| SELENIUM | 0.01 | 0.02 | 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 | 0.01 U | 0.01 U | 0.01 U |
| SODIUM | 20 | -- | **54.5** | **58.3** | **55.1** | **42.4** | **42** |
| THALLIUM | 0.0005 | 0.0005 | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| VANADIUM | -- | -- | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U |
| ZINC | 2 | 5 | 0.0522 | 0.0336 | 0.0041 J | 0.0126 J | 0.0062 J |
| **Conventional Chemistry (mg/L)** | | | | | | | |
| TOTAL DISSOLVED SOLIDS | -- | -- | 454 | 482 | 570 | 452 | 440 |
| TOTAL SUSPENDED SOLIDS | -- | -- | 14.5 | 26 | 0.25 U | 0.25 U | 1.9 |

**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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