DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

N268859822

FACILITY: Arbor Hills Landfill, Inc.		**SRN / ID:** N2688
LOCATION: 10690 W. SIX MILE RD, NORTHVILLE		**DISTRICT:** Jackson
CITY: NORTHVILLE		**COUNTY:** WASHTENAW
CONTACT: Anthony Testa , Landfill Site Engineer		**ACTIVITY DATE:** 09/14/2021
STAFF: Diane Kavanaugh Vetort	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: FCE/PCE Major Source. Conducted complete compliance inspection ROP Section 1 and 2. See also PCE 9/14/21 On-site inspection Mike Kovalchick for SEM Survey conducted. See also 9/24/21 On-site inspection of Arbor Hills Energy Section 3.		
RESOLVED COMPLAINTS:		

Major / ROP Source. Full Compliance Evaluation (FCE) and Partial Compliance Inspection (PCE) Which Consisted of an Abbreviated Methane SEM Survey

Company Contacts:

Anthony Testa, GFL Landfill Site Engineer Anthony.Testa@glfenv.com (AT)

Dave Seegert, GFL Landfill Manager (Dave)

EGLE-AQD Staff:

Diane Kavanaugh Vetort, Jackson District (DKV)

Mike Kovalchick, Jackson District (MK)

Scott Miller, Supervisor Jackson District (SM)

Jorge Acevado, Detroit Office

Purpose:

On September 14, 2021, AQD conducted an announced compliance inspection of the Arbor Hills Landfill (AHL) owned and operated by Green for Life Environmental (GFL or Company) located at 10690 West Six Mile Road, Northville, Michigan. The purpose of this inspection was to determine the facility's compliance with the requirements of the federal Clean Air Act; Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended; the conditions of Renewable Operating Permit (ROP) Permit Number MI-ROP-N2688-2011a (This includes a separate Permit to Install (PTI) No. 79-17 issued for the AHL operated Flare gas control compound. An Administrative Amendment and Minor Modification application were submitted but have not yet been incorporated into the ROP); National Emission Standards for Hazardous Air Pollutants (NESHAP), Title 40 of the Code of Federal Regulations (40 CFR), Part 63, Subpart AAAA (LF MACT AAAA) and the Federal Plan requirements for Municipal Solid Waste Landfills that Commenced Construction On or Before July 17, 2014, and Have Not Been Modified or Reconstructed Since July 17, 2014, 40 CFR, Part 62, Subpart OOO (Subpart OOO).

Mike Kovalchick (MK) performed an abbreviated methane surface emission monitoring (SEM) survey on this date. See separate MACES Report for this PCE. Jorge Acevado, accompanied MK and performed some limited monitoring using the EGLE FLIR camera.

FACILITY DESCRIPTION

On October 29, 2020, the AHL ownership changed from Advanced Disposal Services to GFL. The landfill currently operates under Construction Permit Number 475946 issued on December 11, 2009 (as amended 2013, 2017) and is operating in accordance with the Solid Waste Management Act (Part 115 of 1994 Public Act 451 as amended).

AHL is a Municipal Type II Solid Waste (MSW) landfill located in Salem Township, Washtenaw County. It has a maximum design capacity of 63.6 million cubic yards per the 2020 Washtenaw County Solid Waste Capacity Report received as part of AQD requested records. The report states at the current rate of filling (1 million gate tons) remaining capacity is approximately 15 years. AHL is divided into an East (closed, 131 acre unlined) landfill and West (active, 242.41 acre double composite liner) landfill referred to as Arbor Hills East (AHE) and Arbor Hills West (AHW). AHW is currently permitted for six waste cells, 1, 2, 3, 4A-E, 5 and 6. Cell 6 is a portion of the AHE that was never properly constructed and is permitted to be excavated, properly constructed, and filled. Exhumed waste will be relocated to an active cell in AHW. The Cell 6 project which has had some pre-construction evaluation, design changes, and numerous proposed start dates since about 2016, has not yet been formally started. During the inspection I was told by AT and Dave, that the excavation is scheduled to begin in November 2021 and the Cell should be completed by July 2022. On October 6, 2021 AQD received a revised Cell 6 Odor Control Plan from AHL (2017 version previously submitted).

The AHL has an active gas collection and control system (GCCS) for the entire landfill. The last GCCS Plan received was a 2016 revision and significant changes have happened since then. AQD requested an updated GCCS plan and per AT it is close to being completed. The landfill gas (LFG) control consists of a Treatment System, LFG to energy electricity generating facility owned/operated by Fortistar Methane Group, also referred to as Arbor Hills Energy (ROP Section 3), and three LFG Flares. The LFG to energy facility consists of four Turbines, three having Duct Burners. LFG that is not treated and combusted in the Turbines is routed pre-treatment to the AHL owned/operated Flare Building. The Flares consist of two Enclosed Flares and one Utility (Open) Flare and four associated Blowers. AHL owns/operates a portable diesel emergency generator. Arbor Hills Energy has a stationary diesel emergency generator subject to 40 CFR 60 Subpart IIII (RICE MACT).

AHL operates a Compost Operation located across 6 Mile to the north.

AHL has a large leachate storage, treatment and disposal facility south of the railroad tracks with an entrance off of Napier Road.

The AHL and Arbor Hills Energy are one stationary source under the existing ROP No. MI-ROP-2688-2011a. AHL is the responsible official for Sections 1 and 2 of the ROP and Arbor Hills Energy is the responsible official for Section 3. The Arbor Hills Energy Facility inspection portion of this FCE, was conducted on 9/24/21. See separate MACES FCE/PCE report.

The AHL and Arbor Hills Energy companies submitted an ROP renewal application to AQD and are operating under the permit shield. However due to permit non-compliance initially with Arbor Hills Energy, and subsequent and ongoing EGLE-AQD (and at times EPA) enforcement actions with both companies, it has not been processed. The ROP application will need to be amended to account for the 2021 Federal Plan requirements and revised MACT Subpart AAAA.

AHL and Arbor Hills Energy reported FACILITY WIDE emissions in their 2020 Michigan Air Emissions Reporting System (MAERS) of: CO 122 tons; NMOC 61 tons; NOx 109 tons; PM-10 (filterable) 113 tons; SO2 134 tons; VOC 2.36.

<u>The AHL is subject to the following federal standards</u>:

1. Federal Plan Requirements for Existing Municipal Solid Waste Landfills promulgated in 40 CFR Part 62, Subpart OOO. The Federal Plan will apply until a State Plan is approved or delegation of the Federal Plan approved. [Replaces: Standards of Performance for Municipal Solid Waste Landfills promulgated under 40 CFR Part 60, Subparts A and WWW (NSPS Subpart WWW)]

2. The Maximum Achievable Control Technology Standards (MACT) for Municipal Solid Waste Landfills promulgated in 40 CFR Part 63, Subparts A and AAAA.

3. The National Emission Standard for Hazardous Air Pollutants (NESHAP) for Asbestos promulgated in 40 CFR Part 61, Subparts A and M.

<u>Odor Complaint Situation</u>:

There is an ongoing odor complaint situation involving AHL and the surrounding community. AQD and EGLE, Materials Management Division (MMD) have been working together and with the various owner/operators of the AHL facility to address significant odors and emissions from the landfill operations since approximately 2015. Odors are generally in four categories; garbage (includes special wastes and sewage sludge), landfill gas (including H2S), liquids (leachate/condensate), and compost. Numerous corrective actions have been implemented. Enforcement action is ongoing. Related detailed comprehensive documentation is contained in the AQD and MMD databases and facility files.

FACILITY INSPECTION

I arrived at the facility office 10599 W. 5 Mile Road, at approximately 8:30 AM. AQD staff Scott, Mike, Jorge, and other staff from EGLE -AQD's Michigan Ontario Ozone Source Experiment

(MOOSE), were also present today. We met with Anthony and Dave outside in the parking lot. Following pre-inspection discussions, the MOOSE staff departed to conduct a separate drone survey on the north end of the LF. AHL-GFL are aware of and are participating in this voluntary study. Mike departed to conduct a SEM survey on the north side of the AHL as part of the inspection, accompanied by Jorge with FLIR camera. Anthony accompanied Scott and I during the site-inspection. Anthony and Dave extended their full cooperation and addressed our questions.

SM and I rode with AT during the inspection. We first inspected the Flare compound, then the Leachate Storage area, then the Compost area, and finally drove to various locations on the landfill. We returned to the main office for an exit conference with Dave.

[EULANDFILL-S2] - SITE OBSERVATIONS AND RECORDS REVIEW

Records pertaining to maximum design capacity and year-by-year waste acceptance rates are maintained on site in accordance with ROP requirements. As of December 31, 2020, according to the Washtenaw County Solid Waste Report there was approximately 48.1 million cubic yards of waste in place in active Cells 1, 2, 3, 4A-E, and 5 with a remaining air space for those cells of 15.5 million cubic yards.

AHL submitted an existing gas well as-built map per request. (AH-GAS-2021 EXISTING (003) PDF). It identifies Cell 6 as actually three different Cells 6A, 6B, and 6C.

AHL implements a program to monitor the cover integrity on a monthly basis and records the information. Cover integrity is verified on a regular basis and documented during the monthly well monitoring event. In recent years AQD required that AHL improve these forms to include more detail on corrective actions and to implement actions quicker. For Jan -Aug 2021 AHL records indicate repairs were made within the month they were identified. It appears cover issues such as erosion, leachate, tarp tears, etc... are documented and addressed appropriately.

During the inspection SM and I observed a portion of the Tarp cover on the West side of AHW was torn. AT said this is the area where they recently repaired the above ground lateral on the DW well (alternative compliance remedy request submitted/approved). He said they are coming back to fix it soon.

At the closing conference we had a discussion with AT and Dave about odorous waste receipts. Last year October 2020 there was an incident involving accepting Toledo sludge (possibly) and odor complaints were received. Larry Bean, EGLE - MMD spoke to them at that time. It appears GFL stopped accepting this material. AQD is aware that AHL has a long term contract with Ann Arbor WWTP. Dave stated that sewage sludge is currently not beng accepted because Ann Arbor is land applying. It will resume receipt in November. He provided an example of a recent proposed waste GFL rejected for being odorous. The process included he and GFL staff visiting the waste generator and evaluating the waste in person. He said they didn't accept that waste. He stated GFL hired "Joel", to review special wastes for odors.

[FUGITIVE DUST PLAN]

AHL has an existing FDP that was updated a couple years ago by Advanced Disposal Services, as part of the ROP Renewal application (Fugitive Dust Plan.pdf). This plan appears to have been revised again by GFL and is dated September 17, 2021 (another needed ROP application update). Per AT they have not applied Calcium Chloride this year because they didn't think it was needed. He confirmed they operate 2 water trucks and 2 sweepers. They do not have any rumble strips or a wheel wash. Dust was not excessive or seen exiting the property during the inspection however there were some dry locations where dust was observed being entrained from truck traffic. I advised AT to be vigilent about dust control and wet sweeping is best. Track out onto Napier and across 6 Mile to the Compost area is common and AHL has been warned about this many times over the years. Today these areas were not an issue.

[SURFACE EMISSION MONITORING (SEM)]

AHL is monitoring surface methane concentration on a quarterly basis in accordance with the ROP and NSPS standard (now Federal Plan). All records of surface monitoring include the sampling date, sampling location, and occurrence/location of any exceedances, and are maintained in accordance with the ROP. AHL uses the services of Sniffer Robotics (specializes in drone monitoring). Calibration of the Inficon IRwin (infrared) methane leak detector with a sensitivity of 1-100% PPM, appears to be conducted in accordance with EPA Method 21 and records are maintained appropriately. The ROP requires that the collection system be operated so that the methane concentration is less than 500 ppm above background at the surface of the landfill and that the surface methane is monitored on a quarterly basis. If a reading above 500 ppm exists, corrective actions and re-monitoring is required with 10 days of the exceedance. A violation exists if any reading above 500 parts per million (ppm) is detected three times within a quarterly period.

AHL SEM records were reviewed for the 2nd Quarter of 2021. Surface monitoring exceedances above 500 ppm were recorded; 15 during Q2 and all were cleared within the quarter. All calibrations appeared to be consistent with Method 21 and the NSPS. AHL appears to be in compliance with SEM requirements. It is noted that as of the 3rd Q all penetrations must be monitored in accordance with the revised Landfill NESHAP Subpart AAAA. Penetrations have been problematic for most landfills and will require additional measures to address within a quarter. AT indicated this was true for them in the 3rd quarter (just completed SEM) and they had many hits at penetrations that did not clear in the quarter. He indicated their concern for expanding the well field due to penetrations on a long term basis if they can't be cleared within the quarter. This report is pending.

[EUACTIVECOLL-S2]

Because AHL calculated non-methane organic compound (NMOC) emissions above 50 Mg/year, they installed an active GCCS in accordance with the ROP/NSPS. AHL reported Total Fugitive emissions of NMOC for 2020 of 61.11 tons (Report in MAERS).

According to AT, during Phase 1 2021 Construction, AHL redrilled 33 wells, and installed new perimeter wells related to an existing offsite gas migration issue. Drilling has been completed this construction season and they are now continuing to work on associated piping. AHL records received include drill logs for all the new wells (Draft AHL 2021 GCCS Well Logs.pdf).

In addition AHL-GFL utilized the services of SCS Engineers Environmental Consultants & Contractors to conduct an initial assessment of the GCCS and provide recommended improvements in early 2020. Quarterly status update reports were provided in 2020. In April 2021 an update status report (Q1) was prepared and was submitted as part of AQD's request for records. It provides the current implementation status for enhancements to the GCCS infrastructure as recommended. It includes Well Liquid Levels (% open screen). This 235 page report (210428_2021 Q1_AHL GCCS Enhancement Status Report_Final.pdf) will be attached to this report to file.

The ROP requires that each interior wellhead be operated with a landfill gas temperature less than 131°F, an oxygen level less than 5%, and negative pressure. AHL is monitoring static pressure, oxygen (O2) concentration, and temperature on a monthly basis in accordance with the ROP using an Elkins Envision gas meter. All active gas wells are equipped with required sampling ports. AHL submitted well data and GPS Coordinates.pdf as part of the records request.

AQD regularly obtains and reviews a large quantity of well data from AHL and has for several years. AQD has submittals of pump data, liquid levels, % open screen, and downhole temperature data for many wells. Reasons for this include; the ongoing odor complaint situation, an ongoing Elevated Temperature landfill (ETLF) area, and other specific compliance and enforcement related requests. AHL submits comprehensive bimonthly higher operating value (HOV) temperature waiver reports for the Wells of Interest (WOI) associated with the ETLF. AQD and EGLE-Materials Management Division are monitoring this situation closely and require GFL's annual renewal of the waiver at this time.

AHL submitted hydrogen sulfide (H2S) levels measured in the LFG Wells (8.2021 Measures H2S Levels.pdf). The Table lists Wells abandoned, and vertical wells H2S sampling date and result (Draeger Tube usually). H2S results range from 0 to 6500 ppm at AHWW257R. About 6 Wells are over 2000 ppm, about 16 are above 1000 ppm. About 47 are above 500 ppm. About 100 are above 100 ppm. H2S is an ongoing concern to AQD related to offsite odors.

[EUTREATMENTSYSTEM-S3] - This will be inspected and reported under separate entry for N2688 Arbor Hills Energy Section 3. A landfill gas treatment and compressor system is installed to allow landfill gas to be burned in the four Turbines at the LFG to energy plant. The general process: landfill gas captured from the field is sent into the compressor station. The gas passes through a knockout tank that contains a demister pad to remove any condensed liquid and then through a filter section to remove particulates. The filtered gas then goes through an electric compressor to compress the gas. The gas is then cooled through an air-to-air heat exchanger. Following the cooler, liquids are removed by a moisture separator (cyclone) to remove any free liquid. The gas is dried using a refrigeration dryer. Treated gas is metered, analyzed, and transported to the landfill gas to energy facility (Arbor Hills Energy). All operating conditions including gas flow, temperatures, and pressures are monitored using a computer monitoring system.

[AIR USE PEMIT TO INSTALL PTI No 79-17]

[FGPROJECT, FGENCLOSEDFLARES-S2, EUENCLOSEDFLARE1-S2 (#392, ZINK, 3400cfm), EUENCLOSEDFLARE2-S2 (#391, MCGILL, 4600cfm), EU5000CFMFLARE (Utility Flare), EUACTIVECOLL-S2] Note: FGPROJECT contains emission limits and conditions for all the flares and the active collection system.

I conducted an inspection of the Flare system during the inspection. I observed approximately 2200 scfm of landfill gas was going to the Utility Flare and asked AT why. AT contacted Craig Hicks, Plant Supervisor at Fortistar and was told that the Steam plant was down. SM and I noted an odd persistent loud noise coming from the LFG Plant. This was later confirmed during the 9/24 Arbor Hills Energy inspection that it was related to the steam turbine shut down, which was still offline and I was told will not be back in service until October 4.

The two FGENCLOSEDFLARES were not operating during the inspection. I observed the following readings for the EU5000CFMFLARE at the control panel inside the building next to the flares: Valve Open 71%; 2 of 4 Blowers operating; Vacuum 79 inches; Temperatures (3) locations: 859, 359, 242 degrees F. The methane content is not shown on the Flare Control Panel. I observed an open flame from the Utility Flare but did not observe any visible smoke. (See note on Infra Red Camera FLIR used by AQD staff Jorge Acevado to observe flare at the end of the inspection).

FGENCLOSEDFLARES-S2

The permit contains emission limits for NMOC (each flare), NOx and CO (combined). The last compliant performance test of the #391 and #392 Flares was 12/19/2019 for NOx, CO, NMOC. The operating parameters at the time of the tests were as follows:

Tested average temperature is 1,520 degrees F (#391). For #392 they set two temperatures as follows: @ 2,633 scfm 1,396 degrees F; and @ 3,396 scfm 1479 degrees F. Note: Temperature required minimums are for ENCLOSEDFLARES only. Temperatures must be recorded every 15 minutes and averaged over the same time period of the performance test (3 hours). Daily records of landfill gas usage and hours of operation are monitored and recorded as required.

AHL submitted the Flare daily Average Temperature pdfs. for #391 and #392 for the month of August 2021. The records indicate the flares operated in compliance with the minimum required temperatures. Average temperatures indicate over 1500 degrees for #392 and over 1600 degrees for #391.

AHL has an acceptable preventative maintenance plan on site. In accordance with that plan, personnel conduct daily inspections of the flare system components and document any maintenance activities performed or equipment notes. Per AT no significant maintenance has been needed over the past year. None of the flares have a bypass.

EU5000CFMFLARE

The flare has emission limits of 0% Opacity (Visible Emissions); NOx and CO hourly limits, and Material limit of Net heating value of landfill gas >=200 Btu/scf for non-assisted flares.

The Utility Flare is an Open Flare and underwent a separate testing methodology and has different operating parameters pursuant to NSPS WWW and 40 CFR 60.18. A compliant test was conducted on 4/2/2019.

The flare is equipped with an ultraviolet sensor that continuously monitors flame presence. In addition, it has a pilot flame system fueled by a propane tank in which the temperature is also monitored. Upon flare outage, the flame controller shuts down the blower and main well field valve until the flame is relighted. Re-ignition of the flare is conducted automatically; however, it can be done manually. AHL is recording the presence of flame by monitoring the temperature of the flame when the flare is operating and the temperature of the pilot flame. All flare outages are being recorded in accordance with the ROP and SSM plan.

FGPROJECT

This Permit Table contains requirements following the modification to the GCCS including the existing (2) enclosed flares and the new utility flare. Note: initially there was also a temporary utility flare but this was subsequently removed. This Table contains emission limits for CO, NOx and SO2 tons per year for the FGPROJECT (active collection system and all flares).

There is a LFG usage limit of 4,257 million cubic feet per year. AHL Record indicates: 859.4 MMCF gas flow for the 12 month rolling period ending August 2021. Compliant - not exceeded in the past 12 months.

Emission limits are based on a 12 month rolling time period. AQD requested, received, and reviewed these records. For the 12 month rolling time period ending August, 2021, AHL reports the following emissions based on LFG Flare Emission Factors (EF below) and hours of operation:

<u>Utility Flare EF</u>

NOx = 0.068 lbs/MMBTU, CO = 0.31 lbs/MMBTU, PM = 17 lbs/MMSCF of CH4, VOC = 595 ppm

<u>Enclosed flare 1 EF</u>

NOx = 0.06 lbs/MMBTU, CO= 0.2 lbs/MMBTU, PM = 17 lbs/MMSCF of CH4, VOC 0.14 lbs/hr (based on stack test)

<u>Enclosed flare 2 EF</u>

NOx = 0.06 lbs/MMBTU, CO= 0.2 lbs/MMBTU, PM = 17 lbs/MMSCF of CH4, VOC 0.19 lbs/hr

EMISSIONS:

NOX 12.87 tons; LIMIT: 70.1 TPY

EUENCLOSEDFLARE1 & 2 are also in Source-wide FGNOX with LIMIT: 205 TPY.

CO 49.38 tons; LIMIT: 289.1 TPY

SOX 13.62 tons; LIMIT: 142.9 TPY - Is based on sulfur content of 408 ppm in LFG operating 8760 hrs/yr.

AHL's permit requires regular sampling of the LFG to the Flares for hydrogen sulfide (H2S) and total reduced sulfur (TRS). The Permit Limit is 408 ppm with results 80% of limit (326 ppm) allowing monthly sampling. If sampling results exceed 326 ppm AHL must return to weekly sampling for 12 weeks. If exceed 408 ppm must conduct daily sampling.

During the inspection I requested that AT submit these results from 2021 to date. AHL is currently conducting monthly Draeger Tube H2S samples of the LFG to the flares. Twice a year every 6 months, they collect a sample by bag/canister for lab analysis for TRS. Records received on 9/17/21 included the 6 month sampling (1.0L Silonite Summa Canister) and lab analysis conducted on May 18-19, 2021. The following are the results:

Hydrogen Sulfide: 82 ppm, 330 ppm, 320 ppm (Avg. last 2 samples 325). AHL reported 325 ppm.

Total Reduced Sulfur: 97 ppm, 350 ppm, 330 ppm (Avg 259)

Records received indicated the Monthly required H2S Draeger Tube sampling has been conducted and were in compliance during the period of January to August 2021. Ranged from 100 to 325 ppm. On 10/5 DKV contacted AT to discuss limit and advise if exceed 326 will need to revert to weekly sampling. He acknowledged and is aware of this.

Startup/Shutdown/Malfunction (SSM)

A SSM plan is maintained and implemented at the site. All SSM events are documented in accordance with the permit and are reported in ROP Certification Reports semi-annually and annually. 2021 1st Semi-annual report was received timely and reviewed. No significant events or deviations were reported.

[EUASBESTOS-WEST-S1, EUASBESTOS-EAST-S1]:

AHL records included: Asbestos Receipts Aug 1-7, 2021 pdf; Asbestos Handling procedure pdf.; Asbestos Maps pdf. Procedure indicates AHL accepts approximately 10-15 deliveries of friable asbestos per month. My review of Maps found four months in 2021 had 20 or more receipts. The records indicate compliance with the ROP and federal Asbestos NESHAP. The records were shared with AQD Asbestos program staff for the Jackson District.

[LEACHATE COLLECTION SYSTEM]

AHL has a site liquids management plan. During the inspection SM and I walked through the leachate collection system infrastructure with AT and Ben Adams, Engineer, GFL. AHL submitted a "Description of leachate handling system (003).pdf " as part of the records request. AHW (active) and Arbor Hills East (closed) have separate processes. We observed the new 1 million gallon leachate storage tank (Blue) was installed but is not yet operational. We observed the carbon filter systems on the existing Green Tank (smallest, Arbor Hills East) and Blue Tank (550,000 AHW). This area has been observed to be under construction for many months now. There was no tanker loading ocurring during this time and no noticeable odors were detected.

AQD requested a leachate summary for the month of January 2021. AHL submitted Leachate Summary -2021.pdf. Record shows Arbor Hills Energy Condensate was 340,034 gallons; Arbor Hills East total was 574,619 gallons; Arbor Hills West total was 3,216,814 gallons. AHL pumped and hauled 95,565 gallons of this total.

<u>Leachate Description document</u>: (Includes two pdf attached process flow diagrams)

AHE (not to be confused with Arbor Hills Energy) does not have a modern leachate collection system. It has a manhole in the southwest corner of the landfill where leachate is extracted. The document states that there are also a series of leachate extraction wells on the east side of the AHW landfill that are pumped via a force main to this manhole. Liquids from the manhole are pumped to a 321,000 gallon above ground storage tank (Green Tank).

AHW has 5 cells and 4 primary leachate collection sumps. Primary sumps are 2, 1/3, 4 & 5. Each cell also has a separate secondary collection sump. All of the primary sumps have two 18-inch riser pipes that extend into the sump and have pumps. Each pump has a liquid level sensor that controls on-off operation. There is a control panel. Currently Cells 2 and 4 have flow meters on both the primary and secondary systems.

Cell 4 discharges to a 4"/8" dual contained force main. It travels south approx. 1,300 feet before discharging into an 8" gravity sewer. It runs south along the west side where the Cell 2 leachate is discharged. As the sewer turns east it becomes a 10 inch sewer that extends along the southern side of the landfill collecting leachate from Cells 1/3 & 5. The sewer discharges to a double contained pump station named AHW Pump Station (AHWPS). It is controlled by float switches on two pumps; controls on-off. If exceed high level, an alarm activates and the control system will turn off al lthe cell leachate sumps (primary and secondary).

A separate sump is for leachate collected from TS-01R. It has two pneumatic pumps controlled by float switch. Liquid is pumped into a gravity force main that slopes down to the AHWPS. It is currently collected in two frac tanks, aerated with carbon control and chemically treated. Tanks also have floats and automatic valve drain. AT, SM and I later observed the Frac Tanks from the south perimeter road. While we were at the leachate station Ben had explained they are closed loop to air filters on each tank and hydrogen peroxide is added to the tanks. No odors were observed at the tank site.

Arbor Hills West Gas Well Leachate is collected from wells with pumps, to AHWGWLPS.

Leachate collected via AHWPS and AHWGWLPS is currently conveyed to a 540,000 gallon above ground storage tank (existing Blue Tank).

AHE leachate tank (Green) is aerated and mixed, and has carbon control on its vent for odor control. Liquids in this tank are loaded onto tanker trucks and disposed of at an appropriate treatment facility.

AHW leachate (Blue) is pretreated via physical, chemical, and biological methods to reduce various pollutants including PFAS. Implement aeration, chemical oxidation, clarification via dissolved air floatation of DAF (coagulation and flocculation is implemented at DAF), particle filtration, and adsorption to granular activated carbon. An upgrade to the system is in process and will include activated sludge process to remove organic pollutants. They included two process flow diagrams for the existing and upgraded future systems.

Per Ben, either granular activited carbon systems or passive carbon in 55 gallong drums are used for odor control. Carbon is changed out twice per year minimum and they watch for breakthrough.

Pretreated leachate is pumped into a 4 inch dual contained force main where it is discharged to the sanitary sewer located on Napier Road.

[COMPOST OPERATION]

The compost facility is approximately 25 acres of designated compost area. At any given time, it contains several different stockpiles of compost in varying stages of completion. These stockpiles are mixed or turned to introduce air and moisture, to facilitate the degradation of organic materials. AHL receives yard waste from local communities and these piles are "shredded" initially before being placed into processing rows. Finished compost is also stored, sold, and used on the landfill as daily cover and intermediate cover.

SM and I observed some visible steam from equipment processing main pile. Rows looked good, dry, and pond water levels were lower than saw on last visit to the site this summer. A light unpleasant odor and some finished compost-like earthy odor were observed while in this area. No strong odor was observed here or offsite.

OVERALL RECORDS REVIEW (AHL)

AQD sent an email to AHL contacts AT and DS on 9/2/21 notifying them of the proposed inspection and requesting records (an attached list) be submitted on or before 9/17/21. All requested records were received timely and were reviewed. All records are attached to this report and filed in the plant file. Records are discussed in the relevant section of this report, or below.

Gas Well Hydrogen Sulfide Concentrations

Record of - 2021 (8.2021 Measures H2S Levels.pdf)

AHL included a list of Wells: Well type, and indicates those that have been abandoned. If not abandoned it lists H2S ppm, date, and sampling instrument (Draeger, MRU AirFair).

It is noted the EAST abandoned wells are:

AHEW0033 Vertical - Abandoned East **Well Abandoned**

AHEW0038 Vertical - Abandoned East **Well Abandoned**

AHEW00AD Vertical - Abandoned East **Well Abandoned**

AHEW045R Vertical - Abandoned East **Well Abandoned**

AHEW049R Vertical - Abandoned East **Well Abandoned**

AHEW053RVertical w/ remote combined wellhead - AbandonedEast **Well Abandoned**

AHEW47R2 Vertical - Abandoned East **Well Abandoned**

AHEW68AR Vertical - Abandoned East **Well Abandoned**

FLARE RECORDS

Three pdfs., one for each flare, were submitted covering Flare Daily LFG usage and hours of operation during January through August, 2021. The records indicate the Utility Flare operates frequently. The Utility Flare operated every day except for 12 days, usually 24 hours per day (most days but not always) . Flare #391 operated 98 days (various durations most not 24 hrs) and #392 operated much less often, just 32 days (most not 24 hours) during this period.

When the Arbor Hills Energy gas plant is down for whatever reason, the Flares are supposed to operate and usually this is what happens. Three noteable events occurred in the past 12 months and were recorded 9/23-24/20 (Flares issue starting/running @ 48 complaints rec'd), 6/17/21 (3 complaints rec'd. GFL used emergency generator), and 8/12//21 (plant equipment down 8hrs to 2 days).

GAS FLOW TO ARBOR HILLS ENERGY (2021 Daily measured gas flow sent to AHE.pdf)

Plant data received monthly for the period January to August 2021 indicates LFG to plant is very consistent overall. The methane content generally ranges around 45%, Oxygen <3% and Vacuum (inches H2O) @ 80.0. MMBTU/day and scf/day are reported daily and footnotes indicate explanation of equipment or total plant downtimes.

GCCS PLAN (Arbor Hills GCCS Design Plan 042816.pdf)

Existing plan AQD has in plant files. Last revision April 2016 was during Republic Services ownership of LFG collection and flare controls, and Advanced Disposal Services ownership of the landfill. GFL will be submitting a new or updated plan soon per AT. As part of records AHL submitted an excerpt of the LFG Generation Rate Model of the GFL revised plan (see below).

GAS EXTRACTION AUGUST 2021 (Arbor Hills Gas Extraction August 2021.pdf)

This is a 41 page document containing August NSPS Well data: Well ID, Date/time monitored, O2%, Temp F, Well Pressure (inches H2O). GFL has been timely in submittal of NSPS parameter alternative compliance timeline/remedy requests, higher operating value requests, decommissioning and abandonments, for AHL's Wells, as applicable, during the time period of this Full Compliance Evaluation.

GAS GENERATION RATE MODELING (Gas Generation Rate Modeling.pdf)

This appears to be an excerpt from the GFL updated GCCS Plan. The document is Appendix A-1 and the header shows *GFL-Arbor Hills Landfill, Updated NSPS Landfill Gas Collection and Control System Design Plan*. The footer indicates *Weaver Consultants Group & EIL, LLC* as authors.

The document uses the EPA LFG Model. Based on model output it provides the following maximum gas generation flow rate, estimated for the year 2028 for the GFL-AHL:

Total LFG Production = 11,150 ft3/min

The document states the average collected flow rate reported by the site in 2020, approximately 9,447 scfm, compares well to the modeled value in 2020 of 10,280 scfm.

MISCELLANEOUS

Following the inspection I emailed AT and received his response. See below:

On 9/29 DKV: Please see the attached video and email below related to FLIR camera use during the inspection. At the end of inspection yesterday Jorge took some video of the Utility Flare with the FLIR camera. Based on this, I am requesting that GFL review recent maintenance, preventative or other, conducted on the flare, and to conduct a tune-up now to make sure the flare is operating efficiently. Please submit follow up results of this review and the tune up when completed.

AT reply: Received. We will schedule a tune-up and follow-up when it is completed.

On 10/5 DKV spoke to AT by telephone. AHL has contracted Zink to conduct semi-annual preventative maintenance flare tune-ups starting this fall. He will let me know when first one is complete. (PENDING)

On 10/4/2021 DKV sent an email regarding my review of their Fugitive Dust Plan. AQD requested GFL address descrepancies between the plan submitted as part of this records request, the revised plan submitted as part of the ROP application, and what was communicated during the inspection.

AT reply:

1. The site currently has 2 water trucks and 1 wet sweeper and 1 dry sweeper. The wet sweeper is utilized to remove dirt and mud during wet conditions on the haul roads and entrance and the dry sweeper is utilized during dry conditions to remove dirt and dust from the haul roads and entrance. The water trucks are utilized during dry conditions to minimize dust.
2. In 2019 the installation of rumble strips were an option under Advanced Disposal. However, it was realized that the reason tracking was an issue was because Cell 4E was in the initial stages of being filled. While Cell 4E was being filled early on, trucks had very short haul road in and out and were not being routed around the paved road before exiting – trucks were simply going in and out without having any time on the inner haul road to allow for mud and dirt to be removed from their wheels. As opposed to installing rumble strips, the landfill re-routed trucks to exit the landfill be going all the way around (travel the north haul road, to the west upper haul road, around to the south haul road and on to the paved road before exiting). Once trucks were re-routed the tracking at the entrance and Napier Road was drastically less.

3. As described in item #1; the site has **1 dry rotary sweeper, 1 pelican wet sweeper, and 2 water trucks.**

DKV telephoned AT on 10/5 with inspection follow up questions and requests for additional information on Flare and Leachate pdf. AT fullly answered some items and we agreed several others require information review/submittal. This report has been updated as applicable. On 10/6 AT emailed several items including update "The GCCS Plan is complete and we are just waiting on the final version from our consultant, we should have it in the next week or so. I will send it to you once we have it in-hand."

COMPLIANCE SUMMARY

AQD determined based on the physical inspection and review of compliance records submitted that Arbor Hills Landfill - GFL is in substantial compliance with the ROP and the state and federal applicable requirements reviewed. This acknowledges and is outside of the ongoing EGLE multi-media enforcement negotions.

EGLE and the U.S. Environmental Protection Agency (USEPA) have conducted several investigations of the landfill since @ 2016. Based on these investigations, EGLE has issued multiple violation notices for failing to properly operate the gas collection and control system as well as other issues of non-compliance with environmental rules and regulations. In October 2020, EGLE and the Michigan Attorney General's Office filed a lawsuit against the landfill for continued non-compliance.

NAME Adriane Kavanaugh Vetort DATE 9/14/21 SUPERVISOR