

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

N384566528

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|--|--------------------------------------|----------------------------------|
| FACILITY: EAGLE VALLEY RECYCLE AND DISPOSAL FACILITY | | SRN / ID: N3845 |
| LOCATION: 600 W. SILVER BELL RD., ORION TWP | | DISTRICT: Warren |
| CITY: ORION TWP | | COUNTY: OAKLAND |
| CONTACT: David Rogers , Responsible Official | | ACTIVITY DATE: 03/22/2023 |
| STAFF: Robert Joseph | COMPLIANCE STATUS: Compliance | SOURCE CLASS: MAJOR |
| SUBJECT: Scheduled inspection municipal solid waste landfill. | | |
| RESOLVED COMPLAINTS: | | |

On October 25, 2022, and March 22, 2023, I, Michigan Department of Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD) staff Robert Joseph, conducted a scheduled inspection of WM - Eagle Valley Landfill (SRN: N3845) located at 600 West Silver Road, Orion Township, Michigan 48359. The purpose of the inspection was to determine the facility's compliance with the requirements of the Federal Clean Air Act Part 55 - Air Pollution Control, Natural Resources and Environmental Protection Act - 1994 PA 451; Michigan Department of Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD) Administrative Rules; and conditions of the facility's Renewable Operating Permit (ROP) MI-ROP-N3845-2022.

Opening Introduction

I arrived at the Eagle Valley gas engine plant (WM Renewable Energy) on October 25, 2022, and at the landfill on March 22, 2023, both shortly after 10:30 a.m. I met with Richard Kunze, Engine Plant Supervisor, and Steve Walters, Landfill Engineer. I stated my name, the purpose of my visit as a civil service AQD employee of the state of Michigan, and presented my credentials. Eagle Valley Landfill and its associated gas-to-energy plant both are subsidiaries of WM (previously named Waste Management). The hours of operation of the facility are 6 a.m. - 5 p.m. daily which began operations in 1986.

The facility is a Type II Sanitary Landfill which is a discrete area of land that receives household waste. It also receives other types of non-hazardous wastes such as commercial solid waste, nonhazardous sludge, conditionally exempt small quantity generator waste, construction and demolition debris and industrial nonhazardous solid waste.

Eagle Valley Landfill is subject to the National Standards of Performance for Municipal Solid Waste Landfills (NSPS), 40 CFR Part 60, Subpart XXX, due to the expansion of the facility in May 2019 which permitted additional landfill cells. The landfill became subject to the NSPS - 40 CFR Part 60, Subpart XXX, in November 2019. These regulations are applicable to landfills that have commenced construction, reconstruction, or modification after July 17, 2014.

The facility is also subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Municipal Solid Waste Landfills, 40 CFR Part 63 - Subpart AAAA.

Both the NSPS and NESHAP share similar landfill regulations with some slight differences. The NESHAP allows landfills more flexibility with gas collection operations, however, additional monitoring and enhanced reporting - when necessary, are required to remain compliant. The facility chose to opt-in to the operational standards (40 CFR 63.1958), compliance provisions (40 CFR 63.1960), and monitoring of operations (40 CFR 63.1961) of the NESHAP (AAAA) over their counterparts in the NSPS (XXX) before the regulation

applicability due date of September 28, 2021, however, the facility remains subject to the remaining sections of both.

Prior to July 1, 2021, the facility was also subject to the NSPS – Subpart WWW. The facility opted-out of this subpart on July 1, 2021, which was earlier than the federal end date of this subpart on September 27, 2021.

Prior to March 26, 2020, the NESHAP regulations were intertwined with the Subpart WWW regulations. The U.S. Environmental Protection Agency (U.S. EPA) modified the NESHAP regulations as a single set of regulations and all landfills that were subject to Subpart WWW were required to opt-in to the new NESHAP regulations no later than September 28, 2021.

Approximately 3,000 waste tons is accepted daily at the facility from Oakland and Macomb counties in Michigan.

The facility has two enclosed flares for combustion of the landfill gas (4,000 ft³/min and 1,000 ft³/min), and two spark ignition, lean burn, reciprocating internal combustion engines (Caterpillar G3520C, 2,233 bhp at 100% load) for combusting treated landfill gas to produce electricity (1.6 MW gross electrical output). The engines drive an associated generator set to produce the electricity and the facility is a major source of Hazardous Air Pollutants (HAPs). The facility's engines are subject to the National Emission Standards for Hazardous Air Pollutant (NESHAP) for Stationary Reciprocating Internal Combustion Engines, 40 CFR Part 63, Subpart ZZZZ, and the National Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, 40 CFR Part 60, Subpart JJJJ.

Facility Tour

The landfill gas (LFG) is collected through an active landfill gas collection system, which consists of wells, headers, and gas mover equipment. Risers are also installed to tie-in the gas wells. The collected LFG can be sent to one of the two facility flares for combustion, sent to the facility's gas-to-energy engine plant (which is utilized by DTE energy), or sold off-site to the General Motors (GM) Orion Assembly Plant for combustion in their boilers.

The site currently has 14 active landfill cells with 172 gas wells in operation. The 14 active landfill cells comprise 129.2 acres. In addition, there are three cells (14, 16, 17) that are unconstructed which will add additional 18.6 acres. The total landfill area, active and unconstructed is 147.8 acres. Six acres are used for conservation easement and 32.4 acres are currently under final cover. All cells that are covered have 2-synthetic liners except for cell 1.

MI-ROP-N3845-2022

The facility has permit conditions for the following Emission Units: EU-ABESTOS, EU-LANDFILL, EU-ACTIVECOLLECTION, EU-TREATMENTSYSYSTEM 1 and 2, EU-ENCLOSEDFLARE 3 and 4, EU-ICENGINE 1 and 2.

These flexible groups have permit conditions: FG-LANDFILL-XXX/AAAA, FG-ACTIVECOLLECTION-XXX/AAAA, FG-TREATMENTSYSYSTEM-XXX/AAAA, FG-ENCLOSEDFLARES-XXX/AAAA, FG-ICENGINES, FG-RICEMACT.

GENERAL CONDITIONS

There were no concerns regarding these conditions at the facility. No visible emissions were observed, no malfunctioning equipment, and no modifications of the facility's equipment was observed.

EU-ASBESTOS

The facility accepts non-friable asbestos waste but has not done so in three years. The asbestos waste location is documented via GPS (Global Positioning System).

III. PROCESS/OPERATIONAL RESTRICTION(S)

Given that the facility has not received asbestos in over three years, I did not detect any asbestos fugitive emissions while on-site. The facility places topsoil and aggregate materials over the asbestos area daily and uses a petroleum-based cover to minimize dust generation.

IV. DESIGN/EQUIPMENT PARAMETERS

The facility stated there are no areas in the landfill where asbestos is placed by itself as it is placed in active waste cell areas with other waste. Its location is documented to prevent unnecessary disturbance or damage to the waste during future construction.

VI. MONITORING/RECORDKEEPING

The most recent asbestos-waste shipment received by the facility occurred on March 16, 2020, which contained over 4 tons. It listed the generators name (Blue Star Inc. from the city of Warren), address, phone number and transporter (Royal Container). The location, depth, and quantity of asbestos containing waste is documented and there are no asbestos containing areas excluded from gas collection.

VI. REPORTING

The facility has not reported any asbestos-waste disturbance occurrences during the most recent reporting period and no deviations have occurred.

FG-LANDFILL-XXX/AAAA

I. EMISSION LIMITS

| Pollutant | Limit | Time Period/ Operating Scenario |
|-------------------------------|--|---------------------------------------|
| 1. Methane (CH ₄) | Less than 500-ppm above background level | Calendar quarter |

The facility utilizes the LandTec SEM 5000 to conduct the surface emission monitoring scans. The facility reported 24 locations that initially exceeded the 500-ppm methane concentration limit during the 1st quarter surface emissions monitoring (SEM) event performed on March 16, 2022, and the facility did not report any locations that exceeded the 500-ppm methane concentration during the 2nd quarter scan performed April 14, 2022. The facility reported six surface monitoring location exceedances of 500-ppm during the 3rd quarter scan on September 15, 2022, and three surface monitoring location exceedances of

500-ppm during the 4th quarter scan on October 25, 2022. The facility states all locations were successfully remediated upon re-monitoring with corrective actions (additional cover of bentonite clay and vacuum increases) reducing the concentration below the regulatory standard.

III. PROCESS/OPERATIONAL RESTRICTIONS

The facility has provided a SSM plan describing how emissions will be minimized during periods of startup, shutdown, and malfunction. The facility is longer required to submit an SSM report since they've opted-in to the modified NESHAP regulations which require landfills to now comply with the SSM work practices at all times to minimize emissions. The facility monitors all events via monthly records and the corrective actions taken are documented. The facility did not state any deviations regarding this with all events consistent with the facility's SSM plan.

IV. DESIGN/EQUIPMENT PARAMETERS

The facility maintains two enclosed flares, 3 and 4, and they are designed in accordance with 40 CFR part 60.18. Recent performance test results indicate the NMOC is being reduced by 98% to less than 20 ppmv on dry basis as hexane at 3% oxygen. The facility processes the landfill gas via for subsequent sale to either the General Motors Orion plant or to DTE via the electrical grid using the facility's landfill gas engines, as well as combusted in the flares. There have been no venting events of the landfill gas reported by the facility. The landfill has a network of wells, pipes, and a blower system to capture the landfill gas and the facility's treatment system is outlined in the preventative maintenance plan listing the operating parameters and maintenance schedule.

V. TESTING/SAMPLING

The facility performs quarterly scans of the landfill, and the results and exceedances are documented in the facility's NESHAP reports along with the corrective actions taken for all exceedances.

VI. MONITORING/RECORDKEEPING

The facility maintains on-site records of the design capacity for the current amount of solid waste in place and the year-by-year waste acceptance rate via the LandGem software - accepting 805,859 tons in 2022. The facility has not converted design capacity from volume to mass or mass to volume and has not reported adding leachate or liquids in a controlled fashion to the waste mass. The facility maintains the SEM monitoring event records and reports methane concentration readings above 500-ppm - also documenting the meteorological conditions. The facility observes the cover integrity of the gas well collection system on a monthly basis and intermittently each week.

VI. REPORTING

The facility has submitted semi-annual and annual reports as required per the facility's ROP, NSPS, and NESHAP (40 CFR 63.1981(h)).

IX. OTHER REQUIREMENTS

The facility has not expanded or installed the gas collection system in a manner not consistent with the design plan or regulations, nor has the system been decommissioned as it is still active with no closure reports submitted.

FG-ACTIVECOLLECTION-XXX/AAAA

III. PROCESS/OPERATIONAL RESTRICTIONS

The facility operates the gas collection system for all waste that has been in-place for five years. The facility states that no gas wells exhibited zero or positive pressure and that no gas wells exceeded the NESHAP 145-degree standard temperature. The facility is required to operate each interior wellhead in the collection system with a landfill gas temperature less than 62.7°C (145°F) - under negative pressure, per the NESHAP regulations given that they opted into the modified regulations in July 2021. There are 172 gas wells in operation and there have not been any documented events of a fire.

The facility decommissioned/redrilled 22 gas wells during the first of 2022 (Jan.1 - June 30) and 14 gas wells during the 2nd half (July 1 - Dec. 31). The facility has not operated any gas wells beyond 145 F and has not requested a higher operating value in 2022 for any gas wells. The facility equipment includes blowers, vertical wells, horizontal wells, and risers and the collected gases are vented to a control system (flares) or sold for beneficial use previously stated. The facility uses a two synthetic liner cover for its gas collection system.

Facility records indicate that the wellfield operates in a manner that should the gas collection or control system become inoperable, the gas mover system shuts down and all valves in the gas collection and control system (GCCS) contributing to venting of the gas to the atmosphere are closed within 1 hour per the Startup, Shutdown, and Malfunction plan. There have not have been any events reported by the facility in which the collection system was not operating and there have not been any such events reported by the facility. The facility is longer required to submit a SSM report since they've opted-in to the modified NESHAP regulations which require landfills to now comply with the SSM work practices at all times to minimize emissions.

IV. DESIGN/EQUIPMENT PARAMETERS

The facility operates the gas collection system for all waste that has been in-place for five years and monitors the wellfield, and if necessary, makes adjustments to handle the gas flow rate by either adjusting the parameters of a specific well, increasing the vacuum on the wellfield, or installing additional wells or risers. Collected landfill gas is sent either to the facility's flares for combustion, sent to the facility's gas-to-energy engine plant (which is then sold to DTE energy), or sold off-site to the GM Orion Assembly Plant for combustion in their boilers.

The facility has installed a series of horizontal, vertical, and horizontal wells capable of controlling and extracting the landfill gas, and each gas well is equipped with a sample port and thermometer to measure the subsurface temperature (Subparts XXX and AAAA). The facility submits their gas collection control system designs plans to the EGLE's Materials Management Division (MMD) for approval which is also reviewed by the AQD.

The facility accepts asbestos waste but has not done so in over three years (previous areas are documented) and there are no documented areas that are excluded from gas control.

VI. MONITORING/RECORDKEEPING

The facility chose to opt-in to the operational standards (40 CFR 63.1958), compliance provisions (40 CFR 63.1960), and monitoring of operations (40 CFR 63.1961) of the NESHAP (AAAA) over their counterparts in the NSPS (XXX). The present gas mover equipment is adequate to handle the maximum gas generation flowrate, and the wellfield density is based on the waste acceptance rates with 172 gas wells currently in operation. The facility maintains on file the manufacture control equipment information and is collecting landfill gas at approximately 3800 ft³/min. Existing cell #1 is the largest permitted site at 25.7 acres and has been in place since the facility began operations in 1986. Existing cell #7 is the smallest permitted site at 5.0 acres and has been in-place since 1997.

The facility maintains a diagram of all vertical wells, horizontal wells, and their associated infrastructure. The facility maintains an up-to-date plot showing each existing and planned gas collection well in the system and maintains the dates of the newly installed gas wells. There were ten new wells installed during the 1st half of 2022, along with the associated header and lateral conveyance piping, air and force mains, and liquid extraction pumps. Records were reviewed for the 16 gas wells installed during the 2nd half of 2022 as well as the additional auxiliary equipment. Dates of the landfill gas well installations are maintained within the facility's database, and the age of the waste in which the landfill gas wells were installed is also documented.

All asbestos-waste is placed in marked locations and is documented within the landfill and there are no waste areas that are excluded from gas collection. The facility maintains test wells outside the limits of waste to measure methane concentrations detected off-site.

The facility measures gauge pressure and temperature in the gas well header at each individual well monthly and daily as needed and reports that no gas wells exhibited zero or positive pressure and that no gas wells exceeded the NESHAP 145-degree standard temperature during the 2nd half of 2022. The facility has not requested a higher operating value for any gas well nor has enhanced monitoring occurred due to gas well temperatures exceeding 145 F. The facility reports that no applicable standard for SSM as not been met per the SSM plan.

VI. REPORTING

The facility has submitted semi-annual, annual, and liquid reporting reports as required per the facility's ROP, NSPS, and NESHAP (40 CFR 63.1981(h)) documenting the applicable gas information for 40 CFR 63.1958. The facility reports there were no occurrences when the gas collection system was not in operation and there were no instances of positive pressure occurring for any gas well beyond 60-days, and all occurrences appear to be documented that occur under this. The facility is required to submit a root cause analysis, corrective action plan, and implementation timeline (beginning and end date) for all exceedances expected to exceed 120-days. Notifications for this are required no later than 75-days. In addition, notifications are required if corrective actions are not completed within 60-days per Subpart AAAA and must be submitted no later than 75-days from initial exceedance. The facility did not report corrective actions beyond 60-days for any gas well and no enhanced monitoring occurred during 2022. All newly installed gas collection devices are documented.

IX. OTHER REQUIREMENTS

The landfill appears to be meeting all NESHAP and NSPS regulations and has not installed a GCCS that does not conform to these regulations.

FG-TREATMENTSYSTEM-XXX/AAAA

This emission unit treats landfill gas before it is sold for use to DTE via the facility's two engines or sent to the GM Orion Assembly Plant. The treatment system removes particulate to at least the 10 microns and compresses the gas. In addition, enough moisture is removed to ensure good combustion of gas so the destruction of the NMOC will be maintained.

III. PROCESS/OPERATIONAL RESTRICTION(S)

There are no atmospheric vents associated with Eagles Valley's treatment system. The facility operates the treatment system at all times and there were no occurrences when the system was down for more than one hour in 2022. A site-specific monitoring plan has been submitted by the facility which outlines the treatment system's processes and monitoring protocols, as well as the responsible individual who oversees each occurrence.

The facility maintains an alarm system which shuts down the system in the event the gas stream temperature downstream of the post-compression air-to-air cooler exceeds 120 degrees F. In addition, in the event the collection or control system is inoperable, the gas mover system is shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere is closed within one hour.

IV. DESIGN/EQUIPMENT PARAMETER(S)

The treatment system appears to operate according to the NESHAP regulations. The facility has installed a device to continuously measure gas flow to the treatment system and there are no bypass lines within the system.

VI. MONITORING/RECORDKEEPING

Per facility records and the semi-annual reports, there have not been any control or treatment exceedances or records which indicate that an alarm event occurred regarding the gas stream temperature. Also, there have not been any control or treatment exceedances, and the facility maintains records of all maintenance activities per the preventative maintenance plan (PMP).

The facility does not have a bypass of the control system so landfill gas is not discharged directly to the ambient air. Monitoring and recording of the flow to the treatment system occurs every 10 minutes and it ranges between 3,000 and 4,200 ft³/min, and was approximately 3,330 ft³/min at the time of inspection.

VI. REPORTING

The facility has submitted the semi-annual, annual, and liquids reporting notification as required per the facility's ROP, NSPS, and NESHAP reporting requirements. The facility reports there were no deviations regarding the treatment system.

IX. OTHER REQUIREMENTS

The landfill has opted into Subpart AAAA (NESHAP) as allowed in 40 CFR 60.762(b)(2)(iv), therefore, they are bound by the operational standards for collection and control systems in 40 CFR 63.1958, compliance provisions in 40 CFR 63.1960, and monitoring of operations in 40 CFR 63.1961, and cannot return to their counterpart provisions of 40 CFR 60.763, 40 CFR 62.60.765 and 40 CFR 60.766 of Subpart XXX (NSPS).

FG-ENCLOSED FLARES-XXX/AAAA

I. EMISSION LIMITS

| Pollutant | Limit | Time Period / Operating Scenario | Equipment | Test Result |
|-------------------|--|--|--------------------------------|---------------------|
| . NMOC | NMOC by 98 weight-percent or reduce the outlet NMOC concentration to less than 20 ppm by volume, dry basis as hexane at 3 percent oxygen | Hourly | Each flare | Flare 3 0.26 ppm |
| | | | | Flare 4 0.24 ppm |
| . CO | 24.3 pph ₂ | Hourly | Flare 3 | 0.24 |
| . CO | 6.1 pph ₂ | Hourly | Flare 4 | 0.24 |
| . SO ₂ | 109 tpy ₂ | 12-month rolling time period as determined at the end of each calendar month | Combined total for both flares | 31.36 tons/yr |

The above emission limits apply to the facility's two enclosed flares, flare 3 (4,000 ft³/min) and flare 4 (1,000 ft³/min). The flares were last tested on September 21-23, 2021, upon ROP renewal. Flare 3 measured to have a combustion chamber temperature of 1,596 F with an NMOC emission limit of 0.26 ppm, flare 4 measured to have a combustion chamber temperature of 1,600 F with an NMOC emission rate of 0.24 ppm. Both flares measured less than 20 ppm by volume (dry hexane C₆ at 3% O₂). The SO₂ emissions is the 12-month rolling total for 2022.

III. PROCESS/OPERATIONAL RESTRICTION(S)

The facility has implemented and maintains a MAP (updated in 2023) for the flares and operates them according to the NESHAP, 40 CFR 63.1959(b)(2)(iii). The facility operates the flares based on the parameter ranges established during the 2021 performance tests and it is documented electronically when the performance ranges are not being met. There

have been no documented occurrences of the flares venting to the atmosphere or not operating due to inoperable events. The updated MAP identifies the equipment covered along with the inspection/service frequency and replacement parts maintained in inventory. Inspection records are maintained electronically and saved to the facility's network drive.

Landfill gas is routed to the flares when there is a surplus of gas available after it has been routed to the facility's gas engines and the GM Orion plant when operating. These flares are designed to reduce NMOC by 98% per Subparts XXX and AAAA and the data recorder downloads the operating parameters every five minutes. The flares appear to operate within the parameter ranges established during the most recent performance test and deviations from this are noted in the facility's NSPS and NESHAP reports. Each flare was operating at over 1600 F at the time of inspection (flare 3 - 1,638 F and flare 4 - 1,622).

IV. DESIGN/EQUIPMENT PARAMETER(S)

Flare 3 and 4 were last calibrated on March 1, 2021, per the flowmeter device manufacturer, Kurz. Per the manufacturer, after sale meter calibration is not required provided the meter has been operated within its design specification and the sensors are clean, free from corrosion, erosion, or other physical damage. There are no bypass lines for the flares and they are equipped with a temperature monitoring device with a continuous recorder minimum accuracy of plus or minus 1 percent of the temperature being measured expressed in degrees. A propane tank is available to light the flares, if necessary, which operates between 20%-80% of its total volume, and the Yokogawa and Golder Watch systems monitor flow to the control device every five minutes. Thermocouples measure the presence of a flame on each flare and the GoldenWatch system (variable frequency drive) monitors and regulates gas flow to the compressor. The compressor controls the valves to direct flow to the flares and measures the average combustion temperatures of both flares.

V. TESTING/SAMPLING

Both flares were tested upon the facility's ROP renewal on September 21-23, 2021. Flare 3 resulted with an NMOC emission limit of 0.26 ppm, and flare 4 resulted in an NMOC emission rate of 0.24 ppm. Both flares measured less than 20 ppm by volume (dry hexane C₆ at 3% O₂). Both flares were tested for visible emissions and none were observed during the stack test.

The facility conducts monthly H₂S sampling via Draeger Tubes and semi-annually by gas sampling via laboratory analysis. The facility verified the 2nd half semi-annual test on November 10, 2022, using ASTM test method D5504 to measure the H₂S and other sulfur-bearing compounds. The lab analysis was performed by ATM AA Inc. located at 23917 Craftsman Road, Calabasas, CA 91302. The total sulfur concentration was 310 ppm and the H₂S concentration was 307 ppm, both below the 500 ppm corrective action limit. Monthly H₂S gas sampling in 2022 has ranged between 195 and 301 ppm.

VI. MONITORING/RECORDKEEPING

The facility maintains flare performance records and maintains compliance test records and records the average temperature of the flares via the Yokogawa and GolderWatch systems every five minutes. Rolling 12-month SO₂ combined flare totals vary between 22 and 32 tons/month with flares 3 and 4 operating between 670 and 744 hours per month, respectively. The facility monitors the flare hours, flowrate, and landfill gas usage. Flare 3

had a 12-month rolling operational total in 2022 of 8,742 hours, and flare 4 had a 12-month rolling operational total of 8,709 hours. Flare 3 had a flowrate of 2,192 ft³/min and flare 4 was operating with a flowrate of 513 ft³/min at the time of inspection.

Flare 3 gas usage in 2022 has varied between 97,000 and 125,000 MCF and flare 4 usage has varied between 9,000 and 27,000 MCF. Flare 3 had a 2022 12-month rolling usage total of 1,300,146 MCF and Flare 4 had a 12-month rolling usage total of 235,283 MCF. The fuel content for the flares varies between 504 and 530 Btu/ft³. The facility maintains maintenance activity performed on the flares per the MAP and conducts weekly, monthly, quarterly, semi-annual, and annual checks on specified equipment.

The landfill has opted into Subpart AAAA (NESHAP) as allowed in 40 CFR 60.762(b)(2)(iv), and appears to maintain records regarding the operational standards for the gas collection and control system per 40 CFR 63.1958, compliance provisions per 40 CFR 63.1960, and monitoring of operations per 40 CFR 63.1961.

The following was recorded during the most recent performance test on September 21-23, 2021.

ENCLOSED FLARE 3:

- Combustion Temperature 1,598 F
- LFG Fuel Use 996 ft³
- LFG CH₄ Content 52.9%,
- Moisture 8.4%
- Exhaust gas temperature 1,332 F
- Exhaust gas flowrate 19,970 ft³/m
- LFG Fuel H₂S measurements (Draeger Tubes) 207 ppm

ENCLOSED FLARE 4:

- Combustion Temperature 1,600 F
- LFG Fuel Use 807 ft³
- LFG CH₄ Content 54.9%,
- Moisture 9.3%
- Exhaust gas temperature 1,569 F
- Exhaust gas flowrate 12,906 ft³/m
- LFG Fuel H₂S measurements (Draeger Tubes) 223 ppm

The facility updated its MAP in 2023 after it discovered that flare 3 had operated on 22 occasions during the 2nd half of 2022 of more than 82 F below its established parameter of 1,598 F due to a process logistic controller (PLC) failure which the facility believes was damaged during a DTE power outage. The flare manufacturer, Parnel Inc. determined that the PLC experienced two malfunctions likely due to utility power interruptions – the low temperature down timer and low-temperature set point. Upon discovery, the facility confirmed the issues have been resolved. The facility updated its MAP and implemented additional monitoring protocols in an attempt to prevent this from occurring again. The facility's five-point plan included installing a backup battery, upgrading the monitoring devices' display additional operational settings to reveal the flares' operating parameters, increase the flare's operating setpoint (1,625 F) beyond the established performance test (1,598 F), decrease the low-temperature down timer from one to one-half hour, and retained a consultant to review the flares' quality control data on a monthly basis. Both are

currently meeting NMOC efficiencies and operating within their combustion range per their performance test as both were operating over 1600 F at the time of inspection (flare 3 - 1,638 F and flare 4 - 1,622).

VII. REPORTING

The facility has submitted the semi-annual and annual reporting notifications as required per the facility's ROP, NSPS, and NESHAP. The landfill has opted into Subpart AAAA (NESHAP) and appears to maintain records regarding the operational standards for collection and control systems per 40 CFR 63.1958, compliance provisions per 40 CFR 63.1960, and monitoring of operations per 40 CFR 63.1961, per 40 CFR 63.1981(h). The facility has not reported any occurrences when the flares have not been operating and there is no bypass lines to divert the flow.

IX. OTHER REQUIREMENTS

The landfill has opted into Subpart AAAA (NESHAP) as allowed in 40 CFR 60.762(b)(2)(iv), therefore, they are bound by the operational standards for collection and control systems per 40 CFR 63.1958, compliance provisions per 40 CFR 63.1960, and monitoring of operations per 40 CFR 63.1961, and cannot return to their counterpart provisions of 40 CFR 60.763, 40 CFR 60.765 and 40 CFR 60.766 of Subpart XXX (NSPS).

FG-ICENGINES

I. EMISSION LIMITS

| Pollutant | Limit | Time Period/ Operating Scenario | Equipment | Test Result 09/21, 10/25 2022 |
|--------------------------------------|---|---|--------------------------------|-------------------------------------|
| . CO | 5.0 g/hp-hr or 610 ppmvd at 15% O ₂ | Hourly | Each Engine in FG-ICENGINES | NA |
| . CO | 4.13 g/bhp-hr | Hourly | Each Engine in FG-ICENGINES | 3.33 g/bhp-hr 2.55 g/bhp-hr |
| . NO _x | 2.0 g/hp-hr or 150 ppmvd at 15% O ₂ | Hourly | Each Engine in FG-ICENGINES | NA |
| . NO _x | 0.9 g/bhp-hr | Hourly | Each Engine in FG-ICENGINES | 0.58 g/bhp-hr 0.52 g/bhp-hr |
| . VOC (excluding Formaldehyde) | 1.0 g/bhp-hr or 80 ppmvd at 15% O ₂ | Hourly | Each Engine in FG-ICENGINES | 0.10 g/bhp-hr 0.12 g/bhp-hr |
| . *SO ₂ | 2.92 pph | Hourly | Each Engine in FG-ICENGINES | 1.39 lb/hr 1.31 lb/hr |
| . SO ₂ | 25.6 tpy | 12-month rolling time period as determined at | Each Engine in FG-ICENGINES | 9.4 tons/yr combined |

| | | | |
|--------------------------|-------------------------------|----------------|------------|
| | end of each calendar month | | |
| . Formaldehyde* 2.07 pph | Hourly | Each Engine in | 1.70 lb/hr |
| | | FG-ICENGINES | 1.65 lb/hr |

The above results are for engines 1 and 2 conducted on September 21 and October 25, 2022. All are within the permitted limits. *SO₂ and Formaldehyde were tested in September 2021, per ROP renewal. The SO₂ limit is below the permit limit of 2.92 lb/hr during each month's gas sampling event ranging from 0.92 to 1.80 lb/hr. The following are additional results from the recent performance test in 2022:

ENGINE 1: GZJ00418 serial number

- Generator Output 1,617 kW,
- Engine horsepower 2,256 bhp,
- Fuel use 576 ft³,
- LFG CH₄ Content 51.5%,
- Air to Fuel Ratio 7.1%
- Moisture 12.9%,
- Exhaust gas temperature 973 F
- Exhaust gas flowrate 5,352 ft³/m
- Engine hours 96,820

ENGINE 2: GZJ00672 serial number

- Generator Output 1,633 kW,
- Engine horsepower 2,289 bhp,
- LFG Fuel Use 547 ft³,
- LFG CH₄ Content 51.6%
- Air to Fuel Ratio 7.3%
- Moisture 12.2%,
- Exhaust gas temperature 936 F
- Exhaust gas flowrate 5,470 ft³/m.
- Engine hours: 54,927

All are within the permitted limits.

III. PROCESS/OPERATIONAL RESTRICTION(S)

It appears the facility only burns landfill gas in the engines and the facility provided an updated malfunction abatement/preventative maintenance plan with their ROP renewal. The plan on file includes the following; identification of the equipment and the supervisory personnel responsible for overseeing it, the description of the items and the frequency of the inspection and repairs, the identification of the equipment and operating parameters that are monitored to detect a malfunction or failure, the identification of the major replacement parts that are maintained in inventory for quick replacement and a description of the corrective procedures or operational changes that are taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

The air/fuel ratio controller is inspected daily by the facility, and each engine has a digital metering display to monitor and record the engine's kilowatt output.

IV. DESIGN/EQUIPMENT PARAMETER(S)

The engines air/fuel ratio controller is installed, maintained and appears to operate satisfactorily as it is self-adjusting. Each engine runs an associated generator which displays the hours of operation for each engine, and each engine has 2,233 hp and is manufactured by Caterpillar.

V. TESTING/SAMPLING

The facility performs yearly testing for the pollutants of CO, NO_x, and VOC for each engine, as well as testing for all the pollutants listed in Section I every five years for each engine. The facility also conducts monthly SO₂ sampling of the engines with concentrations varying between 195 to 310 ppm each month, as well as between 300 to 310 ppm for each semi-annual laboratory test for the total sulfur compounds. Engine performance tests are required every 8,760 engine hours and three separate test runs are conducted during each performance test. Each test run is conducted within 10 percent of 100 percent peak (or the highest achievable) load for one hour per the National Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, 40 CFR Part 60 - Subpart JJJJ.

VI. MONITORING/RECORDKEEPING

The facility logs of all maintenance activities conducted according to the malfunction abatement/preventative maintenance plan. Some activities include oil and filter changes, check valve clearance, and piston head changes.

The facility maintains monthly SO₂ mass emission calculations. The engine with the highest monthly emission rate in 2022 was Engine 2 at 1.82 lbs/hr in November, and the engine with the lowest emission rate was Engine 2 at 0.88 lbs/hr in July.

The facility observes, in a satisfactory manner, the hours of operation for each engine via a digital monitoring device located within the gas-to-energy building. Engine 1 hours varied between 499 and 739 hours each month in 2022, and engine 2 hours varied between read 477 and 739 hours each month. The facility maintains all applicable information regarding their specifications which includes manufacturer information by Caterpillar, each have the model number G3520C, and both are lean burn 4 stroke engines. Each engine has 2,233 brake-horsepower with an engine displacement of 86 liters with 20 pistons. The initial start-up date for the engines is February 2011. Compliance tests were last performed by the facility in September/October 2022 and are required yearly per Subpart JJJJ and every five years upon ROP renewal.

The engine plant houses a one system compartment which contains an Operator Interface Module touchscreen for each engine, a one tie-breaker compartment containing the digital meter display and lockout relay, and a two-engine/generator set with an emergency stop pushbutton. Engine hours are recorded via the digital meter display. In 2022, Engine 1 had usage varying between 499 and 739 hours each month, and engine 2's monthly usage varied between 467 and 739 hours. The 12-month rolling hours of operation for each in 2022 was 8,116 hours and 7,407 hours for engine 1 and 2, respectively. The volumetric flow at the time of inspection was 572 ft³/min and 546 ft³/min for engine 1 and 2,

respectively. In 2022, Engine 1 had its highest gas usage in March with 23,788 MCF and Engine 2 had its highest in December 23,539 MCF. The 2022 12-month rolling total for engines 1 and 2 was 238,977 MCF and 225,594 MCF, respectively. The heating value of the engines in 2022 varied between 500 and 520 Btu/ft³.

VII. REPORTING

The facility has submitted the semi-annual and annual reporting notifications as required per the facility's ROP.

VIII. STACK/VENT RESTRICTIONS

There were no visible emissions from each engine's stack and there were no observed obstructions.

IX. OTHER REQUIREMENTS

The facility appears to be complying with Subpart A and Subpart JJJJ of the NSPS.

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III. PROCESS/OPERATIONAL RESTRICTION(S)

Each engine operates in a manner which reasonably minimizes HAP emissions. The facility observes the air-to fuel ratio via digital controller. The engine load factor for engine 1 read 99%, and engine 2 read 98%, at the time of inspection with an average air-to-fuel ratio of 7.1.

Each engine operates in a manner which minimizes time spent at idle during start-up and minimizes the start-up time to a period needed for appropriate and safe loading of each engine. After the engine oil has obtained a minimum operating temperature, the engines can be loaded to a desired load. The engine oil temperature at the time of inspection for engines 1 and 2 were 195 F and 197 F, respectively. There was no indication or documentation which indicates idle time has exceeded 30 minutes.

IV. DESIGN/EQUIPMENT PARAMETER(S)

The engines are equipped with separate fuel meters to record the daily fuel usage and volumetric flow rate. The fuel usage to both engines was 240,466 MCF with a heating value of 509 Btu/SCF in the first half of 2022, and 224,411 MCF with a heating value of 517 Btu/SCF in the second half of 2022 with an average methane concentration of 51.1%. The volumetric flow for each engine is displayed via a digital metering display on each generator set and recorded for the total plant given that landfill gas is the only fuel used in the engines.

VI. MONITORING/RECORDKEEPING

The engines as mentioned are monitored and recorded regarding their daily fuel usage and volumetric flowrate as a whole for the two-engine plant since landfill gas is the only fuel used by the engines. Engines 1 and 2 had flow rates of 572 ft³/min and 546 ft³/min at the time of inspection.

VII. REPORTING

The facility has submitted the semi-annual and annual reporting notifications as required per the facility's ROP and did not report any deviations or fuel flow meter errors with the engines' operations in 2022.

IX. OTHER REQUIREMENTS

The facility appears to be complying with Subpart A and Subpart ZZZZ of the NESHAP.

Conclusion

Based on the AQD inspection and records review, Eagle Valley Landfill is in compliance with the aforementioned requirements and conditions of the facility's Renewable Operating Permit (ROP) (ROP) MI-ROP-N3845-2022.

NAME Robert Joseph

DATE 04-25-23

SUPERVISOR Joyce