

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

N598426333

FACILITY: PINE TREE ACRES, INC.		SRN / ID: N5984
LOCATION: 36600 29 MILE RD., LENOX		DISTRICT: Southeast Michigan
CITY: LENOX		COUNTY: MACOMB
CONTACT: Steve Walters, Environmental Engineer		ACTIVITY DATE: 08/06/2014
STAFF: Rebecca Loftus	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Annual Compliance Inspection; See also SRN: N8004 - Sumpter Energy		
RESOLVED COMPLAINTS:		

On August 6, 2014, I, Rebecca Loftus, and Sam Liveson, from the Department of Environmental Quality (DEQ), Air Quality Division (AQD), conducted an inspection of Pine Tree Acres, Inc., SRN: N5984, located at 36600 29 Mile Road, in Lenox Township, Michigan. The purpose of this inspection was to determine the facility's compliance with the Federal Clean Air Act, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act of 1994, PA 451, as amended, Michigan's Air Pollution Control Rules, and Renewable Operating Permit (ROP) No. MI-ROP-N5984-2013.

Upon arriving at the facility, Sam and I met with Mr. Steve Walters, WM Environmental Engineer and Courtney Fournier, WM Intern. Below is a summary of my findings during my inspection and file review.

Contacts

Steve Walters, Environmental Engineer, 586-749-6122, SWalter3@wm.com
Lee Bilinsky, Engine Plant Manager, 586-749-5182, LBilinsk@wm.com

Facility Overview

Pine Tree Acres, Inc. (operated by Waste Management of Michigan, Inc.) owns and operates a municipal solid waste landfill, named Pine Tree Acres Landfill (PTA), located at 36600 29 Mile Road, Lenox Township, Macomb County, Michigan. Sumpter Energy Associates (operated by Landfill Energy Systems) owns an electric generating facility that currently consists of nine internal combustion engines. Sumpter Energy receives its fuel, landfill gas (LFG), for nine internal combustion engines from Pine Tree Acres Landfill. The two companies have a contractual agreement in which Pine Tree Acres, Inc. sells LFG to Sumpter Energy Associates.

On February 11, 2008, an agreement was made between Michigan's Air Quality Division, the management of Pine Tree Acres, Inc., and Sumpter Energy Associates, which allowed the two entities to have separate Renewable Operating Permits. Together these entities comprise one single stationary source. Upon issuing the separate permits a new State Registration Number (SRN) was issued to Sumpter Energy Associates; the SRN for Pine Tree Acres, Inc. is N5984, and the SRN Sumpter Energy Associates is N8004.

PTA is a Type II Sanitary Landfill, which accepts and landfills municipal solid waste (MSW), bio-solids from wastewater treatment plants (sludge), and inert wastes such as construction debris, demolition debris, foundry sand, ash and low-level contaminated soils. The facility also accepts asbestos containing waste. Waste materials arrive in a variety of vehicles that have the potential to generate fugitive dust emissions; this is controlled by frequent wetting and sweeping of the entrance roads.

PTA is approximately 500 acres total, with roughly 282 acres consisting of permitted cells, and a total disposal capacity of 53,900,000 cubic yards (of which 1,223,560 cubic yards is inert waste). PTA currently has permitted capacity for 23 cells. At the time of my inspection, PTA is active in cells 18 and 22. Cell 18 is permitted by DEQ's Waste division to receive ash from DWSD (see attached copy of license).

The landfill has a total of four flares: #4 and #6 are enclosed flares located near the main office building, #3 is a candle stick open flare located on the west side of the landfill, and #5 is a candle stick open flare located near cells 3 and 4. On February 28, 2011, Pine Tree Acres, Inc. installed eight internal combustion engines, which are located across from the landfill, on the north side of 29 Mile Road.

PTA operates a landfill gas collection system consisting of multiple LFG wells, the LFG header system, the LFG treatment system, and two sulfur treatment systems. Currently, PTA is collecting LFG at flows rates of approximately 8500 scfm. The collected LFG can be routed to two enclosed flares, two open flares, eight reciprocating internal combustion engines (RICEs), or an additional nine engines owned/operated by Sumpter Energy Associates.

PTA is subject to the National Standards of Performance for Municipal Solid Waste Landfills, 40 CFR Part 60 Subpart WWW, and the National Emission Standards for Hazardous Air Pollutants for Municipal Solid Waste Landfills, 40 CFR Part 63 Subpart AAAA, and is permitted under ROP No. MI-ROP-N5984-2013. The ROP has enforceable limits/conditions for the following: EULANDFILL, EUALGCS, EUTREATMENTSYS, EUASBESTOS, FGFLARES, FGOPENFLARES, FGICENGINES, and FGRICEMACT.

Landfill/Gas Collection System

PTA's ROP has two sections covering the landfill and gas collection system, EULANDFILL and EUALGCS. During my inspection, WM provided me with copies of the surface methane monitoring reports, monthly integrity checks, waste acceptance rates/design capacity, the LFG NSPS parameters report, and a list of current wells under a NSPS variance. The records provided are needed to demonstrate compliance with the ROP and federal landfill regulations. Summaries of the reviewed reports have been provided below.

The 2nd and 3rd quarterly methane scans were conducted on June 5, 2014, and July 25, 2014 (see attached reports). Both reports indicate that there were no locations at PTA with a measured surface concentration of methane great than 500 part per million above background.

According to the records, WM conducts monthly integrity checks of the landfill cover (see attached summary). The records indicate the corrective action needed and when repairs occurred.

For 2013, PTA had the following acceptance rates: 1,363,247 Mg/year and 1,499,572 tons/year.

PTA's wellfield currently consists of approximately 345 wells; of which approximately 221 are NSPS subject. On a monthly basis, WM monitors temperature, oxygen, and pressure for each NSPS subject well (data is available electronically on-site). According to these records and PTA's semi-annual reports, WM properly documents instances in which wells have temperature, oxygen, and/or pressure exceedances. In the instances in which an exceedance cannot be corrected within 15 days, WM has requested higher operating variance, alternative

timelines, and/or to decommission wells (see file for individual request). During my inspection, WM provided me with a list of the wells currently operating under a NSPS variance (see attached list).

Treatment Systems

As part of the LFG collection and control system, PTA's has LFG treatment systems which filter particulate matter, remove moisture, and compress the LFG; the treatment systems are designated in the ROP as EUTREATMENTSYS. These treatment systems are used to process the gas prior to it being sent to WM's eight Reciprocating Internal Combustion Engines and Sumpter Energy's nine engines. Maintenance activities are kept on-site in a binder and any malfunctions are reported in the semiannual reports.

Sulfur Treatment Systems

Due to the H₂S concentrations of the gas, PTA currently has two sulfur removal systems in which they can treat LFG: a non-renewable system – Sulfa Treat and a renewable system – Thiopaq. The requirements for these systems can be found in the ROP under FGFLARES and FGICENGINES.

During my inspection, Mr. Walters explained that as of last Thursday (7/31/14), the slip stream construction was completed allowing WM to blend sulfur treated gas with untreated LFG with a total H₂S concentration not to exceed 100ppm (below permit limits). See provided H₂S/SO₂ data.

Flares

PTA's currently operates two enclosed flares and two open flares. The ROP has emission limits for SO₂, CO, NO_x, PM and Visible Emissions, as well as special conditions for testing, recordkeeping, maintenance activities, and operational restrictions.

Equipment	Type	Capacity (CFM)	Install Dates
Flare #3	open	3,000	Aug 2005/ Aug 2006
Flare #4	enclosed	3,000	2009
Flare #5	open - back up only	2,100	2009
Flare #6	enclosed	6,100	2009/2010

The flares are continuously monitored and the temperatures are recorded every 15 minutes (records available on-site). WM appropriately reports any flare downtime in their Annual/Semi-Annual reports. The emissions data is reported yearly in the Michigan Air Emissions Reporting System (MAERS). At the time of my inspection, Mr. Walters also provided me with the SO₂/H₂S report for each flare (see attached). All post sulfur treatment readings are below the permit limit of 160ppm.

At the time of my inspection only Flare #4 was operating. Blower #2 and 3 were sending gas to Sumpter Energy plant #2 or to Thiopaq.

Observations during inspection:

	Flow (scfm)	Temp (°F)	Temp (°F)	Temp (°F)
Flare 4	1806	1473	1610	1667
LES Engine Plant #2	1159	---	---	---

In 2013, WM installed the Golder Watch system at PTA, which allows them to monitor the flares and compressor remotely. This system also collects and stores greenhouse gas data.

Asbestos

PTA does accept asbestos containing waste. These activities are permitted in the ROP under EUASBESTOS. Currently, when asbestos waste is accepted, WM records the coordinates in their database so that in the future they can avoid drilling wells in those areas. If a well is needed in those areas, WM is required to submit a notification to the AQD before drilling occurs. At this time, PTA appears to be in compliance with the conditions listed in EUASBESTOS.

Engines

In 2009, WM applied for a permit to operate eight CAT 3520C RICE at PTA. The ROP has emission limits for CO, NOx, PM, VOC, and Visible Emissions, as well as special conditions for testing, recordkeeping, maintenance activities, and operational restrictions. The engine specifications are as follows:

Emission Unit ID	Make	Model	Model Year	Fuel	Serial #	Max Engine Power (bhp)
EUCENGINE1	Lean Burn; 4 stroke	CAT G3520C	2010	LFG	GZJ00469	2333
EUCENGINE2	Lean Burn; 4 stroke	CAT G3520C	2010	LFG	GXJ00464	2333
EUCENGINE3	Lean Burn; 4 stroke	CAT G3520C	2010	LFG	GXJ00467	2333
EUCENGINE4	Lean Burn; 4 stroke	CAT G3520C	2010	LFG	GXJ00466	2333
EUCENGINE5	Lean Burn; 4 stroke	CAT G3520C	2010	LFG	GXJ00462	2333
EUCENGINE6	Lean Burn; 4 stroke	CAT G3520C	2010	LFG	GXJ00468	2333
EUCENGINE7	Lean Burn; 4 stroke	CAT G3520C	2010	LFG	GXJ00463	2333
EUCENGINE8	Lean Burn; 4 stroke	CAT G3520C	2010	LFG	GXJ00465	2333

During my inspection, Mr. Lee Bilinsky, Engine Plant Manager, was able to show me the following records: daily readings for all engine parameters, daily readings for LFG parameters/flow, monthly operating reports for each engine, and maintenance activity logs for each engine.

I also recorded the following engine parameters during my inspection:

Total Plant (KW)	12561
Batteries (volts)	25.5
Btu set point	495

Gas Quality	%
CH4	48.1
CO2	39.5
Balance Gas N	11.3
O2	0.83

	Engine No. 1	Engine No. 2	Engine No. 3	Engine No. 4
Engine Hours	Data	20918.97	209880.89	20868.73
Actual Engine Speed (rpm)	cables	1200	1200	1201
Generator Total Real Power (Kw)	to the	1639	1650	1595
Engine Load Factor (%)	computer	96	97-98	97-98
Actual Engine Ignition Timing (Deg.)	were down.	28	28	28
Dentation	---	1	1	1
Actual Oxygen (sensor)	---	OFF LINE	OFF LINE	OFF LINE
Inlet Manifold Air Pressure ABS (psi)	---	49.3	48.5	47.4
Inlet Air Temperature (°F)	---	133	132	128
Engine Oil Temp (°F)	---	201	199	201
Engine Coolant Temp (°F)	---	230	228	221
Desired Engine Speed (rpm)	---	1200	1200	1201
Throttle Actuator Position %	---	55.93	53.31	60.03
Engine Droop %	---	0	0	0
Air Flow Intake Manifold (scfm)	---	4646	4558	4502
Air to Fuel Ratio	---	8	7.9	7.9
Gas Fuel Flow (scfm)	---	584	575	572
Fuel Valve %	---	56	56	56
Frequency (Hz)	---	60	59.9	60
Generator Ave RMS Voltage	---	4280	4210	4208
Generator Total RMS current (Amps)	---	670	657	662
Power Factor	---	0.994	0.993	0.997
Unit Base Load Set Point (KW)	---	1600	1600	1600

	Engine No. 5	Engine No. 6	Engine No. 7	Engine No. 8
Engine Hours	20934.16	20844.88	20848.12	20945.94
Actual Engine Speed (rpm)	1201	1200	1201	1200
Generator Total Real Power (Kw)	1658	1640	1606	1625
Engine Load Factor (%)	99	97	95-97	97
Actual Engine Ignition Timing (Deg.)	28	28	28	28
Dentation	1	1	1	1
Actual Oxygen (sensor)	OFF LINE	OFF LINE	OFF LINE	OFF LINE
Inlet Manifold Air Pressure ABS (psi)	50.6	47	48.6	46.4
Inlet Air Temperature (°F)	128	126	128	129
Engine Oil Temp (°F)	201	199	198	199
Engine Coolant Temp (°F)	217	223	226	226
Desired Engine Speed (rpm)	1201	1200	1200	1200
Throttle Actuator Position %	64-65	52.9	50.49	57.99
Engine Droop %	0	0	0	0
Air Flow Intake Manifold (scfm)	4816	4467	4662	4429
Air to Fuel Ratio	8.1	7.7	8	7.8
Gas Fuel Flow (scfm)	593	580	576	567
Fuel Valve %	58	57	56	56
Frequency (Hz)	60	60	59.9	60
Generator Ave RMS Voltage	4212	4205	4210	4204
Generator Total RMS current (Amps)	658	669	662	668
Power Factor	0.996	0.996	0.997	0.998
Unit Base Load Set Point (KW)	1600	1600	1600	1600

Based on my review of the records and my observations during the inspection, the engines are operating similar to the conditions during the last stack test and appear to be in compliance with the conditions of FGICENGINES.

In addition to the permit requirements, the engines are subject to the National Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, 40 CFR Part 60 Subpart JJJJ (NSPS JJJJ) and the National Emission Standards for Hazardous Air Pollutant for Stationary Reciprocating Internal Combustion Engines, 40 CFR Part 63 Subpart ZZZZ (NESHAP ZZZZ). The initial notification for NSPS JJJJ was received on March 4, 2011, and the initial notification and annual report for NESHAP ZZZZ were received on January 11, 2013.

All eight engines were tested in April 2014 for NO_x, CO, and NMOC to demonstrate compliance with the NSPS and permit limits. Based on the test report and data received, all eight engines were in compliance with the permit limits during the test (See attached Summary for the test results).

No engine Swap-outs have occurred at the WM Engine Plant.

MAERS

For 2013, PTA reported the following emissions:

Pollutant	Tons
CO	410.8
NMOC	87.8
NOx	87.9
PM10	50.0
PM2.5	6.7
SO2	37.8
VOC	20.7

Note: Formaldehyde emissions from the engines were not included in the reported VOC emissions.

Formaldehyde and HAP emissions

As of 2014, PTA's does not have formaldehyde limits in their permit. The AQD landfill work group and AQD management are continuing discussions on how to approach the industry-wide concern of formaldehyde emissions.

As noted in my previous inspection report, on December 7, 2012, Derenzo and Associates calculated the following source-wide PTE for HAPs. These calculations were based on updated emission factors provided by Caterpillar Inc., and included the eight engines operated at Pine Tree Acres, Inc., two enclosed flares, and nine engines operated at Sumpter Energy.

HCl: 9.2 TPY
Formaldehyde (HCHO): 115.2 TPY
Other Landfill gas HAPS: 6.9 TYP
Total HAPs: 131.3 TPY

Using the Caterpillar emission factors of 2.07 lbs/hr for the CAT 3520C Engines, and operating hours provided by PTA (68,384 hours), AQD staff calculated the 2013 formaldehyde emissions from the eight engines as 70.78 tons.

Additional Information

The most recent Malfunction Abatement/Preventative Maintenance Plans required by the permit for the Treatment Systems, Flares 4 and 6, the Sulfur Removal System, and the Landfill Engines were received by the AQD on April 26, 2013 (see file for documents).

During my inspection, Mr. Walters also provided a copy of the Phase 2 and Phase 3 Gas collection and control system construction/expansion plan. This plan was submitted to and approved by DEQ's Waste Division. See attached plan for details

Currently there are no emergency generators located on-site. The following equipment is on-site, but conditions are not included in the ROP as they are exempt pursuant to Rule 212(4):

Emission Unit ID	Description	Rule 212(3) or Rule 212(4) Exemption	Rule 201 Exemption
EUGASTANK	500 Gallon Unleaded Gasoline tank	R 336.1212(4)(c)	Rule 284(g)
EUDIESELTANK1	12,000 Gallon Diesel tank	R 336.1212(3)(e)	Rule 284(d)

Emission Unit ID	Description	Rule 212(3) or Rule 212(4) Exemption	Rule 201 Exemption
EU DIESEL TANK 2	500 Gallon Diesel tank	R 336.1212(3)(e)	Rule 284(d)
EU HYDRAULIC	400 Gallon Hydraulic oil tank	R 336.1212(3)(e)	Rule 284(c)
EU TRANSMISSION	400 Gallon Transmission Fluid	R 336.1212(3)(e)	Rule 284(c)
EU USED OIL	300 Gallon Used oil tank	R 336.1212(3)(e)	Rule 284(c)
EU SEED OIL 2	300 Gallon used oil tank	R 336.1212(3)(e)	Rule 284(c)
EU ENGINE OIL	2000 Gallon engine oil tank	R 336.1212(3)(e)	Rule 284(c)
EU USED OIL 2	2000 gallon used oil tank	R 336.1212(3)(e)	Rule 284(c)
EU CAUSTIC TANK	6,650 gallon caustic tank	R 336.1212(3)(e)	Rule 284 (h)
EU COOL TANK	750 gallon coolant tank	R 336.1212(3)(e)	Rule 284(h)
EU LEACHATE 1	40,000 gallon above ground leachate storage tank	R336.1212(3)(f)	Rule 285(aa)
EU LEACHATE 2	400,000 gallon above ground leachate storage tank	R336.1212(3)(f)	Rule 285(aa)

Conclusions

Based on information gathered during the inspection and the records reviewed, PTA appears to be in compliance with the Federal Clean Air Act, Michigan's Air Pollution Control Rules, the conditions of ROP No. MI-ROP-N5984-2013.

NAME Rebecca J. [Signature]

DATE 9/10/14

SUPERVISOR CJE