

M4510

MAWLL

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

M451041632

FACILITY: CITY SAND & LANDFILL INC		SRN / ID: M4510
LOCATION: 46805 WILLOW RD, SUMPTER TWP		DISTRICT: Detroit
CITY: SUMPTER TWP		COUNTY: WAYNE
CONTACT:		ACTIVITY DATE: 08/11/2017
STAFF: Stephen Weis	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: Compliance inspection of the City Sand and Landfill facility in Sumpter Twp. The City Sand facility is scheduled for inspection in FY 2017.		
RESOLVED COMPLAINTS:		

Location:

City Sand & Landfill, Inc. (SRN M4510)
46805 Willow Road
Sumpter Twp. 48111

Date of Activity:

Friday, August 11, 2017

Personnel Present:

Steve Weis, DEQ-AQD Detroit Office
Jerry Krawiec, DEQ-AQD Detroit Office
Brad Norton, District Manager, CSMG – Midwest, Waste Management

Purpose of Activity

A self-initiated inspection of the City Sand & Landfill facility (hereinafter "City Sand") was conducted on Friday, August 11, 2017. The City Sand facility is on my list of sources targeted for an inspection during FY 2017. The purpose of this inspection is to determine compliance of operations at the City Sand facility with applicable rules, regulations and standards as promulgated by Public Act 451 of 1994 (NREPA, Part 55 Air Pollution Control), applicable Federal standards, and any applicable permits and orders.

Facility Description

The City Sand facility is a closed landfill that is located in Sumpter Township in far southwestern Wayne County. The facility occupies a roughly 289 acre site southeast of the intersection of Willow and Elwell Roads. The facility property extends approximately ½ mile along the south side of Willow Road, and approximately ¾ mile along the east side of Elwell Road. The area around the facility consists of open land, and residential properties that are primarily on larger, rural lots. The closest residences to the facility are located directly across Willow and Elwell Roads from the facility property lines. The land directly to the south and east of the facility for at least ¼ mile is open land.

The City Sand facility consists of a closed municipal solid waste landfill that is owned and managed by Waste Management, a closed ash monofill that is located at the southeast corner of the facility property, and a landfill gas-to-energy operation, which is based in a building located at the far southwestern corner of the facility property along Elwell Road, that was owned and operated by Landfill Energy Systems, a subsidiary of Sumpter Energy Associates. The current owner and operator of the landfill gas-to-energy operation is Aria Energy, based in Novi, MI.

The landfill opened and began accepting waste in 1967. The landfill operated as a Type II Sanitary Landfill. The landfill accepted and landfilled municipal solid waste, which consists of household waste (e.g. food waste, garden waste, paper waste), as well as inert wastes that included construction and demolition debris, ash, and asbestos waste. The landfill is lined with clay; it was constructed prior to the requirement to line landfills with geosynthetic membranes. According to facility records and related information, the landfill ceased accepting

waste for landfilling on October 9, 1993, and began closure activities. I was told during the site visit that the southwest corner of the landfill was the last active area that accepted and landfilled waste prior to closure. According to facility information, the landfill was estimated to have accepted 14,639,136 tons of waste during the time that it operated; the landfill's design capacity is reported as 14.25 million megagrams (or 15,707,936 tons).

A landfill gas collection and control system (GCCS) was installed at the facility to collect and treat gas that is generated by the landfill. Landfill gas is produced via the microbial decomposition of municipal solid waste (or MSW) within the landfill, which occurs under both aerobic and anaerobic conditions. The staff report associated with the most recent Renewable Operating Permit that was issued to the facility contains the following information regarding the generation of landfill gas:

"MSW initially undergoes aerobic microbial activity which produces predominantly nitrogen gas and carbon dioxide. As oxygen levels decline, gas composition changes to a mixture of methane and carbon dioxide. LFG (landfill gas) typically contains small percentage of non-methane organic compounds (NMOC). The NMOC fraction consists of various organic hazardous air pollutants (HAP), greenhouse gases, and volatile organic compounds (VOC)."

Landfills of a certain size are required to install a GCCS per the requirements of 40 CFR Part 60, Subpart WWW (Standards of Performance for Municipal Solid Waste Landfills). According to information in the City Sand facility file, the GCCS first operated in 1992, and consisted of a network of landfill gas extraction wells, an enclosed flare (which has since been replaced with two open flares), and the afore-mentioned landfill gas-to-energy operation. The gas extraction wells are part of a system consisting of vertical and horizontal extraction wells that were installed into the waste material in the landfill. The wells operate under a vacuum, and they collect landfill gas from throughout the landfill, directing it to a gas treatment system through which the landfill gas is treated (the gas undergoes dewatering, particulate removal, and compression) to prepare it for combustion. The treated landfill gas is combusted in the engines in the onsite landfill gas-to-energy facility. The engines utilize the gas to generate electricity, and they also serve as an emissions control device to control emissions from the landfill gas. The treated landfill gas can also be combusted in the remaining operational flare, which is utilized as back-up control to the engines.

The ash monofill is separate from the rest of the landfill. It has a synthetic geomembrane liner, and it is not connected to the GCCS. I was told during the site visit that the ash monofill operated for 2-3 years, and closed in the mid 1990's.

The facility also operates a leachate collection and treatment system. Leachate is the liquid found in a landfill. Some of the leachate is produced by precipitation that enters into and percolates through the waste in the landfill. Some of the waste material in the landfill releases additional moisture/liquid that contributes additional leachate. In addition, all of this moisture in the landfill also enhances the environment for bacteria that help in decomposing other waste in the landfill, which generates additional leachate. The leachate is managed in order to avoid having too much moisture in the landfill, which, from an air perspective, can interfere with the operation of the gas collection wells. The leachate is also managed and collected to prevent it from escaping from the landfill and into the environment (i.e. soil, groundwater). Some of the leachate from the landfill is directed to a leachate storage pond at the east end of the landfill. There is a pump and distribution apparatus connected to the pond adjacent to the access road around the landfill through which leachate is loaded into tanker trucks for offsite disposal. I was told during the site visit that it takes about 28 minutes to fill a tanker truck, and that 13-14 million gallons of leachate is sent for offsite disposal per year. Starting last year, the facility began managing a portion of the leachate from the landfill utilizing a leachate irrigation system that sprays leachate over a portion of the top surface of the landfill. Currently, the irrigation system is utilizing 3-4 million gallons of leachate per year.

Facility Operations

As mentioned in the last section, the City Sand facility consists of a closed municipal solid waste landfill, a closed ash monofill, and a landfill gas-to-energy operation. The current operations at the facility pertain to the management of landfill gas that is produced by the landfill via the landfill gas collection and control system (GCCS), and the management of leachate and stormwater at the facility.

Regarding the GCCS, I was told during the site visit that there are approximately 85 gas wells in the landfill, with 20 of them drawing and putting out landfill gas, which is sent to the landfill gas-to-energy operation. I requested and

received information regarding the landfill gas-to-energy operation and its associated engines from Aria Energy via e-mail. This e-mail included a copy of correspondence from Sumpter Energy Associates to the DEQ-AQD Detroit Office, dated June 24, 2014, that served to present the permit exempt status of the landfill gas-to-energy operation at the City Sand facility. The correspondence includes attachments that provide data of the amount of refuse that was accepted at the landfill in the years that it operated, and information relating to the range of the amount of landfill gas that has been produced in the landfill, and that is predicted to be produced through the year 2030. A copy of this correspondence and its attachment is included with this report.

After a landfill is closed, the amount of landfill gas that is produced declines over time. The June 24, 2014 correspondence states that the landfill gas-to-energy operation was originally constructed to house ten Caterpillar G3516 engines, each rated at 1,140 bhp and 800 kW. These engines were installed at the engine plant on July 27, 1991. The engines began operation in July of 1992, which corresponds to the period of peak landfill gas generation from the landfill. According to facility records, landfill gas generation around this time peaked in 1990 when the lower limit of landfill gas generation was 4,266 scfm, and the upper limit was 6,399 scfm. For that same year, it was reported that between 2,346 scfm (lower limit) and 3,519 scfm (upper limit) of landfill gas was recovered by the GCCS, and the average energy recovery rate for that year was 770,760 MMBTU. The year with the highest documented landfill gas and energy recovery rate was 1995, when between 3,093 scfm (lower limit) and 4,640 scfm (upper limit) of landfill gas was recovered by the GCCS, and the energy recovery rate was 1,016,051 MMBTU. These numbers have steadily decreased every year since. As the amount of landfill gas being generated declined, engines were removed from service. According to the e-mail that I received from Emily Zambuto of Aria Energy, engines were removed from service in 1999, 2001, 2004 and 2007. There are currently two engines left at the engine facility. Based on the amount of landfill gas that is currently being generated, the facility operates one of the two engines at 700-800 kW, with the other used as a swing unit. I was told during the site visit that, on average, around 350 scfm of landfill gas is currently sent to the engine facility. Emily provided that operators from the Aria Energy landfill gas-to-energy operation at the Carleton Farms landfill (28800 Clark Road in Sumpter Twp., SRN N5986) are onsite at the City Sand facility's landfill gas-to-energy engine building multiple times each week to check on the engines and take necessary readings. End of month reports are maintained that track items such as electrical output, total landfill gas usage, landfill gas quality and engine downtime.

There are also two open flares at the City Sand facility. One is located at the west end of the facility, just north of the engine building, and the other is located near the south boundary of the City Sand facility property. The flare that is located at the south end of the property is no longer operational. I was told during the site visit that this flare has not operated in around 4 years, that it would need a complete overhaul to be operational again, and that there are no plans to repair or operate this flare. The flare on the west side of the property was manufactured by LFG Technologies; it has a maximum flow rate of 750 scfm at a maximum heat input rate of 22.5 MMBTU/hr. This flare is approximately 10 years old, and it operates as back-up control to the Caterpillar engine at the landfill gas-to-energy operation.

The leachate collection and treatment system collects some of the leachate from the landfill to a pond located at the east end of the property. As mentioned in the previous section of this report, the leachate from the pond has a pump and distribution apparatus associated with it through which leachate is loaded into tanker trucks for offsite disposal. I was told during the site visit that 13-14 million gallons of leachate is sent for offsite disposal per year. Starting last year, the facility began managing a portion of the leachate from the landfill utilizing a leachate irrigation system that sprays leachate over a portion of the top surface of the landfill. Thus far, the irrigation system distributes 3-4 million gallons of leachate per year. The irrigation system currently consists of 144 sprinklers located in 14 zones on top of the landfill. The use of the leachate irrigation system was approved by DEQ's Waste Management and Radiological Protection Division.

Inspection Narrative

Jerry and I arrived at the facility at 10:15am. We entered the City Sand facility via the driveway from Willow Road at the northeast corner of the facility, where we were met by Brad Norton of Waste Management. Jerry and I got into Brad's truck, and we started to drive along the facility road that follows the perimeter of the City Sand property while discussing the operations at the facility.

Brad told us that the landfill is not producing very much landfill gas as the landfill gas production is towards the bottom of the landfill gas production curve. As we drove along the north edge of the landfill property, he explained the ownership of the site – it was originally owned by City, then sold to USA Waste, which eventually

merged with Waste Management. Brad told us that the landfill stopped accepting waste around 1992, and that the landfill was closed under approval and a consent order entered with DEQ's Waste Division in the early 2000's. Brad provided us with the size of the facility – it consists of 289 acres, including buffer zones, and the fill area is approximately 184 acres. He told us that the landfill is clay-lined, and he briefly discussed the leachate management practices at the facility.

As we drove along the western edge of the property, Brad discussed the landfill GCCS. He told us that of the approximately 85 landfill gas wells currently in place, 20 of them are putting out gas to send for energy recovery. Brad told us that after closure, the moisture level inside the landfill drops without the introduction of new waste. The moisture helps the "bugs" that decompose the waste, and with less decomposition activity, less gas is produced. He told us the GCCS averages 350 scfm to the engine facility. Quarterly gas probe monitoring is performed at the landfill, and there have been no exceedances/hits. We arrived at the location of the functional open flare. We got out of the vehicle and looked at the flare unit. We looked at the informational plate on the unit, and I took a picture of it. We then drove up to the fence line between the landfill and the engine facility. Brad briefly described the engine facility. He told us that Jason Neumann of Aria Energy is the point of contact for the landfill gas-to-energy engines.

We drove the facility road along the south perimeter of the facility property, and we stopped to look at the second open flare. Brad told us that this flare is not operational, and it has not operated in around 4 years. He stated that there are no plans to operate it in the future, as it needs too much maintenance and a complete overhaul in order to make it operational again, and due to the decreasing amount of landfill gas being produced, it is not needed. As we approached the southwest corner of the facility, we looked at the ash monofill. Brad told us that the monofill is separate from the municipal solid waste landfill; it has a synthetic liner, and it accepted waste for between two and three years in the early 1990s.

We then drove to the leachate and stormwater ponds located in the southeast quadrant of the facility property along the eastern border of the property. There is a loop road that passes between the two ponds, the leachate pond being located to the west, and the stormwater pond located to the east. Brad showed us the leachate pump apparatus through which leachate is pumped to tanker trucks for offsite treatment and disposal. Brad mentioned that as the landfill has been closed, more of the leachate production is caused by precipitation that permeates into the landfill. As such, the leachate that is currently being collected from the landfill has little color or odor, and the concentration of certain components, such as ammonia, is lower due to dilution.

Brad then drove us back to the north side of the landfill to the access road that leads to the top of the landfill. Brad told us that there is approximately 118 feet of waste at the top point of the landfill. As we drove, Brad pointed out and described the leachate irrigation system. The irrigation system consists of 144 sprinklers in 14 zones on top of the landfill. Leachate is pumped to one zone at a time at a rate of 150 gallons per minute, and it is sprayed through the sprinklers for 14 minutes per zone for one run, and 12 minutes per zone for a second run. The sprinklers are equipped with Rain Bird sensors to ensure that the irrigation system does not operate if there is $\frac{3}{4}$ inch of precipitation. In the approval for the use of the irrigation system by DEQ's Waste Management and Radiological Protection Division, 1 inch of precipitation is allowed to be applied to the top of the landfill. Brad said that the sprinklers are operated at the point in the day when the sun is at its highest to encourage evaporation.

We returned to the driveway at the northeast corner of the facility where my vehicle was parked. After a brief conversation with Brad summarizing the site visit, Jerry and I left the facility at 11:35am.

Permits/Regulations/Orders/

There are currently no active permits for the City Sand facility.

The facility was formerly categorized as a potential major source of criteria pollutant emissions, and the landfill was subject to the applicability provisions of 40 CFR Part 60, Subpart WWW. These applicability provisions, as put forth in 40 CFR 60.752(c), require that municipal solid waste landfills with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters, are subject to the requirements of the Title V program, including applying for and obtaining a Renewable Operating Permit (ROP). The facility was first issued a ROP on May 25, 2001, and the last ROP that was issued to the City Sand facility was ROP Number MI-ROP-M4510-2010, which became effective on July 14, 2010. The ROP was issued to both City Sand and Landfill, Inc. and Sumpter Energy Associates, Inc., and it consisted of two sections – Section 1 addressed the landfill, the

landfill gas collection system, the treatment system for the collected landfill gas and the two flares, while Section 2 addressed the landfill gas-to-energy engines (there were three in place at the time that the ROP was issued).

40 CFR 60.752(d) provides that when a municipal solid waste landfill is closed, it is no longer subject to the requirements of Title V as long as, in the case of the City Sand facility, the conditions for removal of the control system in 40 CFR 60.752(b)(2)(v) are met. Waste Management's Closed Site Management Group sent correspondence dated March 13, 2014 to the DEQ-AQD Detroit Office requesting that Section 1 of ROP No. MI-ROP-M4510-2010 be voided. Per this correspondence, Waste Management provided a demonstration that the landfill met the criteria in 40 CFR 60.752(b)(2)(v)(A),(B) and (C), which stated the following:

- 40 CFR 60.752(b)(2)(v)(A) requires that the landfill shall be a closed landfill as defined in 40 CFR 60.751. The correspondence provided that the City Sand facility's landfill ceased accepting waste on October 9, 1993, immediately commenced with closure activities, and submitted a closure report in accordance with 40 CFR 60.257(d) on February 25, 1997.
- 40 CFR 60.752(b)(2)(v)(B) requires that the landfill GCCS shall have been in operation for a minimum of 15 years. Waste Management provided that the GCCS was first operated in 1992, and that the initial performance test of the original enclosed flare and an internal combustion engine was conducted on September 15, 1992, the results of which demonstrated that the control devices met the NSPS performance standards.
- 40 CFR 60.752(b)(2)(v)(C) requires that the calculated NMOC gas produced by the landfill (following the procedures specified in 60.754(b)) shall be less than 50 Mg per year on three successive test dates. Per the correspondence, three test events were conducted in 2013 (April 2, August 6 and December 10) to determine the annual NMOC gas produced by the landfill. The results of all three tests showed a NMOC emissions rate of 4.5 Mg per year, well below the 50 Mg per year requirement.

The correspondence also provides that the two flares are exempt from DEQ-AQD permitting requirements per the provisions of Michigan Administrative Rule 285(aa), which exempts "landfills and associated flares and leachate collection and handling equipment." Per a letter sent to Waste Management dated August 7, 2014, DEQ-AQD agreed to void Section 1 of ROP No. MI-ROP-M4510-2010.

Sumpter Energy Associates sent correspondence to the DEQ-AQD Detroit Office dated June 24, 2014 requesting that Section 2 of ROP No. MI-ROP-M4510-2010 be voided. In this correspondence, Sumpter provided that the remaining two engines are exempt from DEQ-AQD permitting requirements per the provisions in Michigan Administrative Rule 285(g), and that the potential emissions from the engines are less than 100 tons per year of CO, and less than 40 tons per year of NOx. DEQ-AQD agreed with the information presented, and a letter dated August 2, 2014 was sent to Sumpter Energy that served to void Section 2 of the ROP.

In summary, there are currently no permits in effect at the City Sand facility. The landfill, the flares and the leachate collection and handling system is exempt from DEQ-AQD permitting requirements. The remaining two Caterpillar landfill gas-to-energy engines are also exempt from DEQ-AQD permitting requirements, as their maximum heat input capacity is 7.92 MMBTU/hour. Due to the age of these two engines, they are not subject to Federal NSPS (Part 60) or NESHAP (Part 63) requirements.

Compliance Determination

Based upon the results of the August 11, 2017 site visit and subsequent information review, the City Sand & Landfill facility appears to be in compliance with all applicable rules and regulations. Given the decreasing amount of landfill gas that is being generated and collected by the facility's landfill gas collection and control system, it is anticipated that, going forward, the City Sand facility's status relative to permitting and regulatory applicability will remain unchanged.

Attachments to this report: a copy of the e-mail received from Aria Energy that contains information about the engines, and includes a copy of the correspondence from June 24, 2014 that addresses the permit exempt status of the landfill gas-to-energy operation, which includes data of the amount of refuse that was accepted at the landfill over the years that it operated, and the range of the amount of landfill produced in the landfill; copies of the correspondence sent by DEQ-AQD to void the two sections of the facility's ROP; some pictures that were taken during the site visit.

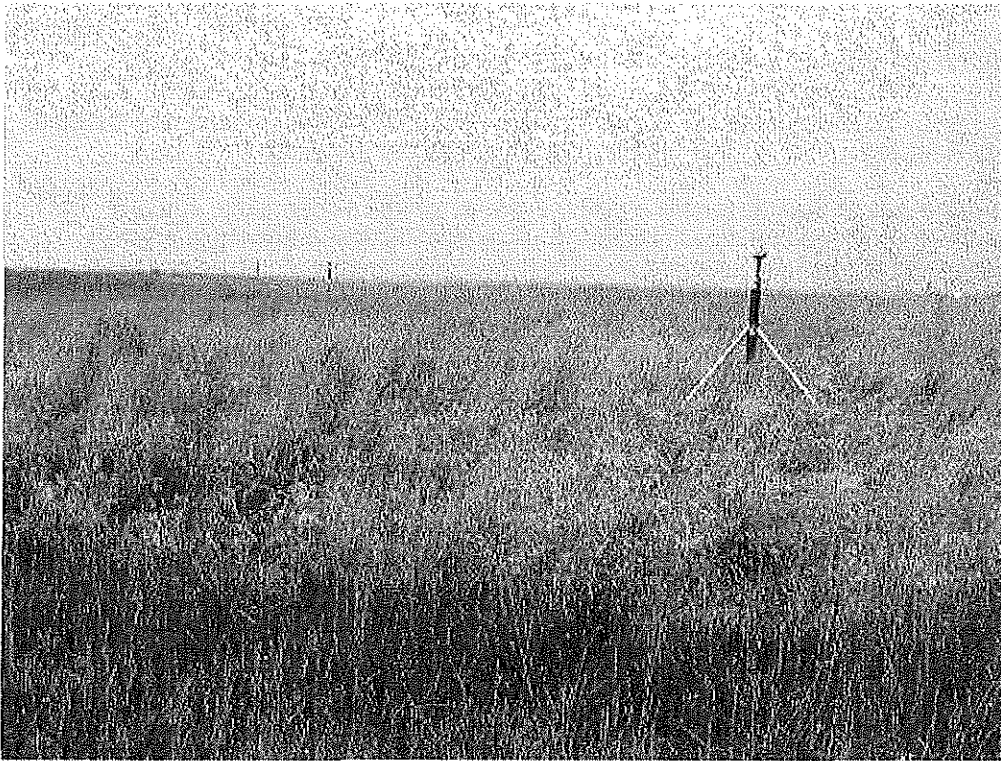


Image 1(irrigation system) : Some of the sprinkler heads, part of the leachate irrigation system at the top of the landfill.



Image 2(engine facility) : The landfill gas-to-energy engine building, with the landfill in the background.

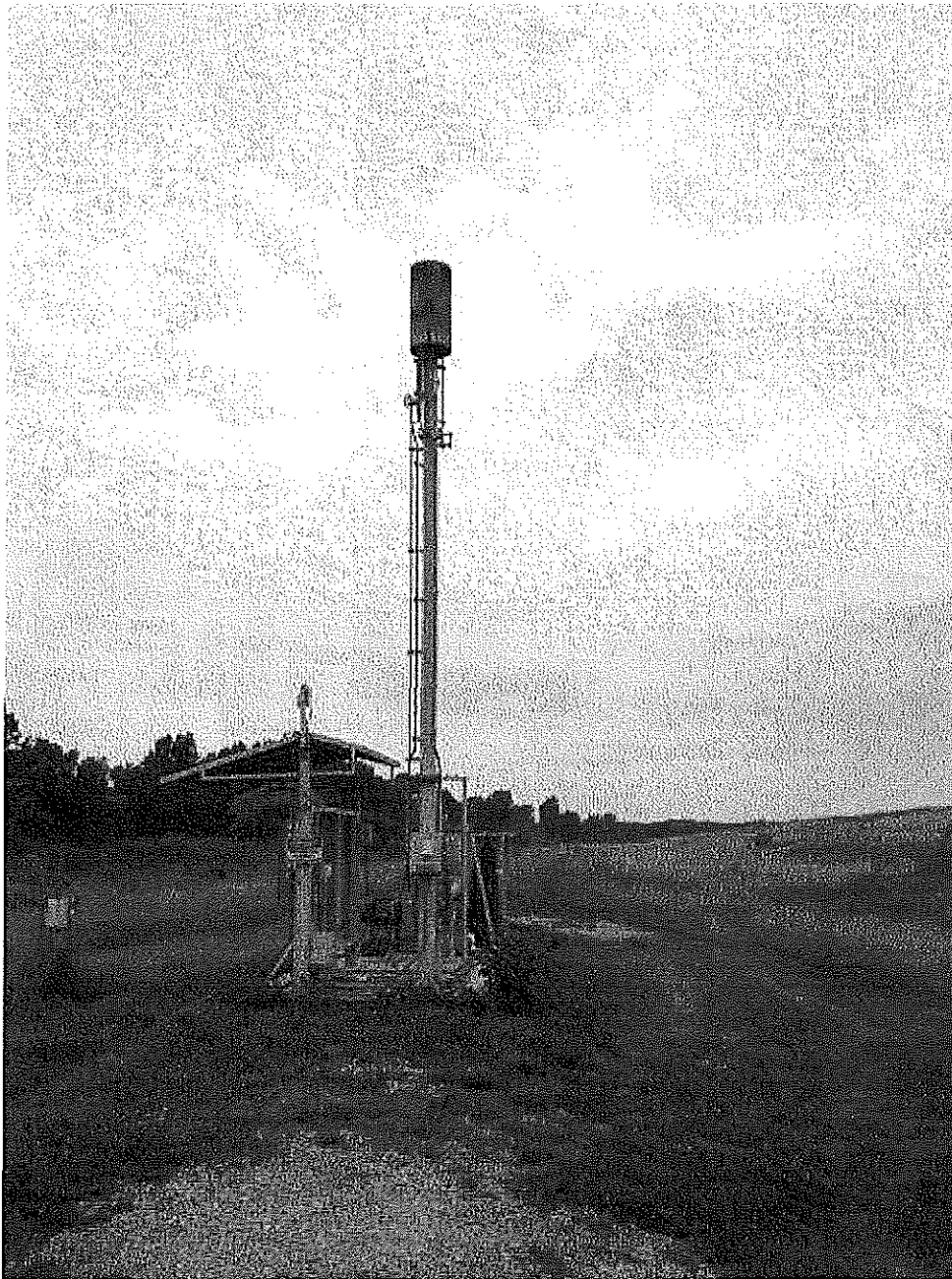


Image 3(Active flare) : The flare located at the west end of the property that is currently operational.

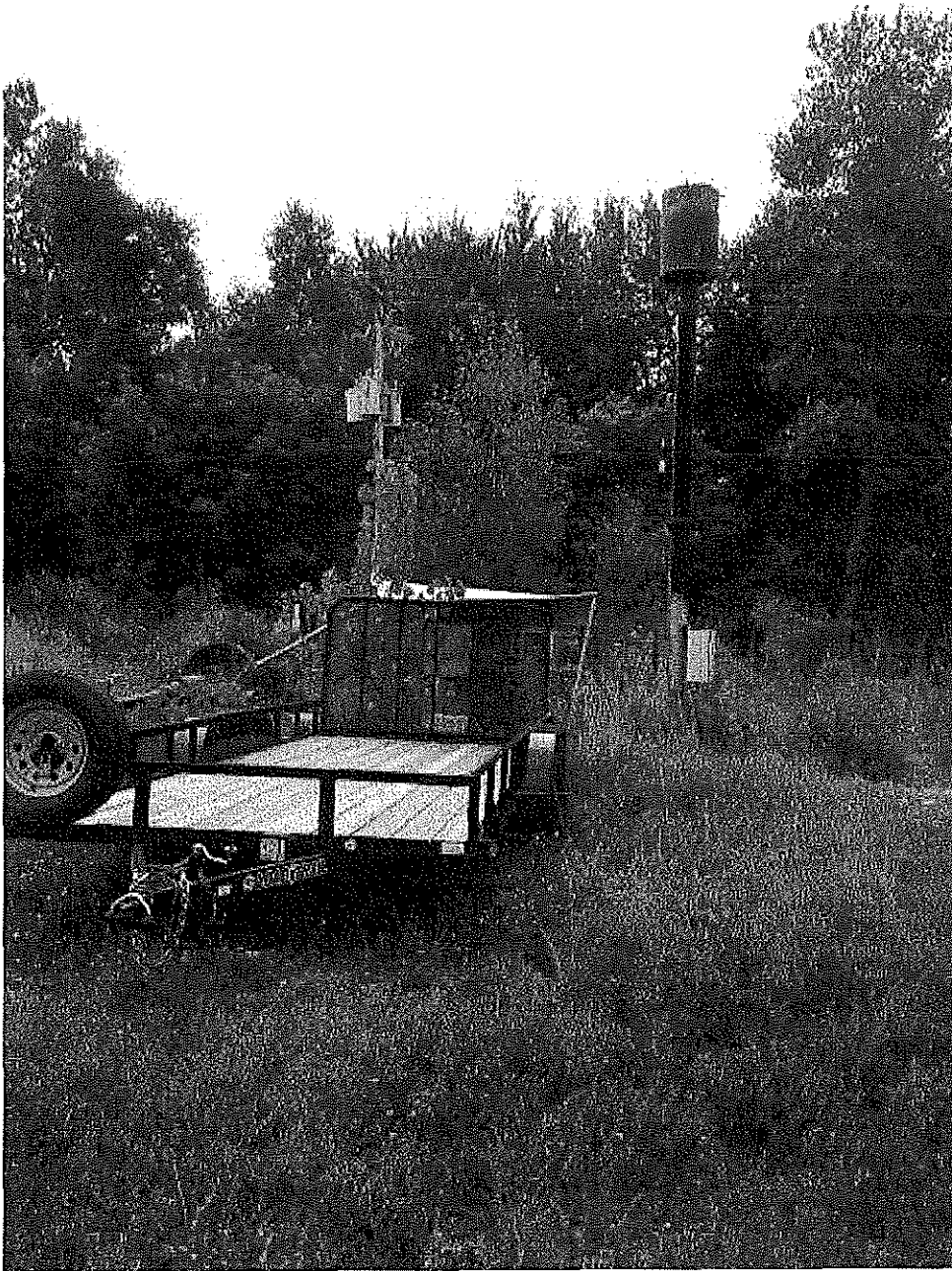


Image 4(Unused flare) : The flare located at the south end of the facility that is no longer operational.



Image 5(storm water pond) : The storm water pond at the east end of the facility with the leachate pumping apparatus and the ash monofill in the background.

NAME Steve Wes

DATE 11/21/17

SUPERVISOR JK