DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Complaint Investigation

N620771794

FACILITY: SMITHS CREEK LANDFILL	**SRN / ID:** N6207
LOCATION: 6779 SMITHS CREEK ROAD, SMITHS CREEK	**DISTRICT:** Warren
CITY: SMITHS CREEK	**COUNTY:** SAINT CLAIR
CONTACT: Travis Heslop , Senior Operations Specialist	**ACTIVITY DATE:** 05/01/2024
STAFF: Iranna Konanahalli **COMPLIANCE STATUS:** Non Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: FY 2023-24 Complaints: complaint investigations	
RESOLVED COMPLAINTS: C-24-00845, C-24-00846, C-24-00871, C-24-00882, C-24-00903, C-24-00906, C-24-00921, C-24-00927, C-24-00937, C-24-00970, C-24-00971, C-24-00983, C-24-01024, C-24-01025, C-24-01026, C-24-01027, C-24-01028, C-24-01029, C-24-01030, C-24-01031, C-24-01032, C-24-01033, C-24-01052, C-24-01053	

Smiths Creek Landfill (SCL) (N6207)

6779 Smiths Creek Road

Smiths Creek (Kimball), Michigan 48074-3506

FY 2023-24 Complaints

Contacts:

1. **Mathew (Matt) Williams** (Phone: 810-989-6979; Fax: 810-367-3062; Cell: 248-459-3309; E-mail: mWilliams@StClairCounty.org), Landfill Resource Recovery Manager, Responsible Official

2. **Travis C. Heslop** (Phone: 810-989-6918; Fax: 810-367-3062; Cell: NA; E-mail: tHeslop@StClairCounty.org)

3. **Erin Berish** (Phone: 248-560-0725-Direct; Fax: 248-486-5050; Cell: 248-787-4069; E -mail: eBerish@ctiCompanies.com), CTI Senior Project Manager, assisted me. CTI and Associates, Inc., [28001 Cabot Dr., Ste. 250, Novi, MI 48377 (800-CTI-TODAY)] is a consulting company for Smiths Creek Landfill.

4. **Laura Niemann** (Phone: 616-891-2592-Direct; Fax: NA; Cell: 248-787-4069; E-mail: LNiemann@eilLLC.com), Sr. Project Engineer. CTI has contracted out landfill compliance, reporting to Environmental Information Logistics, LLC

5. **Terri Zick**, Director, Compliance Services, CTI and Associates, Inc.

6. **Karry A. Hepting (Phone: 810-989-6900), C.P.A., Administrator/Controller, St. Claire County**

ROP: MI-ROP-N6207-2018 effective June 07, 2018, Expiring June 07, 2023. SCL has an application shield to continue to operate as SCL submitted an administratively complete renewal application in a timely manner. i.e., SCL can legally operate under the existing ROP until a renewal is issued. MI-ROP-N6207-20XX (renewal ROP) is under public participation process and 30-day public comment period ended on November 01, 2023.

Federal regulations: Federal Plan that Implements Emission Guidelines (EG) and Compliance Times (40 CFR Part 62, Subpart OOO) for existing (commenced construction before July 17, 2014) landfill and federal Major Source NESHAP / MACT 4A (40 CFR 63, Subpart AAAA , Landfill NESHAP / MACT 4A). NOT Subject to NSPS 3X (40 CFR Part 60, Subpart XXX).

Michigan Department of Environment, Great Lakes and Energy, Air Quality Division (EGLE-AQD) conducted FY 2023-24 complaint investigations on the dates stated in the following report.

All hydrogen sulfide (H_2S) rotten egg odors were detected by AQD on downwind from the landfill. None was detected upwind. All weather information is based upon information from iPhone at the investigation time. All vacuum pressures are in negative inches (below atmospheric pressure) of water.

October 04,2023, investigation

Old landfill (certified closed) has no active gas collection system (GCS), only solar flare passive collection system. Nor does it have synthetic and natural barriers for leachate collection. This portion is known as inactive landfill with passive gas collection. New RCRA permit has been approved by EGLE-MMD to build RCRA-compliant landfill on top this inactive landfill. Original non-bioreactor landfill is equipped with vertical GCS. All new bioreactor cells (Nos. 3, 4, 8) are primarily equipped with horizontal GCS.

Landfill gas production increased from 1,150 (past years) to 1,400 (September 2023) cfm of LFG containing sulfur-bearing, especially hydrogen sulfide (H_2S), compounds at Cell8. There was no rotten egg H_2S-like odor reported last year in the neighborhood villages according to Matt Williams; and AQD hardly received odor

complaints in past years. Nevertheless, some complainants stated that they smelled odor in previous years.

Although at the main blower near DTE, according to Williams, vacuum was at -55 inches of water, at many locations the vacuum was at -9-11 inches of water due to substantial pressure drop in the piping system. Together with reduced vacuum and increased production of landfill gas (LFG) (from 1,150 (past years) to 1,400 (September 2023) cfm of LFG with sulfur-bearing compounds predominantly hydrogen sulfide or H_2S) resulted in landfill gas migrating to neighboring villages via dispersion in the air.

At bioreactors (primarily Cells 3, 4 & 8 where liquid septage is injected) only horizontal GCS are present. Only Cell8 is alleged to be a source of noxious odors. All active cells are equipped with horizontal gas collectors.

During the complaint investigation of October 04, 2023 (Southerly Wind 10 mph S è N at 81 °F), Solar Flare Nos. 6 & 7 were on fire; the rest were not burning. The flares burn only when LFG, a combustible gas, is detected by rapid sparking system that uses solar batteries. Solar flares (Nos. 1-7) area has only passive (not active) collection system. Most solar flares hardly ever burn as LFG is not produced in this old passive landfill.

On October 04, 2023, I found objectional and overpowering odors on the SCL landfill property near Cell8. During the drive-around with Williams, Berish and Niemann in the villages, I did not detect odor (Southerly Wind 10 mph S to N at 81 °F). The villagers detect intermittent odors. Williams stated that he detected odors in the neighborhood villages in the past. We visited the possible areas where the odors were detected in the past; however, most these areas were not downwind on October 04.

Near the scale house / office, on October 04, I smelled clearly detectable H2S odor. Overpowering odor detected near Cell8.

October 10,2023, investigation

During the complaint investigation of October 10, 2023 (Westerly Wind 10 mph W at 51 °F, 71%RH, 29.73 inches of Hg), when I was driving towards the landfill, I smelled clearly detectable (mild to medium to strong at various locations) odor on Smiths Creek Road near Wadhams Road (downwind) on continuous basis. Hydrogen sulfide (H2S) odor is characterized as obnoxious rotten egg odor. The rotten egg odor is

determined to be Rule 901 violation as cited in by October 25, 2023, Violation Notice (VN).

On the way out on October 10th, I did not detect odor on Smiths Creek Road.

October 18,2023, Surface Emissions Monitoring (SEM)

On October 18, 2023, during the SEM surface emissions monitoring, AQD staff detected, at various locations outside the landfill property, distinct and definite objectionable hydrogen sulfide (H_2S) odor. Safety alarm for H_2S rang several times during SEM. The October 18th odor is determined to be Rule 901 violation.

November 15,2023, investigation

I observed on November 15, 2023 (9 mph SW, 54 °F, 44%RH, 30.16 inches Hg) clearly detectable mild H_2S odor on Smiths Creek Road near Wadhams Road (downwind). The odor was intermittent depending upon the location and wind.

Both DTE SI RICE engines (Engine1 & Engine2) were running at setpoint 1,550 kW. However, between 1-2 PM, Engine1, was repeatedly shutting down due to detonation in Cylinder14. Engine2 was running normally. This interruption in operation of one of the two engines resulted in 2-in-1 flare burning due to excess gas.

On November 15th I toured the surroundings of the landfill with Heslop with following observations:

1. 6639 Smiths Creek Road (1:30 PM): No odor (downwind)
2. Sturdevant Road (1:52 PM): No odor (downwind, north of Smiths Creek Road)
3. 2-in-1 flare was operating
4. Near Cell 8 clearly detectable odor observed although not as bad as October odor.
5. The portable rental flare was operating. No visible emissions (VE). Heat was felt underneath the rental flare burning at 1,200 °F.
6. Garbage odor near Cell8

December 11,2023, investigation

On the way to the landfill on December 11, 2023 (10 mph W, 34 °F, 61%RH, 30.11 inches Hg), I did NOT detect odor on Smiths Creek Road.

December 11,2023, I toured the surroundings of the landfill with Heslop with following observations:

1. Sturdevant Road (3:42 PM) and Holy Trinity Monastery: No odor (downwind, south of Smiths Creek Road)
2. N. Pine River Road (3:50 PM): No odor (downwind)
3. Smiths Creek Road: No odor (downwind)
4. Richmond Road: No odor (upwind)
5. On the landfill property: No odor (upwind and downwind)
6. Hint of H_2S and garbage odors on Cell8
7. -42 inches of water vacuum before condensate knockout at the flare and -34 inches of water vacuum at the manifold where landfill gas (LFG) is pulled.
8. At the portable rental flare, visible flame (VF) was observed (dark outside due to clouds) but no visible emissions (VE). LFG temperature (T) = 113 °F. Flare T = 1,216 °F.
9. The 2-in-1 flare was working. It appears one of the two engines appeared not to be operating based upon the size of the flame.

December 20,2023, investigation

SCL closed the gates at 4PM.

On the way to the landfill on December 20, 2023 (3 mph S, 37 °F Sunny, 66%RH, 30.39 inches Hg), I did NOT detect odor on Smiths Creek Road (4:20PM). It turned dark towards the end of the day.

No landfill gas odor (especially, hydrogen sulfide) was detected at the following locations (downwind):

1. Smiths Creek Road (4:20 PM)
2. Pine River and Smiths Creek Road (4:30 PM)
3. Pine River Road (north of Smiths Creek Road (4:35 PM)
4. Pine River Road (between Ravenswood Road & Smiths Creek Road (4:40 PM))
5. Ravenswood Road (between Pine River Road & Sturdevant Road (4:45 PM))
6. Sturdevant Road (north of Smiths Creek Road (4:50 PM)
7. Smiths Creek Landfill (SCL) gate (4:53 PM)
8. Smiths Creek Road: A large flame was visible at the main 2-in-1 flare near DTE from Smiths Creek Road. A visible flame was observed without visible emissions (VE) at

5:20 PM (dark). It appeared one of the two engines (possibly both engines) was not operating based upon the size of the flame.

9. **Richmond Road (north of Smiths Creek Road (5:35 PM))**

10. **be operating based upon the size of the flame.**

February 08,2024, investigation

On the way to the landfill on February 08,2024, (11 mph SSE, 49 °F Sunny, 53%RH, 30.3 inches Hg), I did NOT detect hydrogen sulfide odor on Smiths Creek Road (12:20 -1 PM). On February 08, Jeff Benya (EGLE-AQD, Detroit) accompanied me to monitor methane (CH_4) and hydrogen sulfide (H_2S) using portable instruments. We met Cody Kirkum (Cell: 586-557-4544), DTE Biomass plant operator, who stated that LFG contained 900 ppm hydrogen sulfide on this day. The LFG CAT 1.6 MW SI RICE engines (2) were shut down to facilitate like-for-like swapping of one of two engines. The other engine will also be swapped soon. After swapping both engines, annual NSPS 4J stack testing will be performed.

Because both engines (2) were shut down on February 08, large flame was present atop 2-in-1 flare. It was uncomfortably hot underneath the flare when ambient temperature was 49 °F Sunny.

About 1-1:30 pm on February 08, we monitored methane and hydrogen sulfide (Jerome H_2S Monitor) using portable instruments. Hydrogen sulfide was detected as 0 ppb and methane was at background level at various locations (condensate drains 1 & 2, 52-gallon used oil drums 1 & 2 and other areas surrounding the engines). New valves (2) have been installed at the drains. New filters have been installed at the 52-gallon used oil drums.

PLC controls which 2-in-1 one flare pipe of two pipes (10-inch diameter pipe with 2,000 cfm capacity or 3-inch diameter pipe with a 30-200 cfm capacity) to use based upon volumetric flow rate of LFG.

Using Jerome H_2S Monitor, we surveyed for hydrogen sulfide at various locations focusing on downwind areas (Smiths Creek Landfill gates, Smiths Creek Road, RR Crossing at Smiths Creek Road, Richmond Road, etc.). Jerome detected 0 ppb hydrogen sulfide at all locations. We did NOT detect (nasally) hydrogen sulfide odor either at all previously mentioned locations.

March 29,2024, investigation

On the way to the landfill on March 29, 2024 (9 mph NW, 46 °F Sunny, 45%RH, 30.03 inches Hg), I did NOT detect hydrogen sulfide odor on Smiths Creek Road (1 PM).

Location #01 = Entire Smits Creek Road (1:20 pm. Location #02 = Sturdevat Road (4 pm. South of Smiths Creek Road). Location #03 = Warrens Lane (4 pm. South of Smiths Creek Road). No odor at any of three above mentioned locations.

Northwest monitor read 9 ppb at 2 pm. The portable flare to be replaced next week increasing LFG flow rate from 400 cfm (existing) to 1,000 cfm (new). Main flare (DTE area), upon debottlenecking, now produces negative 15-20 inches of water vacuum compared the previous vacuums of negative 10 inches of water vacuum around Cell 8.

When new 1,000 cfm flare is installed, five (5) wells will be connected to the new flare instead of current three (3) wells.

May 01,2024, investigation

On the way to the landfill on May 01,2024 (15 mph SSW, 72 °F Sunny, 56%RH, 29.80 inches Hg), I did NOT detect hydrogen sulfide odor on Smiths Creek Road (1 PM).

1. Location #01 = Entire Smits Creek Road (1 pm). No odor.

2. Location #02 = Inside and around SCL office building = No odor. Reading = 0.00 ppb H2S.

3. Location #03 (2:46 pm) = Near and around the portable flare = No odor. Reading = 0.00 ppb H2S.

4. Location #04 (3:06 pm) = SCL Main Gate = No odor. Reading = 0.00 ppb H2S.

5. Location #05 (3:08 pm) = 6639 Smiths Creek Road = No odor. Reading = 0.00 ppb H2S.

6. **Location #06 (3:10 pm) = Smiths Creek Road & Sturdevant = No odor. Reading = 0.00 ppb H2S**

7. **Location #07 (3:13 pm) = Ravenwood Road & Sturdevant = No odor. Reading = 0.00 ppb H2S**

8. **Location #08 (3:18 pm) = Ravenwood Road & Richmon = No odor. Reading = 0.00 ppb H2S**

New flare (1,000 cfm) has been installed and operating and hydrogen sulfide contained in LFG is removed using dry scrubber (see below)

During May 01,2024, odor survey, Heslop accompanied me with H2S measuring instruments.

Odor control measures

The St. Clair County has allocated $400,000 towards additional gas collection lines. DTE increased vacuum from -50 inches to -59 inches of water at the main blower to increase vacuum at Cell8. SCL has completed installation of LFG capture perimeter interceptor pipes (1,200 ft total length, 6 inches diameter, perforated pipes) and the pipes have been buried 4-5 feet deep. The perimeter construction was completed by late December 2023. SCL stopped accepting septage since September 22, 2023. The portable rental flare has been hooked up to a couple of Cell8 critical headers and the flare has been operating burning 400-500 cfm landfill gas at 1,200 °F. The portable flare's blower is producing over -30 inches of water vacuum in three wells of Cell8. Between two blowers (main & portable), the gas collection systems are collecting 1,850 cfm instead of 1,500 cfm with only one main blower. Upon debottlenecking, the main blower producing -15 to -18 inches of water vacuum at Cell8. The portable flare is burning about 500 cfm from Cell8 without opacity or visible emissions (VE). SCL has hired TetraTech for air monitoring.

The perimeter interceptor pipes are currently (February 2024) operating at -3 inches of water vacuum. At higher vacuum, too much air intrusion occurs. Landfill cover needs to be improved to increase vacuum at the perimeter such that air intrusion is prevented. New portable flare, which is being manufactured, of higher capacity (1,000 cfm) will be installed by beginning of April 2024 replacing current portable flare (400 cfm).

New flare and scrubber

INTERRA GLOBAL (164 S. Prospect Ave, Park Ridge IL 60068. https://www.interraglobal.com. 847-292-8600) portable flare has been installed and operating (VAV675M-CRSS-36-8ST. Serial No. 23015301). The flare replacement occurred on March 21, 2024. The scrubber media was filled with granular adsorbent material (small pebble stone size). The Interra flare (1,000 cfm) is equipped with a self-igniter. A malfunction notification system has not been installed yet.

FerroSorp®, H2S Removal Media granular material (bulk density = 36 pound per cubic feet), by INTERRA GLOBAL, is used to pack the dry scrubber. The gas flow is horizontal. FerroSorp® material easily removes Hydrogen Sulfide (H2S) from a gas stream in landfill gas applications.

The dry scrubber causes some pressure dop reducing available vacuum at the wells. The adsorption media material is designed to cause low differential pressure drops (ΔP) across the media. The LFG gas is flowing in horizontal direction. A vacuum truck can be used to easily remove the spent material.

The removal of H_2S from a gas stream, utilizing a pelletized gas purification compound based on iron hydroxide (FeO(OH)) with highly porous surface, can be described through the following chemical reactions:

1. **Adsorption: $2\ Fe(OH)_3 + 3\ H_2S \rightarrow Fe_2S_3 + 6\ H_2O$ (adsorption with chemical reaction or chemisorption)**
2. **Regeneration: $Fe_2S_3 + 1^1/_2\ O_2 + 3\ H_2O \rightarrow 2\ Fe(OH)_3 + 3\ S$**

The adsorption (chemisorption or specifically FerroSorption) is based on palletized iron hydroxide (FeO(OH)). Moisture content of LFG can affect the chemisorption.

Currently Dreger Tube H2S readings are taken at the inlet and outlet of the scrubber by CTI of Farmington Hills. On May 01, 2024 (2:50 pm) inlet LFG temperature = 118 °F and outlet combustion products temperature = 1,230°F.

NAME J Shenanahall. _____ **DATE** 05-07-2024 **SUPERVISOR** Joyce St