

DEPARTMENT OF ENVIRONMENTAL QUALITY  
 AIR QUALITY DIVISION  
 ACTIVITY REPORT: Self Initiated Inspection

N268848383

FACILITY: Advanced Disposal Services Arbor Hills Landfill Inc		SRN / ID: N2688
LOCATION: 10690 W. SIX MILE RD, NORTHVILLE		DISTRICT: Jackson
CITY: NORTHVILLE		COUNTY: WASHTENAW
CONTACT:		ACTIVITY DATE: 04/02/2019
STAFF: Mike Kovalchick	COMPLIANCE STATUS: Non Compliance	
SUBJECT: Elevated Temperature Landfill (ETLF) Event visit.		SOURCE CLASS: MAJOR
RESOLVED COMPLAINTS:		

On April 2, 2019, I conducted unannounced compliance inspection of Advanced Disposal Services (ADS) Arbor Hills landfill located in Northville, Michigan (Washtenaw County) at 10690 6 Mile Road. The purpose of this inspection was to determine the facility's compliance status with applicable federal and state air pollution regulations, particularly Michigan Act 451, Part 55, Air Pollution Control Act and administrative rules, conditions of the ADS's Renewable Operating Permit (ROP) number MI-ROP-N2688-2011a and Permit to Install (PTI) permits 19-17B and 79-17. The inspection was also conducted to support on-going EGLE efforts at negotiating a proposed Consent Order with ADS to resolve previously identified violations.

Some background information. Just after our meeting with ADS last week, Anthony gave Diane a request for Alternate Operating Standard for temperature for a number of wells at the landfill. It included carbon monoxide concentrations for some of the high temperature wells. We finally got a chance to look at it. It turns out that CO levels from AHW272R2 were alarming. They recorded a reading of 14,400 ppm back in January for this well. Note that this very well sits directly over top of the approximately 1 acre area of subsidence that recently occurred on the upper North slope. Anything over 1000 ppm suggests the possibility of a near surface low/no oxygen smoldering style fire especially combined with the area of subsidence. (A more recent attempt at taking a CO reading using a draeger tube failed. The tube simply turned pink which possibly means that it was saturated with CO or otherwise contaminated.) Diane and I alerted Larry B. about this issue yesterday. I decided that this issue may not be as nearly as benign as it appeared to be presented to us at last week's meeting and decided to dig deeper into it. Note: I contacted Art O. about obtaining a thermal camera since this could prove to be useful in investigating this problem. (Should have it in hand later this week for a future visit.)

It appears that this event has all the ear marks of an ETLF event.

They include:

- 1) Hot gas wells. We now have approximately 35 acres on the landfill that contains elevated well temperatures despite the wells in many cases being saturated with water.
- 2) Increased hydrogen content in the landfill gas along with increased odors. AHW272R2 contains 5.86% hydrogen with elevated hydrogen in several others. Yes on the rather acrid/burning type gas odor.
- 3) Rapid Landfill settlement. New 1 acre of the North side.
- 4) Increased leachate volume/strength/breakouts. We have the TS-01 leachate seep that appears directly tied into the high temperature areas. It has very high biological oxygen demand containing basically zero percent oxygen. We have whole system wide problem of water logged wells which is aggravated by boiling all the liquid out of the waste mass itself.
- 5) Low methane content vs CO2 content. We now have numerous wells at the problem area showing the ratio at less than 1. (Recall the discussion about needing a new propane gas assisted flare for the top to direct bad gas to it so not to degrade what is flowing to Fortistar after the dewatering project.)

Good read on this can be found here: <https://www.waste360.com/landfill-operations/diagnosing-and-understanding-elevated-temperature-landfills-part-1>

Other areas of concern from this type of phenomena includes an increase in toxic air emissions such as benzene, dangerous ground level concentrations of CO which is a threat to landfill workers, the possibility of slope failures after a heavy rain event, sudden sink holes, and pressurized leachate geysers. Also the gas well collection degrades/could be destroyed as the high temperature wave front migrates to new areas of the landfill. (Note this area sits over a liner that was placed on the unlined western part of Arbor Hills East section of the

landfill. Waste stacked on top of this liner is considered Arbor Hills West. Liners can be destroyed by high heat.)

I decided to head back to the landfill this morning to meet with Mark Johnson to discuss. I arrived around 8:30 am and noted moderate gas odors near the compost entrance turnoff on 6-mile road. H<sub>2</sub>S meter reading was a slightly elevated 0.005 ppm. I meet with Mark till about 10:30 am which included a quick visit to the top. Note that the candlestick flare was burning as there was a stack test scheduled for it today. (Diane attending.)

I discussed my concerns that this issue may be more serious than what we understood from the last week as we were not well versed on this topic so really didn't understand what you were trying to tell us. I mentioned that I was worried that this could progress. I mentioned the very extensive area at the landfill that does have excess well temperatures and this has now gone on since 2017 and perhaps before suggesting it indeed has spread. He said that excess temperature has likely spread way beyond the actual area of the active underground event. (He says landfill industry has very specific verbiage on what to call these types of exothermic combustion like reactions that does not contain the word "fire". Flames would only be present if it actually breaks out to the surface. ) He says that it is currently impossible to accurately characterize the size/severity of the problem until the wells up top are dewatered so they can take accurate temperature/gas measurements in the wells. He says he expects that they won't have good data to draw firm conclusions until about Mid-May. He says they are also currently working with a consulting firm on the placement of a temporary liner on the North side of the landfill to contain odors and prevent oxygen infiltration into the high temp area. I asked why not put this on top as well. Mark said that there is plenty of layers of cover up there and no odors so should be okay. They are proceeding with moving forward with above ground piping system to the top so that the pumps can be installed in the wells to dewater that area.

I asked Mark that these type of events usually degrade/destroy the gas collection system and was that occurring yet? He mentioned that type of well casing that they have used historically loses its rigidity at around 150 degrees F. Compaction pressure then generally pinches off the wells. (Note all the high number of pinched wells.) Based on the likely soil temperatures, it does appear that the elevated temperature area is in fact starting to destroy wells and associated piping. He did mention that the new wells they are putting in are resistant to high temperature.

I told Mark that I didn't think myself/DEQ necessarily has the expertise to properly oversee this developing situation. I mentioned that I would be recommending to Scott that we consider contacting EPA to review all the well data (they have the data but I don't believe they have bothered to look at it), do a site tour, meet with the company, look at their compliance plan and make sure they are addressing the issue properly as the consequences could be severe otherwise if not done correctly. It also makes sense to seek EPA involvement in the matter due to their existing Consent Order with Advanced which includes issues with the well collection system. Mark seemed to welcome EPA's possible involvement. (Note: Greg M. is out this week so didn't get a chance for his perspective on the potential severity of the matter. It may be that he is well versed enough on ETLF's events that he can oversee the resolution of this issue?)

Briefly discussed the Asbestos issue. He noted that due to long term contracts, new friable asbestos disposal fees would not go into effect until May 1. At that time, he expects asbestos disposal to drop to zero. He did say that they have acquired asbestos disposal signs.

Mark mentioned that the aeration system at the two Frac tanks should start up in the next week. It should make a noticeable difference in reducing leachate related odors.

Discussed Bob Nix with Northville Township. Mark was very frustrated that talks with him are going nowhere regarding increasing the amount of leachate through the township sewers to Yucca from 100,000 to 250,000 gallons per day. (He thinks it will take at least a year to return to normal levels. The ten day period granted by the township to increase the pump rate will accomplish basically nothing.) He says it is absolutely imperative that they dewater the landfill to address the temperature issue. He says logistically pumping the extra leachate out via a truck is a problem. They don't have a private source that can handle the amounts of leachate that will need to be disposed of. He says they might have to fund an upgrade at Yucca which will allow them to directly truck leachate to this facility. He is worried that this will delay everything.

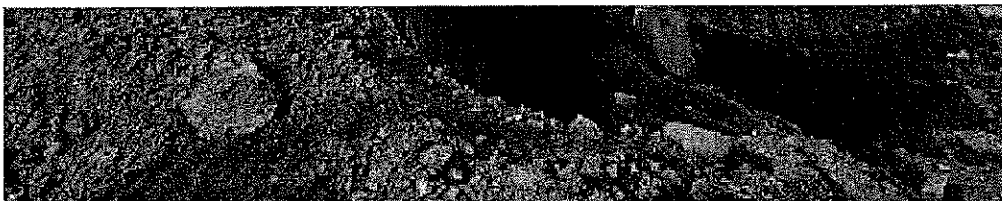
Took a brief trip to the subsidence area. I immediately noted a well adjacent to the subsidence area that was steaming. The well head had come off. Mark didn't know why it was off but suspected it was bumped off by a dozer. I asked if increased landfill gas pressure had caused it? (Common with ETLF's.) He said probably not. He attempted to place the well head back on but it immediately came off again. He mentioned he needed to go get a screw driver to secure it properly.

The area where we witnessed the small bubbling geyser last week was still active. It appears to have grown somewhat in size with several bubbling areas now present in a small line. It appears that they attempted to cover it up with more dirt but it seemly broke through again. Same acrid/burned gas smell as before. I tested it for methane and H<sub>2</sub>S. H<sub>2</sub>S came in at similar levels to last time. The methane meter quickly pegged out at its 10,000 ppm limit. Mark was surprised by this as it should contain little if any methane since methyl genesis had liked stopped. (I looked into this issue, it appears our meter likely mistook hydrogen for methane.)

Mark believes that EQ lime waste is the likely initial cause of the high temperature. I walked over to AHW272R2. Nothing very noteworthy. The well appeared to be functioning. It was warm to the touch but nothing unusual. Mark mentioned that they already had come out with a thermal camera to this area. He said it showed a spider like pattern of elevated temperatures that corresponded to the ground fissures prior to covering the area of soil. He said it was elevated by about 20 degrees F. He said that they put a temperature probe in the ground down about 18" inches and recorded a temperature of about 170 degrees F. in the vicinity of the subsidence area. Nothing else to report other than strong petroleum odors at the top due to the contaminated soil disposal that was occurring.



**Image 1(Boiling Gas)** : Boiling gas coming out of the ground near subsidence area.





**Image 3(Leaking gas well)** : Gas well with well head knocked off releasing heated landfill gas into the atmosphere.

NAME M. Kowalchuk

DATE 10/14/19

SUPERVISOR 