

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

N268849917

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: 08/15/2019
STAFF: Mike Kovalchick	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: MAJOR
SUBJECT: Documents EGLE and MaxKrause, US EPA site visit, meeting and tour. Pre-planned with ADS and Fortistar in order to review well data and observe technician conducting well monitoring. In part follow up to ETLF and monthly reports. ADS management present and AQD and MMD District staff.		
RESOLVED COMPLAINTS:		

On August 15, 2019, we conducted announced 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.

We arrived at the office parking lot at 9 am. (Myself, Scott, Diane, Larry, Greg M., Max.) We met with quite a few ADS personnel including Mark, Anthony and several others including corporate representation (Jay Warzinski, VP; Todd Whittle, East Region LF Mgr.; Randy Frank, Mgr. LF Gas Program; Brian Sanders (new) Operations) and Fortistar personnel Carlos and a Gas Well Technician (name?). 2 pick-up trucks were provided for the tour.

We first stopped at the Leachate tank farm area. Mark gave an explanation of how the system worked to the group. Some odors were noted downwind of the tanks. Jerome H2S readings of only .003 ppm were noted. Based on the intensity of the odors, it appears the odors consisted of more than just H2S. Some evidence of past spills of leachate were observed around the tanks and associated aeration/control equipment/loading docks. This included dead vegetation. (See attached photos.) Individual carbon cannisters appeared to be being used to control emissions from the 2 smaller green bullet tanks that are currently empty. The carbon systems and aeration are also being used on the larger Green Tank (West LF) and Blue Tank ( East LF) however these were not clearly observed. Todd and Brain informed us that these carbon systems are to be upgraded in the near future.

We proceeded to the south edge of the top of the hill. There we were meet by the representatives of Fortistar who were there to demonstrate taking gas well head readings. I had previously indicated to ADS that we would like to have them do this for well 259R3 and adjacent well 290. Of the WO1 wells, these 2 showed the most evidence of the gas samples being contaminated with air. A gas technician took readings from both wells using an Envision ENV200 Gas Analyzer. (Refer to <http://www.raeco.com/products/gasmonitoring/Elkins-earthworks-Envision-landfill-gas-monitor.html> ) See attached photos which include screen shots of readings for both wells. The gas analyzer itself was carried in a backpack with 4 plastic tubes that are used to connect to the well head. Separately, a tablet is used to display the gas readings which connects wirelessly to the backpack. Gas is drawn through the analyzer for 300 seconds before a final reading is recorded although values appear to stabilize long before that time.

Well 259R3 showed only 12.27 % methane, a high 9.5 % oxygen, high balance gas reading of 69.23% and a temperature of only 94.1 F. I didn't see the gas flow rate but knew that it was very low as the valve had been turned nearly off due to the high levels of oxygen that exceeded the NSPS. (July well data showed flow to between 2 to 6 scfm.) Well bore hole data taken in April 2019 showed temperatures at depth of 175 degrees F, which shows how unrepresentative the temperature data is for this well. Based on both the high oxygen/balance gas readings, the temperature of the gas is being highly diluted by air. Furthermore, the very low gas flow rate also would tend to lower the temperature. Note that the well head on 259R3 was at a sharp angle due to being pushed over by dirt coming down the side of the hill. Mark asked Anthony why this well was in this condition?

Mark also asked Anthony to do a downhole camera survey to see if they could locate the source of the air infiltration or if the well had become pinched off or otherwise damaged.

Well 290 was just above 259R3 and located on plateau on top of the hill. The well head itself also had been pushed over at an angle. For this well, methane was at 31.7%, Oxygen 0.12%, balance gas at 55.3% and a

temperature of 126.1 degrees F. July well data showed flow at 8 scfm. This is much lower than previously reported as the orifice plate data inputted in the ENV200 had been .4" instead of 1" actual. Mark also asked Anthony to do a down camera evaluation of this well also. The data from this well is quite different than nearby well 259R3. This well had an odd combination of low oxygen but high balance gas that is assumed to be nitrogen or otherwise air. It appears that oxygen is getting used up underground with the nitrogen unreacted. It is possible that the air intrusion in this well is occurring at a greater depth than hole 259R3. There was also some discussion that perhaps the balance gas doesn't really contain nitrogen but something else. (Note: Balance gas % is determined by mass balance, not directly.) Max suggested one gas to test for is ammonia but seems like a long shot that the gas will have significant levels of that. See attached photo of well.

Next, we proceeded to the subsidence area on the north side of the hill top plateau. From the top, I was able to see that fresh dirt had been placed on the seam area just below the geomembrane liner where I had detected high levels of methane the previous day. I also could see that the odorous pile of uncomposted material that was present the previous day had been removed. See attached photo that shows the new areas of dirt and the distant compost area. With everyone else remaining up top, I descended to the base of the subsidence area which is bowl shaped to take H<sub>2</sub>S and methane readings. As from the previous day, very high levels of odors were encountered and significant levels of both H<sub>2</sub>S and methane were detected. As before, the highest levels of methane (saturated meter so above 10,000 ppm) were detected in a dry stream bed/ditch that drained the subsidence area. It was at least 4 ft deep in places with some trash visible on the sides of the ditch. H<sub>2</sub>S reading as high as 5 ppm were detected in the ditch. (I think I heard that there was some suggestion that more dirt was going to be placed below the subsidence area within the next few days but not sure. )

Next, we proceeded to TS-01. The three leachate containment ponds were lower than previous visits. Very significant H<sub>2</sub>S odors were noted. Visible holes in the ground where the gas was seen coming out of the ground during previous visits were no longer present. H<sub>2</sub>S readings were as high as 4 ppm although likely the most concentrated area was not sampled out of abundance of caution. Max took some temperature readings using a simple IR device. I saw a value of 118 degrees F. on the ground near the actual TS-01 sump head. I took methane readings at a number of locations around TS-01. Unexpectedly, no methane was detected. This was the first time anywhere at the landfill, that high H<sub>2</sub>S levels were present coming out of the ground unaccompanied with methane. Not sure of the significance of this. Mark reiterated that this project of fixing TS-01 is to start in Mid-September. See attached photos.

Next, we proceeded to the 2 frac tanks. Wastewater from the TS-01 sump has been directed to these 2 frac tanks for all of 2019. Aeration is being used in both tanks in order to encourage sulfides to remain in solution. An anti-foaming agent is also being added. More recently, some type of ion-exchange system has been installed as way to remove PFAS compounds (and maybe also phenolics since it is above discharge limits) from the liquid. This was due to recent TS-01 samples that showed high levels of various types of PFAS. (See attached results sheet for TS-01). Lesser but still significant levels were detected in the liquid from AHW, AHE, AHW condensate and also in the outfall. Results from all of these were attached to the August WOI report that we received yesterday for the month of July. PFAS air emissions remain untested/unquantified. It appears that ADS is concerned about PFAS landfill wide and is considering onsite treatment for all the leachate for PFAS. Ultimately, they want a system setup so that all the leachate can be discharged into the sanitary sewer. Observations of the frac tanks showed some foam (PFAS foam?) being emitted out the top of the tanks. There was also significant build-up of material around the frac tank vents. (See attached photos.) The frac tanks remain highly odorous. I recorded elevated H<sub>2</sub>S readings in the 0.02 ppm to 0.04 range standing about 100 feet downwind. (Mark still insists that there is no H<sub>2</sub>S being emitted from the frac tanks despite the Jerome readings to the contrary. He felt the H<sub>2</sub>S must be coming from somewhere else.)

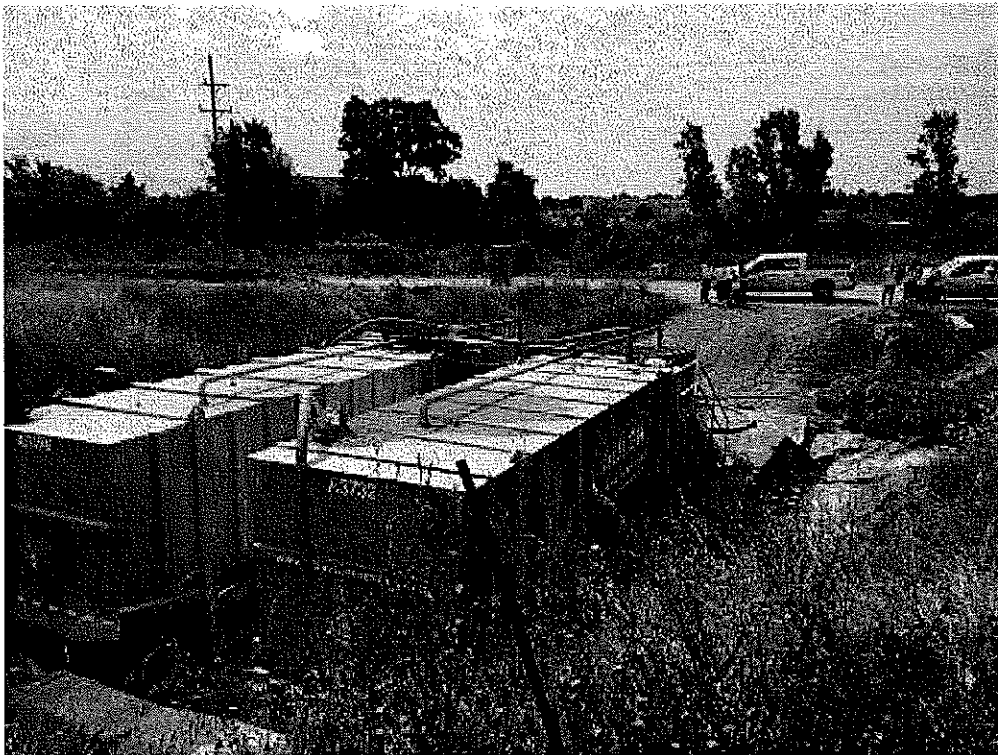
We then proceeded to the office conference room to wrap-up the tour. A number of topics were touched on. ADS presented a series of maps from 2010 to the present that show where waste had been placed in the landfill and to what elevation. It is in these area where the problematic EQ waste was placed. Overall, it appeared that the elevated temperatures coincided with the waste locations. ADS also presented records that included the specific break down of the various types of waste and quantities accepted and placed in the landfill each year by major category for example, MSW, Sludges, etc... They also provided some analytical data for the EQ waste. (The analytical data was also attached to the August WOI report.) A total of 1.2 million tons of EQ waste had been disposed of as previously reported. I noted that the amount of sewage sludge waste appears to have increased since 2016 despite previously expressed concerns about odors. Approximately 70,000 tons of sludge was received in 2018. This week, record high waste volumes were being received by landfill. A maximum daily total of 22,000 tons were received in one day. Only about 4000 to 6000 tons of it were considered MSW with most being of the contaminated soils, and some clean soils. C&D was also observed being landfilled on top. ADS said they have a contractor that will be taking downhole temperature measurements at 10 foot intervals for

all the WOI wells. This should start in a couple of weeks with data expected to be presented in the WOI Report that comes out in September. This dataset should rather definitely give us some useable temperature data of which to make some final conclusions on the extent/severity of the ETLF. Max requested leachate volumes going back to 2016. Mark indicated that they do have that data and can provide it but there is many problems with it. He thinks the data starting in June 2019 is of high enough quality to start drawing conclusions from. There was some discussion about the pH of the landfill. Arbor Hills is showing high levels of pH above 8 which is interesting. Other ETLF landfills have shown low pH. This is due to hydrogen being released from the chemical reactions that gets into solution and lowers the pH. Hydrogen levels (and CO) in the WOI wells remain low suggesting no higher temperature pyrolysis reaction going on. Some discussion that this situation is still in the early stages of an ETLF event and if appropriate measures are followed, the more advanced stages may be prevented from occurring. Everyone agreed we still need more and better data.

I did a brief review of the August WOI report (received late 8/15). Doesn't appear to be any real significant changes. The report didn't include any leachate volume information. (I think we wanted them to add that to the report.) It did include a tab showing 3 month trends for all the WOI wells with some written commentary for each well. Based on the data, it is clear the temperature/flow data that has been presented to date has been unsatisfactory. More than 40 wells were found to have problems with orifice plate measurements that messed up the gas flow readings. In particular, it showed the higher gas flow trends from the top of the hill that we saw in the data were erroneous. Overall, these wells remained tuned/mostly closed in order to prevent oxygen infiltration into the landfill. These same wells generally had little liquid in them to begin with so it raises a concern that heat is not being removed to an appreciable degree other than from the wells that are lower down/lateral to the WOI wells which have higher flow rates and much higher levels of liquid currently in them.

Anthony informed DKV that the Robotics Drone Company is planning to conduct their required 3<sup>rd</sup> Quarter SEMs of AHLF at the same time as the traditional walking SEM. (must be forthcoming in August or September)

Enclosed Flares – the two existing Flares have still not been refurbished (to bring them up to their original maximum capacity). Per Anthony there is still no schedule to do so. He had a recent email with John Zink (manufacturer) and told them they want this done by the end of the year. Stack Testing will need to be conducted afterwards. There was a recent unplanned DTE shutdown of the Fortistar Plant on 8/7 @ 5 pm to 10 pm. Per Anthony the Flare compound operated properly. All three flares turned on to control landfill gas at @ 9800 scfm and 78 inches vacuum he said.



**Image 1(Frac tanks) :** Frac tanks



**Image 2(Bullet tank carbon) :** Bullet tank carbon units.



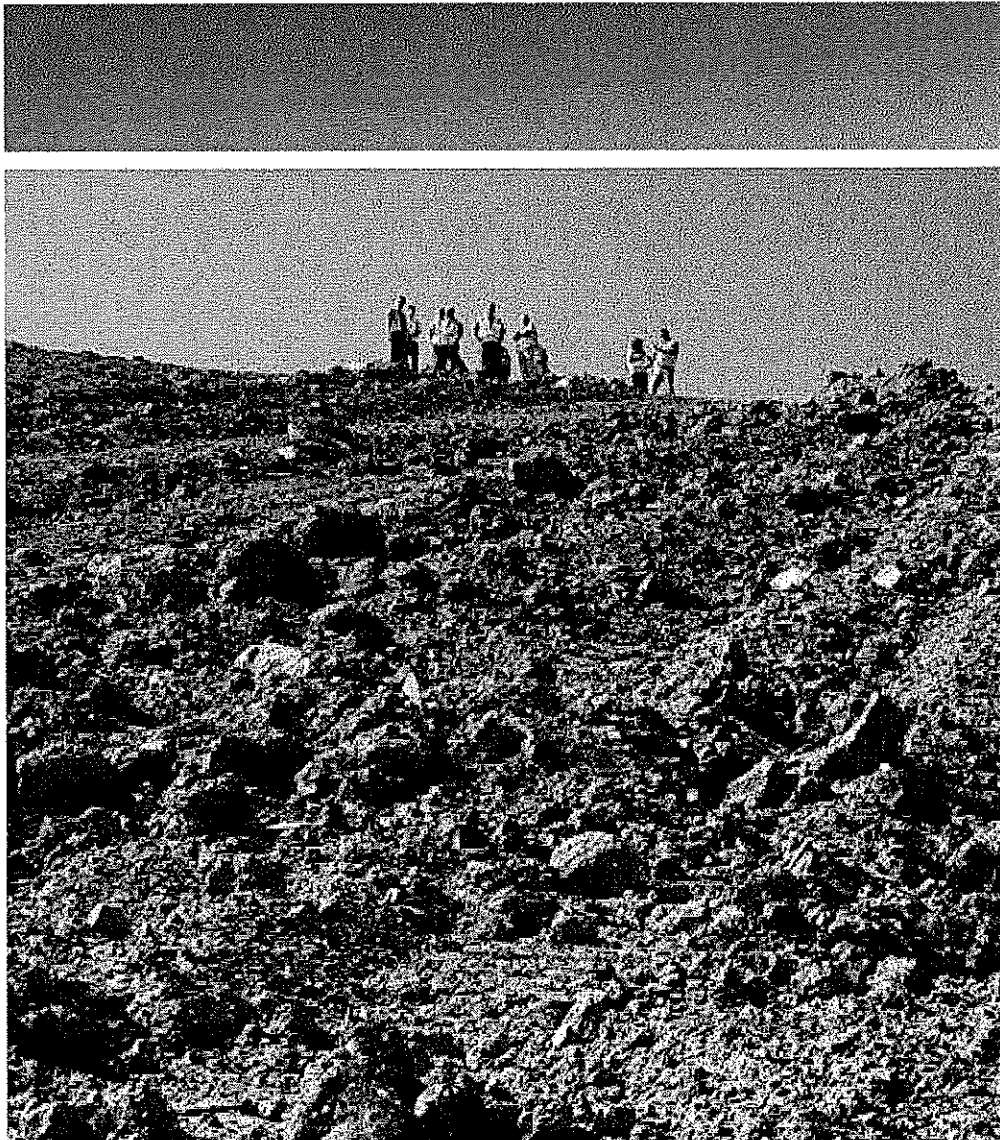


Image 4(North slope) : North slope

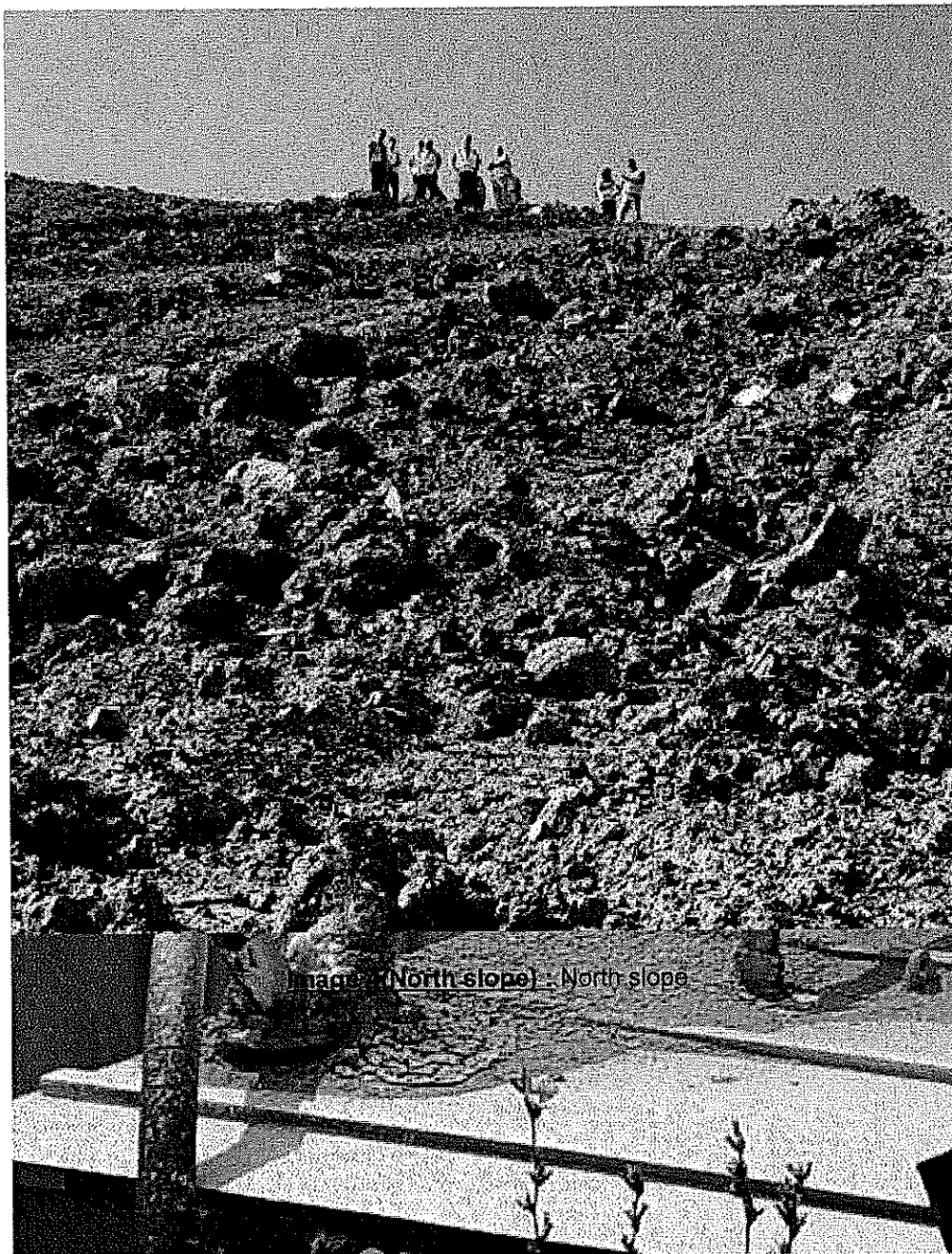
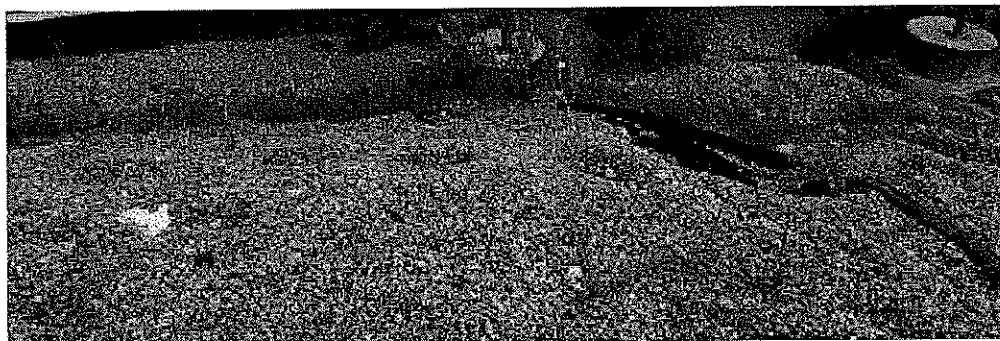


Image 5(North slope) : North slope

Image 6(Frac tank top) : Frac tank top showing deposit of unknown substance.



Image

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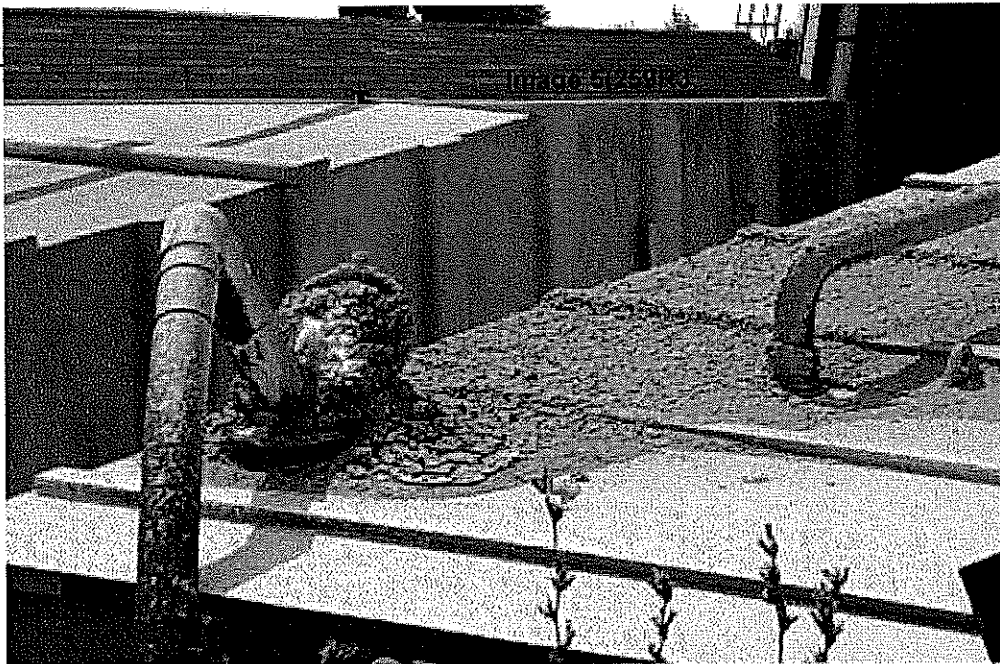


Image 5(Well 290)

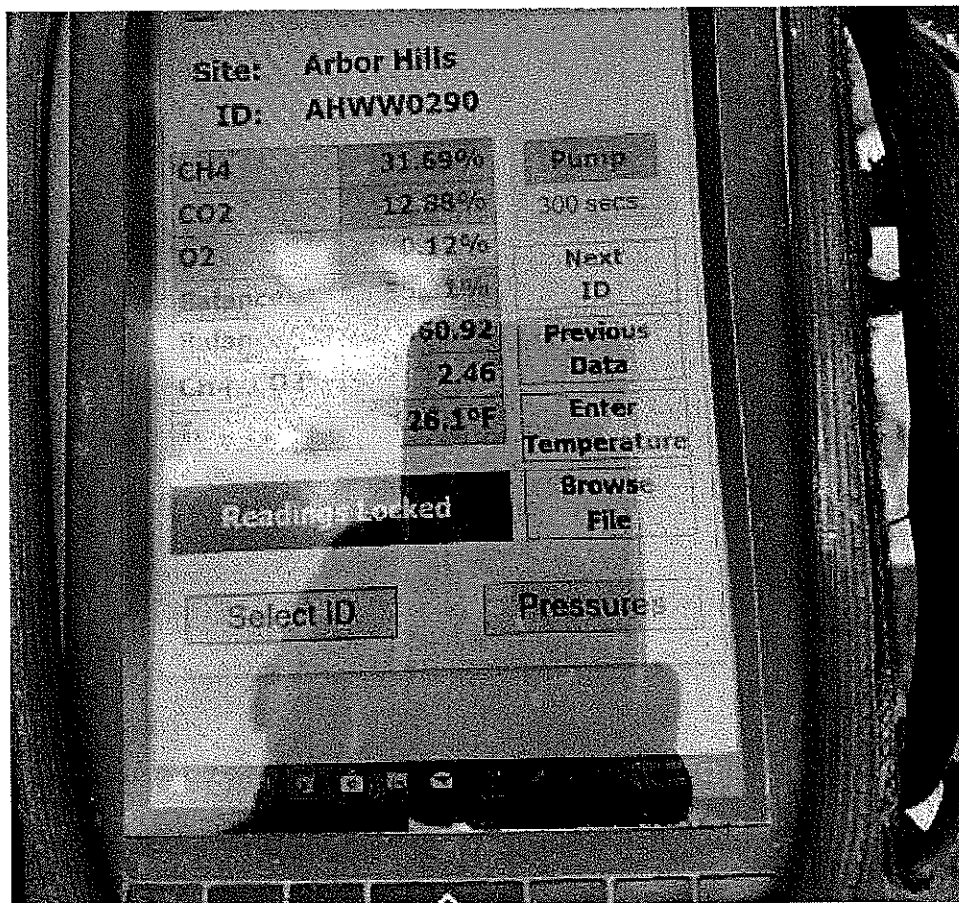


Image 6(Well tank top) : Flac tank top showing deposit of unknown substance

Image 8(Well 290) : Well 290

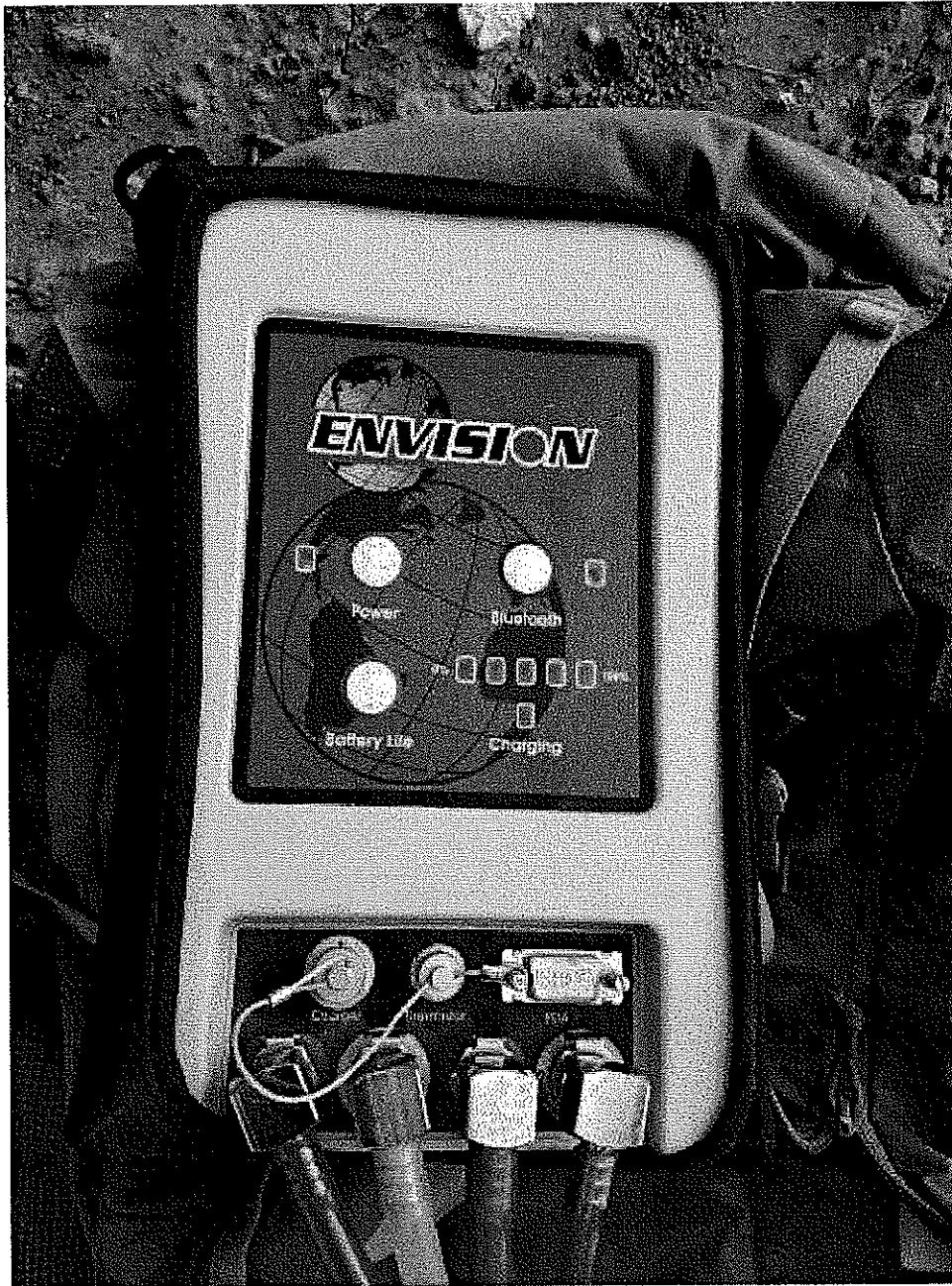


Image 9/18/2018 Wed 12:03 PM AHW0290 site pond.



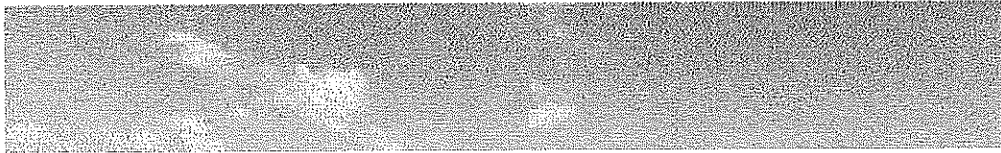






**Image 11(Well head device)** : Well head gas meter.





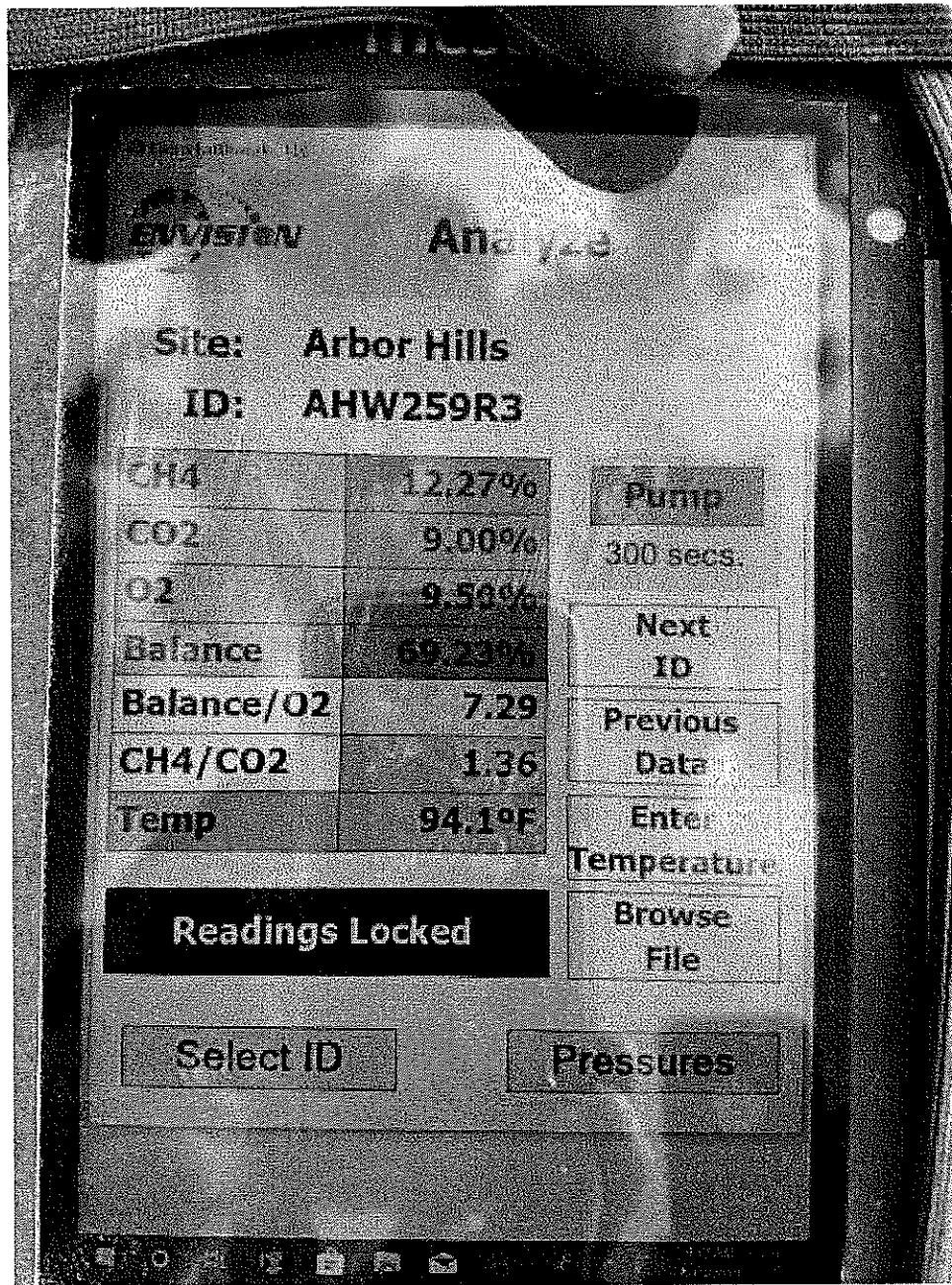
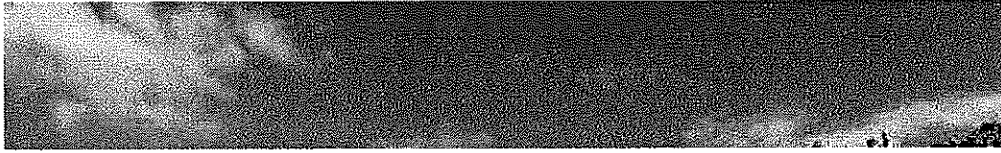


Image 13(Well 259R3 data) : Well 259R3 data.





NAME M. Kovalchuk

DATE 10/14/19

SUPERVISOR 