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TRCcompanies.com

February 21, 2023

Ms. Cindy Koepke
Hydrogeologist
Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711

Subject: Refuse Hideaway Landfill
January 2023 Operation Monitoring and Maintenance Activities

Dear Cindy:

TRC completed the following operation, monitoring, and maintenance activities and system troubleshooting at the Refuse Hideaway Landfill in Middleton, WI in January 2023.

- January 4, 2023 – Biweekly Site Visit
- January 18, 2023 – Gas Probe Monitoring
- January 25, 2023 – Monthly Site Inspection

Electrical Upgrades

TRC is working with an electrical subcontractor to restore electrical service to the Site to allow for system operation.

Gas Extraction System

The gas extraction system (GES) was restarted in October 2022 and was operated until December 15, 2022 when an overvoltage fault was observed and the system was shut down until the electrical service issue is resolved.

Perimeter gas probe monitoring was conducted at the site on January 18, 2023.

Field data from system and gas probe monitoring is included in the attachments.

Leachate Extraction System

The leachate extraction system remained off during the month of January due to the electrical issues to the Site.

The leachate tank level was gauged during the January 25, 2023, Monthly Site Inspection and contained 62 inches of leachate.

Cap Inspection

Due to snow cover, TRC was unable to conduct a monthly inspection of the landfill cap and stormwater conveyance features in January 2023.

Monitoring results collected during the site visit completed in January 2023 are attached.

If you have any questions, please contact me at astehn@trccompanies.com or 608-807-8112.

Sincerely,

TRC

Katherine Vater, PE
Senior Project Engineer

Andrew Stehn, PE
Project Manager

Attachments: January 2023 Monitoring Results

January 2023 Monitoring Results

REFUSE HIDEAWAY LANDFILL
GAS PROBE MONITORING FORM

TECHNICIAN(S): J. Roelke

DATE: 1/18/2023

START TIME: 7:44 AM

END TIME: 1:00 PM

GAS/INSTRUMENT TYPE: **GEM 5000**

SERIAL NO.: Rental: FA02503

DATE LAST CALIBRATED: 1/18/2023

METHOD: Standard Calibration Gases

PRESS INSTRUMENT : Manometer

WEATHER CONDITIONS: cloudy

TEMPERATURE: 33 °F

BAROMETRIC PRESSURE & TREND: 30.04 in. Hg, rising

GROUND CONDITIONS: frozen

GAS PROBE NAME	Time	PRESSURE (in. WC)	METHANE (% LEL)	METHANE (%, by vol.)	CARBON DIOXIDE (%, by vol.)	OXYGEN (%, by vol.)	COMMENTS
GP-1D	8:15	0.0	0.0	0.0	2.8	18.3	(2)
GP-1S	8:17	0.0	0.0	0.0	0.0	20.8	(2)
GP-2D	8:22	0.02	0.0	0.0	0.8	20.2	(1)
GP-2S	8:24	0.0	0.0	0.0	0.0	20.8	(1)
GP-3	8:27	0.0	20	1.0	1.8	19.8	(1)
GP-4	8:34	0.04	0.0	0.0	2.0	19.7	(1)
GP-5	8:37	0.0	0.0	0.0	1.4	20.3	(2)
GP-6	8:41	0.0	0.0	0.0	0.9	18.6	(1)
GP-7	8:48	0.0	0.0	0.0	3.1	17.9	(2)
GP-8	8:45	0.0	0.0	0.0	3.4	17.6	(1)
GP-9	8:50	0.0	0.0	0.0	2.0	19.6	(1)
GP-10	8:53	0.0	0.0	0.0	7.8	11.1	(1)
GP-11D	8:59	0.0	0.0	0.0	0.4	20.4	(2)
GP-11S	9:01	0.0	0.0	0.0	0.9	18.8	(2)
GP-12D	9:05	0.0	36	1.8	4.8	17.2	(1)
GP-12S	9:08	0.0	0.0	0.0	2.1	18.7	(1)
GP-13D	9:15	0.0	10	0.5	4.0	15.6	(2)
GP-13S	9:18	0.0	0.0	0.0	0.9	19.5	(2)

GAS PROBE NAME	Time	PRESSURE (in. WC)	METHANE (% LEL)	METHANE (%, by vol.)	CARBON DIOXIDE (%, by vol.)	OXYGEN (%, by vol.)	COMMENTS
GP-16D	9:40	0.0	0.0	0.0	6.5	12.2	(2)
GP-16S	9:42	0.0	0.0	0.0	0.6	20.1	(2)
GP-17D	9:30	0.0	0.0	0.0	2.4	18.1	(1)
GP-17M	9:32	0.0	0.0	0.0	0.2	20.4	(1)
GP-17S	9:34	0.0	0.0	0.0	0.7	19.9	(1)
GP-18D	9:46	0.0	0.0	0.0	0.5	20.4	(3)
GP-18M	9:48	0.0	0.0	0.0	0.0	20.7	(3)
GP-18S	9:50	0.0	0.0	0.0	0.3	20.6	(3)
GP-19$^{85-100}$	10:26	0.0	0.0	0.0	4.9	15.4	(1)
GP-19$^{50-70}$	10:28	0.0	0.0	0.0	1.5	18.8	(1)
GP-19$^{25-40}$	10:30	0.0	0.0	0.0	1.9	19.2	(1)
GP19$^{2-15}$	10:32	0.0	0.0	0.0	1.0	19.4	(1)
GP-20$^{85-100}$	10:17	0.0	0.0	0.0	0.3	20.4	(2)
GP-20$^{50-70}$	10:19	0.0	0.0	0.0	1.3	19.4	(2)
GP-20$^{25-40}$	10:21	0.0	0.0	0.0	1.7	19.3	(2)
GP-20$^{2-15}$	10:23	0.0	0.0	0.0	2.0	18.9	(2)
GP-21$^{85-100}$	10:08	0.06	0.0	0.0	0.7	20.1	(2)
GP-21$^{50-70}$	10:10	0.0	0.0	0.0	1.3	19.0	(2)
GP-21$^{25-40}$	10:12	0.0	0.0	0.0	2.7	18.4	(2)
GP-21$^{2-15}$	10:16	0.0	0.0	0.0	1.0	19.8	(2)
GP-22$^{85-100}$	10:33	0.0	0.0	0.0	4.2	16.7	(2)
GP-22$^{50-70}$	10:35	0.07	0.0	0.0	2.4	18.1	(2)
GP-22$^{25-40}$	10:37	0.0	0.0	0.0	1.4	19.9	(2)
GP-22$^{2-15}$	10:39	0.0	0.0	0.0	2.1	19.0	(2)

GAS PROBE NAME	Time	PRESSURE (in. WC)	METHANE (% LEL)	METHANE (%, by vol.)	CARBON DIOXIDE (%, by vol.)	OXYGEN (%, by vol.)	COMMENTS
GP-23$^{85\text{-}100}$	10:45	0.0	0.0	0.0	1.3	19.3	(2)
GP-23$^{50\text{-}70}$	10:47	0.0	0.0	0.0	5.3	15.7	(2)
GP-23$^{25\text{-}40}$	10:49	0.0	0.0	0.0	6.4	15.3	(2)
GP-23$^{2\text{-}15}$	10:51	0.0	0.0	0.0	3.6	17.5	(2)
GP-24$^{85\text{-}100}$	10:45	0.0	0.0	0.0	11.7	7.9	(2)
GP-24$^{50\text{-}70}$	10:58	0.0	0.0	0.0	1.6	19.4	(2)
GP-24$^{25\text{-}40}$	11:00	0.0	0.0	0.0	6.3	14.9	(2)
GP-24$^{2\text{-}15}$	11:02	0.0	0.0	0.0	5.1	15.3	(2)
GPW-1D	12:16	0.32	0.0	0.0	1.5	18.6	(1)
GPW-1M	12:18	0.27	0.0	0.0	1.1	18.4	(1)
GPW-1S	12:20	0.03	0.0	0.0	1.9	19.0	(1)
G-1D	8:08	0.0	0.0	0.0	0.1	20.8	(1)
G-1S	8:10	0.0	0.0	0.0	0.2	20.7	(1)
G-2D	9:24	0.0	0.0	0.0	0.3	20.4	(1)
G-2S	9:26	0.0	0.0	0.0	0.5	20.3	(1)
G-5	8:41	0.0	0.0	0.0	2.8	18.6	(1)
G-6	7:57	0.0	0.0	0.0	0.2	20.6	(1)
G-8	10:05	0.0	0.0	0.0	0.0	20.7	(1)
G-9	9:57	0.0	0.0	0.0	1.0	17.9	(1)
G-10	11:12	0.0	0.0	0.0	0.3	20.4	(1)
Speedway Office	8:13	Open to ATM	0.0	0.0	0.0	20.8	Open to ATM

NOTES:

(1); Locked probe casing.
(2): Probe is above casing and cannot be locked.
(3): No cap for probe casing and cannot be locked.

Key:

Shallow or 2'-15'
Medium or 25'-40'
Deep or 50'-70'
85'-100'

Entered by: J. Roelke 1/18/2023
Checked by: T. Perkins 2/17/2023

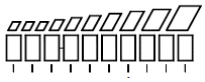
Monthly System Inspection Log
Landfill Gas Extraction and Leachate Pump System
WDNR - Refuse Highway Landfill
Middleton, Wisconsin

TRC Operator Name:	**John Roelke**				
Date:	**1/25/2023**	**Arrival Time:**	**8:00**	**Departure Time**	**8:20**

Site Conditions	Initial[1]	Final[2]	Equipment	
Weather Conditions:	Light snow	-	Gas/Instrument Type:	GEMS 2000
Ground Condition:	Frozen ground, snow cover	-	Serial Number:	11668
Barometric Pressure:	29.81 in Hg	-	Date Last Calibrated:	NA
Barometric Pressure Trend:	Falling	-	Method:	Standard field calibration
Temperature:	30F	-	Pressure Instrument:	Dwyer Series 475 Manometer

Landfill Gas Extraction System[3]							
System	***Location***	***Tag #***	***Equipment Description***	***Set Point***	***Typical Range***	***Initial Field Reading [1]***	***Final Field Reading [2]***
Blower Motor -	Remote	GHS-BLR-301	Amperage	-	3 - 4 amps	NM	NM
			Speed	-	1800 - 1900 rpm	NM	NM
			Frequency	-	30 - 35 Hz	NM	NM
	HMI		Amperage	-	3 -4 amps	NM	NM
	HMI		Speed	-		NM	NM
	HMI		Hours	-	-	NM	NM
Blower Operating (YES). Note excessive noise or issues observed.							
Blower Inlet	HMI	PT-301	Blower Inlet Vacuum	7 in. w.c.	7 in. w.c.	NM	NM
	HMI	TE-301	Blower Inlet Temperature	-	50 - 90 °F	NM	NM
	Local	GHS-PI-301	Blower Inlet Vacuum	7 in. w.c.	7 in. w.c.	NM	NM
	Local	GHS-TI-301	Blower Inlet Temperature	-	50 - 90 °F	NM	NM
	Local	Sample Port	Gas Composition - % Methane	-		NM	NM
			Gas Composition - % CO2	-		NM	NM
			Gas Composition - % Oxygen	-		NM	NM
			Gas Composition - % Balance	-		NM	NM
Demister	Local	GHS-PDI-301	Demister Differential Pressure	-	1-2 in w.c	NM	NM
	Local		Slight Glass: Liquid Present	-	-	NM	NM
	HMI	LS-701	Level Indication	-	-	NM	NM
Blower Outlet	HMI	PT-302	Blower Outlet Flow Pressure	-	-	NM	NM
	HMI	TE-302	Blower Outlet Temperature	-	50 - 90 °F	NM	NM
	HMI	PDT-301	Blower Outlet Flow Differential Pressure	-	1-2 in w.c	NM	NM
	HMI	-	Blower Outlet Flow Rate	-	180 - 190 scfm	NM	NM
	Local	GHS-PI-302	Blower Outlet Flow Pressure	-	-	NM	NM
	Local	GHS-TI-302	Blower Outlet Temperature	-	50 - 90 °F	NM	NM
	Local	Sample Port	Gas Composition - % Methane	-		NM	NM
			Gas Composition - % CO2	-		NM	NM
			Gas Composition - % Oxygen	-		NM	NM
			Gas Composition - % Balance	-		NM	NM
Branch Headers	Local	North	North Branch Vacuum	-	6 - 7 in w.c.	NM	NM
	Local	North	Valve Position	6 turns open /6	6 turns open	NM	NM
	Local	North Sample Port	Gas Composition - % Methane	-		NM	NM
			Gas Composition - % CO2	-		NM	NM
			Gas Composition - % Oxygen	-		NM	NM
			Gas Composition - % Balance	-		NM	NM
	Local	Central	Central Branch Vacuum	-	6 - 7 in w.c.	NM	NM
	Local	Central	Valve Position	-	6 turns open	NM	NM
	Local	Central Sample Port	Gas Composition - % Methane	-		NM	NM
			Gas Composition - % CO2	-		NM	NM
			Gas Composition - % Oxygen	-		NM	NM
			Gas Composition - % Balance	-		NM	NM
	Local	South	South Branch Vacuum	-	6 - 7 in w.c.	NM	NM
	Local	South	Valve Position	-	6 turns open	NM	NM
	Local	South Sample Port	Gas Composition - % Methane	-		NM	NM
			Gas Composition - % CO2	-		NM	NM
			Gas Composition - % Oxygen	-		NM	NM
			Gas Composition - % Balance	-		NM	NM

Air Compressor System[3,5,6] - AIR COMPRESSOR SYSTEM OFFLINE								
Operational Settings	Pressure Set Points					Condensate Set Points		
	Tank Low (psi)	Tank High (psi)	Well Field (psi)	On (min.)	Off (min.)	Open (sec.)	Closed (min.)	Test Operation
	NOT OPERATING							(yes/no)

Air Dryer System[4] - AIR DRYER OFFLINE		Electrical Status		HMI Heater/Air Conditioner	
System Operational:	NA	3-Phase Power Indicator:	3 of 3	Operational	Yes
Condensate Drain Operational:	NA	GFI 1 Status:	GREEN	Temperature	47
Alarm Indictor:	NA	GFI 2 Status:	GREEN	Filter Cleaned	No
Condenser Cleaned[2]:	No	**Leachate Tank/Loadout**			
Dew Point Indicator:		Liquid Level (inches):	62	Visual Check:	
	Indicate which bars are green(G) or red (R) and note (F) if flashing.	***Contact WDNR if level is above***	71 inches	·Evidence of Tank Overflow:	No
		Leak Detection Test Completed:	(yes/no)	·Inspect concrete pad and storm sewer for damage or backup	
		Overfill Float Functional[7]	(yes/no)		
		Exhaust Stack			
		Drain Stack Sump (vol. removed)	0.25 gal	Stack Condition[6]:	Good

1. Initial site conditions represents readings collected upon arrival to the site and initial field readings are collected prior to the landfill balancing.

2. Final site conditions represents readings collected upon departure from the site and final field readings are collected following the landfill balancing.

3. Check all air lines and gas extraction lines for leaks during each site visit. Drain inline air filters and replace as needed.

4. Air Dryer - Clean the condenser monthly using an air jet (max. 2 bar / 30 psig) inside out. Make sure not to damage the aluminum lamellae of the cooling package.

5. On a quarterly basis change the oil and check/clean the air filters and intercoolers for the air compressor.

6. Inspect mounting brackets and bolts for the air compressor and effluent stack for tightness.

7. Test overfill float operation on a monthly basis.

Comments/Notes:
NM - Not Measured
Blower, air compressor and air dryer systems off line due to high voltage spikes from the transformer. O&M services were conducted for the PLC heater, heat tape, leachate tank, and stack sump. PLC heater and heat trace checked and working. Drained approximately 0.25 gallons from stack sump. No balancing of gas extraction wells conducted.

Data Entered By: T. Perkins 2/17/2023
Checked By: J. Roelke 2/17/2023

Cap Inspection
Note: Photograph all issues encountered during inspection
Note: Keep vehicle traffic to gravel roadways, avoid driving on the landfill surface
Is the landfill surface covered in snow (Y/N)? **Yes**
Inspect the landfill surface when not covered in snow. Describe the condition and any issues observed for each category below:
Cap integrity: No inspection - Snow cover.
Condition of drainage ways: No inspection - Snow cover.
Extent of vegetation cover: No inspection - Snow cover.
Significant erosion: No inspection - Snow cover.
Repeated erosion: No inspection - Snow cover.
Vegetation die-off: No inspection - Snow cover.
Maintain surface water conveyances and the sedimentation basin by completing the following:
Inspect drainage ditches for erosion, blockages, and vegetation, describe and note any issues: No inspection - Snow cover.
Inspect sedimentation basin banks and outfalls for erosion, describe and note any issues: No inspection - Snow cover.
Measure the distance between the invert of the sedimentation basin outlet and the top of the sediments accumulated in the basin **(June Only!)**: NA

Created by: J Roelke 1/20/2023
Checked by: T. Perkins 1/20/2023

Bi-weekly - System Inspection Log
Landfill Gas Extraction and Leachate Pump System
WDNR - Refuse Highway Landfill
Middleton, Wisconsin

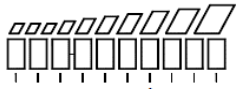
TRC Operator Name:	John Roelke				
Date:	1/4/2023	Arrival Time:	13:45	Departure Time	14:15

Site Conditions		Equipment	
Weather Conditions:	Light rain	Gas/Instrument Type:	GEMS 2000
Ground Condition:	Frozen, partial snow cover	Serial Number:	11668
Barometric Pressure:	29.58 in Hg	Date Last Calibrated:	NA
Barometric Pressure Trend:	Rising	Method:	standard field calibration gas
Temperature:	33F	Pressure Instrument:	Dwyer Manometer

Landfill Gas Extraction System[1]

System	*Location*	*Tag #*	*Equipment Description*	*Set Point*	*Typical Range*	*Field Reading*
Blower Motor	Remote	GHS-BLR-301	Amperage	-	3 - 4 amps	NM
			Speed	-	1800 - 1900 rpm	NM
			Frequency	-	30 - 35 Hz	NM
	HMI		Amperage	-	3 -4 amps	NM
	HMI		Speed	-		NM
	HMI		Hours	-	-	NM
Blower Operating (yes/no). Note excessive noise or issues observed.						
Blower Inlet	HMI	PT-301	Blower Inlet Vacuum	7 in. w.c.	7 in. w.c.	NM
	HMI	TE-301	Blower Inlet Temperature	-	50 - 90 °F	NM
	Local	GHS-PI-301	Blower Inlet Vacuum	7 in. w.c.	7 in. w.c.	NM
	Local	GHS-TI-301	Blower Inlet Temperature	-	50 - 90 °F	NM
	Local	Sample Port	Gas Composition - % Methane	-		NM
			Gas Composition - % CO2	-		NM
			Gas Composition - % Oxygen	-		NM
			Gas Composition - % Balance	-		NM
Demister	Local	GHS-PDI-301	Demister Differential Pressure	-	1-2 in w.c	NM
	Local		Slight Glass: Liquid Present	-	-	NM
	HMI	LS-701	Level Indication	-	-	NM
Blower Outlet	HMI	PT-302	Blower Outlet Flow Pressure	-	-	NM
	HMI	TE-302	Blower Outlet Temperature	-	50 - 90 °F	NM
	HMI	PDT-301	Blower Outlet Flow Differential Pressure	-	1-2 in w.c	NM
	HMI	-	Blower Outlet Flow Rate	-	180 - 190 scfm	NM
	Local	GHS-PI-302	Blower Outlet Flow Pressure	-	-	NM
	Local	GHS-TI-302	Blower Outlet Temperature	-	50 - 90 °F	NM
	Local	Sample Port	Gas Composition - % Methane	-		NM
			Gas Composition - % CO2	-		NM
			Gas Composition - % Oxygen	-		NM
			Gas Composition - % Balance	-		NM
Branch Headers	Local	North	North Branch Vacuum	-	6 - 7 in w.c.	NM
	Local	North	Valve Position	6 turns open /6	6 turns open	NM
	Local	North Sample Port	Gas Composition - % Methane	-		NM
			Gas Composition - % CO2	-		NM
			Gas Composition - % Oxygen	-		NM
			Gas Composition - % Balance	-		NM
	Local	Central	Central Branch Vacuum	-	6 - 7 in w.c.	NM
	Local	Central	Valve Position	-	6 turns open	NM
	Local	Central Sample Port	Gas Composition - % Methane	-		NM
			Gas Composition - % CO2	-		NM
			Gas Composition - % Oxygen	-		NM
			Gas Composition - % Balance	-		NM
	Local	South	South Branch Vacuum	-	6 - 7 in w.c.	NM
	Local	South	Valve Position	-	6 turns open	NM
	Local	South Sample Port	Gas Composition - % Methane	-		NM
			Gas Composition - % CO2	-		NM
			Gas Composition - % Oxygen	-		NM
			Gas Composition - % Balance	-		NM

Air Compressor System[1,3,4] - AIR COMPRESSOR SYSTEM OFFLINE								
Operational Settings	Pressure Set Points					Condensate Set Points		
	Tank Low (psi)	Tank High (psi)	Well Field (psi)	On (min.)	Off (min.)	Open (sec.)	Closed (min.)	Test Operation
	Offline - NM					NM	NM	NM

Air Dryer System[2] OFFLINE		Electrical Status		HMI Heater/Air Conditioner	
System Operational:	NA	3-Phase Power Indicator:	3 of 3	Operational	Yes
Condensate Drain Operational:	NA	GFI 1 Status:	(Green / Red)	Temperature	47
Alarm Indictor:	NA	GFI 2 Status:	(Green / Red)	Filter Cleaned	No
Condenser Cleaned[2]:	No	**Leachate Tank/Loadout**			
Dew Point Indicator:		Liquid Level (inches):	55.5	Visual Check:	
	Indicate which bars are green(G) or red (R) and note (F) if flashing.	***Contact WDNR if level is above***	**71**	· Evidence of Tank Overflow:	
		Leak Detection Test Completed:	no	· Inspect concrete pad and storm sewer for damage or backup	
		Overfill Float Functional[5]:	yes		
		Exhaust Stack			
		Drain Stack Sump (vol. removed)	1/4 gallon	Stack Condition[4]: Good	

1. Check all air lines and gas extraction lines for leaks during each site visit. Drain inline air filters and replace as needed.

2. Air Dryer - Clean the condenser monthly using an air jet (max. 2 bar / 30 psig) inside out. Make sure not to damage the aluminum lamellae of the cooling package.

3. On a quarterly basis change the oil and check/clean the air filters and intercoolers for the air compressor.

4. Inspect mounting brackets and bolts for the air compressor and effluent stack for tightness.

5. Test overfill float operation on a monthly basis.

Comments/Notes:
NM - Not Measured
Blower, air compressor and air dryer systems off line due to high voltage spikes from the transformer. Blower 301, over voltage fault observed on Dec. 15 at 02:53. Electrical breakers shut off for blower and air compressor systems. O&M services were conducted for the PLC heater, heat tape, leachate tank, and stack sump. PLC heater and heat trace checked and working.

Data Entered By: T. Perkins 2/17/2023
Checked By: J. Roelke 2/17/2023