Current Conditions Evaluation

Refuse Hideaway Landfill
Town of Middleton, Dane County, WI

Revision 0
December 2019

Prepared For:

Wisconsin Department of Natural Resources
101 S. Webster Street
Madison, WI 53707

Prepared By:

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1.0 Introduction

1.1 Background

The Refuse Hideaway Landfill (RHL) is located at 7562 Highway 14 in the Town of Middleton, Wisconsin. The landfill closed in 1988 and became a Superfund site. The landfill is approximately 23 acres and contains municipal, commercial, and industrial waste. An active landfill gas (LFG) recovery system and a leachate extraction system were constructed at the landfill which became operational in 1991.

The RHL design final cover consists of two feet of clay, 18 inches of general soil, and six inches of topsoil. Surface water controls consist of a sedimentation basin located on the eastern side of the landfill, swales on the final cover, and western and eastern drainage ditches.

The LFG recovery system consists of a network of pipes, a blower/flare station, and gas monitoring ports used to extract and combust LFG produced by RHL. The system was installed to withdraw gas from the landfill to assist with minimizing surface emissions and subsurface LFG migration. The LFG collection network consists of 13 extraction wells, 4 drip legs, and associated gas piping. A pedestal flare was put into service in July 2013, when gas concentrations were too low to operate the enclosed flare. The existing blower/flare station consists of a centrifugal blower, an enclosed flare, a pedestal flare, and associated controls and appurtenances. Based on observations, the enclosed flare is not connected to the existing appurtenances, and the pedestal flare was most recently used. The LFG recovery system has been off-line since August 2016.

The existing leachate extraction system at RHL consists of a network of pipes, pumps, and storage units. When operational, the leachate extraction system can be used to lower leachate head levels in the landfill. Pneumatic pumps in the leachate extraction system were installed in the extraction wells in 1996. A compressor located near the LFG blower/flare station supplied air to the pneumatic pumps. The compressor has been off-line since August 2017 when it failed. When the system is operable, leachate is pumped to an on-site 25,000-gallon underground storage tank (UST) where the leachate is stored until it is removed and transported to the Madison Metropolitan Sewerage District (MMSD) for treatment and disposal.

The State of Wisconsin, through the Wisconsin Department of Natural Resources' (WDNR) Remediation and Redevelopment Program, is responsible for overseeing the operation of the landfill control systems. To this end, the WDNR put out a Specifications/Scope of Work on June 9, 2019 that provided details of the landfill systems condition assessment and recommendations scope of work. TRC prepared and submitted a Current Conditions Workplan, dated September 2019, to the WDNR describing the field inspection and surveying program that TRC conducted at the RHL.

1.2 Purpose

The Current Conditions Evaluation uses information gathered during a field inspection, electrical inspection and surveying activities conducted from September through December 2019 to provide recommendations to the WDNR for possible future operations and maintenance.

1.3 Scope

This evaluation consists of six sections, including:

- **Section 1** background, purpose, and scope of the evaluation
- **Section 2** discussion of the site survey and development of the topographic map
- **Section 3** evaluation of the existing RHL final cover and stormwater systems
- **Section 4** evaluation of the existing RHL leachate extraction system
- **Section 5** evaluation of the existing LFG recovery system features
- **Section 6** evaluation of the existing LFG site access control
- **Section 7** evaluation of the existing RHL electrical system
- **Section 8** recommendations

2.0 Survey and Topographic Map

TRC subcontracted with MSA Professional Services, Inc. (MSA) located in Madison, Wisconsin to survey the extents of the landfill and prepare a current 1-foot topographic contour map of the extent of the landfill using the North American Vertical Datum coordinate system. MSA set permanent control points/monument so the relationship between the topographic data and the section can be identified and reproduced in the future. The permanent control points are in the electronic version of the survey. For example, there is one located approximately 90-feet south of GW-7.

MSA was on-site surveying for several days in September. They prepared a topographic contour map which includes locations of features such as trees on the final cover, tree lines, roads, gas wells, monitoring wells, gas probes, and other landfill control system components. Due to dense vegetation, the sedimentation basin was not able to be surveyed without clearing. The western storm water drainage ditch was surveyed to the tree line on the western edge of the landfill but not beyond due to tree cover. TRC used the topographic contour map prepared by MSA as a base map for documenting features observed during the landfill inspection such as locations of stressed vegetation and depressions on the final cover and the locations of photographs. The map prepared by MSA and TRC is included as Figure 1. An electronic version of MSA's topographic map in AutoCAD format is included in Attachment 1.

MSA returned to the site on December 2, 2019 to survey the location of one possible leachate seep as shown on Figure 1. The survey data from the December 2, 2019 visit is included in Attachment 1.

3.0 Final Cover and Stormwater System

3.1 Landfill Final Cover

The landfill surface was inspected September 16, 2019 to evaluate cap integrity, determine the condition of the drainage ways, and to assess the extent of vegetative cover. The inspector walked the landfill cap on approximately 50-ft lines allowing the inspector to look approximately 25-ft in either direction to make observations. A hand-held global positioning system unit (GPS) was used by the inspector to note the areas and locations where trees, erosion, bare ground and stressed vegetation, depressions or ponding was occurring. A photographic log of photographs collected during the September 2019 inspections are included in Attachment 2. The inspector also recorded notes on an inspection form which is included in Attachment 3.

Several groves of trees exist on the landfill which may impact the clay portion of the final cover since the tree roots may penetrate the final cover. It was not clear during the inspection where the limits of the final cover are located, and trees likely also exist on the final cover near the limits of the final cover. The trees and shrubs located on the final cover should be cut and the stumps treated with herbicide to kill the roots. The stumps should be cut to ground or below ground surface so that the areas can be mowed in the future. Grubbing/removing stumps and roots will cause more damage to the final cover than killing the trees stumps with herbicide.

In general, shallow rooted vegetative cover (grasses, flora and weeds) was in good condition on the final cover except for some spots of bare soil and stressed vegetation. Some multiflora rose (an invasive species) and poison ivy plants were observed on the final cover. Mowing has appeared to have kept these plant species small and controlled. The final cover should be mowed several times a year to control tree and invasive species growth, encourage grass vegetation growth, and make control items (cleanouts, valves, monitoring ports, etc.) visible and easily accessed for monitoring and inspection. The areas within the fence enclosures (e.g. cages and fences around the gas wells, leachate storage tank and blower flare system) should also be mowed and trimmed several times a year.

Rills from stormwater erosion were only observed at one location on the southern slope of the final cover. At this location, two sets of erosion control wattles were installed upstream in August by TRC per the WDNR's request to minimize additional erosion until the areas can be repaired. Bare ground and stressed vegetation existed at the location where the erosion rills were forming on the final cover. Several other small areas of the final cover exhibited bare soil and stressed vegetation. Refer to Figure 1, noting the areas where bare ground and stressed vegetation was identified using a handheld GPS. The cause of the bare ground and stressed vegetation could be from LFG penetrating the final cover, leachate exposure, sterile soil, shade from trees or other causes. Seed could be placed on these bare areas, but if the bare areas are caused by LFG, leachate, sterile soil, or shade from trees, the seeding likely will not establish.

There were no leachate seeps identified on the final cover during the inspection. The final cover inspection was conducted after some recent rain events and it was difficult to determine if damp areas could be potential leachate seeps or just damp from the recent rains. TRC reported a possible leachate seep on the southern edge of the landfill in the May 2019 Landfill Gas Monitoring Results report. Comparison of the location of the possible leachate seep with the May 2019 groundwater elevation map shows where groundwater/leachate may be seeping. No additional leachate seeps were identified during the September inspection. WDNR identified a

possible leachate seep on November 8, 2019. Both possible leachate seeps are shown on Figure 1.

Differential settlement has occurred at the landfill resulting in the formations of some depressions in the final cover. These depressions where identifiable by ponding water from the recent rain events and visual vehicle tire ruts indicating saturated soil areas in the final cover. In general, the depressions appeared to be shallow and have not significantly affected the final cover vegetation growth. The depressions in the final cover should continue to be monitored and if these areas continue to hold water over dry periods during the seasons, the WDNR should consider repairing the depressions. Repair would include the addition of topsoil to the specific areas. No regrading or other final cover repairs would be needed. The worst depressions exist west of gas well GW-6, in the northern portion of the landfill and in the northern portion of the western drainage ditch. Table 1 contains an engineer's opinion of probable cost (OPC) for repairing the depressions by adding topsoil. The OPC assumes the repair of 0.5 acres of depressions at an average depth of 1-foot.

3.2 Storm Water Controls

The eastern ditch leading to the sedimentation basin was overgrown and contained many trees growing within the riprap, but the riprap appeared in-place and stable. The water level in the sediment basin was 4 inches above the discharge pipe invert because the discharge pipe at the inlet slopes slightly towards the basin which may or may not be by design. The amount of sediment in the basin could not be measured, but it appears to be significant and is likely affecting the storage capacity of the sedimentation basin.

The top of the sedimentation basin berm has a low area over the discharge pipe where water has breached the berm and eroded an approximate 3-feet deep by 8-feet wide area on the backside of the berm. The eroded area has exposed the downstream half of the discharge pipe including an elbow. The WDNR should consider cleaning the sedimentation basin to remove the accumulated sediment to increase the capacity of sedimentation basin. The WDNR should also consider increasing the sedimentation basin berm elevation and constructing an emergency spillway to control breaching of the berm. The berm can likely only be raised a couple of feet because if the berm was raised any higher, water could breach over the adjacent access road to the landfill. Table 2 contains an OPC for upgrading the sedimentation basin as discussed above. Limited engineering for review of the existing sedimentation basin capacity and berm elevation is included in the OPC. If the WDNR chooses to design and construct a new sedimentation basin to current design standards rather than upgrading the existing approved sedimentation basin, the cost would be much higher.

Riprap in the western drainage ditch, southwest of the landfill, has eroded and exposed geotextile at a couple of locations in the ditch. The riprap portion of the western drainage ditch is also overgrown with trees and vegetation which has helped stabilize the riprap and ditch. To repair the ditch at the locations where the geotextile is exposed, trees will need to be removed to access the ditch and repair the riprap. The WDNR should consider repairing the location in the western drainage ditch where the geotextile is exposed by placing additional geotextile and riprap. Table 3 contains an OPC for repairing the riprap in the western drainage ditch.

4.0 Leachate Recovery System

4.1 Leachate Levels

Leachate levels were measured in the 13 gas extraction wells using an electric water level indicator on September 16, 2019. The leachate levels in the gas extraction wells are shown on the table and field notes in Attachment 3. In the table in Attachment 3, the Leachate Level Elevation was calculated based on the surveyed top of casing elevation and field measurements of distances from top of casing to leachate level port and leachate level port to leachate. Leachate levels in the various extraction wells ranged from approximately 937.32 feet (GW-3) to 993.13 feet (GW-13).

4.2 Leachate Extraction and Storage

From historical site documents, on August 29, 2017 the compressor failed, and the leachate extraction system has remained non-operational since. Upon failure of the compressor, the compressor manufacturer's service vendor was contacted. On September 6, 2017 a representative from Energetics (Division of EMS Industrial, Inc.) was on-site to inspect and troubleshoot the compressor. Energetics indicated that several internal components of the compressor's motor were damaged or had failed. Energetics provided information about repair and replacement options as well as information with regard to the installation of a temporary compressor and flow meter to more accurately determine the leachate collection system air demands.

Energetics conducted a leachate collection system air demand test from November 28, 2017 through December 1, 2017. The leachate collection system operated with a demand of approximately 1.0 scfm with all leachate pumps turned off, and approximately 6.0 scfm with all functional pumps at the time of the air demand test (GW-4, GW-10, and GW-11) turned on. The desiccant dryer was bypassed during the air demand test. Results of the test and options for replacing the compressor were submitted to the WDNR.

According to historical records, leachate pumps are stuck in gas well GW-7 and GW-13, possibly due to damaged wells from settlement. Pumps were not installed in wells GW-1, GW-2, GW-3, and GW-6. Excess slack was indicated in the pump suspension cable and airlines in GW-9 after the pump was removed and placed back in the well during cleaning in June 2018 indicating a possible blockage or damaged well casing in GW-9. It appears that the only 7 wells (GW-4, GW-5, GW-8, GW-9 (possibly), GW-10, GW-11 and GW-12) can be used for leachate extraction.

TRC visually inspected the compressor and desiccant dryer in the compressor building. The major operational components of the compressor were removed and only the compressor tank and an electric motor on the compressor tank existed. The desiccant dryer was intact with the piping between the dryer and compressor disconnected.

The above ground components of the leachate storage tank were inspected. The loadout pipe and concrete loadout pad were in good condition and power was live to the control panels. The loadout pad is large and uncovered so the pad is likely collecting storm water during rain events which are required to be treated as leachate.

Because the leachate collection system is off-line, it is not known what components of the leachate recovery system are working, need repair, or need replacement to operate the system.

The WDNR should determine whether operating the leachate collection system is beneficial for control of contaminate migration or to lower heads in the gas well for more efficient gas extraction. If the WDNR determines that operating the leachate extraction system is needed, the following repairs are necessary:

- Repair or replace the compressor,
- Install piping between the compressor and the dryer,
- Replace desiccant and filters in the dryer,
- Jet the leachate pipes, and
- Repair or replace the existing pumps and components in gas wells GW-4, GW-5, GW-8, GW-9, GW-10, GW-11 and GW-12.

The system should be monitored, evaluated and adjusted during the operation to maximize the effectiveness of the system. Table 4 contains an OPC for repairing the leachate extraction system. Note that the OPC does not include costs for maintenance, monitoring, transporting and treating leachate, or electrical power. The OPC also does not include a cover for the leachate cleanout pad, which collects storm water and adds to the volume of leachate requiring treatment.

5.0 Landfill Gas Extraction System

The gas extraction collection network consists of a network of 13 vertical extraction wells. The wells, which connect to a header pipe, are grouped together in "branches". The header pipe from each of the branches is connected to the blower to draw the LFG from the wells.

Gas monitoring for gas pressure, methane, oxygen and carbon dioxide was conducted on the 13 gas extraction wells using a Landtec meter on September 16, 2019. All the wells had positive pressure except for gas well GW-4 which was missing a cap and was open to the atmosphere. Methane concentrations observed ranged from 54.9 percent (GW-1) to 88.9 percent (GW-9). The gas pressures and methane, oxygen and carbon dioxide concentrations in each gas well are shown on the field notes in Attachment 3.

The header piping system consists of three branches (North, Central, and South branches). The three branches are also connected by header segments for redundancy. The South and Central branches are connected near gas wells GW-5 and GW-9, and the Central and North branches are connected near GW-9 and GW-11. A pipe segment was also installed to connect the Central branch to GW-4, GW-5 and the GW-5 laterals to re-establish vacuum to these wells on the South branch. Individual piping from each of the three branches enters the blower station. Each branch pipe has an individual control valve. The branch headers enter a manifold which combines the LFG from the branches prior to entering the blower. It was noted in the 2018 O&M Report (WSP, August 2018), that when the system was in operation, vacuum could be applied to the gas wells connected to the North and Central branches, but vacuum could not be applied to gas wells GW-1 through GW-3 on the South branch due to low points on the South branch header. After LFG system upgrades were completed, vacuum could be applied to GW-4, GW-5 and the GW-5 laterals from the Central branch.

It was also noted in the 2018 O&M Report (WSP, August 2018), that in September 2015, sewer balls were placed in the solid piping of the GW-5 laterals upstream of the perforated screens to prevent a vacuum from being applied to the laterals. The sewer balls were installed because monitoring data indicated that elevated methane concentrations and low oxygen levels could not be sustained in the lateral wells.

The gas wellhead components such as monitoring ports, flexible tubing and insulation are deteriorating from exposure to the elements and some of the piping on the wells is cracking due to settling of the header piping resulting from flexible tubing which is too short. During the inspection, TRC checked the valves on the gas wells and on the pipe header system. The valves open and close properly.

The blower/flare station has been off-line since August 2016 due to operational issues with the flare and its electrical components. The blower and flare were visually examined during TRC's inspection. The blower was coved with oil and the flare seemed to be intact but was completely rusty. The valves at the three branches at the manifold and the valve near the flare appeared to open and close properly. Due to the age of the blower and flare and the extended duration of it being off-line, the blower, panel and flare will likely experience operational issues if it is determined that the blower and flare should be restarted.

The WDNR should determine whether operating the gas recovery system is needed based on the information presented. The LFG concentrations may be low enough to allow the gas to be vented to the atmosphere without being combusted. If the WDNR determines that operating the

gas recovery system is needed, the following repairs should be considered and/or may be necessary:

- the gas well heads will need to be repaired due to deterioration of the wellheads and settlement of the header pipe,
- portions of the header piping may be watered-out and need to be realigned,
- Alternatively, to the preceding two items, new gas extraction wells can be installed to current design standards. This would allow for better optimization of the gas control system but would be more costly. For a lower cost alternative, gas venting can be considered instead of combustion.
- the blower may need to be repaired or replaced;
- the flare may need to be repaired or replaced;
- the control panel may need to be rewired and replaced; and
- the flame arresters cleaned.

If it is determined that the gas recovery system should be restarted, TRC recommends that a service technician from a blower/flare company trouble shoot the system and determine what items on the blower/flare system can be salvaged and what items need to be replaced to get the system functioning properly. The system should be monitored, evaluated and adjusted during the operation to maximize the effectiveness of the system. Table 5 contains an OPC for repairing the gas recovery system by installing a new skid mounted blower and flare system. This OPC represents the worst-case cost scenario for repairing the system. The costs will likely be much less if any of the blower, panel, and/or flare can be repaired rather than be replaced and if the LFG can be vented to the atmosphere. Note that the OPC does not include costs for maintenance, monitoring, transporting and treating condensate, or electrical power for operating the system. A quote received from Perennial Energy, LLC and used for the OPC is included in Attachment 4.

Due to the low quality and quantity of gas produced historically at the landfill and the high cost for capital development, gas collection for energy production is not viable.

6.0 Site Access Control

There is not a chain-link fence enclosing the landfill and many hunting tree-stands and ground blinds exist around the perimeter of the landfill indicating that there are people accessing the property. There are signs located near the perimeter of the landfill indicating that the cover area is closed to the public. The blower/flare station, leachate compressor station and the electrical panels for the stations are enclosed in a chain-link fenced area which has a locked gate. The underground leachate storage tank, vents and control panel are also within a chain-linked fenced enclosure, but this enclosure was not locked.

Many of the monitoring wells and gas probes are not locked. The gas wells are enclosed in chain-link fence cages that are not locked. The tops on many of the cages have been removed likely because of settlement of the cover and cages and the stationary position of the wells.

Under separate work, TRC is providing monitoring for RHL and TRC is installing new locks on monitoring wells and gas probes. Locks should be considered for the fence enclosures noted above that are not currently locked.

7.0 Electrical Inspection

TRC subcontracted with Van Ert Electric Company Inc. (Van Ert) to perform an inspection of the electrical system components. Van Ert conducted their on-site electrical inspection concurrent with TRC's September 16, 2019 inspection. The electrician's findings indicated that many electrical items have deteriorated over years and become unsafe. Most significantly, there is only one electrical disconnect for both the gas extraction and leachate extraction systems. Therefore, if work is necessary on one system, both have to be shut-down.

The items recommend for replacement on the electrical system are listed in Van Ert quote included in Attachment 5. These recommendations also include new separate panels for the two systems. Table 6 contains an OPC for replacing the components of the electrical that have deteriorated.

8.0 Recommendations

The following are TRC's recommendations for maintenance and operations for the controls at RHL. Items noted as priority are more highly recommended compared to those noted as monitor. The Record of Decision for the site includes operation and maintenance of the gas and leachate collection systems. WDNR should consider repairing and replacing these systems to resume operation of the landfill gas control and/or leachate management systems.

- **Landfill Final Cover**
  - PRIORITY: The trees and shrubs located on the final cover should be cut and the stumps treated with herbicide to kill the roots. The stumps should be cut or ground to or below ground surface so that the areas can be mowed in the future. Grubbing or removing stumps and roots will cause more damage to the final cover than treating them with herbicide.
  - PRIORITY: The final cover should be mowed several times a year to control tree and invasive species growth, encourage grass vegetation growth, and make control items (cleanouts, valves, monitoring ports, etc.) visible and easily accessed for monitoring and inspection. The areas within the fence enclosures (e.g. cages and fences around the gas wells, leachate storage tank and blower flare system) should also be mowed and trimmed several times a year.
  - MONITOR: Consider verifying the limits of waste/limits of the landfill and documenting the limits of the landfill in an updated survey.
  - MONITOR: Depressions in the final cover should continue to be monitored and if these areas continue to hold water over dry periods, the WDNR should consider repairing the depressions by adding topsoil to the specific areas. Seeding to be completed after depression repair can include other stressed areas of the final cover.
  - MONITOR: Repair areas of stormwater erosion to the final cap.
- **Storm Water Controls**
  - PRIORITY: The WDNR should consider cleaning the sedimentation basin to remove the accumulated sediment to increase the capacity of sedimentation basin.
  - MONITOR: The WDNR should also consider increasing the sedimentation basin berm elevation and constructing an emergency spillway to control breaching of the berm.
  - PRIORITY: The WDNR should consider repairing the location in the western drainage ditch where the geotextile is exposed by placing additional geotextile and riprap.
- **Leachate Recovery System**
  - PRIORITY: The WDNR should determine whether operating the leachate collection system to lower leachate head in the gas wells is necessary for more efficient gas extraction. If the WDNR determines that operating the leachate extraction system is needed, repairs to the entire leachate collection system from extraction pumps to the collection tank are needed. The system should be monitored, evaluated and adjusted during the operation to maximize the effectiveness of the system.

- **Landfill Gas Extraction System**
  - PRIORITY: The WDNR should make repairs and replacements necessary to operate the gas recovery system Repairs to the entire gas recovery system from well heads to flare are needed. TRC recommends that service technician from a blower/flare company trouble shoot the system and determine what items on the blower/flare system can be salvaged and what items need to be replaced to get the system functioning properly prior to finalizing the scope of the repairs/replacements. The system should be monitored, evaluated and adjusted during the operation to maximize the effectiveness of the system.

    Repair, start-up, rebalancing, and monitoring of the gas recovery system will take several years. Following rebalancing and operation of the gas recovery system, the WDNR can evaluate LFG concentrations for the possibility of passive venting. If some or all of the LFG concentrations are low enough, those gas extraction wells could be converted for passive venting. It is not possible to determine if passive venting will meet site requirements without the gas recovery system being in operation because LFG concentrations are not reflective of a site with operating leachate/gas recovery systems. September 2019 LFG concentrations are anticipated to be concentrated/biased high since there has not been gas recovery since 2016.
  - PRIORITY: The electrical system has deteriorated over the years. The WDNR should consider upgrading the electrical system by replacing unsafe/deteriorated components and removing components that are no longer in service in conjunction with restarting the leachate recovery and/or landfill gas extraction systems.
- **Site Access Control**
  - MONITOR: The condition of the existing fencing should be monitored and repaired/replaced as needed.
  - PRIORITY: Add locks to fence enclosures that are not currently locked.

SUMMERS CHRISTMAS TREE FARM LLC

SUMMERS CHRISTMAS TREE FARM LLC

L&G INVESTMENTS LLC

REFUSE HIDEAWAY INC

SUMMERS CHRISTMAS TREE FARM LLC

L&G INVESTMENTS LLC

REFUSE HIDEAWAY INC

DANE COUNTY

WILLIAM L KAHL LLC

AMERICAN TRANSMISSION COMPANY LLC

Pedestal Flare

Ground Flare

Leachate Collection Holding Tank

Eastern Drainage Ditch

Western Drainage Ditch

Sedimentation Basin

Wonk Dr

See Note 5

LEGEND

- GAS PROBE
- GAS WELL
- MONITORING WELL
- LATERAL WELL SAMPLE PORT LOCATION
- FIELD PHOTO LOCATION AND PHOTO NUMBER
- POSSIBLE LEACHATE/GROUNDWATER SEEP
- SOLAR PANELS
- 5' MAJOR CONTOUR
- 1' MINOR CONTOUR
- TREELINE
- FENCE
- ACCESS ROAD
- DRAINAGE DITCH
- SEDIMENTATION BASIN
- PARCEL BOUNDARY

FIELD NOTES

- BARE GROUND AND STRESSED VEGETATION
- LOW AREA WITH STANDING WATER OR DAMP SOIL
- WASHOUT WITH WATTLE INSTALLED

NOTES

1. BASE MAP IMAGERY FROM ESRI/DANE COUNTY, 2017.
2. TOPOGRAPHY FROM MSA PROFESSIONAL SERVICES, INC. SURVEY, SEPTEMBER 2019.
3. PARCELS FROM WISCONSIN STATE CARTOGRAPHER'S OFFICE, 2018.
4. SITE FEATURES SHOWN ARE APPROXIMATE.
5. POSSIBLE SEEP LOCATED AT LATITUDE 43.0967 AND LONGITUDE -89.5797 WAS LOCATED BY WDNR USING A HANDHELD MOBILE DEVICE ON 11/8/2019 AND WAS NOT LOCATED BY CERTIFIED SURVEY.

0 150 300 Feet

1 " = 150 '

1:1,800

N

PROJECT:

WISCONSIN DNR
REFUSE HIDEAWAY LANDFILL

TITLE:

FIELD OBSERVATIONS MAP

DRAWN BY:	R. SUEMNICHT	PROJ NO.:	335719
CHECKED BY:	K. PAWLISCH		
APPROVED BY:	K. VATER		**FIGURE 1**
DATE:	DECEMBER 2019		

TRC
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FILE NO.: 335719-003.mxd

TRC - GIS
Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet (Foot US)
Map Rotation: 0
Plot Date: 12/17/2019, 10:01:25 AM by RSUEMNICHT -- LAYOUT: ANSI B (11"x17")
Path: S:\1-PROJECTS\WI_DNR\RefuseHideaway\335719\335719-003.mxd

Table 1: Engineer's Opinion of Probable Cost for Repair of Depressions
WDNR
Refuse Hideaway Landfill
October 1, 2019

Item No.	Item Description	Unit	Unit Cost	Quantity	Total Cost
1	**Repair of Depressions**				
2					
3	**Design & Start-Up**				
4					
5	Surveying	LS	$500	1	$500
6	Design and Engineering	LS	$2,000	1	$2,000
7	Bid/Secure a Contractor	LS	$2,000	1	$2,000
8					
9					
10					
11					
12	**Construction Costs**:				
13					
14	Place Topsoil	CY	$27	810	$21,870
15	Seed, Fertilize and Mulch	Acre	$8,000	0.25	$2,000
16					
17					
18					
19					
20					
21					
22					
23					
24					
25	**CQA and Documentation Costs**				
26					
27	On-site CQA (1 days @ $1,500/day)	Day	$1,500	1	$1,500
28	Survey As-Built	LS	$500	1	$500
29	Certified Documentation Report/Letter	LS	$1,000	1	$1,000
30					
31					
32					
33					
34					
35					
				Subtotal:	$31,370
				Total with contingency (25 percent):	$39,000

Assumptions:

1. Costs are in 2019 dollars. Some totals may not agree due to rounding.
2. Unit prices are based on similar project experience and information obtained from vendors and Contractors.
3. Volume of topsoil is assumed at 0.50 acres @ 1-foot depth or 810 cubic Yards.

Prepared By: K. Pawlisch
Checked By: K. Vater

Table 2: Engineer's Opinion of Probable Cost for Upgrade Sedimentation Basin
WDNR
Refuse Hideaway Landfill
October 1, 2019

Item No.	Item Description	Unit	Unit Cost	Quantity	Total Cost
1	**Upgrade Sedimentation Basin**				
2					
3	**Design & Start-Up**				
4					
5	Surveying and Develop Existing Conditions Map	LS	$1,000	1	$1,000
6	Design and Engineering	LS	$6,000	1	$6,000
7	Bid/Secure a Contractor	LS	$2,000	1	$2,000
8					
9					
10					
11					
12	**Construction Costs**:				
13					
14	Pump Sedimentation Basin	LS	$750	1	$750
15	Remove Sediment	LS	$8,000	1	$8,000
16	Raise Berm and Install Emergency Spillway	LS	$25,000	1	$25,000
17					
18	Landscaping (clearing and treatment of roots)	LS	$1,500	1	$1,500
19					
20					
21					
22					
23					
24					
25	**CQA and Documentation Costs**				
26					
27	On-site CQA (5 days @ $1,500/day)	Day	$1,500	5	$7,500
28	Survey As-Built	LS	$500	1	$500
29	Certified Documentation Report/Letter	LS	$2,000	1	$2,000
30					
31					
32					
33					
34					
35					
				Subtotal:	$54,250
				Total with contingency (25 percent):	$68,000

Assumptions:

1. Costs are in 2019 dollars. Some totals may not agree due to rounding.
2. Unit prices are based on similar project experience and information obtained from vendors and Contractors.
3. Cost assumes upgrading the existing sedimentation basin and not redesigning the basin to meet current design standards.
4. Cost assumes using the existing outlet structure, raising the berm and constructing an emergency riprap spillway in the raised portion of the berm.

Prepared By: K. Pawlisch
Checked By: K. Vater

Table 3: Engineer's Opinion of Probable Cost for Repair Western Riprap Ditch
WDNR
Refuse Hideaway Landfill
October 1, 2019

Item No.	Item Description	Unit	Unit Cost	Quantity	Total Cost
1	**Repair Western Riprap Ditch**				
2					
3	**Design & Start-Up**				
4					
5	Design and Engineering	LS	$500	1	$500
6	Bid/Secure a Contractor	LS	$2,000	1	$2,000
7					
8					
9					
10					
11					
12	**Construction Costs**:				
13					
14	Clear Trees for Equipment Access	LS	$1,500	1	$1,500
15	Place Riprap and geotextile	CY	$300	20	$6,000
16					
17					
18					
19					
20					
21					
22					
23					
24					
25	**CQA and Documentation Costs**				
26					
27	On-site CQA (1 day @ $1,500/day)	Day	$1,500	1.0	$1,500
28	Certified Documentation Report/Letter	LS	$750	1	$750
29					
30					
31					
32					
33					
34					
35					
				Subtotal:	$12,250
				Total with contingency (25 percent):	$15,000

Assumptions:

1. Costs are in 2019 dollars. Some totals may not agree due to rounding.
2. Unit prices are based on similar project experience and information obtained from vendors and Contractors.
3. Volume of riprap is assumed to be two truckloads or 20 CY.

Prepared By: K. Pawlisch
Checked By: K. Vater

Table 4: Engineer's Opinion of Probable Cost for Leachate Recovery System Startup
WDNR
Refuse Hideaway Landfill
October 1, 2019

Item No.	Item Description	Unit	Unit Cost	Quantity	Total Cost
1	**Leachate Recovery System Startup**				
2					
3	**Design & Start-Up**				
4					
5	Design and Engineering	LS	$10,000	1	$10,000
6	Bid/Secure a Contractor	LS	$2,000	1	$2,000
7					
8					
9					
10					
11					
12	**Construction Costs**:				
13					
14	Repair Gas Wellheads for Leachate Extraction	Each	$300	7	$2,100
15	New Pumps, Counters, Regulators and Tubing for 4 new pumps	Each	$4,000	4	$16,000
16	Install/Repair Compressor	LS	$5,000	1	$5,000
17	Electrical Hookup	LS	$2,000	1	$2,000
18	Replace desiccant and filters in Dryer	LS	$1,100.00	1	$1,100
19					
20					
21					
22					
23					
24					
25	**CQA and Documentation Costs**				
26					
27	On-site CQA (1 week @ $7,500/week)	Week	$7,500	1	$7,500
28	Certified Documentation Report with Operation Manual	LS	$5,000	1	$5,000
29				1	
30					
31					
32					
33					
34					
35					
				Subtotal:	$50,700
				Total with contingency (25 percent):	$63,000

Assumptions:

1. Costs are in 2019 dollars. Some totals may not agree due to rounding.
2. Unit prices are based on similar project experience and information obtained from vendors and Contractors.
3. Cost assumes that leachate will be extracted from 7 Gas Wells.
4. Costs assume that 3 pumps still work and 4 pumps need replacement.
5. Cost assumes that none of the airlines supply or leachate discharge pipes are damaged and need repair.
6. Cost assumes that the desiccant dryer works and only needs desiccant and filters to be replaced.
7. Costs do not include electrical power or Leachate trucking and disposal.
8. Costs do not include monitoring and operation and maintenance of the system.

Prepared By: K. Pawlisch
Checked By: K. Vater

Table 5: Engineer's Opinion of Probable Cost for Gas System Startup
WDNR
Refuse Hideaway Landfill
October 1, 2019

Item No.	Item Description	Unit	Unit Cost	Quantity	Total Cost
1	**Gas System Startup**				
2					
3	**Design & Start-Up**				
4					
5	Design and Engineering	LS	$5,000	1	$5,000
6	Bid/Secure a Contractor	LS	$2,000	1	$2,000
7					
8					
9					
10					
11					
12	**Construction Costs**:				
13					
14	Repair Wellheads	Each	$1,000	13	$13,000
15	Realign 200 feet of Watered-out Gas Header Pipe	LF	$50	200	$10,000
16	Install New Skid Mounted Blower and Flare System	LS	$137,000	1	$137,000
17	Electrical Work	LS	$2,000	1	$2,000
18					
19					
20					
21					
22					
23					
24					
25	**CQA and Documentation Costs**				
26					
27	On-site CQA (2 weeks @ $7,500/week)	Week	$7,500	2	$15,000
28	Certified Documentation Report/Letter	LS	$10,000	1	$10,000
29					
30					
31					
32					
33					
34					
35					
				Subtotal:	$194,000
				Total with contingency (25 percent):	$243,000

Assumptions:

1. Costs are in 2019 dollars. Some totals may not agree due to rounding.
2. Unit prices are based on similar project experience and information obtained from vendors and Contractors.
3. Cost assumes that gas will be extracted from Gas Wells GW1 through GW13 (13 wells)
4. Cost assumes the realignment of 200 feet of gas pipe that is watered-out
5. Cost assumes a new skid mounted blower, flare and control panel.
6. Costs do not include electrical power for the equipment and condensate trucking and disposal.
7. Costs do not include monitoring and operation and maintenance of the system.
8. Costs assumes bypassing the existing blower and connecting to the new skid mounted system.

Prepared By: K. Pawlisch
Checked By: K. Vater

Table 6: Engineer's Opinion of Probable Cost for Electrical System Upgrades
WDNR
Refuse Hideaway Landfill
October 1, 2019

Item No.	Item Description	Unit	Unit Cost	Quantity	Total Cost
1	**Electrical System Upgrades**				
2					
3	**Design & Start-Up**				
4					
5	Design and Engineering	LS	$200	1	$200
6	Bid/Secure a Contractor	LS	$500	1	$500
7					
8					
9					
10					
11					
12	**Construction Costs**:				
13					
14	Upgrade System Per Van Ert Quote in Attachment 5	LS	$10,550	1	$10,550
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25	**CQA and Documentation Costs**				
26					
27	On-site CQA (concurrent with other work)	LS	N/A	0	
28	Record Electrical Drawings and Information	LS	$1,000	1	$1,000
29					
30					
31					
32					
33					
34					
35					
				Subtotal:	$12,250
				Total with contingency (25 percent):	$15,000

Assumptions:

1. Costs are in 2019 dollars. Some totals may not agree due to rounding.
2. Unit prices are based on similar project experience and information obtained from vendors and Contractors.

Prepared By: K. Pawlisch
Checked By: K. Vater

Attachment 1: Electronic Site Topographic Map in AutoCAD Format

Survey Data (December 2, 2019)

4000	490846.2	769383.3	932.298	GV *P3 - SHOT TOP PIPE INSIDE CASING
4001	490853.2	769092.8	932.4	GV *P4 - SHOT TOP PIPE INSIDE CASING
4002	490840.1	768790.3	936.78	GV *P16 - SHOT TOP PIPE INSIDE CASING
4003	490915.8	769058.9	936.94	GV *P21 - SHOT TOP PIPE INSIDE CASING
3075	490959.1	769164.8	932.53	SEEP

Attachment 2: Photographic Log

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
1	09-16-2019

Description
Area with erosion, bare ground and stressed vegetation with wattle installed.

Photo No.	Date
2	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
3	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photo No.	Date
4	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
5	09-16-2019

Description
Area with erosion, bare ground and stressed vegetation with wattle installed.

Photo No.	Date
6	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photographic Log

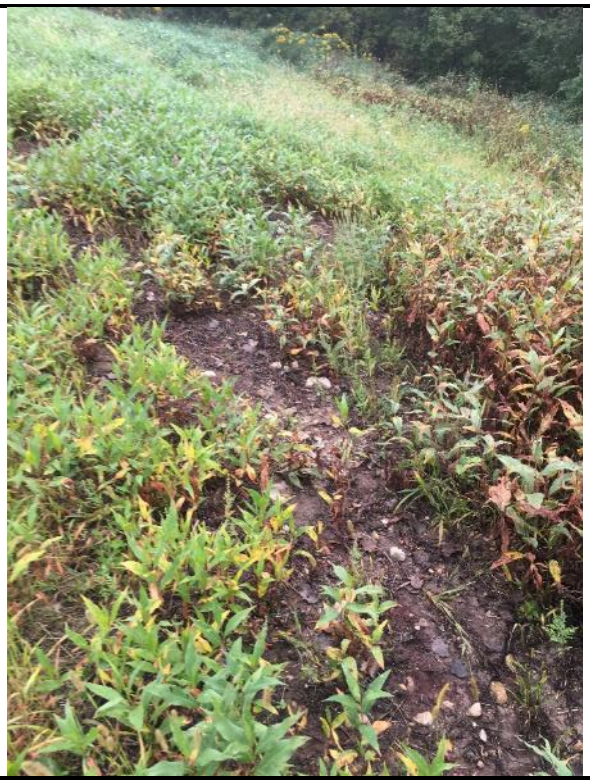
Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
7	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photo No.	Date
8	09-16-2019

Description
Area with bare ground and stressed vegetation.



Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
9	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photo No.	Date
10	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
11	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photo No.	Date
12	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
13	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photo No.	Date
14	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
15	09-16-2019

Description
Area with bare ground and stressed vegetation.

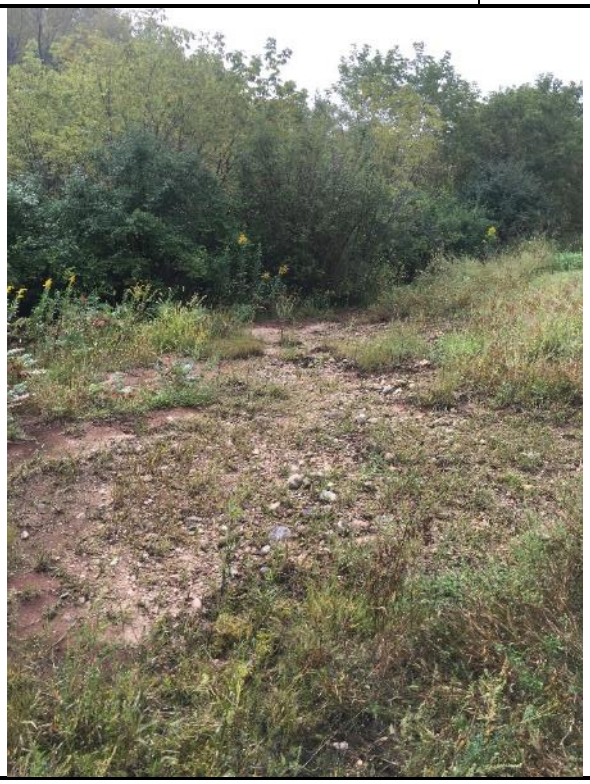


Photo No.	Date
16	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
17	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photo No.	Date
18	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
19	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photo No.	Date
20	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
21	09-16-2019

Description
Low area with standing water.

Photo No.	Date
22	09-16-2019

Description
Low area with some standing water/damp soil.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
23	09-16-2019

Description
Low area with standing water.

Photo No.	Date
24	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
25	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photo No.	Date
26	09-16-2019

Description
Low area with standing water.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
27	09-16-2019

Description
Low area with standing water.

Photo No.	Date
28	09-16-2019

Description
Low area with standing water.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
29	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photo No.	Date
30	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
31	09-16-2019

Description
Area with bare ground and stressed vegetation.

Photo No.	Date
32	09-16-2019

Description
Low area with standing water.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
33	09-16-2019

Description
Low area with standing water.

Photo No.	Date
34	09-16-2019

Description
Low area with standing water/damp soil

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
35	09-23-2019

Description
Riprap drainage ditch with overgrown trees.

Photo No.	Date
36	09-22-2019

Description
Sedimentation basin looking south.

Photographic Log

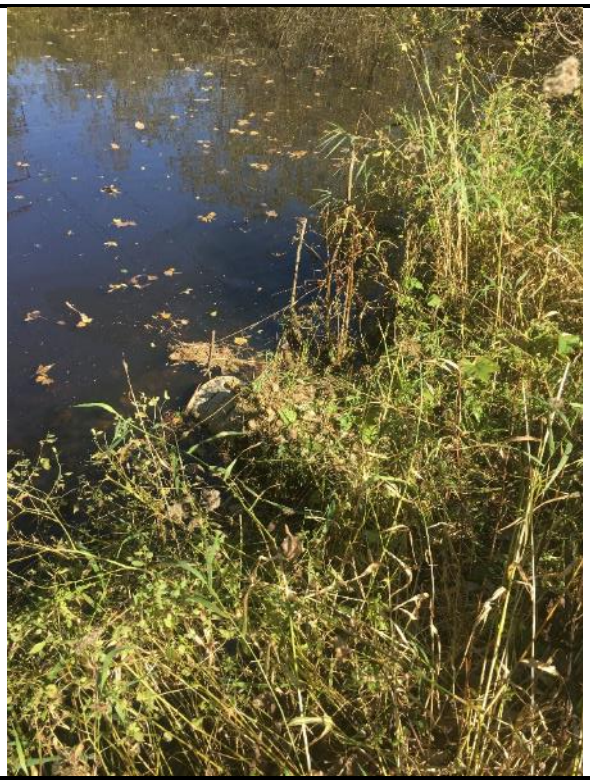
Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
37	09-23-2019

Description
Sedimentation basin looking north.

Photo No.	Date
38	10-09-2019

Description
Sedimentation basin discharge pipe inlet.



Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
39	10-09-2019

Description
Washout on the backside of the sedimentation basin berm exposing the back-half of the discharge pipe.

Photo No.	Date
40	10-09-2019

Description
Washout on the backside of the sedimentation basin berm exposing the back-half of the discharge pipe.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
41	09-23-2019

Description
Exposed geotextile and washout on the southern portion of the western drainage ditch.

Photo No.	Date
42	09-23-2019

Description
Riprap and overgrown vegetation on the southern steep portion of the western drainage ditch.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
43	09-23-2019

Description
Exposed geotextile and washout near the southern discharge on the western drainage ditch.

Photo No.	Date
44	09-16-2019

Description
Compressor tank, motor and electrical components remaining on the compressor tank.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
45	09-16-2019

Description
Electric motor and electrical on the existing compressor tank.

Photo No.	Date
46	09-16-2019

Description
Existing compressor tank.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
47	09-16-2019

Description
Existing desiccant dryer.

Photo No.	Date
48	09-16-2019

Description
Manifold for the South, North and Center branches of the gas system piping network.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
49	09-16-2019

Description
Piping, valve, flame arrester and fitting at the inlet of the existing blower.

Photo No.	Date
50	09-16-2019

Description
Existing blower.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
51	09-16-2019

Description
Electric motor on the existing blower.

Photo No.	Date
52	09-16-2019

Description
Piping, valves, flame arrester and base of the existing pedestal flare.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
53	09-16-2019

Description
Existing pedestal flare.

Photo No.	Date
54	09-16-2019

Description
Piping, valves and flame arrester for the existing pedestal flare.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
55	09-16-2019

Description
Existing enclosed flare.

Photo No.	Date
56	09-16-2019

Description
Existing control panel for the existing blower and flares.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
57	09-16-2019

Description
Existing control panel for the existing blower and flares.

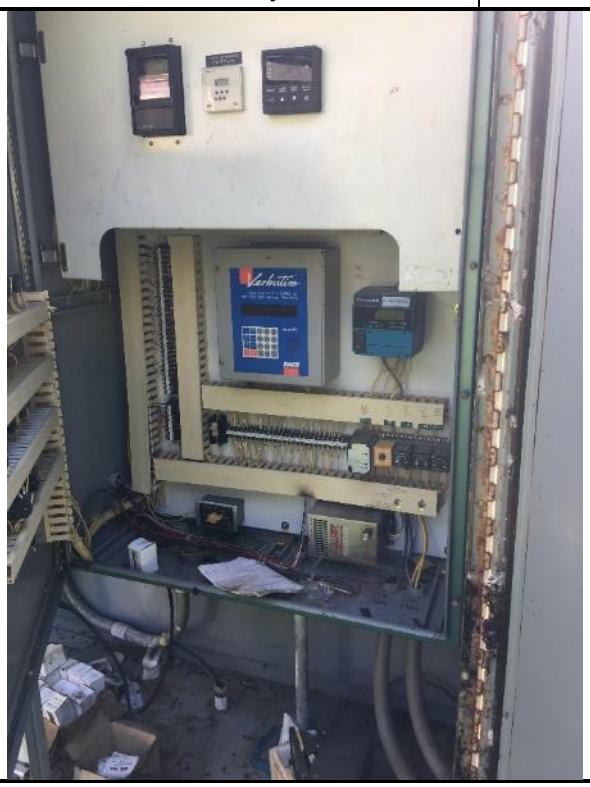


Photo No.	Date
58	09-16-2019

Description
Existing electrical panel for the gas extraction and leachate recovery systems.

Photographic Log

Client Name:	Site Location:	Project No.:
Wisconsin Department of Natural Resources	Refuse Hideaway Landfill Town of Middleton, Dane County, Wisconsin	335719.0001.0000, Phase 1

Photo No.	Date
59	09-16-2019

Description
Existing electrical panel for the gas extraction and leachate recovery systems.

Photo No.	Date
60	09-16-2019

Description
Control panel for the leachate storage tank.

Attachment 3: Field Notes

Leachate Levels (9/16/2019)

Gas Well ID	Distance from TOC to Leachate Level Port (inches)	Distance from TOC to Leachate Level Port (feet)	TOC Elevation (feet)	Distance from Leachate Level Port to Leachate (feet)	Leachate Level Elevation (feet)
GW-1	31.5	2.63	984.75	36.38	945.75
GW-2	34.5	2.88	986.12	35.19	948.06
GW-3	38.0	3.17	992.78	52.29	937.32
GW-4	40.5	3.38	997.93	31.58	962.98
GW-5	46.5	3.88	998.4	37.02	957.51
GW-6	40.0	3.33	986.91	34.85	948.73
GW-7	52.0	4.33	995.09	27.79	962.97
GW-8	40.0	3.33	1005.32	38.37	963.62
GW-9	40.5	3.38	1013.25	41.16	968.72
GW-10	32.0	2.67	1025.31	52.1	970.54
GW-11	34.5	2.88	1026.76	39.98	983.91
GW-12	44.5	3.71	1032.24	37.95	990.58
GW-13	37.0	3.08	1038.29	42.08	993.13

9/16/19

Loc	Time	TOC to bottom of port (in)	Leachate Level (ft)	Comments
GW-1	0917	31.5	36.38	
GW-2	0911	34.5	35.19	@ Pt port
GW-3	0904	38.0	52.29	
GW-4	0924	40.5	31.58	@ flex hose
GW-5	0937	46.5	37.02	
GW-6	0846	40.0	34.85	
GW-7	1000	52.0	27.79	
GW-8	0951	40.0	38.37	
GW-9	0943	40.5	41.16	
GW-10	1008	32.0	52.16	replace header port
GW-11	1031	34.5	39.98 ~~37.95~~	
GW-12	1023	44.5	37.95	
GW-13	1016	37.0	42.08	replace air reg

1035 - Helped Kim find standing water areas

1050 - Helped Ben locate and mark gas probes

- Gas extraction wells had positive pressure and CH_4 > 50%, pg 32
- Took photos of all wells to help in assessing well condition
- Replace all ~~flex~~ hose for GW's
- All butterfly valves for GW & LF isolation valves are in working condition.
- Replace all air lines

9/16/19

LOC	P (in H2O)	CH4	CO2	O2	Time
GW-1	+0.03	54.9	44.9	0.0	0917
GW-2	+0.74	56.7	44.2	0.0	0911
GW-3	+1.55	63.2	36.4	0.0	0904
GW-4	open to atm	67.4	32.6	0.0	0929
GW-5	+0.03	68.9	30.8	0.0	0937
GW-6	+1.39	64.8	35.0	0.1	0846
GW-7	+1.56	71.7	28.1	0.0	1000
GW-8	+0.03	69.2	21.0	2.7	0951
GW-9	+0.37	88.9	10.6	0.0	0943
GW-10	+0.06	78.6	20.9	0.3	1008
GW-11	+0.07	79.2	20.7	0.0	1031
GW-12	+0.06	69.2	30.4	0.1	1023
GW-13	+0.12	71.1	28.7	0.1	1016

Rite in the

Landfill Control System Inspection Report
Refuse Hideaway Landfill
Middleton, WI

(Revised: 8/2019)

	General Information					
1	Facility Name: Refuse Hideaway Landfill			Date of Inspection:		
2	Facility Location: Middleton, WI			Inspector: Kim Pawlisch		
3	Reason for Inspection: Condition Assessment for Leachate Extraction, Gas Extraction, Cover, and Site Access					
4	Temperature/Weather: temperature 60 to 70 degree					
5	Ground Conditions: Damp with fog and rain the last couple of days					
6	**Condition Final Cover/Cap:**	☐ Good	☐ Fair	☐ Needs Maintenance	☐ N/A	
7	Vegetation	☐ Good	☑ Fair	☐ Needs Maintenance	☐ N/A	
8	Erosion	☐ Good	☑ Fair	☐ Needs Maintenance	☐ N/A	
9	Burrowing	☑ Good	☐ Fair	☐ Needs Maintenance	☐ N/A	
10	Settlement	☐ Good	☑ Fair	☐ Needs Maintenance	☐ N/A	
11	Leachate Seeps	☑ Good	☐ Fair	☐ Needs Maintenance	☐ N/A	
12	Damage from wildlife?	☑ Good	☐ Fair	☐ Needs Maintenance	☐ N/A	
13	Damage from unauthorized use?	☐ Good	☑ Fair	☐ Needs Maintenance	☐ N/A	
14	Exposed Geotextile/Geomembrane	☐ Good	☐ Fair	☐ Needs Maintenance	☑ N/A	
15	Other? Yes, trees on the final cover	☐ Good	☐ Fair	☑ Needs Maintenance	☐ N/A	
16	If "Fair" or "Needs Maintenance", provide description (attach photos with scale/reference) and indicate location on site map (Figure 1): There are many small areas where there is bare soil and stressed vegetation that were mapped using the handheld GPS. There is erosion in two small areas with rills, but TRC placed wattles in early August in these two areas to help control the erosion. These two erosion locations were mapped using the GPS. Differential settlement has occurred at some locations causing depressions, but none of them were deeper than possibly 6". There are hunting tree stand and many blinds on the property surrounding the final cover but no damage noticed from unauthorized use. There are many cluster of trees on the final cover and possibly on the final cover near the final cover limits.					
17	**Condition of Perimeter Drainage:**	☐ Good	☐ Fair	☑ Needs Maintenance	☐ N/A	
18	Vegetation? Yes	Erosion? yes		Sediment? Yes	Other?	
19	If "Fair" or "Needs Maintenance", provide description (attach photos with scale/reference) and indicate location on site map (Figure 1): The eastern and western and drainage ditches have trees and shrubs growing in them, but the trees root growth probably stabilizes the ditch. There are two locations in the western ditch where the riprap has washed away and should be replaces with new geotextile and riprap (trees will need to be cut to gain access to complete the repair. The sedimentation basin should be cleaned. the sedimentation berm has breached and washed some of the backside of the berm exposing the downstream half of the discharge pipe. The washout areas should be repaired and the berm raised. Possibly install a riprap emergency spillway. The inlet of the discharge pipe is approximately 3' above the invert (pipe sloping towards the inlet).					
20	**Leachate Extraction Wells/Equipment**	☐ Good	☐ Fair	☑ Needs Maintenance	☐ N/A	
21	Well head tubing and connections					
22	Components in the control panels					
23	Components in the compressor building					
24	Visible components of the collection tank					
25	Other					
26	Measure leachate elevations at 13 leachate/gas extraction wells, attach documentation table.					
27	If "Fair" or "Needs Maintenance", provide description (attach photos with scale/reference) and indicate location on site map (Figure 1): Wells are deteriorating, cracking and settling. Many parts need repair and some are missing on the wells. The tank and control panel seem to be operating. The working components of the compressor have been removed and only the tank and motor remain. the loadout pad looks good. Piping from the compressor to the dryer have been disconnected. The control panel for the compressor is questionable for use on visual inspection.					

28	**Gas Extraction Wells/Equipment**	☐ Good	☐ Fair	☑ Needs Maintenance	☐ N/A
29	Inspect visible components				
30	Field screen gas conditions in six locations, attach documentation table.				
31	Other				
32	If "Fair" or "Needs Maintenance", provide description (attach photos with scale/reference) and indicate location on site map (Figure 1):				
	Wells are deteriorating, cracking and settling. Many parts need repair and some are missing on the wells such as monitoring ports. The valves operate on all the wells. Blower and flare has not been operated for years and deteriorating. The blower is covered with oil and the blower is rusty. It is not known if the panel to the blower/flare can operate. Control valves can be opened and closed.				
33	**Condition of Fence:**	☐ Good	☑ Fair	☐ Needs Maintenance	☐ N/A
34	Damage to gates? No Locks? Some Fencing? Some Signage? Yes Vandalism? No Other?				
35	If "Fair" or "Needs Maintenance", provide description (attach photos with scale/reference) and indicate location on site map (Figure 1):				
	There isn't a fence around the landfill, but there are chain-link fences around the blower/flare station and around the underground storage tank. The tank fence is not locked. Many wells and gas probes are not locked (TRC will put locks on the monitoring wells and gas probes). Many hunting tree stands and ground blinds exist on the site. Signs are installed on the final cover indicating no unauthorized people are allowed.				
36	**Condition of Access Roads:**	☐ Good	☑ Fair	☐ Needs Maintenance	☐ N/A
37	Excessive rills/gullies? Standing water? Yes Excess potholes? Yes Scour? Other?				
38	If "Fair" or "Needs Maintenance", provide description (attach photos with scale/reference) and indicate location on site map (Figure 1):				
	There is one pothole on the road the is holding water, but it is small.				

Additional Comments/Observations

39		
40	Name of Inspector/Company: TRC	Date: September 16, 2019
41	Inspector Signature:	Phone No.: (608) 358-1762
42		Email: Kpawlisch@trccompanies.com

Notes: "N/A" = Not Applicable

(1) Describe issues, observations, and unexpected changes to assess whether the drainage features is effective and functioning as designed. Condition is a personal judgment based on experience and previous observations.

(2) Include representative photos to support observations and/or concerns.

(3) Areas of damage or concern must be indicated on a site map to accompany Inspection Checklist.

Further Actions Required (to be completed by Engineer)			
	Actions Required:	Due Date:	Date Action Completed:

Attachment 4: Perennial Energy, LLC Quote

October 11th, 2019

TRC

Re: Refuse Hideaway Landfill

Attn: Kim Pawlisch

Kim,

Per your request, following and attached please find our **budgetary quotation** to supply the described products and services relative to your project requirements. We appreciate the opportunity to furnish this proposal.

Perennial Energy proposes to provide a unitized, modular, landfill gas extraction and flare station, with off-loading and installation by others. The flare station shall be sized per the specification to exert a **25" WC vacuum** at the inlet of the skid (**30" WC vacuum** at the inlet of the blower) and deliver **30% to 50% methane content** LFG to a **300 SCFM,** candlestick flare. The system shall be capable of delivering the specified landfill gas flow at up to 15" WC at the outlet of the blower. Vacuum/Flow control feature is accomplished with VFD blower control. The three-phase, 480 VAC power panel and the single-phase load distribution panel are provided on the Perennial Energy system skid.

The Candlestick Flare Station (CSFS) shall include three principal sub-systems:

- The Candlestick Flare (CSF)
- The Gas Handling System (GHS)
- The Candlestick Flare Station MCC/Control System (CP)

Not included in this proposal are the following:

- Site Civil, Electrical, or Structural Engineering
- Freight, off-loading, or Installation
- Bonds or liquidated damages
- Taxes, permits, fees, etc.

The Candlestick Flare shall include:

- 4**"** Candlestick flare assembly for **30 to 300** SCFM of LFG
- 4**"** schedule 40 carbon steel lower mast
- 4**"** schedule 40 stainless steel upper mast assembly
- 4**"** IPS – ANSI 125# flanged Inlet Nozzle
- 4**"** Eccentric flame arrester with aluminum housing and aluminum element.

- Upstream and downstream pressure / differential pressure indication across the flame arrester
- 4” butterfly valve w/ SS disc & stem and Viton seat w/ pneumatically controlled safety shutoff actuator w/spring assisted shutoff. Dry instrument quality compressed (80-100 psig) air or nitrogen supplied by others.
- 4**”** stainless steel bellows type flex connector
- Stainless steel burner nozzle assembly with manually operated adjustable turbulator orifice vanes to accommodate variable flow rate
- Stainless steel flare shroud assembly w/ operator adjustable air inlet dampers.
- Propane pilot assembly including, igniter, gas solenoid, & manometer port
- Type “K” pilot monitoring thermocouple assembly
- Type “K” flame monitoring thermocouple assembly
- All flare wiring pre-installed and pre-conduited to a flare mounted j-box
- Candlestick flare to be mounted on GHS skid, approximate flare height is 15’ tall.
- All “on flare” flare wiring pre-installed and pre-conduited to junction boxes. Will require field reconnection of numbered wires to numbered terminals in junction box(s)
- All carbon steel surfaces sand blasted to SSPC SP-6 standards, primed and painted to Perennial Energy standard paint specs.

The Gas Handling System shall include:

- 4” system inlet isolation butterfly valve (SS disc & stem / viton elastomer)
- Landfill Vacuum transmitter and thermocouple on system inlet
- Vacuum and Temperature gauges provided on system inlet
- 4” schedule 10 stainless steel (304L) blower inlet and outlet manifold piping.
- Schedule 10 304L weld hub assemblies w/ ANSI 125# powder coated ductile iron flanges
- Inlet demister/knockout, **304L SS construction** with polypropylene knitted mesh, multiple layer demister pad/filter rated for 100% removal efficiency at 6 micron droplet size. Removes free moisture in the incoming gas, equipped with 8” flanged cleanout, differential pressure gauge, removable lid for element inspection and removal, and high level safety switch**, and visual liquid level gauge,** 5 psig vacuum/pressure rating. Demister is heat traced and insulated.
- Blower suction side tuning butterfly valves (SS disc & stem / viton elastomer)

- 1 ea. Regenerative blower with aluminum housings and aluminum impellers, direct driven to a **10.0 HP** TEFC inverter duty motor, 230 volt/60hz/3ph, the blower is sized for 300 SCFM flow, -30" WC inlet vacuum, and 10" WC discharge pressure, the blower condensate drains are heat traced and insulated

- SS bellows expansion joints at blower inlet and outlet connections

- Perennial Energy Tru-tube delivery flow meter to monitor flow to the flare, Veris annubar primary element with differential pressure transmitter, pressure compensated, temperature compensated, specific gravity compensated. PLC calculates SCFM and totalizes flow.

- One each heavy duty unitized structural skid(s) to accommodate all above equipment in a fully integrated package with integrated flare mounting

- All devices fully installed, wired to skid mounted control panel, calibrated, and tested to the extent possible at the factory

- All carbon steel surfaces sand blasted to SSPC SP-6 standards, primed and painted to Perennial Energy standard paint specs.

The Candlestick Flare Station MCC/Control System shall include:

- Nema 12/3R Power Distribution Panel w/main breaker and branch breakers to feed all system loads**.** 480 VAC Three Phase **100 AMP** Main Breaker.

- Nema 3R Rain/Sun Shield

- Control Panel Lighting

- Nema 12/R w/ NEMA 4 gasketing & 3 point locking handle controls/MCC enclosure with air conditioning and heater for closed loop cooling of components

- 1 each **10 HP** Variable Frequency Drives for LFG blowers, controlled via PID loops to maintain landfill vacuum or landfill gas flow

- Automation Direct PLC digital and analog logical supervision system

- C-More Color Touchscreen operator interface
  -All temperatures, pressures, flows, and other analog data displayed
  -All timers, setpoints, PID loops, and other system operator inputs available
  -Alarms and shutdowns with history log

- Ethernet switch for remote connectivity to PLC/HMI

- Yokogawa FX-1006 chart recorder with compact flash memory, ethernet, math function, report function and fail/memory alarm option, will require internet or cellular service for emailing reports

- Raco Guard-it 4 channel autodialer, will require cellular modem or landline service for calling

- Uninterruptable Power Supply for PLC, HMI, and communication devices

- OFF / ON switch for the System
- OPEN / CLOSED / AUTO switch for the safety shutdown valve
- TEST / OFF / AUTO switch for the propane pilot ignition system
- TEST / OFF / AUTO switch for the blower
- Flame failure reset (ALARM RESET / LAMP TEST switch)
- Blower run time indication (Touch Screen)
- Flame failure annunciation for the flare (Touch Screen)
- Shutdown Valve failure annunciation (Touch Screen)
- Low LFG flow rate annunciation (Touch Screen)
- Blower high vibration annunciation (Touch Screen)
- Blower Motor low current (surge) annunciation (Touch Screen)
- Condensate high level annunciation (Touch Screen)
- Alarm and shutdown message annunciation (Touch Screen)
- AC and DC control voltage surge protection
- 15 kVA 480:240/120 single phase transformer
- Single-phase load distribution panel
- U.L. 508A Listed Control Panel

General:

- System is priced on an **FOB Factory, West Plains, MO basis**. Freight can be pre-paid and added to invoicing.
- 3 days of on-site start-up & training services by a factory field services technician/engineer are included.
- 3 copies of full engineering submittals are included.
- 3 copies of “as-built” Operation & Maintenance Manuals are included.

The system as described above and attached is provided as completely pre-packaged, pre-wired, and factory pre-tested as is possible. The system is offered **FOB Factory**, with freight billed at 115% of shipping invoice(s).

The pricing does not include any site civil or structural engineering, or site preparation work of any kind. Neither does the price include any local, state or federal taxes, or any permits, or tariffs of any kind. The system as quoted is to be off loaded, set in place, installed and interconnected by others. The system is designed for installation on equipment pad(s) installed at the same finished

elevation. The system includes only the standard Perennial Energy warranty for 18 months from date of shipment or 12 months from date of first service, whichever occurs first. Please see copy of Perennial Energy warranty, attached. We are pleased to honor this quotation for 30 days from the date of this document. The pricing is dependent on receiving an approved order that would include industry standard commercial terms. Perennial Energy standard terms are:

10% with order
30% with approved submittals or release for manufacturing
30% upon receipt of major components
25% upon notification to customer of ready to ship
05% upon successful start-up, unless failure to achieve successful start-up is neither the fault nor cause of Perennial Energy, then net 60 days of shipment

10% order due upon Receipt of invoice. All other is Net 30 days of Invoice.

The system as described above is offered for**..... $136,971.00**

We anticipate that we could deliver the system in **12 to 18** weeks from receipt of approved submittals or other irrevocable release to order all materials. Actual shipping estimates will have to be given at time of order. We anticipate that submittals can be provided in **1 to 3** weeks from receipt of an approved order.

Thank you for your consideration of Perennial Energy landfill gas products and services. Should you have any questions, or require further information in this regard, please do not hesitate to call.

Respectfully,

David Mathews
Perennial Energy, LLC
West Plains, MO 65775

Attachments / Enclosures:
Perennial Energy *Warranty / Service Policy and Conditions of Sale*

Attachment 5: Van Ert Electric Company, Inc. Quote

Van Ert Electric Company Inc.
2000 Progress Way, Kaukauna, WI 54130
Tel. 920-766-3888 Fax 920-766-0883

October 14, 2019

RE: Replacing bad panels with new

Katherine,

Thank you for the opportunity to provide you a quote on the above referenced project. Our price is based on a site visit and the following;

- Remove old 480 volt jbox
- Remove 3 old disconnects
- Remove 1 old motor starter
- Remove old 480 to 120/240v transformer
- Remove old 120/240 volt panel
- Remove old wood frame structure
- Install new treated lumber wood frame structure
- Install new 120/240 main breaker panel
- Install new 480 to 120/240 volt transformer
- Install new motor starter
- Install new 480 volt panel
- Install new 480 breakers instead of disconnects
- Install panel 2 panel outlets under new panel
- Label all items
- Connection of underground pipes
- Dispose of old equipment
- This is to be done before ground is frozen. Otherwise there will be an extra charge after it does
- Work to be completed during normal business hours
- Weather will hinder completion of this project

Price Quote $10,534.74.00

**********Price good for 30 days**********

We look forward to the opportunity to work with you on this project. Please contact me with any questions at (608) 444-5556.

Sincerely,

Tory Weidemann

Service Technician