Statement of Basis

Permit to Construct No. P-2009.0001
Project ID 61360

Ada County Landfill
Boise, Idaho

Facility ID 001-00195

Final

April 15, 2015
Kelli Wetzel
Permit Writer

KW

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
Btu	British thermal units
CAA	Clean Air Act
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CI	compression ignition
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gases
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
HHE	Hidden Hollow Energy, LLC
hp	horsepower
hr/yr	hours per consecutive 12 calendar month period
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometers
lb/hr	pounds per hour
lb/qtr	pound per quarter
LFG	landfill gas
m	meters
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NMOC	nonmethane organic compounds
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
O&M	operation and maintenance
O_2	oxygen
PAH	polyaromatic hydrocarbons
PC	permit condition
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
ppm	parts per million
ppmw	parts per million by weight
PSD	Prevention of Significant Deterioration
PTC	permit to construct

PTE	potential to emit
RICE	reciprocating internal combustion engines
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
U.S.C.	United States Code
VOC	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Ada County Landfill is a municipal solid waste landfill and is located at 10300 Seaman's Gulch Road, roughly 6.5 miles northwest of Boise. The property consists of approximately 2,700 acres. The landfill is owned and operated by Ada County.

Ada County Landfill consists of two active cells - Hidden Hollow Cell (HHC) and the North Ravine Cell (NRC). The Hidden Hollow Cell encompasses an area of approximately 110 acres with design capacity of 16 million cubic yards and is anticipated to be closed at the earliest 2020. The North Ravine Cell, approximately 260 acres, was designed to have a final capacity of 70 million cubic yards and an active life of 90 years based on the anticipated growth patterns and LANDGEM modeling. The North Ravine Cell has been accepting waste since 2007.

Ada County Landfill generates landfill gas (LFG). This gas is a byproduct of the decomposition of organic material in the landfill. It is typically a mixture of approximately 50% methane and 50% carbon dioxide, and a minor amount of nonmethane organic compounds (NMOC). Within the NMOC are some hazardous air pollutants (HAPs) and toxic air pollutants (TAPs). A trace amount of hydrogen sulfide gas is also found in the landfill gas. Landfills may continue to generate gas for 10 to 20 years, or longer, after waste disposal has ceased.

The extracted LFG is drawn to the flare system by two exhausters (vacuum blowers). Condensate is captured ahead of the exhausters and pumped to the leachate collection ponds. The condensate consists primarily of water vapor generated at a rate of approximately 0.004 gallon per cubic foot of LFG.

Propane-fired pilots provide continuous auto-ignition of the LFG in the flares. Sensors (thermocouples) in the flare stacks continuously monitor flare operations. In the event the flame goes out, the integrated control system will shut down the flares. The flares are enclosed. The flare flame cannot be seen. However, system operators are able to monitor the presence of the flame through sight glasses of the enclosure.

The NMOC and methane are combusted by the enclosed flares at temperatures between 1,400 – 1,800°F.

Federal regulations, 40 CFR 60 Subpart WWW, require municipal landfills to collect and control the gases emitted from the decomposition process. In April 2004, such a system began to collect gases from the forty six acres of HHC. The flares and the landfill gas engines are used as emission control devices and with the issuance of this permit will be permitted for flow rates of 2,320 scfm and 2,379 scfm for Flare 1 and Flare 2, respectively. The flares can be operated individually or concurrently.

Hidden Hollow Energy LLC (HHE) consists of two landfill gas-to-energy units utilizing landfill gas from the Ada County Landfill as fuel for two internal combustion engines that drive 1.6-megawatt (MW) generators. The issuance of this permit provides for the consolidation of operations between Ada County Landfill and HHE into a single facility. This permit also provides for the installation of two additional LFG engines that were originally permitted under the HHE PTC, P-2009.0098 but were never constructed.

A hydrogen sulfide (H_2S) scrubber treatment system will be installed to scrub the LFG prior to combustion activities in the LFG engines and the flares. The system will operate at a pressure drop of 8" water column at a maximum flow rate of 4,699 scfm of LFG. The treatment system is designed to result in an outlet concentration of 600 ppm H_2S.

The wood chipper and power screen engines have been removed from service. Two emergency engines are still operated by the facility.

Permitting History

The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

Ada County Landfill

October 19, 2012	Tier I Operating Permit, T1-2011.0128, Permit status (A)
September 28, 2012	P-2009.0001, Increase the hydrogen sulfide concentration to 600 ppm and flare flow rates to 3,350 scfm, Permit status (A, but will become S upon issuance of this permit).
July 22, 2009	P-2009.0001, Update the flare flow rates to 2,320 scfm for Flare 1 and 2,379 scfm for Flare 2, Permit status (S)
April 13, 2007	Tier I Operating Permit, T1-060050, Permit status (S)
May 18, 2006	PTC No. P-050056, Modification to add North Ravine Cell, Permit status (S)
June 15, 2004	PTC No. P-040004, Construction of two flares and operation of an existing wood chipper, power screen, and two diesel engine generators, Permit status (S)

Hidden Hollow Energy, LLC

June 19, 2012	P-2009.0098, Limit carbon monoxide emissions, incorporate 40 CFR 63, Subpart ZZZZ requirements, and install and operate a H_2S removal system, Permit status (A, but will become S upon issuance of this permit)
March 1, 2010	P-2009.0098, Addition of two new SI engines. The facility proposed four total, currently operating only two, Permit status (S)
December 29, 2008	P-2008.0190, change of ownership from G2 Energy to Hidden Hollow Energy, Permit status (S)
March 23, 2006	P-050049, Initial permit to construct to G2 Energy LLC, Permit status (S)

Application Scope

This PTC is for a modification at an existing Tier I facility. See the current Tier I permit statement of basis for the permitting history.

The applicant has proposed to:

- Consolidate operations with Hidden Hollow Energy, LLC (HHE) into a single facility
- Install a hydrogen sulfide scrubber treatment system
- Increase the allowable flowrate of LFG to the gas collection system from 3,350 scfm to 4,699 scfm.
- Remove two existing non-emergency engines that were used to provide power to the wood chipping operations (Gen 1 and Gen 2)
- Add a new 990 hp non-road engine that is seasonal and portable for wood chipping operations
- Add two LFG engines.

Application Chronology

April 29, 2014	DEQ received an application and an application fee.
May 13 – May 28, 2014	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
June 30, 2014	DEQ determined that the application was complete.
September 22, 2014	DEQ made available the draft permit and statement of basis for peer and regional office review.
September 26, 2014	DEQ made available the draft permit and statement of basis for applicant review.
November 14, 2014	Revised modeling report and EI was submitted by the Applicant

January 28 – February 27, 2015	DEQ provided a public comment period on the proposed action.
September 30, 2014	DEQ received the permit processing fee.
April 15, 2015	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Sources	Control Equipment
Hidden Hollow Cell (HHC) and North Ravine Cell (NRC)	Municipal solid waste landfill HHC: ~110 acres Design capacity of 16 million cubic yards Anticipated closure: 2015 NRC: ~260 acres Design capacity of 70 million cubic yards. Anticipated closure: ~2097	Flares 1 and 2: Manufacturer: John Zink Model: Enclosed ZTOF H_2S Scrubber Treatment System: Manufacturer: MV Technologies Model: H2SPlus Max Flow Rate: 4,699 scfm
Emergency Engine #1	Manufacturer: Detroit Model: 30DS60 Capacity: 44 hp Fuel: Diesel	None
Emergency Engine #2	Manufacturer: John Deere Model: 4024 HF 285 Capacity: 80 hp Fuel: Diesel	None
LFG Engine #1	Internal Stationary Spark Combustion Engine Manufacturer: Caterpillar Model: 3520C Capacity: 1.6 MW, 2233 bhp Fuel: Landfill gas Fuel consumption: 600 scfm	H_2S Scrubber Treatment System: Manufacturer: MV Technologies Model: H2SPlus Max Flow Rate: 4,699 scfm
LFG Engine #2	Internal Stationary Spark Combustion Engine Manufacturer: Caterpillar Model: 3520C Capacity: 1.6 MW, 2233 bhp Fuel: Landfill gas Fuel consumption: 600 scfm	H_2S Scrubber Treatment System: Manufacturer: MV Technologies Model: H2SPlus Max Flow Rate: 4,699 scfm
LFG Engine #3	Internal Stationary Spark Combustion Engine Manufacturer: Caterpillar Model: 3520C Capacity: 1.6 MW, 2233 bhp Fuel: Landfill gas Fuel consumption: 600 scfm	H_2S Scrubber Treatment System: Manufacturer: MV Technologies Model: H2SPlus Max Flow Rate: 4,699 scfm
LFG Engine #4	Internal Stationary Spark Combustion Engine Manufacturer: Caterpillar Model: 3520C Capacity: 1.6 MW, 2233 bhp Fuel: Landfill gas Fuel consumption: 600 scfm	H_2S Scrubber Treatment System: Manufacturer: MV Technologies Model: H2SPlus Max Flow Rate: 4,699 scfm

Emissions Inventories

Potential to Emit

IDAPA 58.01.01 defines Potential to Emit as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

Using this definition of Potential to Emit an emission inventory was developed for the two flares, two emergency engines, and four landfill gas engines at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutant, GHG, HAPs and TAPs were based on emission factors from AP-42, manufacturer data, operation of the LFG engines at 8,430 hours per year each, 500 hours per year for the two emergency engines, and process information specific to the facility for this proposed project. The emission factor for formaldehyde from the LFG engines was taken from the Michigan DEQ emission testing data.

Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project.

The following table presents the pre-project potential to emit for all criteria and GHG pollutants from all emissions units at the facility as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 2 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_x		CO		VOC		CO_2e
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	T/yr[(b)]
ACLF P-2009.0001											
Flare 1	1.59	6.97	10.02	43.89	3.03	13.27	0.76	3.32	4.62	20.24	437
Flare 2	1.64	7.19	10.35	45.33	3.13	13.70	0.78	3.43	4.77	20.90	
Total	**3.23**	**14.16**	**20.37**	**89.22**	6.16	26.97	1.54	6.75	**9.39**	**41.14**	437
HHE P-2009.0098											
Flare 1	1.47	6.46	9.29	40.67	2.81	12.30	0.70	3.08	4.28	18.76	280
Flare 2											
LFG Engine #1	0.78	3.42	1.09	4.77	2.46	10.77	14.77	64.69	0.79	3.46	151
LFG Engine #2	0.78	3.42	1.09	4.77	2.46	10.77	14.77	64.69	0.79	3.46	
Total	3.03	13.30	11.47	50.21	**7.73**	**33.84**	**30.24**	**132.46**	5.86	25.68	431
Constant Sources											
Wood Chipper Engine	0.30	0.50	0.01	0.01	5.36	8.84	0.95	1.57	0.12	0.20	1416
Power Screen Engine	0.27	0.44	0.001	0.002	3.79	6.25	0.82	1.35	0.30	0.50	228
Emergency Engine 1	0.13	0.03	0.005	0.00016	1.85	0.46	0.40	0.10	0.15	0.04	17
Emergency Engine 2	0.20	0.05	0.001	0.00025	2.86	0.71	0.62	0.15	0.23	0.06	26
Pre-Project Totals[c]	**4.13**	**15.18**	**20.38**	**89.23**	**21.59**	**50.10**	**33.03**	**135.63**	**10.19**	**41.94**	**2124**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.
c) The emissions from P-2009.0001 (ACLF) and P-2009.0098 (HHE) are based on the amount of LFG passing through a control device. The total emissions were separated out between the two options (100% to the flares or 1200 scfm to LFG engines and the balance to a single flare). The worst case was used to the baseline emissions.

Post Project Potential to Emit

Post project Potential to Emit is used to establish the change in emissions at a facility and to determine the facility's classification as a result of this project. Post project Potential to Emit includes all permit limits resulting from this project.

The following table presents the post project Potential to Emit for criteria and GHG pollutants from all emissions units at the facility as determined by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 3 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

	PM_{10}		$PM_{2.5}$		SO_2		NO_x		CO		VOC		CO_2e
Source	**lb/hr[(a)]**	**T/yr[(b)]**	**lb/hr[(a)]**	**T/yr[(b)]**	**lb/hr[(a)]**	**T/yr[(b)]**	**lb/hr[(a)]**	**T/yr[(b)]**	**lb/hr[(a)]**	**T/yr[(b)]**	**lb/hr[(a)]**	**T/yr[(b)]**	**T/yr[(b)]**
Flare 1	1.58	6.93	1.58	6.93	13.98	61.23	3.01	13.20	0.75	3.30	4.59	20.13	300
Flare 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emergency Engine 1	0.13	0.03	0.13	0.03	0.0006	0.0002	1.85	0.46	0.40	0.10	0.15	0.04	17
Emergency Engine 2	0.20	0.05	0.20	0.05	0.001	0.0003	2.86	0.71	0.62	0.15	0.23	0.06	26
LFG Engine #1	0.78	3.42	0.78	3.42	3.65	15.99	2.46	10.77	14.77	64.69	0.79	3.46	301
LFG Engine #2	0.78	3.42	0.78	3.42	3.65	15.99	2.46	10.77	14.77	64.69	0.79	3.46	
LFG Engine #3	0.78	3.42	0.78	3.42	3.65	15.99	2.46	10.77	14.77	64.69	0.79	3.46	
LFG Engine #4	0.78	3.42	0.78	3.42	3.65	15.99	2.46	10.77	14.77	64.69	0.79	3.46	
Post Project Totals[c]	**5.03**	**20.69**	**5.03**	**20.69**	**28.58**	**125.18**	**17.56**	**57.45**	**60.85**	**262.31**	**8.13**	**34.07**	**644**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.
c) Based on a worst case scenario with 2,400 scfm LFG going to the LFG engines and the balance going to Flare 1. Therefore Flare 2 emissions are zero.

Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants.

Table 4 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

	$PM_{10}/PM_{2.5}$		SO_2		NO_x		CO		VOC		CO_2e
Source	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**T/yr**
Pre-Project Potential to Emit	4.13	15.18	20.38	89.23	21.59	50.10	33.03	135.63	10.19	41.94	2124
Post Project Potential to Emit	5.03	20.69	28.58	125.18	17.56	57.45	60.85	262.31	8.13	34.07	644
Changes in Potential to Emit	**0.90**	**5.51**	**8.20**	**35.95**	**-4.03**	**7.35**	**27.82**	**126.68**	**-2.06**	**-7.87**	**-1480**

Non-Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions of non-carcinogenic toxic air pollutants (TAP) is provided in the following table.

Table 5 POST PROJECT POTENTIAL TO EMIT FOR NON-CARCINOGENIC TOXIC AIR POLLUTANTS

Non-Carcinogenic Toxic Air Pollutants	Post Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
1,1,1-Trichloroethane	7.97E-04	127	No
1,2-Dichloropropane	2.53E-04	23.133	No
2-Propanol	5.62E-03	65.3	No
Acetone	7.60E-04	119	No
Carbon Disulfide	8.24E-05	2	No
Carbonyl Sulfide	1.47E-04	0.027	No
Chlorobenzene	3.50E-04	23.3	No
Chloroethane	1.00E-03	176	No
Dichlorobenzene	3.84E-04	20	No
Dichlorofluoromethane	3.36E-03	2.67	No
Ethanol	2.34E-03	125	No
Ethyl Mercaptan	2.64E-04	0.067	No
Ethylbenzene	9.14E-04	29	No
Hexane	1.06E-03	12	No
Hydrogen Sulfide	1.20E-01	0.933	No
Methyl Ethyl Ketone	9.55E-04	39.3	No
Methyl Isobutyl Ketone	3.50E-04	13.7	No
Methyl Mercaptan	2.24E-04	0.033	No
Pentane	4.43E-04	118	No
Toluene	2.84E-02	25	No
Trans-1,2-Dichloroethene	3.43E-03	52.7	No
Trichloroethylene	4.61E-03	17.93	No
Xylenes	2.40E-03	29	No

None of the PTEs for non-carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is not required for any non-carcinogenic TAP because none of the 24-hour average carcinogenic screening ELs identified in IDAPA 58.01.01.585 were exceeded.

Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions of carcinogenic toxic air pollutants (TAP) is provided in the following table.

Table 6 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS

Carcinogenic Toxic Air Pollutants	Post Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
1,1,2,2-Tetrachloroethane	2.32E-03	1.10E-05	Yes
1,1,2-Trichloroethane	1.66E-04	4.20E-04	No
1,1-Dichloroethane	2.90E-03	2.50E-04	Yes
1,1-Dichloroethene	2.41E-04	1.30E-04	Yes
1,2-Dichloroethane	5.05E-04	2.50E-04	Yes
Acrylonitrile	6.27E-04	9.80E-05	Yes
Benzene	1.62E-03	8.00E-04	Yes
Carbon Tetrachloride	7.66E-06	4.40E-04	No
Chloroform	4.46E-05	2.80E-04	No
Dichloromethane	1.51E-02	1.60E-03	Yes
Ethylene Dibromide	2.34E-06	3.0E-05	No
Formaldehyde	4.0E-03	5.1E-04	Yes
Mercury	3.65E-05	7.00E-03	No
Perchloroethylene	7.70E-03	1.3E-02	No
Vinyl Chloride	5.71E-03	9.40E-04	Yes

Some of the PTEs for carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is required for 1,1,2,2-tetrachloroethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, acrylonitrile, benzene, dichloromethane, and vinyl chloride because the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

Post Project HAP Emissions

The following table presents the post project potential to emit for HAP pollutants from all emissions units at the facility as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 7 **HAZARDOUS AIR POLLUTANTS EMISSIONS POTENTIAL TO EMIT SUMMARY**

Hazardous Air Pollutants	PTE (T/yr)
1,1,1-Trichloroethane	3.04E-02
1,1,2-Trichloroethane	3.56E-04
1,1,2,2-tetrachoroethane	8.84E-02
1,1-Dichloroethane	1.10E-01
1,1-dichloroethene	9.28E-03
1,2-Dichloroethane	1.93E-02
1,2-Dichloropropane	9.65E-03
1,3-Butadiene	1.04E-05
Acetaldehyde	2.05E-04
Acrolein	2.47E-05
Benzene	0.14
Carbon Disulfide	3.95E-02
Carbon Tetrachloride	3.54E-04
Carbonyl Sulfide	2.64E-02
Chlorobenzene	1.34E-02
Chloroethane	3.82E-02
Chloroform	1.78E-03
Chloromethane (methylchloride)	1.63E-03
Dichloromethane	0.58
Ethyl Benzene	0.44
Ethylene Dibromide	5.01E-06
Formaldehyde	35.41
Hexane	0.51
Hydrogen Sulfide (Controlled)	2.57E-01
Mercury	7.81E-05
Methyl Ethyl Ketone	0.46
Methyl Isobutyl Ketone	1.67E-01
Naphthalene	2.26E-05
Perchloroethylene	0.29
Toluene	3.20
Trichloroethylene	0.18
Vinyl Chloride	0.22
Xylene	1.15
Totals	**43.67**

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of PM_{10}, $PM_{2.5}$, SO_2, NO_x, CO, and TAPs from this project exceeded applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline[1]. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

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[1] Criteria pollutant thresholds in Table 2, State of Idaho Guideline for Performing Air Quality Impact Analyses, Doc ID AQ-011, September 2013.

The applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated pre-construction compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP). A summary of the Ambient Air Impact Analysis for TAP is provided in Appendix A.

An ambient air quality impact analyses document has been crafted by DEQ based on a review of the modeling analysis submitted in the application. That document is part of the final permit package for this permitting action (see Appendix B).

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Ada County, which is designated as attainment or unclassifiable for $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201 ....Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the modified emissions source. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401 ....Tier II Operating Permit

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625 ....Visible Emissions

The sources of PM_{10} emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 2.4, 3.3, and 6.5.

Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

IDAPA 58.01.01.301 ....Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility have a potential to emit greater than 100 tons per year for CO and SO_2 and 10 tons per year for formaldehyde and 25 tons per year for all HAP combined as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, this facility is classified as a major facility, as defined in IDAPA 58.01.01.008.10. Also, the landfill is subject to 40 CFR 60, Subpart WWW and thus defined as a Title V source. The Applicant has requested that in accordance with IDAPA 58.01.01.209.05.c, that the PTC requirements be incorporated into two separate Tier I Operating Permits. One permit will be for the landfill operations and the other for the LFG Engines.

PSD Classification (40 CFR 52.21)

40 CFR 52.21 ....Prevention of Significant Deterioration of Air Quality

Ada County Landfill is an existing synthetic minor source. The facility is required to obtain a Tier I operating permit by virtue of being subject to 40 CFR 60, Subpart WWW because the landfill's design capacity exceeded 2.5E06 megagrams, the threshold in Subpart WWW triggering the requirement to obtain a Tier I operating permit. The initial Tier I permit was issued April 13, 2007.

Hidden Hollow Energy LLC (HHE) is an existing major facility. Permitted sources at HHE are four landfill gas-fired IC engines. This permitting action is to consolidate the operations of HHE into one facility. When combining emissions from both facilities into a single facility, the facility does have a post project potential to emit greater than 250 tons per year of CO. Therefore, any future permit modifications will be evaluated for a major modification subject to the PSD requirements.

NSPS Applicability (40 CFR 60)

Because the facility is a landfill and has an emergency engine (Emergency Engine #2) and two proposed landfill gas engines (LFG Engines #3 and #4), the following NSPS requirements apply to this facility:

- 40 CFR 60, Subpart WWW - Standards of Performance for Municipal Solid Waste Landfills
- 40 CFR 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
- 40 CFR 60, Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

40 CFR 60, Subpart WWW ....Standards of Performance for Municipal Waste Landfills

§ 60.750 Applicability, designation of affected facility, and delegation of authority.

(a) The provisions of this subpart apply to each municipal solid waste landfill that commenced construction, reconstruction or modification on or after May 30, 1991. Physical or operational changes made to an existing MSW landfill solely to comply with subpart Cc of this part are not considered construction, reconstruction, or modification for the purposes of this section.

(b) The following authorities shall be retained by the Administrator and not transferred to the State: §60.754(a)(5).

(c) Activities required by or conducted pursuant to a CERCLA, RCRA, or State remedial action are not considered construction, reconstruction, or modification for purposes of this subpart.

The Ada County Landfill was initially constructed in 1972 and modified in 2006. Therefore, the facility is subject to the subpart.

§ 60.751 Definitions.

This section outlines all the important definitions discussed in the subpart.

§ 60.752 Standards for air emissions from municipal solid waste landfills.

(b) Each owner or operator of an MSW landfill having a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters, shall either comply with paragraph (b)(2) of this section or calculate an NMOC emission rate for the landfill using the procedures specified in §60.754. The NMOC emission rate shall be recalculated annually, except as provided in §60.757(b)(1)(ii) of this subpart. The owner or operator of an MSW landfill subject to this subpart with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters is subject to part 70 or 71 permitting requirements.

(2) If the calculated NMOC emission rate is equal to or greater than 50 megagrams per year, the owner or operator shall:

(iii) Route all the collected gas to a control system that complies with the requirements in either paragraph (b)(2)(iii) (A), (B) or (C) of this section.

(A) An open flare designed and operated in accordance with §60.18 except as noted in §60.754(e);

(B) A control system designed and operated to reduce NMOC by 98 weight-percent, or, when an enclosed combustion device is used for control, to either reduce NMOC by 98 weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen. The reduction efficiency or parts per million by volume shall be established by an initial performance test to be completed no later than 180 days after the initial startup of the approved control system using the test methods specified in §60.754(d).

(1) If a boiler or process heater is used as the control device, the landfill gas stream shall be introduced into the flame zone.

(2) The control device shall be operated within the parameter ranges established during the initial or most recent performance test. The operating parameters to be monitored are specified in §60.756;

(C) Route the collected gas to a treatment system that processes the collected gas for subsequent sale or use. All emissions from any atmospheric vent from the gas treatment system shall be subject to the requirements of paragraph (b)(2)(iii) (A) or (B) of this section.

(iv) Operate the collection and control device installed to comply with this subpart in accordance with the provisions of §§60.753, 60.755 and 60.756.

(v) The collection and control system may be capped or removed provided that all the conditions of paragraphs (b)(2)(v) (A), (B), and (C) of this section are met:

(A) The landfill shall be a closed landfill as defined in §60.751 of this subpart. A closure report shall be submitted to the Administrator as provided in §60.757(d);

(B) The collection and control system shall have been in operation a minimum of 15 years; and

(C) Following the procedures specified in §60.754(b) of this subpart, the calculated NMOC gas produced by the landfill shall be less than 50 megagrams per year on three successive test dates. The test dates shall be no less than 90 days apart, and no more than 180 days apart.

These standards require that the capture system be operated appropriately.

(d) When a MSW landfill subject to this subpart is closed, the owner or operator is no longer subject to the requirement to maintain an operating permit under part 70 or 71 of this chapter for the landfill if the landfill is not otherwise subject to the requirements of either part 70 or 71 and if either of the following conditions are met:

(1) The landfill was never subject to the requirement for a control system under paragraph (b)(2) of this section; or

(2) The owner or operator meets the conditions for control system removal specified in paragraph (b)(2)(v) of this section.

When the facility is closed, if the subpart is the only reason for maintaining a Title V Operating permit, a Title V permit is no longer required.

§ 60.753 Operational standards for collection and control systems.

Each owner or operator of an MSW landfill with a gas collection and control system used to comply with the provisions of §60.752(b)(2)(ii) of this subpart shall:

(a) Operate the collection system such that gas is collected from each area, cell, or group of cells in the MSW landfill in which solid waste has been in place for:

(1) 5 years or more if active; or

(2) 2 years or more if closed or at final grade;

The timeframe in which the collection system must be operated is dependent on whether it is active or closed.

(b) Operate the collection system with negative pressure at each wellhead except under the following conditions:

(1) A fire or increased well temperature. The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire. These records shall be submitted with the annual reports as provided in §60.757(f)(1);

(2) Use of a geomembrane or synthetic cover. The owner or operator shall develop acceptable pressure limits in the design plan;

(3) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes shall be approved by the Administrator;

Under most circumstances the collection system must be operated under negative pressure at each wellhead unless stated in this section.

(c) Operate each interior wellhead in the collection system with a landfill gas temperature less than 55 °C and with either a nitrogen level less than 20 percent or an oxygen level less than 5 percent. The owner or operator may establish a higher operating temperature, nitrogen, or oxygen value at a particular well. A higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens.

(1) The nitrogen level shall be determined using Method 3C, unless an alternative test method is established as allowed by §60.752(b)(2)(i) of this subpart.

(2) Unless an alternative test method is established as allowed by §60.752(b)(2)(i) of this subpart, the oxygen shall be determined by an oxygen meter using Method 3A or 3C except that:

(i) The span shall be set so that the regulatory limit is between 20 and 50 percent of the span;

(ii) A data recorder is not required;

(iii) Only two calibration gases are required, a zero and span, and ambient air may be used as the span;

(iv) A calibration error check is not required;

(v) The allowable sample bias, zero drift, and calibration drift are ±10 percent.

The wellheads must be operated under specific conditions that include temperature, nitrogen and oxygen levels. Also, specific methods must be used when determining nitrogen and oxygen levels.

d) Operate the collection system so that the methane concentration is less than 500 parts per million above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator shall conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan shall be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30 meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.

(e) Operate the system such that all collected gases are vented to a control system designed and operated in compliance with §60.752(b)(2)(iii). In the event the collection or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within 1 hour; and

(f) Operate the control or treatment system at all times when the collected gas is routed to the system.

(g) If monitoring demonstrates that the operational requirements in paragraphs (b), (c), or (d) of this section are not met, corrective action shall be taken as specified in §60.755(a)(3) through (5) or §60.755(c) of this subpart. If corrective actions are taken as specified in §60.755, the monitored exceedance is not a violation of the operational requirements in this section.

The methane concentration not collected shall not exceed 500 ppm. If it does, testing must be conducted and corrective action taken to reduce the concentration. A monitoring plan must also be developed.

§ 60.754 Test methods and procedures.

(b) After the installation of a collection and control system in compliance with §60.755, the owner or operator shall calculate the NMOC emission rate for purposes of determining when the system can be removed as provided in §60.752(b)(2)(v), using the following equation:

$M_{NMOC} = 1.89 \times 10^{-3} Q_{LFG} C_{NMOC}$
where,
M_{NMOC} = *mass emission rate of NMOC, megagrams per year*
Q_{LFG} = *flow rate of landfill gas, cubic meters per minute*
C_{NMOC} = *NMOC concentration, parts per million by volume as hexane*

(1) The flow rate of landfill gas, Q_{LFG}, *shall be determined by measuring the total landfill gas flow rate at the common header pipe that leads to the control device using a gas flow measuring device calibrated according to the provisions of section 4 of Method 2E of appendix A of this part.*

(2) The average NMOC concentration, C_{NMOC}, *shall be determined by collecting and analyzing landfill gas sampled from the common header pipe before the gas moving or condensate removal equipment using the procedures in Method 25C or Method 18 of appendix A of this part. If using Method 18 of appendix A of this part, the minimum list of compounds to be tested shall be those published in the most recent Compilation of Air Pollutant Emission Factors (AP–42). The sample location on the common header pipe shall be before any condensate removal or other gas refining units. The landfill owner or operator shall divide the NMOC concentration from Method 25C of appendix A of this part by six to convert from* C_{NMOC} *as carbon to* C_{NMOC} *as hexane.*

(3) The owner or operator may use another method to determine landfill gas flow rate and NMOC concentration if the method has been approved by the Administrator.

(d) For the performance test required in §60.752(b)(2)(iii)(B), Method 25, 25C, or Method 18 of appendix A of this part must be used to determine compliance with the 98 weight-percent efficiency or the 20 ppmv outlet concentration level, unless another method to demonstrate compliance has been approved by the Administrator as provided by §60.752(b)(2)(i)(B). Method 3 or 3A shall be used to determine oxygen for correcting the NMOC concentration as hexane to 3 percent. In cases where the outlet concentration is less than 50 ppm NMOC as carbon (8 ppm NMOC as hexane), Method 25A should be used in place of Method 25. If using Method 18 of appendix A of this part, the minimum list of compounds to be tested shall be those published in the most recent Compilation of Air Pollutant Emission Factors (AP–42). The following equation shall be used to calculate efficiency:

$\text{Control Efficiency} = (NMOC_{in} - NMOC_{out})/(NMOC_{in})$

Where,

$NMOC_{in}$ = *mass of NMOC entering control device*

$NMOC_{out}$ = *mass of NMOC exiting control device*

This section outlines the methods necessary to calculate NMOC emission rate and measuring flow rate of the landfill gas.

§ 60.755 Compliance provisions.

(a) Except as provided in §60.752(b)(2)(i)(B), the specified methods in paragraphs (a)(1) through (a)(6) of this section shall be used to determine whether the gas collection system is in compliance with §60.752(b)(2)(ii).

(1) For the purposes of calculating the maximum expected gas generation flow rate from the landfill to determine compliance with §60.752(b)(2)(ii)(A)(1), one of the following equations shall be used. The k and L_o *kinetic factors should be those published in the most recent Compilation of Air Pollutant Emission Factors (AP–42) or other site specific values demonstrated to be appropriate and approved by the Administrator. If k has been determined as specified in §60.754(a)(4), the value of k determined from the test shall be used. A value of no more than 15 years shall be used for the intended use period of the gas mover equipment. The active life of the landfill is the age of the landfill plus the estimated number of years until closure.*

(i) For sites with unknown year-to-year solid waste acceptance rate:

$Q_m = 2L_oR\,(e^{-kc} - e^{-kt})$

where,

Q_m = *maximum expected gas generation flow rate, cubic meters per year*
L_o = *methane generation potential, cubic meters per megagram solid waste*
R = *average annual acceptance rate, megagrams per year*
k = *methane generation rate constant, year*$^{-1}$
t = *age of the landfill at equipment installation plus the time the owner or operator intends to use the gas mover equipment or active life of the landfill, whichever is less. If the equipment is installed after closure, t is the age of the landfill at installation, years*
c = *time since closure, years (for an active landfill c = O and* $e^{-kc} = 1$*)*

(ii) For sites with known year-to-year solid waste acceptance rate:

$$Q_M = \sum_{i=1}^{n} 2\,k\,L_o\,M_i\left(e^{-kt_i}\right)$$

where,

Q_M=*maximum expected gas generation flow rate, cubic meters per year*
k=*methane generation rate constant, year*$^{-1}$
L_o=*methane generation potential, cubic meters per megagram solid waste*
M_i=*mass of solid waste in the* i^{th}*section, megagrams*
t_i=*age of the* i^{th}*section, years*

(iii) If a collection and control system has been installed, actual flow data may be used to project the maximum expected gas generation flow rate instead of, or in conjunction with, the equations in paragraphs (a)(1) (i) and (ii) of this section. If the landfill is still accepting waste, the actual measured flow data will not equal the maximum expected gas generation rate, so calculations using the equations in paragraphs (a)(1) (i) or (ii) or other methods shall be used to predict the maximum expected gas generation rate over the intended period of use of the gas control system equipment.

(2) For the purposes of determining sufficient density of gas collectors for compliance with §60.752(b)(2)(ii)(A)(2), the owner or operator shall design a system of vertical wells, horizontal collectors, or other collection devices, satisfactory to the Administrator, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards.

(3) For the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with §60.752(b)(2)(ii)(A)(3), the owner or operator shall measure gauge pressure in the gas collection header at each individual well, monthly. If a positive pressure exists, action shall be initiated to correct the exceedance within 5 calendar days, except for the three conditions allowed under §60.753(b). If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial measurement of positive pressure. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the Administrator for approval.

(4) Owners or operators are not required to expand the system as required in paragraph (a)(3) of this section during the first 180 days after gas collection system startup.

(5) For the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator shall monitor each well monthly for temperature and nitrogen or oxygen as provided in §60.753(c). If a well exceeds one of these operating parameters, action shall be initiated to correct the exceedance within 5 calendar days. If correction of the exceedance cannot be achieved within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial exceedance. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline for correcting the exceedance may be submitted to the Administrator for approval.

(6) An owner or operator seeking to demonstrate compliance with §60.752(b)(2)(ii)(A)(4) through the use of a collection system not conforming to the specifications provided in §60.759 shall provide information satisfactory to the Administrator as specified in §60.752(b)(2)(i)(C) demonstrating that off-site migration is being controlled.

These methods are used to confirm that the gas collection system is in compliance with §60.752(b)(2)(ii).

(b) For purposes of compliance with §60.753(a), each owner or operator of a controlled landfill shall place each well or design component as specified in the approved design plan as provided in §60.752(b)(2)(i). Each well shall be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of:

(1) 5 years or more if active; or

(2) 2 years or more if closed or at final grade.

(c) The following procedures shall be used for compliance with the surface methane operational standard as provided in §60.753(d).

(1) After installation of the collection system, the owner or operator shall monitor surface concentrations of methane along the entire perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals (or a site-specific established spacing) for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in paragraph (d) of this section.

(2) The background concentration shall be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at a distance of at least 30 meters from the perimeter wells.

(3) Surface emission monitoring shall be performed in accordance with section 4.3.1 of Method 21 of appendix A of this part, except that the probe inlet shall be placed within 5 to 10 centimeters of the ground. Monitoring shall be performed during typical meteorological conditions.

(4) Any reading of 500 parts per million or more above background at any location shall be recorded as a monitored exceedance and the actions specified in paragraphs (c)(4) (i) through (v) of this section shall be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of §60.753(d).

(i) The location of each monitored exceedance shall be marked and the location recorded.

(ii) Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance shall be made and the location shall be re-monitored within 10 calendar days of detecting the exceedance.

(iii) If the re-monitoring of the location shows a second exceedance, additional corrective action shall be taken and the location shall be monitored again within 10 days of the second exceedance. If the re-monitoring shows a third exceedance for the same location, the action specified in paragraph (c)(4)(v) of this section shall be taken, and no further monitoring of that location is required until the action specified in paragraph (c)(4)(v) has been taken.

(iv) Any location that initially showed an exceedance but has a methane concentration less than 500 ppm methane above background at the 10-day re-monitoring specified in paragraph (c)(4) (ii) or (iii) of this section shall be re-monitored 1 month from the initial exceedance. If the 1-month remonitoring shows a concentration less than 500 parts per million above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1-month remonitoring shows an exceedance, the actions specified in paragraph (c)(4) (iii) or (v) shall be taken.

(v) For any location where monitored methane concentration equals or exceeds 500 parts per million above background three times within a quarterly period, a new well or other collection device shall be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and a corresponding timeline for installation may be submitted to the Administrator for approval.

(5) The owner or operator shall implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis.

These procedures are used for compliance with the surface methane operational standards.

(d) Each owner or operator seeking to comply with the provisions in paragraph (c) of this section shall comply with the following instrumentation specifications and procedures for surface emission monitoring devices:

(1) The portable analyzer shall meet the instrument specifications provided in section 3 of Method 21 of appendix A of this part, except that "methane" shall replace all references to VOC.

(2) The calibration gas shall be methane, diluted to a nominal concentration of 500 parts per million in air.

(3) To meet the performance evaluation requirements in section 3.1.3 of Method 21 of appendix A of this part, the instrument evaluation procedures of section 4.4 of Method 21 of appendix A of this part shall be used.

(4) The calibration procedures provided in section 4.2 of Method 21 of appendix A of this part shall be followed immediately before commencing a surface monitoring survey.

(e) The provisions of this subpart apply at all times, except during periods of start-up, shutdown, or malfunction, provided that the duration of start-up, shutdown, or malfunction shall not exceed 5 days for collection systems and shall not exceed 1 hour for treatment or control devices.

This section describes the methods used to show compliance with all standards of the subpart.

§ 60.756 Monitoring of operations.

Except as provided in §60.752(b)(2)(i)(B),

(a) Each owner or operator seeking to comply with §60.752(b)(2)(ii)(A) for an active gas collection system shall install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead and:

(1) Measure the gauge pressure in the gas collection header on a monthly basis as provided in §60.755(a)(3); and

(2) Monitor nitrogen or oxygen concentration in the landfill gas on a monthly basis as provided in §60.755(a)(5); and

(3) Monitor temperature of the landfill gas on a monthly basis as provided in §60.755(a)(5).

(b) Each owner or operator seeking to comply with §60.752(b)(2)(iii) using an enclosed combustor shall calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment.

(1) A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of ±1 percent of the temperature being measured expressed in degrees Celsius or ±0.5 degrees Celsius, whichever is greater. A temperature monitoring device is not required for boilers or process heaters with design heat input capacity equal to or greater than 44 megawatts.

(2) A device that records flow to or bypass of the control device. The owner or operator shall either:

(i) Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes; or

(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

(c) Each owner or operator seeking to comply with §60.752(b)(2)(iii) using an open flare shall install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment:

(1) A heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame.

(2) A device that records flow to or bypass of the flare. The owner or operator shall either:

(i) Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes; or

(ii) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

This section indicates the monitoring requirements for the landfill depending on the control device used.

(f) Each owner or operator seeking to demonstrate compliance with §60.755(c), shall monitor surface concentrations of methane according to the instrument specifications and procedures provided in §60.755(d). Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 ppm or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.

This is monitoring requirements for surface methane.

§ 60.757 Reporting requirements.

Except as provided in §60.752(b)(2)(i)(B),Each owner or operator subject to the requirements of this subpart shall submit an initial design capacity report to the Administrator.

(3) An amended design capacity report shall be submitted to the Administrator providing notification of an increase in the design capacity of the landfill, within 90 days of an increase in the maximum design capacity of the landfill to or above 2.5 million megagrams and 2.5 million cubic meters. This increase in design capacity may result from an increase in the permitted volume of the landfill or an increase in the density as documented in the annual recalculation required in §60.758(f).

If the capacity of the landfill increases an updated report needs to be sent in within 90 days of the increase.

(b) Each owner or operator subject to the requirements of this subpart shall submit an NMOC emission rate report to the Administrator initially and annually thereafter, except as provided for in paragraphs (b)(1)(ii) or (b)(3) of this section. The Administrator may request such additional information as may be necessary to verify the reported NMOC emission rate.

(1) The NMOC emission rate report shall contain an annual or 5-year estimate of the NMOC emission rate calculated using the formula and procedures provided in §60.754(a) or (b), as applicable.

(i) The initial NMOC emission rate report may be combined with the initial design capacity report required in paragraph (a) of this section and shall be submitted no later than indicated in paragraphs (b)(1)(i)(A) and (B) of this section. Subsequent NMOC emission rate reports shall be submitted annually thereafter, except as provided for in paragraphs (b)(1)(ii) and (b)(3) of this section.

(B) Ninety days after the date of commenced construction, modification, or reconstruction for landfills that commence construction, modification, or reconstruction on or after March 12, 1996.

(ii) If the estimated NMOC emission rate as reported in the annual report to the Administrator is less than 50 megagrams per year in each of the next 5 consecutive years, the owner or operator may elect to submit an estimate of the NMOC emission rate for the next 5-year period in lieu of the annual report. This estimate shall include the current amount of solid waste-in-place and the estimated waste acceptance rate for each year of the 5 years for which an NMOC emission rate is estimated. All data and calculations upon which this estimate is based shall be provided to the Administrator. This estimate shall be revised at least once every 5 years. If the actual waste acceptance rate exceeds the estimated waste acceptance rate in any year reported in the 5-year estimate, a revised 5-year estimate shall be submitted to the Administrator. The revised estimate shall cover the 5-year period beginning with the year in which the actual waste acceptance rate exceeded the estimated waste acceptance rate.

(2) The NMOC emission rate report shall include all the data, calculations, sample reports and measurements used to estimate the annual or 5-year emissions.

(3) Each owner or operator subject to the requirements of this subpart is exempted from the requirements of paragraphs (b)(1) and (2) of this section, after the installation of a collection and control system in compliance

with §60.752(b)(2), during such time as the collection and control system is in operation and in compliance with §§60.753 and 60.755.

(c) Each owner or operator subject to the provisions of §60.752(b)(2)(i) shall submit a collection and control system design plan to the Administrator within 1 year of the first report required under paragraph (b) of this section in which the emission rate equals or exceeds 50 megagrams per year, except as follows:

(1) If the owner or operator elects to recalculate the NMOC emission rate after Tier 2 NMOC sampling and analysis as provided in §60.754(a)(3) and the resulting rate is less than 50 megagrams per year, annual periodic reporting shall be resumed, using the Tier 2 determined site-specific NMOC concentration, until the calculated emission rate is equal to or greater than 50 megagrams per year or the landfill is closed. The revised NMOC emission rate report, with the recalculated emission rate based on NMOC sampling and analysis, shall be submitted within 180 days of the first calculated exceedance of 50 megagrams per year.

(2) If the owner or operator elects to recalculate the NMOC emission rate after determining a site-specific methane generation rate constant (k), as provided in Tier 3 in §60.754(a)(4), and the resulting NMOC emission rate is less than 50 Mg/yr, annual periodic reporting shall be resumed. The resulting site-specific methane generation rate constant (k) shall be used in the emission rate calculation until such time as the emissions rate calculation results in an exceedance. The revised NMOC emission rate report based on the provisions of §60.754(a)(4) and the resulting site-specific methane generation rate constant (k) shall be submitted to the Administrator within 1 year of the first calculated emission rate exceeding 50 megagrams per year.

(d) Each owner or operator of a controlled landfill shall submit a closure report to the Administrator within 30 days of waste acceptance cessation. The Administrator may request additional information as may be necessary to verify that permanent closure has taken place in accordance with the requirements of 40 CFR 258.60. If a closure report has been submitted to the Administrator, no additional wastes may be placed into the landfill without filing a notification of modification as described under §60.7(a)(4).

(e) Each owner or operator of a controlled landfill shall submit an equipment removal report to the Administrator 30 days prior to removal or cessation of operation of the control equipment.

(1) The equipment removal report shall contain all of the following items:

(i) A copy of the closure report submitted in accordance with paragraph (d) of this section;

(ii) A copy of the initial performance test report demonstrating that the 15 year minimum control period has expired; and

(iii) Dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 50 megagrams or greater of NMOC per year.

(2) The Administrator may request such additional information as may be necessary to verify that all of the conditions for removal in §60.752(b)(2)(v) have been met.

(f) Each owner or operator of a landfill seeking to comply with §60.752(b)(2) using an active collection system designed in accordance with §60.752(b)(2)(ii) shall submit to the Administrator annual reports of the recorded information in (f)(1) through (f)(6) of this paragraph. The initial annual report shall be submitted within 180 days of installation and start-up of the collection and control system, and shall include the initial performance test report required under §60.8. For enclosed combustion devices and flares, reportable exceedances are defined under §60.758(c).

(1) Value and length of time for exceedance of applicable parameters monitored under §60.756(a), (b), (c), and (d).

(2) Description and duration of all periods when the gas stream is diverted from the control device through a bypass line or the indication of bypass flow as specified under §60.756.

(3) Description and duration of all periods when the control device was not operating for a period exceeding 1 hour and length of time the control device was not operating.

(4) All periods when the collection system was not operating in excess of 5 days.

(5) The location of each exceedance of the 500 parts per million methane concentration as provided in §60.753(d) and the concentration recorded at each location for which an exceedance was recorded in the previous month.

(6) The date of installation and the location of each well or collection system expansion added pursuant to paragraphs (a)(3), (b), and (c)(4) of §60.755.

This section identifies all reporting requirements.

§ 60.758 Recordkeeping requirements.

(a) Except as provided in §60.752(b)(2)(i)(B), each owner or operator of an MSW landfill subject to the provisions of §60.752(b) shall keep for at least 5 years up-to-date, readily accessible, on-site records of the design capacity report which triggered §60.752(b), the current amount of solid waste in-place, and the year-by-year waste acceptance rate. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.

(b) Except as provided in §60.752(b)(2)(i)(B), each owner or operator of a controlled landfill shall keep up-to-date, readily accessible records for the life of the control equipment of the data listed in paragraphs (b)(1) through (b)(4) of this section as measured during the initial performance test or compliance determination. Records of subsequent tests or monitoring shall be maintained for a minimum of 5 years. Records of the control device vendor specifications shall be maintained until removal.

(1) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.752(b)(2)(ii):

(i) The maximum expected gas generation flow rate as calculated in §60.755(a)(1). The owner or operator may use another method to determine the maximum gas generation flow rate, if the method has been approved by the Administrator.

(ii) The density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in §60.759(a)(1).

(2) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.752(b)(2)(iii) through use of an enclosed combustion device other than a boiler or process heater with a design heat input capacity equal to or greater than 44 megawatts:

(i) The average combustion temperature measured at least every 15 minutes and averaged over the same time period of the performance test.

(ii) The percent reduction of NMOC determined as specified in §60.752(b)(2)(iii)(B) achieved by the control device.

(3) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.752(b)(2)(iii)(B)(1) through use of a boiler or process heater of any size: a description of the location at which the collected gas vent stream is introduced into the boiler or process heater over the same time period of the performance testing.

(4) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.752(b)(2)(iii)(A) through use of an open flare, the flare type (i.e., steam-assisted, air-assisted, or nonassisted), all visible emission readings, heat content determination, flow rate or bypass flow rate measurements, and exit velocity determinations made during the performance test as specified in §60.18; continuous records of the flare pilot flame or flare flame monitoring and records of all periods of operations during which the pilot flame of the flare flame is absent.

(c) Except as provided in §60.752(b)(2)(i)(B), each owner or operator of a controlled landfill subject to the provisions of this subpart shall keep for 5 years up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored in §60.756 as well as up-to-date, readily accessible records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded.

(1) The following constitute exceedances that shall be recorded and reported under §60.757(f):

(i) For enclosed combustors except for boilers and process heaters with design heat input capacity of 44 megawatts (150 million British thermal unit per hour) or greater, all 3-hour periods of operation during which the average combustion temperature was more than 28 oC below the average combustion temperature during the most recent performance test at which compliance with §60.752(b)(2)(iii) was determined.

(ii) For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone as required under paragraph (b)(3) of this section.

(2) Each owner or operator subject to the provisions of this subpart shall keep up-to-date, readily accessible continuous records of the indication of flow to the control device or the indication of bypass flow or records of monthly inspections of car-seals or lock-and-key configurations used to seal bypass lines, specified under §60.756.

(3) Each owner or operator subject to the provisions of this subpart who uses a boiler or process heater with a design heat input capacity of 44 megawatts or greater to comply with §60.752(b)(2)(iii) shall keep an up-to-date, readily accessible record of all periods of operation of the boiler or process heater. (Examples of such records could include records of steam use, fuel use, or monitoring data collected pursuant to other State, local, Tribal, or Federal regulatory requirements.)

(4) Each owner or operator seeking to comply with the provisions of this subpart by use of an open flare shall keep up-to-date, readily accessible continuous records of the flame or flare pilot flame monitoring specified under §60.756(c), and up-to-date, readily accessible records of all periods of operation in which the flame or flare pilot flame is absent.

(d) Except as provided in §60.752(b)(2)(i)(B), each owner or operator subject to the provisions of this subpart shall keep for the life of the collection system an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label for each collector.

(1) Each owner or operator subject to the provisions of this subpart shall keep up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under §60.755(b).

(2) Each owner or operator subject to the provisions of this subpart shall keep readily accessible documentation of the nature, date of deposition, amount, and location of asbestos-containing or nondegradable waste excluded from collection as provided in §60.759(a)(3)(i) as well as any nonproductive areas excluded from collection as provided in §60.759(a)(3)(ii).

(e) Except as provided in §60.752(b)(2)(i)(B), each owner or operator subject to the provisions of this subpart shall keep for at least 5 years up-to-date, readily accessible records of all collection and control system exceedances of the operational standards in §60.753, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance.

(f) Landfill owners or operators who convert design capacity from volume to mass or mass to volume to demonstrate that landfill design capacity is less than 2.5 million megagrams or 2.5 million cubic meters, as provided in the definition of "design capacity", shall keep readily accessible, on-site records of the annual recalculation of site-specific density, design capacity, and the supporting documentation. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.

This section describes all the recordkeeping requirements.

§ 60.759 Specifications for active collection systems.

(a) Each owner or operator seeking to comply with §60.752(b)(2)(i) shall site active collection wells, horizontal collectors, surface collectors, or other extraction devices at a sufficient density throughout all gas producing areas using the following procedures unless alternative procedures have been approved by the Administrator as provided in §60.752(b)(2)(i)(C) and (D):

(1) The collection devices within the interior and along the perimeter areas shall be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues shall be addressed in the design: depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandibility, leachate and condensate management, accessibility, compatibility with filling

operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, and resistance to the refuse decomposition heat.

(2) The sufficient density of gas collection devices determined in paragraph (a)(1) of this section shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior.

(3) The placement of gas collection devices determined in paragraph (a)(1) of this section shall control all gas producing areas, except as provided by paragraphs (a)(3)(i) and (a)(3)(ii) of this section.

(i) Any segregated area of asbestos or nondegradable material may be excluded from collection if documented as provided under §60.758(d). The documentation shall provide the nature, date of deposition, location and amount of asbestos or nondegradable material deposited in the area, and shall be provided to the Administrator upon request.

(ii) Any nonproductive area of the landfill may be excluded from control, provided that the total of all excluded areas can be shown to contribute less than 1 percent of the total amount of NMOC emissions from the landfill. The amount, location, and age of the material shall be documented and provided to the Administrator upon request. A separate NMOC emissions estimate shall be made for each section proposed for exclusion, and the sum of all such sections shall be compared to the NMOC emissions estimate for the entire landfill. Emissions from each section shall be computed using the following equation:

$Q_i = 2\,k\,L_o M_i (e^{-kt}i)\,(C_{NMOC})\,(3.6 \times 10^{-9})$

where,
Q_i = *NMOC emission rate from the* i^{th} *section, megagrams per year*
k = *methane generation rate constant, year*$^{-1}$
L_o = *methane generation potential, cubic meters per megagram solid waste*
M_i = *mass of the degradable solid waste in the* i^{th} *section, megagram*
t_i = *age of the solid waste in the* i^{th} *section, years*
C_{NMOC} = *concentration of nonmethane organic compounds, parts per million by volume*
3.6×10^{-9} = *conversion factor*

(iii) The values for k and C_{NMOC} *determined in field testing shall be used if field testing has been performed in determining the NMOC emission rate or the radii of influence (this distance from the well center to a point in the landfill where the pressure gradient applied by the blower or compressor approaches zero). If field testing has not been performed, the default values for k,* L_O *and* C_{NMOC} *provided in §60.754(a)(1) or the alternative values from §60.754(a)(5) shall be used. The mass of nondegradable solid waste contained within the given section may be subtracted from the total mass of the section when estimating emissions provided the nature, location, age, and amount of the nondegradable material is documented as provided in paragraph (a)(3)(i) of this section.*

(b) Each owner or operator seeking to comply with §60.752(b)(2)(i)(A) shall construct the gas collection devices using the following equipment or procedures:

(1) The landfill gas extraction components shall be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of suitable dimensions to: convey projected amounts of gases; withstand installation, static, and settlement forces; and withstand planned overburden or traffic loads. The collection system shall extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors shall be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations shall be situated with regard to the need to prevent excessive air infiltration.

(2) Vertical wells shall be placed so as not to endanger underlying liners and shall address the occurrence of water within the landfill. Holes and trenches constructed for piped wells and horizontal collectors shall be of sufficient cross-section so as to allow for their proper construction and completion including, for example, centering of pipes and placement of gravel backfill. Collection devices shall be designed so as not to allow indirect short circuiting of air into the cover or refuse into the collection system or gas into the air. Any gravel used around pipe perforations should be of a dimension so as not to penetrate or block perforations.

(3) Collection devices may be connected to the collection header pipes below or above the landfill surface. The connector assembly shall include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous material of suitable thickness.

(c) Each owner or operator seeking to comply with §60.752(b)(2)(i)(A) shall convey the landfill gas to a control system in compliance with §60.752(b)(2)(iii) through the collection header pipe(s). The gas mover equipment shall be sized to handle the maximum gas generation flow rate expected over the intended use period of the gas moving equipment using the following procedures:

(1) For existing collection systems, the flow data shall be used to project the maximum flow rate. If no flow data exists, the procedures in paragraph (c)(2) of this section shall be used.

This section spells out the specifications for active collection systems.

40 CFR 60 Subpart IIII...................Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

§ 60.4200 Am I subject to this Subpart?

(a) The provisions of this Subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (3) of this section. For the purposes of this Subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

(2) Owners and operators of stationary CI ICE that commence construction after July 11, 2005 where the stationary CI ICE are:

(i) Manufactured after April 1, 2006 and are not fire pump engines, or

(ii) Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.

(3) Owners and operators of stationary CI ICE that modify or reconstruct their stationary CI ICE after July 11, 2005.

(b) The provisions of this Subpart are not applicable to stationary CI ICE being tested at a stationary CI ICE test cell/stand.

(c) If you are an owner or operator of an area source subject to this Subpart, you are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this Subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this Subpart applicable to area sources.

(d) Stationary CI ICE may be eligible for exemption from the requirements of this Subpart as described in 40 CFR part 1068, Subpart C (or the exemptions described in 40 CFR part 89, Subpart J and 40 CFR part 94, Subpart J, for engines that would need to be certified to standards in those parts), except that owners and operators, as well as manufacturers, may be eligible to request an exemption for national security.

Emergency Engine #2 is a stationary compression ignition engine and was installed in August 2011. Therefore the engine is subject to the Subpart.

§ 60.4205 What emission standards must I meet for emergency engines if I am an owner or operator of a stationary CI internal combustion engine?

(b) Owners and operators of 2007 model year and later emergency stationary CI ICE with a displacement of less than 30 liters per cylinder that are not fire pump engines must comply with the emission standards for new nonroad CI engines in §60.4202, for all pollutants, for the same model year and maximum engine power for their 2007 model year and later emergency stationary CI ICE.

The engine must comply with the emission standards for new nonroad CI engines in §60.4202.

The subpart requires that the permittee comply with Table 1 per 40 CFR 89.112.

§ 60.4206 How long must I meet the emission standards if I am an owner or operator of a stationary CI internal combustion engine?

Owners and operators of stationary CI ICE must operate and maintain stationary CI ICE that achieve the emission standards as required in §§60.4204 and 60.4205 according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine.

The permittee must operate the engine for the life of the unit in accordance with manufacturer-approved methods.

§ 60.4207 What fuel requirements must I meet if I am an owner or operator of a stationary CI internal combustion engine subject to this Subpart?

(b) Beginning October 1, 2010, owners and operators of stationary CI ICE subject to this Subpart with a displacement of less than 30 liters per cylinder that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for non-road diesel fuel.

The permittee has stated that they will operate the engine in accordance with 40 CFR 80.510(b). The fuel sulfur content cannot exceed 15 ppm or 0.0015% by weight. All emissions calculations assume that percentage.

§ 60.4209 What are the monitoring requirements if I am an owner or operator of a stationary CI internal combustion engine?

If you are an owner or operator, you must meet the monitoring requirements of this section. In addition, you must also meet the monitoring requirements specified in §60.4211.

(a) If you are an owner or operator of an emergency stationary CI internal combustion engine that does not meet the standards applicable to non-emergency engines, you must install a non-resettable hour meter prior to startup of the engine.

A non-resettable hour meter shall be installed on the engine.

§ 60.4211 What are my compliance requirements if I am an owner or operator of a stationary CI internal combustion engine?

(c) If you are an owner or operator of a 2007 model year and later stationary CI internal combustion engine and must comply with the emission standards specified in §60.4204(b) or §60.4205(b), or if you are an owner or operator of a CI fire pump engine that is manufactured during or after the model year that applies to your fire pump engine power rating in table 3 to this Subpart and must comply with the emission standards specified in §60.4205(c), you must comply by purchasing an engine certified to the emission standards in §60.4204(b), or §60.4205(b) or (c), as applicable, for the same model year and maximum (or in the case of fire pumps, NFPA nameplate) engine power. The engine must be installed and configured according to the manufacturer's specifications.

The permittee is subject to 60.4205(b) and therefore the engine must be installed and configured according to the manufacturer's specifications.

(f) If you own or operate an emergency stationary ICE, you must operate the emergency stationary ICE according to the requirements in paragraphs (f)(1) through (3) of this section. In order for the engine to be considered an emergency stationary ICE under this subpart, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (f)(1) through (3) of this section, is prohibited. If you do not operate the engine according to the requirements in paragraphs (f)(1) through (3) of this section, the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

(1) There is no time limit on the use of emergency stationary ICE in emergency situations.

(2) You may operate your emergency stationary ICE for any combination of the purposes specified in paragraphs (f)(2)(i) through (iii) of this section for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by paragraph (f)(3) of this section counts as part of the 100 hours per calendar year allowed by this paragraph (f)(2).

(i) Emergency stationary ICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year.

(ii) Emergency stationary ICE may be operated for emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference, see §60.17), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.

(iii) Emergency stationary ICE may be operated for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.

(3) Emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in paragraph (f)(2) of this section. Except as provided in paragraph (f)(3)(i) of this section, the 50 hours per calendar year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

Maintenance and testing of the engine shall not exceed 100 hours per year.

§ 60.4214 What are my notification, reporting, and recordkeeping requirements if I am an owner or operator of a stationary CI internal combustion engine?

(b) If the stationary CI internal combustion engine is an emergency stationary internal combustion engine, the owner or operator is not required to submit an initial notification. Starting with the model years in table 5 to this subpart, if the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, the owner or operator must keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The owner must record the time of operation of the engine and the reason the engine was in operation during that time.

The engine does not meet the criteria set forth in the subpart requiring notification unless it is uncertified.

40 CFR 60 Subpart JJJJ....................Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

§60.4230 Am I subject to this subpart?

(a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary spark ignition (SI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (6) of this section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

(4) Owners and operators of stationary SI ICE that commence construction after June 12, 2006, where the stationary SI ICE are manufactured:

(i) On or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 HP (except lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP);

(6) The provisions of §60.4236 of this subpart are applicable to all owners and operators of stationary SI ICE that commence construction after June 12, 2006.

Proposed LFG Engines #3 and #4 are stationary spark ignition engines that will commence construction after June 12, 2006. The proposed engines will have a power rating of more than 2000 HP. Therefore the engines are subject to the Subpart.

§60.4233 What emission standards must I meet if I am an owner or operator of a stationary SI internal combustion engine?

(e) Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 to this subpart for their stationary SI ICE. For owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 100 HP (except gasoline and rich burn engines that use LPG) manufactured prior to January 1, 2011 that were certified to the certification emission standards in 40 CFR part 1048 applicable to engines that are not severe duty engines, if such stationary SI ICE was certified to a carbon monoxide (CO) standard above the standard in Table 1 to this subpart, then the owners and operators may meet the CO certification (not field testing) standard for which the engine was certified.

Table 1 to Subpart JJJJ of Part 60—NO_x, CO, and VOC Emission Standards for Stationary Non-Emergency SI Engines ≥100 HP (Except Gasoline and Rich Burn LPG), Stationary SI Landfill/Digester Gas Engines, and Stationary Emergency Engines >25 HP

Engine type and fuel	Maximum engine power	Manufacture date	Emission standards[a]					
			g/HP-hr			ppmvd at 15% O_2		
			NO_X	CO	VOC[d]	NO_X	CO	VOC[d]
Landfill/Digester Gas (except lean burn 500≤HP<1,350)	HP≥500	7/1/2010	2.0	5.0	1.0	150	610	80

[a]Owners and operators of stationary non-certified SI engines may choose to comply with he emission standards in units of either g/HP-hr or ppmvd at 15 percent O_2.

[b]Owners and operators of new or reconstructed non-emergency lean bum SI stationary engines with a site rating of greater than or equal to 250 brake HP located at a major source that are meeting the requirements of 40 CFR part 63, subpart ZZZZ, Table 2a do not have to comply with the CO emission standards of Table 1 of this subpart.

[c]The emission standards applicable to emergency engines between 25 HP and 130 HP are in terms of NO_X + HC.

[d]For purposes of this subpart, when calculating emissions of volatile organic compounds, emissions of formaldehyde should not be included.

The proposed LFG engines shall comply with the emission standards as shown above in Table 1 to the Subpart.

§60.4234 How long must I meet the emission standards if I am an owner or operator of a stationary SI internal combustion engine?

Owners and operators of stationary SI ICE must operate and maintain stationary SI ICE that achieve the emission standards as required in §60.4233 over the entire life of the engine.

The proposed engines must meet the emission standards over the entire life of the engines.

§60.4236 What is the deadline for importing or installing stationary SI ICE produced in previous model years?

(b) After July 1, 2009, owners and operators may not install stationary SI ICE with a maximum engine power of greater than or equal to 500 HP that do not meet the applicable requirements in §60.4233, except that lean burn engines with a maximum engine power greater than or equal to 500 HP and less than 1,350 HP that do not meet the applicable requirements in §60.4233 may not be installed after January 1, 2010.

The proposed engines will be installed after July 1, 2009 and will have a maximum engine power greater than 1,350 HP.

§60.4243 What are my compliance requirements if I am an owner or operator of a stationary SI internal combustion engine?

(b) If you are an owner or operator of a stationary SI internal combustion engine and must comply with the emission standards specified in §60.4233(d) or (e), you must demonstrate compliance according to one of the methods specified in paragraphs (b)(1) and (2) of this section.

(2) Purchasing a non-certified engine and demonstrating compliance with the emission standards specified in §60.4233(d) or (e) and according to the requirements specified in §60.4244, as applicable, and according to paragraphs (b)(2)(i) and (ii) of this section.

(ii) If you are an owner or operator of a stationary SI internal combustion engine greater than 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test and conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, thereafter to demonstrate compliance.

(g) It is expected that air-to-fuel ratio controllers will be used with the operation of three-way catalysts/non-selective catalytic reduction. The AFR controller must be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times.

The permittee shall keep a maintenance plan and records for minimizing emissions. Performance tests will be required according to the schedule stated above.

§60.4244 What test methods and other procedures must I use if I am an owner or operator of a stationary SI internal combustion engine?

Owners and operators of stationary SI ICE who conduct performance tests must follow the procedures in paragraphs (a) through (f) of this section.

(a) Each performance test must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and according to the requirements in §60.8 and under the specific conditions that are specified by Table 2 to this subpart.

(b) You may not conduct performance tests during periods of startup, shutdown, or malfunction, as specified in §60.8(c). If your stationary SI internal combustion engine is non-operational, you do not need to startup the engine solely to conduct a performance test; however, you must conduct the performance test immediately upon startup of the engine.

(c) You must conduct three separate test runs for each performance test required in this section, as specified in §60.8(f). Each test run must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and last at least 1 hour.

(d) To determine compliance with the NO_x mass per unit output emission limitation, convert the concentration of NO_x in the engine exhaust using Equation 1 of this section:

$$ER = \frac{C_d \times 1.912 \times 10^{-3} \times Q \times T}{HP-hr} \quad \text{(Eq. 1)}$$

Where:

ER = Emission rate of NO_x in g/HP-hr.

C_d = Measured NO_x concentration in parts per million by volume (ppmv).

1.912×10^{-3} = Conversion constant for ppm NO_x to grams per standard cubic meter at 20 degrees Celsius.

Q = Stack gas volumetric flow rate, in standard cubic meter per hour, dry basis.

T = Time of test run, in hours.

HP-hr = Brake work of the engine, horsepower-hour (HP-hr).

(e) To determine compliance with the CO mass per unit output emission limitation, convert the concentration of CO in the engine exhaust using Equation 2 of this section:

$$ER = \frac{C_d \times 1.164 \times 10^{-3} \times Q \times T}{HP - hr} \quad \text{(Eq. 2)}$$

Where:

ER = Emission rate of CO in g/HP-hr.

C_d *= Measured CO concentration in ppmv.*

1.164×10^{-3} *= Conversion constant for ppm CO to grams per standard cubic meter at 20 degrees Celsius.*

Q = Stack gas volumetric flow rate, in standard cubic meters per hour, dry basis.

T = Time of test run, in hours.

HP-hr = Brake work of the engine, in HP-hr.

(f) For purposes of this subpart, when calculating emissions of VOC, emissions of formaldehyde should not be included. To determine compliance with the VOC mass per unit output emission limitation, convert the concentration of VOC in the engine exhaust using Equation 3 of this section:

$$ER = \frac{C_d \times 1.833 \times 10^{-3} \times Q \times T}{HP - hr} \quad \text{(Eq. 3)}$$

Where:

ER = Emission rate of VOC in g/HP-hr.

C_d *= VOC concentration measured as propane in ppmv.*

1.833×10^{-3} *= Conversion constant for ppm VOC measured as propane, to grams per standard cubic meter at 20 degrees Celsius.*

Q = Stack gas volumetric flow rate, in standard cubic meters per hour, dry basis.

T = Time of test run, in hours.

HP-hr = Brake work of the engine, in HP-hr.

(g) If the owner/operator chooses to measure VOC emissions using either Method 18 of 40 CFR part 60, appendix A, or Method 320 of 40 CFR part 63, appendix A, then it has the option of correcting the measured VOC emissions to account for the potential differences in measured values between these methods and Method 25A. The results from Method 18 and Method 320 can be corrected for response factor differences using Equations 4 and 5 of this section. The corrected VOC concentration can then be placed on a propane basis using Equation 6 of this section.

$$RF_i = \frac{C_{Mi}}{C_{Ai}} \quad \text{(Eq. 4)}$$

Where:

RF_i *= Response factor of compound i when measured with EPA Method 25A.*

C_{Mi} *= Measured concentration of compound i in ppmv as carbon.*

C_{Ai} *= True concentration of compound i in ppmv as carbon.*

$$C_{icorr} = RF_i \times C_{imeas} \quad \text{(Eq. 5)}$$

Where:

C_{icorr} *= Concentration of compound i corrected to the value that would have been measured by EPA Method 25A, ppmv as carbon.*

C_{imeas} = *Concentration of compound i measured by EPA Method 320, ppmv as carbon.*

$$C_{Peq} = 0.6098 \times C_{imeas} \quad \text{(Eq. 6)}$$

Where:

C_{Peq} = *Concentration of compound i in mg of propane equivalent per DSCM.*

The permittee shall conduct performance tests according to the procedures outlined above.

§60.4245 What are my notification, reporting, and recordkeeping requirements if I am an owner or operator of a stationary SI internal combustion engine?

Owners or operators of stationary SI ICE must meet the following notification, reporting and recordkeeping requirements.

(a) Owners and operators of all stationary SI ICE must keep records of the information in paragraphs (a)(1) through (4) of this section.

(1) All notifications submitted to comply with this subpart and all documentation supporting any notification.

(2) Maintenance conducted on the engine.

(4) If the stationary SI internal combustion engine is not a certified engine or is a certified engine operating in a non-certified manner and subject to §60.4243(a)(2), documentation that the engine meets the emission standards.

(c) Owners and operators of stationary SI ICE greater than or equal to 500 HP that have not been certified by an engine manufacturer to meet the emission standards in §60.4231 must submit an initial notification as required in §60.7(a)(1). The notification must include the information in paragraphs (c)(1) through (5) of this section.

(1) Name and address of the owner or operator;

(2) The address of the affected source;

(3) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;

(4) Emission control equipment; and

(5) Fuel used.

(d) Owners and operators of stationary SI ICE that are subject to performance testing must submit a copy of each performance test as conducted in §60.4244 within 60 days after the test has been completed.

The proposed engines will not be certified by the manufacturer and the permittee shall comply with the requirements above.

NESHAP Applicability (40 CFR 61)

The facility is not subject to any NESHAP requirements in 40 CFR 61.

MACT Applicability (40 CFR 63)

Because the facility is a landfill and has an emergency engine (Emergency Engine #1), two existing landfill gas engines (LFG Engines #1 and #2), and two proposed landfill gas engines (LFG Engines #3 and #4) the following requirements apply to this facility:

- 40 CFR 63, Subpart AAAA – NESHAP for Municipal Solid Waste Landfill
- 40 CFR 63, Subpart ZZZZ – NESHAP for Stationary Reciprocating Internal Combustion Engines

40 CFR 63, Subpart AAAA..............................National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills

§ 63.1930 What is the purpose of this subpart?

This subpart establishes national emission standards for hazardous air pollutants for existing and new municipal solid waste (MSW) landfills. This subpart requires all landfills described in §63.1935 to meet the requirements of 40 CFR part 60, subpart Cc or WWW and requires timely control of bioreactors. This subpart also requires such landfills to meet the startup, shutdown, and malfunction (SSM) requirements of the general provisions of this part and provides that compliance with the operating conditions shall be demonstrated by parameter monitoring results that are within the specified ranges. It also includes additional reporting requirements.

§ 63.1935 Am I subject to this subpart?

You are subject to this subpart if you meet the criteria in paragraph (a) or (b) of this section.

(a) You are subject to this subpart if you own or operate a MSW landfill that has accepted waste since November 8, 1987 or has additional capacity for waste deposition and meets any one of the three criteria in paragraphs (a)(1) through (3) of this section:

(1) Your MSW landfill is a major source as defined in 40 CFR 63.2 of subpart A.

(3) Your MSW landfill is an area source landfill that has a design capacity equal to or greater than 2.5 million megagrams (Mg) and 2.5 million cubic meters (m^3) and has estimated uncontrolled emissions equal to or greater than 50 megagrams per year (Mg/yr) NMOC as calculated according to §60.754(a) of the MSW landfills new source performance standards in 40 CFR part 60, subpart WWW, the Federal plan, or an EPA approved and effective State or tribal plan that applies to your landfill.

The landfill is now a major source and began taking waste in 1972. Thus, the permittee is subject to the subpart.

§ 63.1940 What is the affected source of this subpart?

(a) An affected source of this subpart is a MSW landfill, as defined in §63.1990, that meets the criteria in §63.1935(a) or (b). The affected source includes the entire disposal facility in a contiguous geographic space where household waste is placed in or on land, including any portion of the MSW landfill operated as a bioreactor.

(b) A new affected source of this subpart is an affected source that commenced construction or reconstruction after November 7, 2000. An affected source is reconstructed if it meets the definition of reconstruction in 40 CFR 63.2 of subpart A.

(c) An affected source of this subpart is existing if it is not new.

The Ada County Landfill is an existing affected source because they commenced construction prior to November 7, 2000.

§ 63.1945 When do I have to comply with this subpart?

(d) If your landfill is an existing affected source and is a major source or is collocated with a major source, you must comply with the requirements in §§63.1955(b) and 63.1960 through 63.1980 by the date your landfill is required to install a collection and control system by 40 CFR 60.752(b)(2) of subpart WWW, the Federal plan, or EPA approved and effective State or tribal plan that applies to your landfill or by January 16, 2004, whichever occurs later.

The landfill is subject to 40 CFR 60, Subpart WWW. The collection system was installed on April 28, 2007.

§ 63.1947 When do I have to comply with this subpart if I own or operate a bioreactor?

The facility does not own and operate a bioreactor. Therefore, this section does not apply.

§ 63.1950 When am I no longer required to comply with this subpart?

You are no longer required to comply with the requirements of this subpart when you are no longer required to apply controls as specified in 40 CFR 60.752(b)(2)(v) of subpart WWW, or the Federal plan or EPA approved *and effective State plan or tribal plan that implements 40 CFR part 60, subpart Cc, whichever applies to your landfill.*

The subpart requirements are voided when the landfill no longer is subject to 40 CFR 60, Subpart WWW.

§ 63.1952 When am I no longer required to comply with the requirements of this subpart if I own or operate a bioreactor?

The facility does not own and operate a bioreactor. Therefore, this section does not apply.

§ 63.1955 What requirements must I meet?

(a) You must fulfill one of the requirements in paragraph (a)(1) or (2) of this section, whichever is applicable:

(1) Comply with the requirements of 40 CFR part 60, subpart WWW.

The Ada County Landfill is subject to 40 CFR 60, Subpart WWW.

§ 63.1960 How is compliance determined?

Compliance is determined in the same way it is determined for 40 CFR part 60, subpart WWW, including performance testing, monitoring of the collection system, continuous parameter monitoring, and other credible evidence. In addition, continuous parameter monitoring data, collected under 40 CFR 60.756(b)(1), (c)(1), and (d) of subpart WWW, are used to demonstrate compliance with the operating conditions for control systems. If a deviation occurs, you have failed to meet the control device operating conditions described in this subpart and have deviated from the requirements of this subpart. Finally, you must develop a written SSM plan according to the provisions in 40 CFR 63.6(e)(3). A copy of the SSM plan must be maintained on site. Failure to write or maintain a copy of the SSM plan is a deviation from the requirements of this subpart.

Compliance with Subpart WWW and development of an SSM plan determines compliance with the Subpart.

§ 63.1965 What is a deviation?

A deviation is defined in §63.1990. For the purposes of the landfill monitoring and SSM plan requirements, deviations include the items in paragraphs (a) through (c) of this section.

(a) A deviation occurs when the control device operating parameter boundaries described in 40 CFR 60.758(c)(1) of subpart WWW are exceeded.

(b) A deviation occurs when 1 hour or more of the hours during the 3-hour block averaging period does not constitute a valid hour of data. A valid hour of data must have measured values for at least three 15-minute monitoring periods within the hour.

(c) A deviation occurs when a SSM plan is not developed or maintained on site.

This section defines a deviation used throughout the rest of the subpart.

§ 63.1975 How do I calculate the 3-hour block average used to demonstrate compliance?

Averages are calculated in the same way as they are calculated in 40 CFR part 60, subpart WWW, except that the data collected during the events listed in paragraphs (a), (b), (c), and (d) of this section are not to be included in any average computed under this subpart:

(a) Monitoring system breakdowns, repairs, calibration checks, and zero (low-level) and high-level adjustments.

(b) Startups.

(c) Shutdowns.

(d) Malfunctions.

This section describes that the average calculations are identical to that stated in WWW except the four components stated in this section.

*§ 63.1980 **What records and reports must I keep and submit?***

(a) Keep records and reports as specified in 40 CFR part 60, subpart WWW, or in the Federal plan, EPA approved State plan or tribal plan that implements 40 CFR part 60, subpart Cc, whichever applies to your landfill, with one exception: You must submit the annual report described in 40 CFR 60.757(f) every 6 months.

(b) You must also keep records and reports as specified in the general provisions of 40 CFR part 60 and this part as shown in Table 1 of this subpart. Applicable records in the general provisions include items such as SSM plans and the SSM plan reports.

All records and reports must be maintained in accordance with 40 CFR 60, subpart WWW and a report must be submitted every 6 months. All records as described in Table 1 must be kept.

40 CFR 60, Subpart ZZZZ..........................National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

*§ 63.6585 **Am I subject to this subpart?***

You are subject to this Subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand.

(a) A stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.

(b) A major source of HAP emissions is a plant site that emits or has the potential to emit any single HAP at a rate of 10 tons (9.07 megagrams) or more per year or any combination of HAP at a rate of 25 tons (22.68 megagrams) or more per year, except that for oil and gas production facilities, a major source of HAP emissions is determined for each surface site.

The facility does operate one emergency engine which is used periodically throughout the year and is used in emergency situations only. The facility also operates four engines that burn LFG to generate electricity. In addition, the facility is a major source for HAPs because the PTE for formaldehyde is greater than 10 tons per year.

*§ 63.6590 **What parts of my plant does this subpart cover?***

This subpart applies to each affected source.

(a) Affected source. An affected source is any existing, new, or reconstructed stationary RICE located at a major or area source of HAP emissions, excluding stationary RICE being tested at a stationary RICE test cell/stand.

(1) Existing stationary RICE.

(i) For stationary RICE with a site rating of more than 500 brake horsepower (HP) located at a major source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before December 19, 2002.

(ii) For stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006.

(2) New stationary RICE. (i) A stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after December 19, 2002.

(2) A new or reconstructed stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis must meet the initial notification requirements of §63.6645(f) and the requirements of §§63.6625(c), 63.6650(g), and 63.6655(c). These stationary RICE do not have to meet the emission limitations and operating limitations of this subpart.

The four LFG engines (LFG Engines #1 and #2) located at the facility are considered new as they commenced construction after December 19, 2002. The emergency engine is considered existing as it was constructed prior to 2006. The two proposed LFG engines (LFG Engines #3 and #4) are also subject to NESHAP 40 CFR 60, Subpart JJJJ requirements.

§ 63.6595 When do I have to comply with the subpart?

(a)(1) If you have an existing stationary RICE, excluding existing non-emergency CI stationary RICE, with a site rating of more than 500 brake HP located at a major source of HAP emissions, you must comply with the applicable emission limitations and operating limitations no later than June 15, 2007. If you have an existing non-emergency CI stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, an existing stationary CI RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, or an existing stationary CI RICE located at an area source of HAP emissions, you must comply with the applicable emission limitations and operating limitations no later than May 3, 2013. If you have an existing stationary SI RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, or an existing stationary SI RICE located at an area source of HAP emissions, you must comply with the applicable emission limitations and operating limitations no later than October 19, 2013.

Emergency Engine #1 must be in compliance with the Subpart no later than May 3, 2013.

(3) If you start up your new or reconstructed stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions after August 16, 2004, you must comply with the applicable emission limitations and operating limitations in this subpart upon startup of your affected source.

The LFG engines do not have to meet the emission limitations and operating limitations of this Subpart in accordance with 40 CFR 63.6590(b)(2).

(c) If you own or operate an affected source, you must meet the applicable notification requirements in §63.6645 and in 40 CFR part 63, subpart A.

§ 63.6600 What emission limitations and operating limitations must I meet if I own or operate a stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions?

(c) If you own or operate any of the following stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with the emission limitations in Tables 1a, 2a, 2c, and 2d to this subpart or operating limitations in Tables 1b and 2b to this subpart: an existing 2SLB stationary RICE; an existing 4SLB stationary RICE; a stationary RICE that combusts landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis; an emergency stationary RICE; or a limited use stationary RICE.

The LFG engines have a heat input from the combustion of landfill gas greater than 10 percent on an annual basis.

§ 63.6602 What emission limitations must I meet if I own or operate an existing stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions?

If you own or operate an existing stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions, you must comply with the emission limitations and other requirements in Table 2c to this subpart which apply to you. Compliance with the numerical emission limitations established in this subpart is based on the results of testing the average of three 1-hour runs using the testing requirements and procedures in §63.6620 and Table 4 to this subpart.

Table 2c applies to Emergency Engine #1 as it applies to emergency CI RICE. Table 2c specifies that during periods of startup, the engine's time spent at idle must be minimized and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes. The engine is subject to changing the oil and filter every 500 hours of operation, inspecting the air cleaner every 1,000 hours, and inspecting all hoses and belts every 500 hours of operation. Each of the maintenance procedures shall occur at the indicated interval or annually, whichever occurs first.

§ 63.6605 What are my general requirements for complying with this Subpart?

(a) You must be in compliance with the emission limitations and operating limitations in this Subpart that apply to you at all times.

(b) At all times you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by this standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

When operating the IC engines, they must be operated in a manner that is consistent with reducing emissions and compliance with appropriate limitations applies at all times.

§ 63.6610 By what date must I conduct the initial performance tests or other initial compliance demonstrations if I own or operate a stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions?

The LFG engines located at the facility do not have to meet the emission limitations and operating limitations of this subpart.

§ 63.6625 What are my monitoring, installation, collection, operation, and maintenance requirements?

(c) If you are operating a new or reconstructed stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, you must monitor and record your fuel usage daily with separate fuel meters to measure the volumetric flow rate of each fuel. In addition, you must operate your stationary RICE in a manner which reasonably minimizes HAP emissions.

(e) If you own or operate any of the following stationary RICE, you must operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions:

(1) An existing stationary RICE with a site rating of less than 100 HP located at a major source of HAP emissions;

(2) An existing emergency or black start stationary RICE with a site rating of less than or equal to 500 HP located at a major source of HAP emissions;

Emergency Engine #1 shall be operated in accordance with manufacturer's specifications or a maintenance plan may be developed that is consistent with good air pollution control practices. The LFG engines must be monitored and the fuel usage must be recorded as well as operated in a manner that minimizes HAP emissions.

(f) If you own or operate an existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing emergency stationary RICE located at an area source of HAP emissions, you must install a non-resettable hour meter if one is not already installed.

A non-resettable hour meter shall be installed on Emergency Engine #1.

(h) If you operate a new, reconstructed, or existing stationary engine, you must minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup in Tables 1a, 2a, 2c, and 2d to this subpart apply.

Idle startup time may not exceed 30 minutes. Applicable emissions standards must be met following the allowable 30 minutes.

(i) If you own or operate a stationary CI engine that is subject to the work, operation or management practices in items 1 or 2 of Table 2c to this subpart or in items 1 or 4 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this subpart. The analysis program must at a minimum analyze the following three parameters: Total Base Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Base Number is less than 30 percent of the Total Base Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil within 2 days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the engine owner or operator must change the oil within 2 days or before commencing operation, whichever is later. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.

This section allows the facility to develop their own oil analysis program to modify the oil changing frequency if the program meets all criteria set forth in subsection i of the subpart.

§ 63.6635 How do I monitor and collect data to demonstrate continuous compliance?

(a) If you must comply with emission and operating limitations, you must monitor and collect data according to this section.

(b) Except for monitor malfunctions, associated repairs, required performance evaluations, and required quality assurance or control activities, you must monitor continuously at all times that the stationary RICE is operating. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions.

(c) You may not use data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities in data averages and calculations used to report emission or operating levels. You must, however, use all the valid data collected during all other periods.

The permittee must monitor and collect data continuously for Emergency Engine #1 when the engine is in operation.

§ 63.6640 How do I demonstrate continuous compliance with the emission limitations and operating limitations?

(a) You must demonstrate continuous compliance with each emission limitation and operating limitation in Tables 1a and 1b, Tables 2a and 2b, Table 2c, and Table 2d to this subpart that apply to you according to methods specified in Table 6 to this subpart.

(b) You must report each instance in which you did not meet each emission limitation or operating limitation in Tables 1a and 1b, Tables 2a and 2b, Table 2c, and Table 2d to this subpart that apply to you. These instances are deviations from the emission and operating limitations in this subpart. These deviations must be reported according to the requirements in §63.6650. If you change your catalyst, you must reestablish the values of the operating parameters measured during the initial performance test. When you reestablish the values of your operating parameters, you must also conduct a performance test to demonstrate that you are meeting the required emission limitation applicable to your stationary RICE.

(f) If you own or operate an emergency stationary RICE, you must operate the emergency stationary RICE according to the requirements in paragraphs (f)(1) through (4) of this section. In order for the engine to be considered an emergency stationary RICE under this subpart, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (f)(1) through (4) of this section, is prohibited. If you do not operate the engine according to the requirements in paragraphs (f)(1) through (4) of this section, the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

(1) There is no time limit on the use of emergency stationary RICE in emergency situations.

(2) You may operate your emergency stationary RICE for any combination of the purposes specified in paragraphs (f)(2)(i) through (iii) of this section for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by paragraphs (f)(3) and (4) of this section counts as part of the 100 hours per calendar year allowed by this paragraph (f)(2).

(i) Emergency stationary RICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency RICE beyond 100 hours per calendar year.

(ii) Emergency stationary RICE may be operated for emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference, see §63.14), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.

(iii) Emergency stationary RICE may be operated for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.

(3) Emergency stationary RICE located at major sources of HAP may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in paragraph (f)(2) of this section. The 50 hours per year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

The above requirements pertain specifically to Emergency Engine #1 at the facility.

§ 63.6645 What notifications must I submit and when?

(a) You must submit all of the notifications in §§63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), 63.9(b) through (e), and (g) and (h) that apply to you by the dates specified if you own or operate any of the following;

(5) This requirement does not apply if you own or operate an existing stationary RICE less than 100 HP, an existing stationary emergency RICE, or an existing stationary RICE that is not subject to any numerical emission standards.

(f) If you are required to submit an Initial Notification but are otherwise not affected by the requirements of this subpart, in accordance with §63.6590(b), your notification should include the information in §63.9(b)(2)(i) through (v), and a statement that your stationary RICE has no additional requirements and explain the basis of the exclusion (for example, that it operates exclusively as an emergency stationary RICE if it has a site rating of more than 500 brake HP located at a major source of HAP emissions).

This section of the subpart is not applicable to Emergency Engine #1 because it is designated as emergency. 63.6645(a)(5) explicitly exempts emergency engines from this requirement. The LFG engines shall meet the initial notification requirement.

§ 63.6650 What reports must I submit and when?

(a) You must submit each report in Table 7 of this subpart that applies to you.

(b) Unless the Administrator has approved a different schedule for submission of reports under §63.10(a), you must submit each report by the date in Table 7 of this Subpart and according to the requirements in paragraphs (b)(1) through (b)(9) of this section.

(1) For semiannual Compliance reports, the first Compliance report must cover the period beginning on the compliance date that is specified for your affected source in §63.6595 and ending on June 30 or December 31, whichever date is the first date following the end of the first calendar half after the compliance date that is specified for your source in §63.6595.

(2) For semiannual Compliance reports, the first Compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date follows the end of the first calendar half after the compliance date that is specified for your affected source in §63.6595.

(3) For semiannual Compliance reports, each subsequent Compliance report must cover the semiannual reporting period from January 1 through June 30 or the semiannual reporting period from July 1 through December 31.

(4) For semiannual Compliance reports, each subsequent Compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date is the first date following the end of the semiannual reporting period.

(5) For each stationary RICE that is subject to permitting regulations pursuant to 40 CFR part 70 or 71, and if the permitting authority has established dates for submitting semiannual reports pursuant to 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6 (a)(3)(iii)(A), you may submit the first and subsequent Compliance reports according to the dates the permitting authority has established instead of according to the dates in paragraphs (b)(1) through (b)(4) of this section.

(g) If you are operating as a new or reconstructed stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, you must submit an annual report according to Table 7 of this subpart by the date specified unless the Administrator has approved a different schedule, according to the information described in paragraphs (b)(1) through (b)(5) of this section. You must report the data specified in (g)(1) through (g)(3) of this section.

(1) Fuel flow rate of each fuel and the heating values that were used in your calculations. You must also demonstrate that the percentage of heat input provided by landfill gas or digester gas is equivalent to 10 percent or more of the total fuel consumption on an annual basis.

(2) The operating limits provided in your federally enforceable permit, and any deviations from these limits.

(3) Any problems or errors suspected with the meters.

There is no applicable report for Emergency Engine #1. An annual report must be submitted for the LFG engines. Specific due dates are stated and the contents of each reports is included.

§ 63.6655 What records must I keep?

(a) If you must comply with the emission and operating limitations, you must keep the records described in paragraphs (a)(1) through (a)(5), (b)(1) through (b)(3) and (c) of this section.

(4) Records of all required maintenance performed on the air pollution control and monitoring equipment.

(c) If you are operating a new or reconstructed stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, you must keep the records of your daily fuel usage monitors.

(d) You must keep the records required in Table 6 of this subpart to show continuous compliance with each emission or operating limitation that applies to you.

(e) You must keep records of the maintenance conducted on the stationary RICE in order to demonstrate that you operated and maintained the stationary RICE and after-treatment control device (if any) according to your own maintenance plan if you own or operate any of the following stationary RICE;

(2) An existing stationary emergency RICE.

(f) If you own or operate any of the stationary RICE in paragraphs (f)(1) through (2) of this section, you must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The owner or operator must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation. If the engine is used for the purposes specified in §63.6640(f)(2)(ii) or (iii) or §63.6640(f)(4)(ii), the owner or operator must keep records of the notification of the emergency situation, and the date, start time, and end time of engine operation for these purposes.

(1) An existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions that does not meet the standards applicable to non-emergency engines.

The permittee is required to maintain records of all required notifications, each malfunction, any required maintenance, and any corrective action that was taken. The facility needs to maintain records demonstrating that the engines are being operated in accordance with an appropriate maintenance plan. Records of operational hours from the non-resettable meter must also be kept as well as how many hours were spent in emergency situations and demand response.

§ 63.6660 In what form and how long must I keep my records?

(a) Your records must be in a form suitable and readily available for expeditious review according to §63.10(b)(1).

(b) As specified in §63.10(b)(1), you must keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.

(c) You must keep each record readily accessible in hard copy or electronic form for at least 5 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to §63.10(b)(1).

All records must be kept by the permittee for a minimum of five (5) years for each record.

Permit Conditions Review

This section describes the permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

Revised Table 1.1

The table has been updated to include the H_2S scrubber treatment system, the removal of two existing non-emergency engines, and the addition of two landfill gas engines.

Revised Table 2.1

The table has been updated to include the H_2S scrubber treatment system.

Revised Permit Condition 2.7

The O&M Manual requirement has been updated to include the H_2S scrubber treatment system and the landfill gas flow-rate monitor.

Revised Permit Condition 2.8

The combined LFG limit to the flares has been raised to 4,699 scfm based on the maximum allowable flow rate as requested by the Applicant.

New Permit Condition 2.9

This condition has been added for the installation and operation of the H_2S scrubber treatment system.

Revised Permit Condition 2.12

The monitoring and recordkeeping schedule for the new H_2S scrubber treatment system is once per day to demonstrate compliance with the landfill gas concentration limit.

Deleted Permit Condition 19

NMOC reporting is no longer required for this facility in accordance with 40 CFR 60.757(b)(3) which states that each owner or operator subject to the requirements of this subpart is exempted from the requirements of paragraphs (b)(1) and (2) of this section, after the installation of a collection and control system in compliance with 60.752(b)(2).

Revised Permit Condition 3.1

The process description has been updated to include the removal of the wood chipper and power screen engines.

Revised Table 3.1

The table has been revised to include the removal of the wood chipper and power screen engines.

Deleted Permit Condition 25

The wood chipper and power screen engines have been removed from service hence the removal of the hours of operation restrictions for those engines.

New Permit Condition 3.4

The maintenance and testing for each emergency engine is limited to one hour to demonstrate compliance with the 1 hour NO_2 NAAQS.

New Permit Conditions 3.10 through 3.25

Emergency Engine #1 is subject to 40 CFR 63 Subpart ZZZZ. These permit conditions outline the requirements for the engine.

New Permit Conditions 3.26 through 3.33

Emergency Engine #2 is subject to 40 CFR 60 Subpart IIII. These permit conditions outline the requirements for the engine.

New Permit Condition 3.34

This permit condition provides for the incorporation of any NSPS and NESHAP standards into the permit.

Revised Permit Condition 4.4

The test methods and procedures was revised to include the performance test description.

Revised Permit Condition 4.8

The recordkeeping requirements were updated to include 40 CFR 60.758(c).

Revised Permit Condition 5.2

This condition was revised to show that Ada County Landfill is now a major source that need to meet the criteria in 40 CFR 63.1935(a)(1).

New Permit Condition 5.6

This condition provides the operating and maintenance requirements for the landfill gas treatment system in accordance with 40 CFR 63 Subpart AAAA.

New Permit Condition 5.8

This condition incorporates the recordkeeping required for the landfill gas treatment system during a startup, shutdown, or malfunction.

New Permit Condition 5.9

This condition incorporates the requirements for the startup, shutdown, or malfunction plan maintenance required for the landfill gas treatment system.

New Permit Condition 5.10

This condition incorporates the requirements by the Administrator for the startup, shutdown, or malfunction plan maintenance required for the landfill gas treatment system.

New Permit Condition 5.11

This condition incorporates the requirements by the permittee for the startup, shutdown, or malfunction plan maintenance required for the landfill gas treatment system.

New Permit Condition 6.1

This condition is a process condition for the LFG engines.

New Permit Condition 6.2

Table 6 provides a description of the LFG engines along with the control device being the H_2S scrubber treatment system.

New Permit Condition 6.3

The H_2S is limited to 600 ppm going into the LFG engines to demonstrate compliance with the 1 hour SO_2 NAAQS.

New Permit Condition 6.6

This condition requires that the permittee operate the LFG engines as required by the manufacturer.

New Permit Condition 6.7

This condition allows the LFG engines to burn only landfill gas.

New Permit Condition 6.9 and 6.10

These conditions ensure that the H_2S concentration and landfill gas flow rate monitoring and recordkeeping are done in accordance with Permit Conditions 2.12 and 2.13.

New Permit Conditions 7.1 through 7.10

The landfill gas engines are subject to 40 CFR 63 Subpart ZZZZ. These permit conditions outline the requirements for the engines.

New Permit Conditions 8.1 through 8.13

Landfill Gas Engines #3 and #4 are subject to 40 CFR 60 Subpart JJJJ. These permit conditions outline the requirements for the engines.

Permit Condition 9.1

The duty to comply general compliance provision requires that the permittee comply with all of the permit terms and conditions pursuant to Idaho Code §39-101.

Permit Condition 9.2

The maintenance and operation general compliance provision requires that the permittee maintain and operate all treatment and control facilities at the facility in accordance with IDAPA 58.01.01.211.

Permit Condition 9.3

The obligation to comply general compliance provision specifies that no permit condition is intended to relieve or exempt the permittee from compliance with applicable state and federal requirements, in accordance with IDAPA 58.01.01.212.01.

Permit Condition 9.4

The inspection and entry provision requires that the permittee allow DEQ inspection and entry pursuant to Idaho Code §39-108.

Permit Condition 9.5

The permit expiration construction and operation provision specifies that the permit expires if construction has not begun within two years of permit issuance or if construction has been suspended for a year in accordance with IDAPA 58.01.01.211.02.

Permit Condition 9.6

The notification of construction and operation provision requires that the permittee notify DEQ of the dates of construction and operation, in accordance with IDAPA 58.01.01.211.03.

Permit Condition 9.7

The performance testing notification of intent provision requires that the permittee notify DEQ at least 15 days prior to any performance test to provide DEQ the option to have an observer present, in accordance with IDAPA 58.01.01.157.03.

Permit Condition 9.8

The performance test protocol provision requires that any performance testing be conducted in accordance with the procedures of IDAPA 58.01.01.157, and encourages the permittee to submit a protocol to DEQ for approval prior to testing.

Permit Condition 9.9

The performance test report provision requires that the permittee report any performance test results to DEQ within 30 days of completion, in accordance with IDAPA 58.01.01.157.04-05.

Permit Condition 9.10

The monitoring and recordkeeping provision requires that the permittee maintain sufficient records to ensure compliance with permit conditions, in accordance with IDAPA 58.01.01.211.

Permit Condition 9.11

The excess emissions provision requires that the permittee follow the procedures required for excess emissions events, in accordance with IDAPA 58.01.01.130-136.

Permit Condition 9.12

The certification provision requires that a responsible official certify all documents submitted to DEQ, in accordance with IDAPA 58.01.01.123.

Permit Condition 9.13

The false statement provision requires that no person make false statements, representations, or certifications, in accordance with IDAPA 58.01.01.125.

Permit Condition 9.14

The tampering provision requires that no person render inaccurate any required monitoring device or method, in accordance with IDAPA 58.01.01.126.

Permit Condition 9.15

The transferability provision specifies that this permit to construct is transferable, in accordance with the procedures of IDAPA 58.01.01.209.06.

Permit Condition 9.16

The severability provision specifies that permit conditions are severable, in accordance with IDAPA 58.01.01.211.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there were comments on the application and there was a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

Public Comment Period

A public comment period will be made available to the public in accordance with IDAPA 58.01.01.209.01.c.

APPENDIX A – EMISSIONS INVENTORIES

Table D-1

Baseline Uncontrolled PTE (facility wide)

Sources	PM_{10}		$PM_{2.5}$		SO_2		NO_X		CO		VOC		HAP[1,2]	CO_2e[3]
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
PTC NO. P-2009.0001														
Flare 1	1.59	6.97	1.59	6.97	10.02	43.89	3.03	13.27	0.76	3.32	4.62	20.24		437
Flare 2	1.64	7.19	1.64	7.19	10.35	45.33	3.13	13.7	0.78	3.43	4.77	20.9		
Total	**3.23**	**14.16**	**3.23**	**14.16**	**20.37**	**89.22**	**6.16**	**26.97**	**1.54**	**6.75**	**9.39**	**41.14**	**4.37**	**437**
PTC No. P-2009.0098														
Flare 1	1.47	6.46	1.47	6.46	9.29	40.67	2.81	12.30	0.70	3.08	4.28	18.76		280
Flare 2														
LFG Engine 1	0.78	3.42	0.78	3.42	1.090	4.77	2.46	10.77	14.77	64.69	0.79	3.46		151
LFG Engine 2	0.78	3.42	0.78	3.42	1.090	4.77	2.46	10.77	14.77	64.69	0.79	3.46		
Total	**3.03**	**13.30**	**3.03**	**13.30**	**11.47**	**50.21**	**7.73**	**33.84**	**30.24**	**132.46**	**5.86**	**25.68**	**21.61**	**431**
Universal Sources (P-2009.0001)														
Wood Chipper Engine	0.30	0.50	0.30	0.50	0.01	0.01	5.36	8.84	0.95	1.57	0.12	0.20		1,416
Power Screen Engine	0.27	0.44	0.27	0.44	0.001	0.002	3.79	6.25	0.82	1.35	0.30	0.50		228
Emergency Gen 1 - Detroit	0.13	0.03	0.13	0.03	0.0006	1.59E-04	1.85	0.46	0.40	0.10	0.15	0.04		17
Emergency Gen 2 - John Deere	0.20	0.05	0.20	0.05	0.001	2.45E-04	2.86	0.71	0.62	0.15	0.23	0.06		26
Universal Sources Total	0.90	1.02	0.90	1.02	0.01	0.01	13.86	16.27	2.79	3.17	0.80	0.80		1687.20
Baseline Totals	**4.13**	**15.18**	**4.13**	**15.18**	**20.38**	**89.23**	**21.59**	**50.10**	**33.03**	**135.63**	**10.19**	**41.94**	**25.98**	**2124.23**

Notes: PTE based on PTC No P-2009.0001 Statement of Basis (SOB) dated 9-28-12 and PTC No P-2009.0098 SOB dated 6-19-12.

[1] HAP emissions (specifically formaldehyde is over 10 tons per year) trigger major HAP facility classification.

[2] HAP emissions for PTC No P-2009.0001 are facility wide total for the pre permit Ada County Landfill. HAP emissions for PTC No P-2009.0098 are total for the Hidden Hollow Energy engines.

Table D-2

Post-Project Uncontrolled PTE for Regulated Air Pollutants

Sources[1]	PM_{10}		$PM_{2.5}$		SO_2[2]		NO_X		CO		VOC		HAP	CO_2e[3,4]
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
Flare 1	1.58	6.93	1.58	6.93	34.95	153.08	3.01	13.20	0.75	3.30	4.59	20.13	0.35	300
Flare 2[5]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Emergency Gen 3 - Detroit	0.13	0.03	0.13	0.03	0.0006	1.59E-04	1.85	0.46	0.40	0.10	0.15	0.04	0.001	17
Emergency Gen 4 - John Deere	0.20	0.05	0.20	0.05	0.001	2.45E-04	2.86	0.71	0.62	0.15	0.23	0.06	0.001	26
LFG Engine 1	0.78	3.42	0.78	3.42	9.12	39.95	2.46	10.77	14.77	64.69	0.79	3.46		
LFG Engine 2	0.78	3.42	0.78	3.42	9.12	39.95	2.46	10.77	14.77	64.69	0.79	3.46		
LFG Engine 3	0.78	3.42	0.78	3.42	9.12	39.95	2.46	10.77	14.77	64.69	0.79	3.46		
LFG Engine 4	0.78	3.42	0.78	3.42	9.12	39.95	2.46	10.77	14.77	64.69	0.79	3.46	43.31	301
Post Project Totals	**5.03**	**20.69**	**5.03**	**20.69**	**71.43**	**312.86**	**17.56**	**57.45**	**60.85**	**262.31**	**8.13**	**34.06**	**43.65**	**644**

Notes:

[1] Criteria pollutants PTE based on LFG flow rate of 4,699 scfm for flares, PTC No P-2009.0001 SOB dated 9-28-12 for emergency generators, and PTC No P-2009.0098 SOB dated 6-19-12 for LFG eng

[2] SO_2 emission estimates based on uncontrolled maximum H2S concentration of 1,500 ppm

[3] GHG emission estimates based on calendar year 2012 recorded data

[4] GHG emissions for flares are based on the potential LFG flow through the flares (4,699 scfm), not the total amount of LFG being generated by the landfill.

[5] Maximum LFG flow rate is 4,699 scfm. Assuming 2,400 scfm LFG passes through the four LFG engines, 2,299 scfm LFG is available to pass through flares. Each flare can candle at least 2,320 scfm LFG so 100-percent of remaining LFG (2,299 scfm) pass through Flare 1 only. Therefore, there are no emissions from Flare 2.

Table D-3

Post-Project Controlled PTE for Regulated Air Pollutants

Sources[1]	PM_{10}		$PM_{2.5}$		SO_2[2]		NO_x		CO		VOC		HAP	CO_2e[3,4]
	(lb/hr)[5]	(ton/yr)[6]	(lb/hr)[5]	(ton/yr)[6]	(lb/hr)[5]	(ton/yr)[6]	(lb/hr)[5]	(ton/yr)[6]	(lb/hr)[5]	(ton/yr)[6]	(lb/hr)[5]	(ton/yr)[6]	(ton/yr)	(ton/yr)[6]
Flare 1[7]	1.58	6.93	1.58	6.93	13.98	61.23	3.01	13.20	0.75	3.30	4.59	20.13	0.35	300
Flare 2[7]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Emergency (Gen 3) - Detroit	0.13	0.03	0.13	0.03	0.0006	1.59E-04	1.85	0.46	0.40	0.10	0.15	0.04	0.001	17
Emergency (Gen 4) - John Deere	0.20	0.05	0.20	0.05	0.001	2.45E-04	2.86	0.71	0.62	0.15	0.23	0.06	0.001	26
LFG Engine 1	0.78	3.42	0.78	3.42	3.65	15.99	2.46	10.77	14.77	64.69	0.79	3.46		
LFG Engine 2	0.78	3.42	0.78	3.42	3.65	15.99	2.46	10.77	14.77	64.69	0.79	3.46		
LFG Engine 3	0.78	3.42	0.78	3.42	3.65	15.99	2.46	10.77	14.77	64.69	0.79	3.46		
LFG Engine 4	0.78	3.42	0.78	3.42	3.65	15.99	2.46	10.77	14.77	64.69	0.79	3.46	43.31	301
Post Project Totals	**5.03**	**20.69**	**5.03**	**20.69**	**28.58**	**125.18**	**17.56**	**57.45**	**60.85**	**262.31**	**8.13**	**34.06**	**43.65**	**644**

Notes: PTE based on PTC No P-2009.0001 Statement of Basis dated 9-28-12 and PTC No P-2009.0098 Statement of Basis dated 6-19-12.

1 Criteria pollutants PTE based on LFG flow rate of 4,699 scfm

2 SO_2 emission estimates based on controlled maximum H2S concentration of 600 ppm (Scenario 3).

3 GHG emission estimates based on calendar year 2012 recorded data

4 GHG emissions for flares are based on the potential LFG flow through the flares (4,699 scfm), not the total amount of LFG being generated by the landfill.

5 Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.

6 Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits. Assume 33,720 total hours of operation between the 4 LFG engines.

7 Maximum LFG flow rate is 4,699 scfm. Assuming 2,400 scfm LFG passes through the four LFG engines, 2,299 scfm LFG is available to pass through flares. Each flare can candle at least 2,320 scfm LFG so 100-percent of remaining LFG (2,299 scfm) pass through Flare 1 only. Therefore, there are no emissions from Flare 2.

Table D-4

PTE Delta for Regulated Air Pollutants

Source	PM_{10}		$PM_{2.5}$		SO_2		NO_X		CO		VOC		HAP	CO_2e
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(ton/yr)	(ton/yr)
Baseline Uncontrolled PTE	4.13	15.18	4.13	15.18	20.38	89.23	21.59	50.10	33.03	135.63	10.19	41.94	25.98	2124
Post Project Controlled PTE	5.03	20.69	5.03	20.69	28.58	125.18	17.56	57.45	60.85	262.31	8.13	34.06	43.65	644
Changes in PTE	**0.90**	**5.51**	**0.90**	**5.51**	**8.20**	**35.95**	**-4.03**	**7.35**	**27.81**	**126.69**	**-2.06**	**-7.88**	**17.67**	**-1480**
Level II Threshold	2.60		0.630	4.10	2.5	14.00	2.40	14.00	175.00					
Exceed Level II Threshold	No		Yes	Yes	Yes	Yes	No	No	No					

Table D-5

Uncontrolled Flare Toxic Air Pollutants (4,699 scfm Landfill Gas to Flares Only)

Pollutant	CAS	Emmissions (lb/hr)	IDAPA 58.01.01.585 EL (lb/hr)	IDAPA 58.01.01.586 EL (lb/hr)	Exceed EL (Exceeds/Below)
1,1,1-Trichloroethane	71-55-6	7.97E-04	1.27E+02		Below
1,1,2,2-Tetrachloroethane	79-34-5	**2.32E-03**		**1.10E-05**	**Exceeds**
1,1,2-Trichloroethane	79-00-5	1.66E-04		4.20E-04	Below
1,1-Dichloroethane (ethylidene dichloride)	75-34-3	**2.90E-03**		**2.50E-04**	**Exceeds**
1,1-Dichloroethene (vinylidene chloride)	75-35-4	**2.41E-04**		**1.30E-04**	**Exceeds**
1,2-Dichloroethane (ethylene dichloride)	107-06-2	**5.05E-04**		**2.50E-04**	**Exceeds**
1,2-Dichloropropane (propylene dichloride)	78-87-5	2.53E-04	2.31E+01		Below
2-Propanol (isopropyl alcohol)	67-63-0	5.62E-03	6.53E+01		Below
Acetone	67-64-1	7.60E-04	1.19E+02		Below
Acrylonitrile	107-13-1	**6.27E-04**		**9.80E-05**	**Exceeds**
Carbon disulfide	75-15-0	8.24E-05	2.00E+00		Below
Carbon tetrachloride	56-23-5	7.66E-06		4.40E-04	Below
Carbonyl sulfide	463-58-1	1.47E-04	2.70E-02		Below
Chlorobenzene	108-90-7	3.50E-04	2.33E+01		Below
Chloroethane (ethyl chloride)	75-00-3	1.00E-03	1.76E+02		Below
Chloroform	67-66-3	4.46E-05		2.80E-04	Below
Dichlorobenzene	95-50-1	3.84E-04	2.00E+01		Below
Dichlorofluoromethane	75-43-4	3.36E-03	2.67E+00		Below
Dichloromethane (methylene chloride)	75-09-2	**1.51E-02**		**1.60E-03**	**Exceeds**
Ethanol	64-17-5	2.34E-03	1.25E+02		Below
Ethyl mercaptan (ethanethiol)	75-08-1	2.64E-04	6.70E-02		Below
Ethylbenzene	100-41-4	9.14E-04	2.90E+01		Below
Ethylene dibromide	106-93-4	2.34E-06		3.00E-05	Below
Hexane	110-54-3	1.06E-03	1.20E+01		Below
Hydrogen sulfide (Controlled)	7783-06-4	1.20E-01	9.33E-01		Below
Mercury (total)	7439-97-6	3.65E-05		7.00E-03	Below
Methyl ethyl ketone (MEK)	78-93-3	9.55E-04	3.93E+01		Below
Methyl isobutyl ketone (MIBK)	108-10-1	3.50E-04	1.37E+01		Below
Methyl mercaptan	74-93-1	2.24E-04	3.30E-02		Below
Pentane	109-66-0	4.43E-04	1.18E+02		Below
Perchloroethylene (tetrachloroethylene)	127-18-4	7.70E-03		1.30E-02	Below
trans-1,2-Dichloroethene	540-59-0	3.43E-03	5.27E+01		Below
Trichoroethylene	79-01-6	4.61E-03	1.79E+01		Below
Vinyl chloride	75-01-4	**5.71E-03**		**9.40E-04**	**Exceeds**
Xylenes	1330-20-7	2.40E-03	2.90E+01		Below
Benzene	71-43-2	**1.62E-03**		**8.00E-04**	**Exceeds**
Toluene	108-88-3	2.84E-02	2.50E+01		Below

Table D-6

Facility Wide HAPs (2,400 scfm to LFG Engines, 2,299 scfm LFG to Flare 1)

Pollutant	CAS	LFG Engines[1] (4 Engines) (ton/yr)	Flares[2] (ton/yr)	HHHW Gen 3 (ton/yr)	Scalres Gen 4 (ton/yr)	Total (ton/yr)
1,1,1-Trichloroethane	71-55-6	2.87E-02	1.71E-03			3.04E-02
1,1,2-Trichloroethane	79-00-5		3.56E-04			3.56E-04
1,1,2,2-tetrachloroethane	79-34-5	8.35E-02	4.97E-03			8.84E-02
1,1-Dichloroethane	75-34-3	1.04E-01	6.20E-03			1.10E-01
1,1-dichloroethene	75-35-4	8.77E-03	5.17E-04			9.28E-03
1,2-Dichloroethane	107-06-2	1.82E-02	1.08E-03			1.93E-02
1,2-Dichloropropane	78-87-5	9.10E-03	5.43E-04			9.65E-03
1,3-Butadiene	106-99-0			4.11E-06	6.33E-06	1.04E-05
Acetaldehyde	75-07-0			8.05E-05	1.24E-04	2.05E-04
Acrolein	107-02-8			9.71E-06	1.50E-05	2.47E-05
Acrylonitrile	107-13-1	2.98E-01	1.34E-03			3.00E-01
Benzene	71-43-2	1.33E-01	0.003	9.80E-05	1.51E-04	0.14
Carbon Disulfide	75-15-0	3.93E-02	1.77E-04			3.95E-02
Carbon Tetrachloride	56-23-5	3.37E-04	1.64E-05			3.54E-04
Carbonyl Sulfide	463-58-1	2.61E-02	3.14E-04			2.64E-02
Chlorobenzene	108-90-7	1.26E-02	7.51E-04			1.34E-02
Chloroethane	75-00-3	3.61E-02	2.15E-03			3.82E-02
Chloroform	67-66-3	1.69E-03	9.55E-05			1.78E-03
Chloromethane (methylchloride)	74-87-3		1.63E-03			1.63E-03
Dichloromethane	75-09-2	5.45E-01	0.03			0.58
Ethyl benzene	100-41-4	4.35E-01	1.96E-03			0.44
Ethylene dibromide	106-93-4		5.01E-06			5.01E-06
Formaldehyde	50-00-0	35.41		1.24E-04	1.91E-04	35.41
Hexane	110-54-3	0.50	2.27E-03			0.51
Hydrogen sulfide (Controlled)	7783-06-4		2.57E-01			2.57E-01
Mercury (total)	7439-97-6		7.81E-05			7.81E-05
Methyl Ethyl Ketone	78-93-3	4.55E-01	2.05E-03			0.46
Methly Isobultyl Ketone	108-10-1	1.67E-01	7.49E-04			1.67E-01
Naphthalene	91-20-3			8.90E-06	1.37E-05	2.26E-05
Perchloroethylene	127-18-4	2.77E-01	0.02			0.29
Toluene	108-88-3	3.20		4.29E-05	6.63E-05	3.20
Trichloroethylene	79-01-6	1.66E-01	0.01			0.18
Vinyl Chloride	75-01-4	2.06E-01	0.01			0.22
Xylene	1330-20-7	1.14	0.01	2.99E-05	4.62E-05	1.15
					HAP Totals	**43.67**

[1] Based on 2,400 scfm landfill gas going to the four LFG engines (worst case)

[2] Based on 2,299 scfm landfill gas going to the Flares (worst case)

Table D-7

Current Facility Wide Total GHG Emissions

Soucre	CO_2		N_2O		CH_4		CO_2e	
	(metric tons/yr)	(ton/yr)	(metric tons/yr)	(ton/yr)	(metric tons/yr)	(ton/yr)	(metric tons/yr)	(ton/yr)
Old Gen 1	1,280	1,411	1.04E-02	1.14E-02	5.19E-02	5.72E-02	1,284	1,416
Old Gen 2	207	228	1.68E-03	1.85E-03	8.38E-03	9.24E-03	207	228
Gen 3	15	17	1.24E-04	1.37E-04	6.21E-04	6.85E-04	15	17
Gen 4	24	26	1.92E-04	2.11E-04	9.58E-04	1.06E-03	24	26
Biogenic						18102		18,102
Flares [1]	77,105	84,993	0.93	1.03	4.74	5.22	396	437
LFG Engine (2x) and Flares [1]								
1200 to LFG Engines			0.32	0.35	1.63	1.80	137	151
2150 to Flares			0.60	0.66	3.04	3.35	254	280
Total			0.92	1.01	4.67	5.15	391	431
Facility Wide Total	**78,631**	**86,675**	**0.95**	**1.04**	**4.80**	**18,107.21**	**1,927**	**20,226**

PSD Requirement (100,000 tons) **PSD not met**

New Facility Wide Total GHG Emissions

Soucre	CO_2		N_2O		CH_4		CO_2e	
	(metric tons/yr)	(ton/yr)	(metric tons/yr)	(ton/yr)	(metric tons/yr)	(ton/yr)	(metric tons/yr)	(ton/yr)
Old Gen 1								
New Gen 1	4,523	4,986	3.67E-02	4.04E-02	1.83E-01	2.02E-01	4,539	5,003
Old Gen 2								
Gen 3	15	17	1.24E-04	1.37E-04	6.21E-04	6.85E-04	15.4	17
Gen 4	24	26	1.92E-04	2.11E-04	9.58E-04	1.06E-03	23.7	26
Biogenic						25,391		25,391
LFG Engine (4x) and Flares [1]								
2,400 to LFG Engines			0.64	0.71	3.27	3.60	273	301
2,299 to Flares			0.64	0.71	3.25	3.58	272	300
Total			1.28	1.41	6.52	7.19	545	601
Facility Wide Total	**4,562**	**5,029**	**1.32**	**1.46**	**6.70**	**7.39**	**5,123**	**5,647**

PSD Requirement (100,000 tons) **PSD not met**

[1] Does not make a difference how the collected LFG is combusted, GHG emissions are the same for LFG engines or flares.

NOTE: Regarding 40 CFR 52.21, the US EPA has deferred CO2 biogenic emissions for three years for stationary sources including; CO2 emissions from the biogenic emissions from the decomposition of solid waste, and CO2 emissions from sources burning LFG from the decomposition of solid waste.

LFG Engines HAP Emissions

LFG Engines HAPs	Baseline PTE (per engine) (lb/hr)	Baseline PTE (2 engines) (ton/yr)	Post Project PTE (4 engines) (ton/yr)
1,1,1-Trichloroethane	1.70E-03	1.42E-02	2.87E-02
1,1-Dichloroethane	6.18E-03	5.15E-02	1.04E-01
1,2-Dichloroethane	1.08E-03	9.01E-03	1.82E-02
1,2-Dichloropropane	5.40E-04	4.50E-03	9.10E-03
Acrylonitrile	1.77E-02	1.48E-01	2.98E-01
Carbon Disulfide	2.33E-03	1.94E-02	3.93E-02
Carbonyl Sulfide	1.55E-03	1.29E-02	2.61E-02
Chlorobenzene	7.50E-04	6.26E-03	1.26E-02
Chloroethane	2.14E-03	1.78E-02	3.61E-02
Ethyl benzene	2.58E-02	2.15E-01	4.35E-01
Hexane	2.99E-02	2.49E-01	5.04E-01
Methyl Ethyl Ketone	2.70E-02	2.25E-01	4.55E-01
Methly Isobultyl Ketone	9.88E-03	8.24E-02	1.67E-01
Toluene	1.90E-01	1.58E+00	3.20E+00
Xylene	6.78E-02	5.65E-01	1.14E+00
1,1,2,2-tetrachloroethane	4.95E-03	4.13E-02	8.35E-02
1,1-dichloroethene	5.20E-04	4.34E-03	8.77E-03
Carbon Tetrachloride	2.00E-05	1.67E-04	3.37E-04
Chloroform	1.00E-04	8.34E-04	1.69E-03
Dichloromethane	3.23E-02	2.69E-01	5.45E-01
Formaldehyde*,**	2.10	**17.70**	**35.41**
Perchloroethylene	1.64E-02	1.37E-01	2.77E-01
Trichloroethylene	9.84E-03	8.21E-02	1.66E-01
Vinyl Chloride	1.22E-02	1.02E-01	2.06E-01
Benzene	7.87E-03	6.56E-02	1.33E-01
HAP Totals	**2.57**	**21.61**	**43.31**

Notes:

*Emission factor provided by Michigan DEQ for Cat G3520C engine of 2.1 lb/hr

Assumptions:

LFG Engines annual operating hours are 33,720 based on 4 identical engines derived from PTC No P-2009.0098 SOB dated 6-19-12.

HAP PTE emissions based on 8,430 hours per year for each generator

Potential Landfill Emissions Calculations

Flares

Assume potential LFG flow of 2299 scfm going to Flare 1 — Worse Case Scenario 3

$Q_{CH4\ Max}$ = ***1.711E+07*** *m^3/yr* — Design maximum; w/ 50% methane content

Note: As methane concentration goes down, the calculated PM10 emissions go down, so assuming 50% methane concentration is a conservative value for this calculation (actual methane concentration is normally between 40 and 45-percent)

Uncontrolled Emissions of PM-10

Manufacturer Specifications

CM_{PM10} =	0.042	lb/MMBTU
Qr_{max} =	65,520,000	Maximum flare heat release (BTU/hr); based on design specifications
LHV =	546	Landfill gas lower heating value (BTU/SCF), based on design specifications
Q_{CH4} =	1.711E+07	m^3/yr
	6.04E+08	ft^3/yr
Qr_{Total} =	37,657,620	Lower flare heat release (BTU/hr)

CM_{PM10} = 1.58 lb/hr — ***6.93 tons/yr*** — Scenario 3, 2299 scfm Flow

AP-42 Emission Factor (Section 2.4, 11/98, Table 2.4-5)

CM_{PM10} = 17 lb/MMdscf

CM_{PM10} = 1.17 lb/hr — ***5.14 tons/yr*** — Scenario 3, 2299 scfm Flow

Note: Conservative Engineering Assumption PM10 is assumed to equal PM10 and PM2.5

Potential Landfill Emissions Calculations

Flares

Given:

Assume potential LFG flow of 2299 scfm going to Flare 1 — Worse Case Scenario 3

$Q_{CH4\,Max}$ = 1.711E+07 m^3/yr — Design maximum; w/ 50% methane content

Note: As methane concentration goes down, the calculated PM10 emissions go down, so assuming 50% methane concentration is a conservative value for this calculation (actual methane concentration is normally between 40 and 45-percent)

Estimate of NMOC & Other Constituent Concentrations

$Q_P = F * Q_{CH4} * (C_P / 1E+06)$ — Eqn 3

Q_P =		Emission rate of pollutant P (m^3/yr)
$Q_{CH4\,Max}$ =	1.711E+07	Methane generation rate at time t (m^3/yr)
C_P =	172.5	Concentration of pollutant P in landfill gas sample, corrected (ppmv)
F =	2.0	Multiplication factor; 1.82 for landfill gas at 55% CH_4; 2.0 for landfill gas at 50% CH_4

Q_P* = *5,903* *m^3/yr* *NMOC* = *0.40* *cfm NMOC — Combined Flares

Uncontrolled Mass Emissions Rate

$UM_P = Q_P * (MW_P * 1\ atm) / (8.205E-05\ m3\text{-}atm/gmol\text{-}K * 1000\ g/kg * (273 + T)\ K)$ — Eqn 4

UM_P =		Uncontrolled mass emission rate of pollutant P (kg/yr)
Q_P =	5,903	Emission rate of pollutant P (m^3/yr)
MW_P =	86.18	Molecular weight of pollutant P; NMOC = hexane, MW =86.18 (g/gmol)
T =	20	Temperature of landfill gas (C); default 25 C.

***UM_P* =**	***21,161***	***kg/yr***	***NMOC =***	***5.31***	***lb/hr NMOC***	Combined Flares
	23.3	***Tons/yr***	***NMOC***			

Controlled Emissions of Methane, NMOC and Speciated Emissions

$CM_P = UM_P * (1 - n_{col}) + UM_P * n_{col} * (1 - n_{cnt})$ — Eqn 5

CM_P =		Controlled mass emissions of pollutant P (kg/yr)
UM_P =		Uncontrolled mass emissions of pollutant P (kg/yr); use Eqn 4
n_{col} =	85.0%	Gas collection system control efficiency; default 75% = 0.75
n_{cnt} =		Emission control device control efficiency

CM_P = *Calculated values given in NMOC & TAPS emissions table*

Controlled Emissions of Carbon Dioxide and Sulfur Dioxide

Carbon Dioxide Emissions

$CM_{CO2} = UM_{CO2} + UM_{CH4} * n_{col} * 2.75$ Eqn 6

CM_{CO2} =		Controlled mass emissions of carbon dioxide (kg/yr)
UM_{CO2} =	3.131E+07	Uncontrolled mass emissions of carbon dioxide (kg/yr); Design Maximum value
$UM_{CH4\ Max}$ =	1.141E+07	Uncontrolled mass emissions of methane (kg/yr); Design maximum value
n_{col} =	85.0%	Gas collection system control efficiency

CM_{CO2} = 57,989,932 kg/yr CO_2 = 14,563.68 lb/hr NMOC Combined Flares

63,905 Tons/yr CO_2

If site-specific total reduced sulfur compound data is available --

Eqn 7

$CM_{SO2} = UM_S * n_{col} * 2.0$

CM_{SO2} =		Controlled mass emissions of sulfur dioxide (kg/yr)
UM_S =		Uncontrolled mass emissions of reduced sulfur compounds (kg/yr); use Eqn 3 & 4
n_{col} =	85%	Gas collection system control efficiency

<u>Sulfur Dioxide Emissions</u>

If site-specific total reduced sulfur compound data is not available --

$C_S = \text{Sigma} (C_P * S_P)$ Eqn 8

C_S =	46.9	Concentration of total reduced sulfur compounds (ppmv as S); default value 46.9 ppmv.
C_P =	NA	Concentration of each reduced sulfur compound (ppmv)
S_P =	NA	No. of moles of S produced from combustion of each reduced sulfur compound
F =	2.0	Multiplication factor; 1.82 for landfill gas at 55% CH_4; 2.0 for landfill gas at 50% CH_4
$Q_{CH4\ Max}$ =	1.711E+07	Methane generation rate at time t (m^3/yr)
MW_S =	32.06	Molecular weight of sulfur (g/gmol)

$Q_S = F * Q_{CH4} * (C_S / 1E+06)$ Eqn 3

Q_S = 1,605 ppmv S, sulfur

$UM_S = Q_S * (MW_S * 1\ atm) / (8.205E-05\ m3\text{-}atm/gmol\text{-}K * 1000\ g/kg * (273 + T)\ K)$ Eqn 4

UM_S = 2,140 Uncontrolled mass emission rate of sulfur (kg/yr)

$CM_{SO2} = UM_S * n_{col} * 2.0$ Eqn 7

CM_{SO2} =		Controlled mass emissions of sulfur dioxide (kg/yr)
UM_S =	2,140	Uncontrolled mass emissions of reduced sulfur compounds (kg/yr); use Eqn 3 & 4
n_{col} =	85%	Gas collection system control efficiency; default 75% = 0.75

CM_{SO2} = 3,639 kg/yr SO_2 Combined Flares

4.0 Tons/yr SO_2 = 0.92 lb/hr SO_2 Existing PTE

Controlled Emissions of Hydrochloric Acid

C_{Cl} = Sigma (C_P * Cl_P) Eqn 9

C_{Cl} =	42.0	Concentration of total chloride (ppmv as Cl^-); default value 42.0 ppmv.
C_P =	NA	Concentration of each chlorinated compound (ppmv)
Cl_P =	NA	No. of moles of Cl^- produced from combustion of each reduced sulfur compound
F =	2.0	Multiplication factor; 1.82 for landfill gas at 55% CH_4; 2.0 for landfill gas at 50% CH_4
$Q_{CH4\ Max}$ =	1.711E+07	Methane generation rate at time t (m^3/yr)
MW_{Cl} =	35.453	Molecular weight of chloride, Cl^- (g/gmol)

Q_{Cl} = F * Q_{CH4} * (C_{Cl} / 1E+06) Eqn 3

Q_{Cl} = 1,437 ppmv Chloride, Cl^-

UM_S = Q_S * (MW_S * 1 atm) / (8.205E-05 m3-atm/gmol-K * 1000 g/kg * (273 + T) K) Eqn 4

UM_{Cl} = 2,120 Uncontrolled mass emission rate of chlorine, Cl^- (kg/yr)

CM_{HCl} = UM_{Cl} * n_{col} * 1.03 * n_{cnt} Eqn 10

CM_{HCl} =		Controlled mass emissions of HCl (kg/yr)
UM_{Cl} =	2,120	Uncontrolled mass emissions of chlorinated compounds (kg/yr); use Eqn 3 & 4
n_{col} =	85%	Gas collection system control efficiency; default 75% = 0.75
n_{cnt} =	99%	Emission control device control efficiency (for flare, halogenated species, high-end of range)

CM_{HCl} = ***1,837** kg/yr HCl* Combined Flares
***2.0** Tons/yr HCl* = ***0.46** lb/hr HCL*

Uncontrolled Emissions of Nitrogen Oxides (NOx) and Carbon Monoxide

Manufacturer Specifications

CM_{NOx} =	0.06	lb/MMBTU @1,600°F
	0.08	lb/MMBTU @1,800°F
CM_{CO} =	0.02	lb/MMBTU @1,600°F
	0.015	lb/MMBTU @1,800°F
Qr_{max} =	65,520,000	Maximum flare heat release (BTU/hr); based on design specifications
LHV =	546	Landfill gas lower heating value (BTU/SCF), based on design specifications
$Q_{CH4\ Max}$ =	1.71E+07	m^3/yr
	6.04E+08	ft3/yr 1.15E+03
Q_{rTotal} =	37,657,620	Total flare heat release (BTU/hr)

Scenario 3 2299 Flow

CM_{NOx} =	*2.26*	*lb/hr @1,600°F*	*9.90*	*tons/yr*	Flare 1
	3.01	*lb/hr @1,800°F*	*13.20*	*tons/yr*	Flare 1
CM_{CO} =	*0.75*	*lb/hr @1,600°F*	*3.30*	*tons/yr*	Flare 1
	0.56	*lb/hr @1,800°F*	*2.47*	*tons/yr*	Flare 1

Flares SO2 Uncontrolled
H2S Conversion from lb/hr H2S to lb/hr SO2 Uncontrolled

4,699 scfm total flow with 2,400 scfm to HHE engines and 2,299 scfm to Flare 1 at 1,500 ppm H2S

Based on IDEQ calculated results

SO2 Total Flares (facility wide modeling)
34.95 lb/hr SO2 Combined Flares
34.95 lb/hr SO2 Flare 1 Uncontrolled
0.00 lb/hr SO2 Flare 2 Uncontrolled

153.08 Ton/yr SO2 Combined Flares
153.08 Ton/yr SO2 Flare 1 Uncontrolled
0.00 Ton/yr SO2 Flare 2 Uncontrolled

CM_{SO2} =	*34.95*	*lb/hr*	SO_2
	153.1	*Tons/yr*	SO_2

Max Flow Rate	2299
Max Flow to Flare 1	2299
Max Flow to Flare 2	0

Based on a IDEQ mass balance equation. Refer to Appendix L. Note: Scenario 3 is worst case with 2,299 scfm to Flare 1

Landfill Emissions Calculations - NMOC & TAP Emissions (Controlled H_2S)

Flares

Note: Values already corrected for air infiltration
Uncontrolled Pollutant Concentrations (AP-42 Table 2.4-1, 11/98)
For calculation purposes, emissions in this worksheet based on a LFG flow rate of 4,699 scfm.

Year: 2011
$Q_{CH4\,Max}$ = $3.497E+07$ m^3/yr — Design maximum for all pollutants except H2S and S02 (Existing Permit Conditions)
Collection system efficiency: 85.0%
Landfill Temp: 20 C

Note: As methane concentration goes down, the calculated pollutant emissions go down, so assuming 50% methane concentration is a conservative value for this calculation (actual methane concentration is normally between 40 and 45-percent)

Pollutant	CAS No.	MW	Concentration in Landfill Gas	Landfill Uncontrolled Emission Rates - No Flare				Flare Emissions (Emissions After Collection and Control)			IDAPA 58.01.01.585/586 Standards			Flare - Controlled	Flare Control Efficiency		
				Volume	Mass - Annual		Mass - Hourly				EL	AAC	AACC			Gas Turbine	IC Engine
		(g/gmol)	(ppmv)	(m^3/yr)	(kg/yr)	(lb/yr)	(lb/hr)	(kg/yr)	(lb/yr)	(lb/hr)	(lb/hr)	(mg/m^3)	(ug/m^3)				
1,1,1-Trichloroethane	71-55-6	133.41	0.48	3.36E+01	1.86E+02	4.11E+02	4.69E-02	3.17E+00	6.98E+00	7.97E-04	127	95.5		Below	98.0%	99.7%	93.0%
1,1,2,2-Tetrachloroethane	79-34-5	167.85	1.11	7.76E+01	5.42E+02	1.20E+03	1.36E-01	9.22E+00	2.03E+01	2.32E-03	1.10E-05		1.70E-02	Exceeds	98.0%	99.7%	93.0%
1,1,2-Trichloroethane	79-00-5	133.41	0.10	6.99E+00	3.88E+01	8.56E+01	9.77E-03	6.60E-01	1.45E+00	1.66E-04	*4.20E-04*	NA	NA	Below	98.0%		
1,1-Dichloroethane (ethylidene dichloride)	75-34-3	98.97	2.35	1.64E+02	6.77E+02	1.49E+03	1.70E-01	1.15E+01	2.54E+01	2.90E-03	2.50E-04		3.80E-02	Exceeds	98.0%	99.7%	93.0%
1,1-Dichloroethene (vinylidene chloride)	75-35-4	96.94	0.2	1.40E+01	5.64E+01	1.24E+02	1.42E-02	9.59E-01	2.11E+00	2.41E-04	1.30E-04		2.00E-02	Exceeds	98.0%	99.7%	93.0%
1,2-Dichloroethane (ethylene dichloride)	107-06-2	98.96	0.41	2.87E+01	1.18E+02	2.60E+02	2.97E-02	2.01E+00	4.42E+00	5.05E-04	2.50E-04		3.80E-02	Exceeds	98.0%	99.7%	93.0%
1,2-Dichloropropane (propylene dichloride)	78-87-5	112.99	0.18	1.26E+01	5.92E+01	1.30E+02	1.49E-02	1.01E+00	2.22E+00	2.53E-04	23.133	17.35		Below	98.0%	99.7%	93.0%
2-Propanol (isopropyl alcohol)	67-63-0	60.11	50.1	3.50E+03	8.76E+03	1.93E+04	2.21E+00	2.23E+01	4.93E+01	5.62E-03	6.53E+01	49		Below	99.7%	98.2%	86.1%
Acetone	67-64-1	58.08	7.01	4.90E+02	1.18E+03	2.61E+03	2.98E-01	3.02E+00	6.66E+00	7.60E-04	119	89		Below	99.7%	98.2%	86.1%
Acrylonitrile	107-13-1	53.06	6.33	4.43E+02	9.77E+02	2.15E+03	2.46E-01	2.49E+00	5.49E+00	6.27E-04	9.80E-05		1.50E-02	Exceeds	99.7%	98.2%	86.1%
Bromodichloromethane	75-27-4	163.83	3.13	2.19E+02	1.49E+03	3.29E+03	3.75E-01	2.54E+01	5.59E+01	6.38E-03	NA	NA	NA		98.0%	99.7%	93.0%
Butane	106-97-8	58.12	5.03	3.52E+02	8.51E+02	1.88E+03	2.14E-01	2.17E+00	4.78E+00	5.46E-04	NA	NA	NA		99.7%	98.2%	86.1%
Carbon disulfide	75-15-0	76.13	0.58	4.06E+01	1.28E+02	2.83E+02	3.23E-02	3.28E-01	7.22E-01	8.24E-05	2	1.5		Below	99.7%	98.2%	86.1%
Carbon tetrachloride	56-23-5	153.84	0.004	2.80E-01	1.79E+00	3.95E+00	4.51E-04	3.04E-02	6.71E-02	7.66E-06	4.40E-04		6.70E-02	Below	98.0%	99.7%	93.0%
Carbonyl sulfide	463-58-1	60.07	0.49	3.43E+01	8.56E+01	1.89E+02	2.16E-02	5.82E-01	1.28E+00	1.47E-04	0.027	0.02		Below	99.2%	94.4%	97.2%
Chlorobenzene	108-90-7	112.56	0.25	1.75E+01	8.19E+01	1.80E+02	2.06E-02	1.39E+00	3.07E+00	3.50E-04	23.3	17.5		Below	98.0%	99.7%	93.0%
Chlorodifluoromethane	75-45-6	86.47	1.3	9.09E+01	3.27E+02	7.21E+02	8.23E-02	5.56E+00	1.23E+01	1.40E-03	NA	NA	NA		98.0%	99.7%	93.0%
Chloroethane (ethyl chloride)	75-00-3	64.52	1.25	8.74E+01	2.35E+02	5.17E+02	5.91E-02	3.99E+00	8.79E+00	1.00E-03	176	132		Below	98.0%	99.7%	93.0%
Chloroform	67-66-3	119.39	0.03	2.10E+00	1.04E+01	2.30E+01	2.62E-03	1.77E-01	3.91E-01	4.46E-05	2.80E-04		4.30E-02	Below	98.0%	99.7%	93.0%
Chloromethane (methylchloride)	74-87-3	50.49	1.21	8.46E+01	1.78E+02	3.92E+02	4.47E-02	3.02E+00	6.66E+00	7.60E-04	NA	NA	NA		98.0%	99.7%	93.0%
Dichlorobenzene	95-50-1	147	0.21	1.47E+01	8.98E+01	1.98E+02	2.26E-02	1.53E+00	3.37E+00	3.84E-04	20	15		Below	98.0%	99.7%	93.0%
Dichlorodifluoromethane	75-71-8	120.91	15.7	1.10E+03	5.52E+03	1.22E+04	1.39E+00	9.39E+01	2.07E+02	2.36E-02	NA	NA	NA		98.0%	99.7%	93.0%
Dichlorofluoromethane	75-43-4	102.92	2.62	1.83E+02	7.85E+02	1.73E+03	1.97E-01	1.33E+01	2.94E+01	3.36E-03	2.67	2		Below	98.0%	99.7%	93.0%
Dichloromethane (methylene chloride)	75-09-2	84.94	14.3	1.00E+03	3.53E+03	7.79E+03	8.89E-01	6.01E+01	1.32E+02	1.51E-02	1.60E-03		2.40E-01	Exceeds	98.0%	99.7%	93.0%
Dimethyl sulfide (methyl sulfide)	75-18-3	62.13	7.82	5.47E+02	1.41E+03	3.12E+03	3.56E-01	9.61E+00	2.12E+01	2.42E-03	NA	NA	NA		99.2%	94.4%	97.2%
Ethane	74-84-0	30.07	889	6.22E+04	7.78E+04	1.71E+05	1.96E+01	1.98E+02	4.37E+02	4.99E-02	NA	NA	NA		99.7%	98.2%	86.1%
Ethanol	64-17-5	46.08	27.2	1.90E+03	3.65E+03	8.04E+03	9.18E-01	9.30E+00	2.05E+01	2.34E-03	125	94		Below	99.7%	98.2%	86.1%
Ethyl mercaptan (ethanethiol)	75-08-1	62.13	2.28	1.59E+02	4.12E+02	9.09E+02	1.04E-01	1.05E+00	2.32E+00	2.64E-04	0.067	0.05		Below	99.7%	98.2%	86.1%
Ethylbenzene	100-41-4	106.16	4.61	3.22E+02	1.42E+03	3.14E+03	3.58E-01	3.63E+00	8.00E+00	9.14E-04	29	21.75		Below	99.7%	98.2%	86.1%
Ethylene dibromide	106-93-4	187.88	0.001	6.99E-02	5.47E-01	1.21E+00	1.38E-04	9.29E-03	2.05E-02	2.34E-06	3.00E-05		4.50E-03	Below	98.0%	99.7%	93.0%
Fluorotrichloromethane	75-69-4	137.38	0.76	5.32E+01	3.04E+02	6.70E+02	7.65E-02	5.16E+00	1.14E+01	1.30E-03	NA	NA	NA		98.0%	99.7%	93.0%
Hexane	110-54-3	86.18	6.57	4.60E+02	1.65E+03	3.63E+03	4.15E-01	4.20E+00	9.26E+00	1.06E-03	12	9		Below	99.7%	98.2%	86.1%

Hydrogen sulfide (Controlled)	7783-06-4	34.08	600	4.20E+04	5.95E+04	1.31E+05	1.50E+01	4.05E+02	1.05E+03	1.20E-01	0.933	0.7		Below	99.2%	94.4%	97.2%
Mercury (total)	7439-97-6	200.61	0.000292	2.04E-02	1.70E-01	3.76E-01	4.29E-05	1.45E-01	3.19E-01	3.65E-05	0.007	0.005		Below	0.0%	0.0%	0.0%
Methyl ethyl ketone (MEK)	78-93-3	72.11	7.09	4.96E+02	1.49E+03	3.28E+03	3.74E-01	3.79E+00	8.36E+00	9.55E-04	39.3	29.5		Below	99.7%	98.2%	86.1%
Methyl isobutyl ketone (MIBK)	108-10-1	100.16	1.87	1.31E+02	5.45E+02	1.20E+03	1.37E-01	1.39E+00	3.06E+00	3.50E-04	13.7	10.25		Below	99.7%	98.2%	86.1%
Methyl mercaptan	74-93-1	48.11	2.49	1.74E+02	3.49E+02	7.68E+02	8.77E-02	8.89E-01	1.96E+00	2.24E-04	0.033	0.025		Below	99.7%	98.2%	86.1%
Pentane	109-66-0	72.15	3.29	2.30E+02	6.91E+02	1.52E+03	1.74E-01	1.76E+00	3.88E+00	4.43E-04	118	88.5		Below	99.7%	98.2%	86.1%
Perchloroethylene (tetrachloroethylene)	127-18-4	165.83	3.73	2.61E+02	1.80E+03	3.97E+03	4.53E-01	3.06E+01	6.74E+01	7.70E-03	1.30E-02		2.10E+00	Below	98.0%	99.7%	93.0%
Propane	74-98-6	44.09	11.1	7.76E+02	1.42E+03	3.14E+03	3.58E-01	3.63E+00	8.00E+00	9.14E-04	NA	NA	NA		99.7%	98.2%	86.1%
trans-1,2-Dichloroethene	540-59-0	96.94	2.84	1.99E+02	8.01E+02	1.77E+03	2.02E-01	1.36E+01	3.00E+01	3.43E-03	52.7	39.5		Below	98.0%	99.7%	93.0%
Trichoroethylene	79-01-6	131.4	2.82	1.97E+02	1.08E+03	2.38E+03	2.71E-01	1.83E+01	4.04E+01	4.61E-03	17.93	13.45		Below	98.0%	99.7%	93.0%
Vinyl chloride	75-01-4	62.5	7.34	5.13E+02	1.33E+03	2.94E+03	3.36E-01	2.27E+01	5.00E+01	5.71E-03	9.40E-04		1.40E-01	Exceeds	98.0%	99.7%	93.0%
Xylenes	1330-20-7	106.16	12.1	8.46E+02	3.74E+03	8.24E+03	9.41E-01	9.53E+00	2.10E+01	2.40E-03	29	21.75		Below	99.7%	98.2%	86.1%

Codisposal Pollutant Concentrations (AP-42 Table 2.4-2, 11/98)

				Uncontrolled		Uncontrolled		Flare	Flare		IDAPA 58.01.01.585/586 Standards			Total - Controlled			
Pollutant	CAS No.	MW (g/gmol)	Concentration (ppmv)	Volume Emission Rate Uncontrolled (m^3/yr)	Mass Emission Rate - Uncontrolled (kg/yr)	Mass Emission Rate - Annual (lb/yr)	Mass Emission Rate - Hourly Avg (lb/hr)	Mass Emission Rate - Controlled (kg/yr)	Mass Emission Rate - Controlled (lb/yr)	Mass Emission Rate - Hourly Avg (lb/hr)	EL (lb/hr)	AAC (mg/m^3)	AACC (ug/m^3)	Exceeds EL?	Flare	Gas Turbine	IC Engine
Benzene																	
Co-disposal	71-43-2	78.11	11.1	7.76E+02	2.52E+03	5.56E+03	6.35E-01	6.43E+00	1.42E+01	1.62E-03	8.00E-04		1.20E-01	Exceeds	99.7%	98.2%	86.1%
No or unknown co-disposal	71-43-2	78.11	1.91	1.34E+02	4.34E+02	9.57E+02	1.09E-01	1.11E+00	2.44E+00	2.79E-04	8.00E-04		1.20E-01	Below	99.7%	98.2%	86.1%
NMOC (as hexane)																	
Co-disposal		86.18	2,420	1.69E+05	6.07E+05	1.34E+06	1.53E+02	4.13E+03	9.10E+03	1.04E+00	NA	NA	NA		99.2%	94.4%	97.2%
No or unknown co-disposal		86.18	595	4.16E+04	1.49E+05	3.29E+05	3.75E+01	1.01E+03	2.24E+03	2.55E-01	NA	NA	NA		99.2%	94.4%	97.2%
Regulatory default		86.18	4,000	2.80E+05	1.00E+06	2.21E+06	2.52E+02	6.82E+03	1.50E+04	1.72E+00	NA	NA	NA		99.2%	94.4%	97.2%
Site-Specific Value		86.18	172.5	1.21E+04	4.33E+04	9.54E+04	1.09E+01	3.68E+04	8.11E+04	9.25E+00	NA	NA	NA				
Toluene																	
Co-disposal	108-88-3	92.13	165	1.15E+04	4.42E+04	9.75E+04	1.11E+01	1.13E+02	2.49E+02	2.84E-02	25	18.75		Below	99.7%	98.2%	86.1%
No or unknown co-disposal	108-88-3	92.13	39.3	2.75E+03	1.05E+04	2.32E+04	2.65E+00	2.69E+01	5.92E+01	6.76E-03	25	18.75		Below	99.7%	98.2%	86.1%

Notes:

1. 1,1,2-Trichloroethane emissions calculated by LANDGEM but not in AP-42 listing (Table 2.4-1, 11/98)
2. Carbon monoxide emissions from flare: 12,000kg/10^6 dscm CH_4

Flares SO2 Controlled
H2S Conversion from lb/hr H2S to lb/hr SO2 Controlled

2,299 scfm total Flow to the Flares at 600 PPM H2S

Based on H2S Scrubber Treatment Controlled calculated results

SO2 Total Flares (facility wide modeling)	
13.98	lb/hr SO2 Combined Flares
13.98	lb/hr SO2 Flare 1 Controlled
0.00	lb/hr SO2 Flare 2 Controlled

61.23	Ton/yr SO2 Combined Flares
61.23	Ton/yr SO2 Flare 1 Controlled
0.00	Ton/yr SO2 Flare 2 Controlled

CM_{SO2} =	*13.98*	*lb/hr*	*SO_2*
	61.2	*Tons/yr*	*SO_2*

Max Flow Rate	4699
Max Flow to Flare 1	2299
Max Flow to Flare 2	0

Based on a IDEQ mass balance equation. Refer to Appendix L. Note Scenario 3 is worst case with 2,299 scfm to Flare 1.

Note: Emissions from the flares are based on a total flow passing through the flares of 2299 scfm LFG since the four LFG engines engines will take up to 2400 scfm LFG

Landfill Emissions Calculations

Based on a Landfill Gas Flow Rate of 2,299 scfm Going to Flare 1 Only (2,400 scfm LFG going to HHE Engines)

		Flare - Controlled		Flare1 - Controlled		Flare 2- Controlled		IDAPA 585/586 EL	
HAP/VOC		(Tons/yr)	(lb/hr)	(Tons/yr)	(lb/hr)	(Tons/yr)	(lb/hr)	(lb/hr)	Exceeds?
HAP	1,1,1-Trichloroethane	1.71E-03	3.90E-04	1.71E-03	3.90E-04	0.00E+00	0.00E+00	1.27E+02	Below
HAP/VOC	1,1,2,2-Tetrachloroethane	4.97E-03	1.13E-03	4.97E-03	1.13E-03	0.00E+00	0.00E+00	1.10E-05	Exceeds
HAP/VOC	1,1,2-Trichloroethane	3.56E-04	8.12E-05	3.56E-04	8.12E-05	0.00E+00	0.00E+00	4.20E-04	Below
HAP/VOC	1,1-Dichloroethane (ethylidene dichloride)	6.20E-03	1.42E-03	6.20E-03	1.42E-03	0.00E+00	0.00E+00	2.50E-04	Exceeds
HAP/VOC	1,1-Dichloroethene (vinylidene chloride)	5.17E-04	1.18E-04	5.17E-04	1.18E-04	0.00E+00	0.00E+00	1.30E-04	Below
HAP/VOC	1,2-Dichloroethane (ethylene dichloride)	1.08E-03	2.47E-04	1.08E-03	2.47E-04	0.00E+00	0.00E+00	2.50E-04	Below
HAP/VOC	1,2-Dichloropropane (propylene dichloride)	5.43E-04	1.24E-04	5.43E-04	1.24E-04	0.00E+00	0.00E+00	2.31E+01	Below
VOC	2-Propanol (isopropyl alcohol)	1.20E-02	2.75E-03	1.20E-02	2.75E-03	0.00E+00	0.00E+00	6.53E+01	Below
*	Acetone	1.63E-03	3.72E-04	1.63E-03	3.72E-04	0.00E+00	0.00E+00	1.19E+02	Below
HAP/VOC	Acrylonitrile	1.34E-03	3.07E-04	1.34E-03	3.07E-04	0.00E+00	0.00E+00	9.80E-05	Exceeds
VOC	Bromodichloromethane	1.37E-02	3.12E-03	1.37E-02	3.12E-03	0.00E+00	0.00E+00	NA	
VOC	Butane	1.17E-03	2.67E-04	1.17E-03	2.67E-04	0.00E+00	0.00E+00	NA	
HAP/VOC	Carbon disulfide	1.77E-04	4.03E-05	1.77E-04	4.03E-05	0.00E+00	0.00E+00	2.00E+00	Below
HAP/VOC	Carbon tetrachloride	1.64E-05	3.75E-06	1.64E-05	3.75E-06	0.00E+00	0.00E+00	4.40E-04	Below
HAP/VOC	Carbonyl sulfide	3.14E-[illegible]	7.17E-05	3.14E-04	7.17E-05	0.00E+00	0.00E+00	2.70E-02	Below
HAP/VOC	Chlorobenzene	7.51E-[illegible]	1.71E-04	7.51E-04	1.71E-04	0.00E+00	0.00E+00	2.33E+01	Below
VOC	Chlorodifluoromethane	3.00E-03	6.85E-04	3.00E-03	6.85E-04	0.00E+00	0.00E+00	NA	
HAP/VOC	Chloroethane (ethyl chloride)	2.15E-03	4.91E-04	2.15E-03	4.91E-04	0.00E+00	0.00E+00	1.76E+02	Below
HAP/VOC	Chloroform	9.55E-05	2.18E-05	9.55E-05	2.18E-05	0.00E+00	0.00E+00	2.80E-04	Below
HAP/VOC	Chloromethane (methylchloride)	1.63E-03	3.72E-04	1.63E-03	3.72E-04	0.00E+00	0.00E+00	NA	
HAP/VOC	Dichlorobenzene	8.23E-04	1.88E-04	8.23E-04	1.88E-04	0.00E+00	0.00E+00	2.00E+01	Below
VOC	Dichlorodifluoromethane	5.06E-02	1.16E-02	5.06E-02	1.16E-02	0.00E+00	0.00E+00	NA	
VOC	Dichlorofluoromethane	7.19E-03	1.64E-03	7.19E-03	1.64E-03	0.00E+00	0.00E+00	2.67E+00	Below
HAP	Dichloromethane (methylene chloride)	3.24E-02	7.40E-03	3.24E-02	7.40E-03	0.00E+00	0.00E+00	1.60E-03	Exceeds
VOC	Dimethyl sulfide (methyl sulfide)	5.18E-03	1.18E-03	5.18E-03	1.18E-03	0.00E+00	0.00E+00	NA	
VOC	Ethane	1.07E-01	2.44E-02	1.07E-01	2.44E-02	0.00E+00	0.00E+00	NA	
VOC	Ethanol	5.02E-03	1.14E-03	5.02E-03	1.14E-03	0.00E+00	0.00E+00	1.25E+02	Below
VOC	Ethyl mercaptan (ethanethiol)	5.67E-04	1.29E-04	5.67E-04	1.29E-04	0.00E+00	0.00E+00	6.70E-02	Below
HAP/VOC	Ethylbenzene	1.96E-03	4.47E-04	1.96E-03	4.47E-04	0.00E+00	0.00E+00	2.90E+01	Below
HAP/VOC	Ethylene dibromide	5.01E-06	1.14E-06	5.01E-06	1.14E-06	0.00E+00	0.00E+00	3.00E-05	Below
VOC	Fluorotrichloromethane	2.79E-03	6.36E-04	2.79E-03	6.36E-04	0.00E+00	0.00E+00	NA	
HAP/VOC	Hexane	2.27E-03	5.17E-04	2.27E-03	5.17E-04	0.00E+00	0.00E+00	1.20E+01	Below
*	Hydrogen sulfide	2.57E-01	5.86E-02	2.57E-01	5.86E-02	0.00E+00	0.00E+00	9.33E-01	Below
HAP	Mercury (total)	7.81E-05	1.78E-05	7.81E-05	1.78E-05	0.00E+00	0.00E+00	7.00E-03	Below
HAP/VOC	Methyl ethyl ketone (MEK)	2.05E-03	4.67E-04	2.05E-03	4.67E-04	0.00E+00	0.00E+00	3.93E+01	Below
HAP/VOC	Methyl isobutyl ketone (MIBK)	7.49E-04	1.71E-04	7.49E-04	1.71E-04	0.00E+00	0.00E+00	1.37E+01	Below
VOC	Methyl mercaptan	4.79E-04	1.09E-04	4.79E-04	1.09E-04	0.00E+00	0.00E+00	3.30E-02	Below
VOC	Pentane	9.50E-04	2.17E-04	9.50E-04	2.17E-04	0.00E+00	0.00E+00	1.18E+02	Below
HAP/VOC	Perchloroethylene (tetrachloroethylene)	1.65E-02	3.77E-03	1.65E-02	3.77E-03	0.00E+00	0.00E+00	1.30E-02	Below
VOC	Propane	1.96E-03	4.47E-04	1.96E-03	4.47E-04	0.00E+00	0.00E+00	NA	
*	trans-1,2-Dichloroethene	7.34E-03	1.68E-03	7.34E-03	1.68E-03	0.00E+00	0.00E+00	5.27E+01	Below
HAP/VOC	Trichoroethylene	9.88E-03	2.26E-03	9.88E-03	2.26E-03	0.00E+00	0.00E+00	1.79E+01	Below
HAP/VOC	Vinyl chloride	1.22E-02	2.79E-03	1.22E-02	2.79E-03	0.00E+00	0.00E+00	9.40E-04	Exceeds
HAP/VOC	Xylenes	5.14E-03	1.17E-03	5.14E-03	1.17E-03	0.00E+00	0.00E+00	2.90E+01	Below
HAP/VOC	Benzene								
	Co-disposal	3.47E-03	7.92E-04	3.47E-03	7.92E-04	0.00E+00	0.00E+00	8.00E-04	Below
	No or unknown co-disposal	5.97E-[illegible]	1.36E-04	5.97E-04	1.36E-04	0.00E+00	0.00E+00	8.00E-04	Below
VOC	NMOC (as hexane)								
	Co-disposal	2.23E+00	5.08E-01	2.23E+00	5.08E-01	0.00E+00	0.00E+00	NA	
	No or unknown co-disposal	5.47E-01	1.25E-01	5.47E-01	1.25E-01	0.00E+00	0.00E+00	NA	
	Regulatory default	3.68E+00	8.40E-01	3.68E+00	8.40E-01	0.00E+00	0.00E+00	NA	
	Site-Specific Value	1.98E+01	4.53E+00	1.98E+01	4.53E+00	0.00E+00	0.00E+00	NA	NA
HAP/VOC	Toluene								
	Co-disposal	6.08E-02	1.39E-02	6.08E-02	1.39E-02	0.00E+00	0.00E+00	2.50E+01	Below
	No or unknown co-disposal	1.45E-02	3.31E-03	1.45E-02	3.31E-03	0.00E+00	0.00E+00	2.50E+01	Below
	Total TAPS	0.411	0.094	4.11E-01	9.39E-02	0.00E+00	0.00E+00		
	Total HAPS	0.3453	0.079	3.45E-01	7.88E-02	0.00E+00	0.00E+00		
	Total VOCS	20.13	4.59	2.01E+01	4.59E+00	0.00E+00	0.00E+00		

	Flare 1		Flare 2	
	Tons/yr	lb/hr	Tons/yr	lb/hr
Total TAPS	0.41	0.09	0.00	0.00
Total HAPS	0.35	0.08	0.00	0.00
Total VOCS	20.13	4.59	0.00	0.00

Notes:

* Not classified as either HAP or VOC

1. 1,1,2-Trichloroethane emissions calculated by LANDGEM but not in AP-42 listing (Table 2.4-1, 11/98)
2. Lead emissions are not calculated by LANDGEM nor is it listed in EPA AP-42 Section 2.4 Municipal Solid Waste Landfills as a landfill gas constituent. Therefore, we assume that the emissions are zero for this pollutant.

100% LFG to ACLF Flares GHG Emission (3350 cfm GHG Flow)		
Maximum Operating Hours	8760	
Fuel Usage (cfm)	3350	Permit limit
Fuel Usage (scf/hr)	201000	
Fuel Usage (scf/yr)	1760760000	

Green House Gases	EF (Biogas) kg/MMBtu	HHV	Reference	Input (scf/yr)	Emission Rate[1,2,3] (metric ton/yr)	(ton/year)
CO_2	52.07	8.41E-04	40 CFR 98 Subpart C Equation C-1	1,760,760,000	77,105.21	84,993.08
N_2O	6.3E-04	8.41E-04	40 CFR 98 Subpart C Equation C-8	1,760,760,000	9.33E-01	1.03E+00
CH_4	3.2E-03	8.41E-04	40 CFR 98 Subpart C Equation C-8	1,760,760,000	4.74E+00	5.22E+00
CO2e			40 CFR 98 Part A		396.47	437.03

[1]Eqn C-1: $CO_2 = 1 \times 10^{-3} \times \text{Fuel} \times \text{HHV} \times \text{EF}$

Fuel = Volume of fuel combusted per year, (scf/Year)

EF = Fuel-specific default CO_2 emission factor for natural gas, from Table C-1 of 40 CFR Part 98 Subpart C (kg CO_2/MMBTU)

HHV = Default high heat value of the fuel, from Table C-1 of 40 CFR Part 98 Subpart C (MMBTU/SCF)

1×10^{-3} = Conversion Factor from Kilograms to Metric Tons

[2]Eqn C-8: CH_4 or $N_2O = 1 \times 10^{-3} \times \text{Fuel} \times \text{HHV} \times \text{EF}$

Fuel = Volume of fuel combusted per year, (scf/Year)

EF = Fuel-specific default CH_4 or N_2O emission factor for natural gas, from Table C-2 of 40 CFR Part 98 Subpart C (kg CH_4 or N_2O/MMBTU)

HHV = Default high heat value of the fuel, from Table C-1 of 40 CFR Part 98 Subpart C (MMBTU/SCF)

1×10^{-3} = Conversion Factor from Kilograms to Metric Tons

[3]CO_2e = (GWP CO_2 x CO_2 metric ton/yr) + (GWP CH4 x CH4 metric ton/yr) + (GWP N_2O x N_2O metric ton/yr)

Global Warming Potential (GWP) for Selected GHG - 40 CFR 98 Subpart A, Table A-1

GWP CO_2 =	1.00
GWP CH_4 =	25.00
GWP N_2O =	298.00

1200 cfm LFG to Engines, 2150 cfm LFG to Flare (3,350 cfm LFG Total)						
Engines				**Flares**		
Maximum Operating Hours	8430			Maximum Operating Hours	8760	
Fuel Usage (cfm)	1200 Permit limit			Fuel Usage (cfm)	2150	
Fuel Usage (scf/hr)	72000			Fuel Usage (scf/hr)	129000	
Fuel Usage (scf/yr)	606960000			Fuel Usage (scf/yr)	1130040000	
Engines Green House Gases	**EF (Biogas) kg/MMBtu**	**HHV**	**Reference**	**Input (scf/yr)**	**Emission Rate[1,2,3] (metric ton/yr)**	**(ton/year)**
CO_2	52.07	8.41E-04	40 CFR 98 Subpart C Equation C-1	606,960,000	26,579.31	29,298.37
N_2O	6.3E-04	8.41E-04	40 CFR 98 Subpart C Equation C-8	606,960,000	3.22E-01	3.54E-01
CH_4	3.2E-03	8.41E-04	40 CFR 98 Subpart C Equation C-8	606,960,000	1.63	1.80
CO2e			40 CFR 98 Part A		136.67	150.65
Flares Green House Gases	**EF (Biogas) kg/MMBtu**	**HHV**	**Reference**	**Input (scf/yr)**	**Emission Rate[1,2,3] (metric ton/yr)**	**(ton/year)**
CO_2	52.07	8.41E-04	40 CFR 98 Subpart C Equation C-1	1,130,040,000	49,485.43	54,547.79
N_2O	6.3E-04	8.41E-04	40 CFR 98 Subpart C Equation C-8	1,130,040,000	5.99E-01	6.60E-01
CH_4	3.2E-03	8.41E-04	40 CFR 98 Subpart C Equation C-8	1,130,040,000	3.04	3.35
CO2e			40 CFR 98 Part A		254.45	280.48
Total for Combined Sources					**391.12**	**431.13**
Total for 100% Going to Flares					**396.47**	**437.03**

[1]Eqn C-1: $CO_2 = 1 \times 10^{-3} \times \text{Fuel} \times \text{HHV} \times \text{EF}$

Fuel = Volume of fuel combusted per year, (scf/Year)

EF = Fuel-specific default CO_2 emission factor for natural gas, from Table C-1 of 40 CFR Part 98 Subpart C (kg CO_2/MMBTU)

HHV = Default high heat value of the fuel, from Table C-1 of 40 CFR Part 98 Subpart C (MMBTU/SCF)

1×10^{-3} = Conversion Factor from Kilograms to Metric Tons

[2]Eqn C-8: CH_4 or $N_2O = 1 \times 10^{-3} \times \text{Fuel} \times \text{HHV} \times \text{EF}$

Fuel = Volume of fuel combusted per year, (scf/Year)

EF = Fuel-specific default CH_4 or N_2O emission factor for natural gas, from Table C-2 of 40 CFR Part 98 Subpart C (kg CH_4 or N_2O/MMBTU)

HHV = Default high heat value of the fuel, from Table C-1 of 40 CFR Part 98 Subpart C (MMBTU/SCF)

1×10^{-3} = Conversion Factor from Kilograms to Metric Tons

[3]CO_2e = (GWP CO_2 x CO_2 metric ton/yr) + (GWP CH4 x CH4 metric ton/yr) + (GWP N_2O x N_2O metric ton/yr)

Global Warming Potential (GWP) for Selected GHG - 40 CFR 98 Subpart A, Table A-1

GWP CO_2 = 1.00

GWP CH_4 = 25.00

GWP N_2O = 298.00

2400 cfm LFG to Engines, 2299 cfm LFG to Flare 1						
Engines				**Flares**		
Maximum Operating Hours	8430			Maximum Operating Hours	8760	
Fuel Usage (cfm)	2400 Permit limit			Fuel Usage (cfm)	2299	
Fuel Usage (scf/hr)	144000			Fuel Usage (scf/hr)	137940	
Fuel Usage (scf/yr)	1213920000			Fuel Usage (scf/yr)	1208354400	
Engines Green House Gases	**EF (Biogas) kg/MMBtu**	**HHV**	**Reference**	**Input (scf/yr)**	**Emission Rate[1,2,3] (metric ton/yr)**	**(ton/year)**
CO_2	52.07	8.41E-04	40 CFR 98 Subpart C Equation C-1	1,213,920,000	53,158.61	58,596.74
N_2O	6.3E-04	8.41E-04	40 CFR 98 Subpart C Equation C-8	1,213,920,000	6.43E-01	7.09E-01
CH_4	3.2E-03	8.41E-04	40 CFR 98 Subpart C Equation C-8	1,213,920,000	3.27E+00	3.60E+00
CO2e			40 CFR 98 Part A		273.34	301.30
Flares Green House Gases	**EF (Biogas) kg/MMBtu**	**HHV**	**Reference**	**Input (scf/yr)**	**Emission Rate[1,2,3] (metric ton/yr)**	**(ton/year)**
CO_2	52.07	8.41E-04	40 CFR 98 Subpart C Equation C-1	1,208,354,400	52,914.89	58,328.08
N_2O	6.3E-04	8.41E-04	40 CFR 98 Subpart C Equation C-8	1,208,354,400	6.40E-01	7.06E-01
CH_4	3.2E-03	8.41E-04	40 CFR 98 Subpart C Equation C-8	1,208,354,400	3.25E+00	3.58E+00
CO2e			40 CFR 98 Part A		272.08	299.92
Total for Combined Sources					**545.42**	**601.22**
Total for 100% Going to Flares					**396.47**	**437.03**

[1]Eqn C-1: $CO_2 = 1 \times 10^{-3}$ x Fuel x HHV x EF

Fuel = Volume of fuel combusted per year, (scf/Year)

EF = Fuel-specific default CO_2 emission factor for natural gas, from Table C-1 of 40 CFR Part 98 Subpart C (kg CO_2/MMBTU)

HHV = Default high heat value of the fuel, from Table C-1 of 40 CFR Part 98 Subpart C (MMBTU/SCF)

1×10^{-3} = Conversion Factor from Kilograms to Metric Tons

[2]Eqn C-8: CH_4 or $N_2O = 1 \times 10^{-3}$ x Fuel x HHV x EF

Fuel = Volume of fuel combusted per year, (scf/Year)

EF = Fuel-specific default CH_4 or N_2O emission factor for natural gas, from Table C-2 of 40 CFR Part 98 Subpart C (kg CH_4 or N_2O/MMBTU)

HHV = Default high heat value of the fuel, from Table C-1 of 40 CFR Part 98 Subpart C (MMBTU/SCF)

1×10^{-3} = Conversion Factor from Kilograms to Metric Tons

[3]CO_2e = (GWP CO_2 x CO_2 metric ton/yr) + (GWP CH4 x CH4 metric ton/yr) + (GWP N_2O x N_2O metric ton/yr)

Global Warming Potential (GWP) for Selected GHG - 40 CFR 98 Subpart A, Table A-1

GWP CO_2 =	1.00
GWP CH_4 =	25.00
GWP N_2O =	298.00

Old Chipper Generator (700 HP) - Gen 1

Maximum Operating Hours 3300 (Title V permit condition 5.6)
Fuel Usage (gal/hr) 38 (manufacturer specs)
Fuel Usage (gal/yr) 125400

Green House Gases	EF (Diesel) kg/MMBtu	HHV	Reference	Input (gal/yr)	Emission Rate[1,2,3] (metric ton/yr)	(ton/year)
CO_2	73.96	0.138	40 CFR 98 Subpart C Equation C-1 Tier 1	125,400	1,279.89	1,410.83
N_2O	6.0E-04	0.138	40 CFR 98 Subpart C Equation C-8 (Tiers 1 & 3)	125,400	1.04E-02	1.14E-02
CH_4	3.0E-03	0.138	40 CFR 98 Subpart C Equation C-8 (Tiers 1 & 3)	125,400	5.19E-02	5.72E-02
CO2e			40 CFR 98 Part A		1,284.28	1,415.67

New Chipper Generator (990 HP) - Gen 1

Maximum Operating Hours 8760
Fuel Usage (gal/hr) 50.59 (manufacturer specs)
Fuel Usage (gal/yr) 443168.4

Green House Gases	EF (Diesel) kg/MMBtu	HHV	Reference	Input (gal/yr)	Emission Rate[1,2,3] (metric ton/yr)	(ton/year)
CO_2	73.96	0.138	40 CFR 98 Subpart C Equation C-1 Tier 1	443,168	4,523.19	4,985.91
N_2O	6.0E-04	0.138	40 CFR 98 Subpart C Equation C-8 (Tiers 1 & 3)	443,168	3.67E-02	4.04E-02
CH_4	3.0E-03	0.138	40 CFR 98 Subpart C Equation C-8 (Tiers 1 & 3)	443,168	1.83E-01	2.02E-01
CO2e			40 CFR 98 Part A		4,538.71	5,003.02

Old Screen Generator (106 HP) - Gen 2

Maximum Operating Hours 3300 (Title V permit condition 5.6)
Fuel Usage (gal/hr) 6.13 (manufacturer specs)
Fuel Usage (gal/yr) 20238

Green House Gases	EF (Diesel) kg/MMBtu	HHV	Reference	Input (gal/yr)	Emission Rate[1,2,3] (metric ton/yr)	(ton/year)
CO_2	73.96	0.138	40 CFR 98 Subpart C Equation C-1 Tier 1	20,238	206.56	227.69
N_2O	6.0E-04	0.138	40 CFR 98 Subpart C Equation C-8 (Tiers 1 & 3)	20,238	1.68E-03	1.85E-03
CH_4	3.0E-03	0.138	40 CFR 98 Subpart C Equation C-8 (Tiers 1 & 3)	20,238	8.38E-03	9.24E-03
CO2e			40 CFR 98 Part A		207.27	228.48

HHHW Emergency Generator (44 HP) - Gen 3

Maximum Operating Hours 500 (Title V permit condition 6.4)
Fuel Usage (gal/hr) 3.00 (manufacturer specs)
Fuel Usage (gal/yr) 1500

Green House Gases	EF (Diesel) kg/MMBtu	HHV	Reference	Input (gal/yr)	Emission Rate[1,2,3] (metric ton/yr)	(ton/year)
CO_2	73.96	0.138	40 CFR 98 Subpart C Equation C-1 Tier 1	1,500	15.31	16.88
N_2O	6.0E-04	0.138	40 CFR 98 Subpart C Equation C-8 (Tiers 1 & 3)	1,500	1.24E-04	1.37E-04
CH_4	3.0E-03	0.138	40 CFR 98 Subpart C Equation C-8 (Tiers 1 & 3)	1,500	6.21E-04	6.85E-04
CO2e			40 CFR 98 Part A		15.36	16.93

Scales Emergency Generator (80 HP) - Gen 4

Maximum Operating Hours 500 (Title V permit condition 6.4)
Fuel Usage (gal/hr) 4.63 (manufacturer specs)
Fuel Usage (gal/yr) 2314

Green House Gases	EF (Diesel) kg/MMBtu	HHV	Reference	Input (gal/yr)	Emission Rate[1,2,3] (metric ton/yr)	(ton/year)
CO_2	73.96	0.138	40 CFR 98 Subpart C Equation C-1 Tier 1	2,314	23.62	26.04
N_2O	6.0E-04	0.138	40 CFR 98 Subpart C Equation C-8 (Tiers 1 & 3)	2,314	1.92E-04	2.11E-04
CH_4	3.0E-03	0.138	40 CFR 98 Subpart C Equation C-8 (Tiers 1 & 3)	2,314	9.58E-04	1.06E-03
CO2e			40 CFR 98 Part A		23.70	26.13

[1] Eqn C-1: $CO_2 = 1 \times 10^{-3} \times Fuel \times HHV \times EF$

Fuel = Volume of fuel combusted per year, (gal/Year)

EF = Fuel-specific default CO_2 emission factor for natural gas, from Table C-1 of 40 CFR Part 98 Subpart C (kg CO_2/MMBTU)

HHV = Default high heat value of the fuel, from Table C-1 of 40 CFR Part 98 Subpart C (MMBTU/SCF)

1×10^{-3} = Conversion Factor from Kilograms to Metric Tons

[2] Eqn C-8: CH_4 or $N_2O = 1 \times 10^{-3} \times Fuel \times HHV \times EF$

Fuel = Volume of fuel combusted per year, (gal/Year)

EF = Fuel-specific default CH_4 or N_2O emission factor for natural gas, from Table C-2 of 40 CFR Part 98 Subpart C (kg CH_4 or N_2O/MMBTU)

HHV = Default high heat value of the fuel, from Table C-1 of 40 CFR Part 98 Subpart C (MMBTU/SCF)

1×10^{-3} = Conversion Factor from Kilograms to Metric Tons

[3] CO_2e = (GWP CO_2 x CO_2 metric ton/yr) + (GWP CH4 x CH4 metric ton/yr) + (GWP N_2O x N_2O metric ton/yr)

Global Warming Potential (GWP) for Selected GHG - 40 CFR 98 Subpart A, Table A-1

GWP CO_2 = 1.00
GWP CH_4 = 25.00
GWP N_2O = 298.00

Biogenic GHG Emissions

Estimated collection efficiency of LFG collection system	85%
Maximum LFG collected	3350 scfm
LFG composition	50% Methane (CH_4)
	50% Carbon dioxide (CO_2)

NOTE: Regarding 40 CFR 52.21, the US EPA has deferred CO_2 biogenic emissions for three years for stationary sources including; CO_2 emissions from the biogenic emissions from the decomposition of solid waste, and CO_2 emissions from sources burning LFG from the decomposition of solid waste.

Step 1 - Estimate Fugitive Volume of LFG

Total LFG produced (based on 85% capture efficiency)	3941 scfm
Volume of Fugitive Volume LFG	591 scfm

Step 2 - Calculating weight of CH_4 and CO_2 in Fugitive LFG using Ideal Gas Law

Ideal Gas Law: PV = nRT or n = PV/RT where:

P = pressure	1	ATM
V = volume	591	cubic feet
	16.7	cubic meters (1 cubic meter = 35.3147 cubic feet)
n = number of moles	Unknown	mol
R = Constant	8.21E-05	m^3 x atm / K x mol
T = temperature	298.15	K (25 C or 77 F)
n_{LFG} =	684.24	mol
n_{CH4} =	342.12	mol
Molar weight of CH_4	16	g/mol

<u>Weight per Minute</u>

Weight of CH_4	5,473.92	gram
	12.07	pound (453.592 gram to pound)

<u>Weight per Year</u>

Weight of CH_4	6,342,912	lb/year	724 ton/yr

Step 3: Convert Weight to GHG Emissions using Global Warming Potentials

Global warming potentials

GWP CH_4 = 25.00

Global Warming Potential (GWP) for Selected GHG - 40 CFR 98 Subpart A, Table A-1

For CO_2e, multiply the GWP by the weight

CH_4 =	18,102 ton/yr
Total CO_2e	**18,102 ton/yr**

Notes

The volume of nitrogen in LFG is negligable and therefore not included in this calculation

Also, 50-percent methane is a conservative estimate (actual is closer to 44-percent). Calculation used more conservative estimate.

Biogenic GHG Emissions

Estimated collection efficiency of LFG collection system	85%
Maximum LFG collected	4699 scfm
LFG composition	50% Methane (CH_4)
	50% Carbon dioxide (CO_2)

NOTE: Regarding 40 CFR 52.21, the US EPA has deferred CO2 biogenic emissions for three years for stationary sources including; CO2 emissions from the biogenic emissions from the decomposition of solid waste, and CO2 emissions from sources burning LFG from the decomposition of solid waste.

Step 1 - Estimate Fugitive Volume of LFG

Total LFG produced (based on 85% capture efficiency)	5528 scfm
Volume of Fugitive Volume LFG	829 scfm

Step 2 - Calculating weight of CH4 and CO2 in Fugitive LFG using Ideal Gas Law

Ideal Gas Law: PV = nRT or n = PV/RT where:

P = pressure	1	ATM
V = volume	829	cubic feet
	23.5	cubic meters (1 cubic meter = 35.3147 cubic feet)
n = number of moles	Unknown	mol
R = Constant	8.21E-05	m^3 x atm / K x mol
T = temperature	298.15	K (25 C or 77 F)
n_{LFG} =	959.77	mol
n_{CH4} =	479.89	mol
Molar weight of CH4	16	g/mol

<u>Weight per Minute</u>

Weight of CH_4	7,678.20	gram
	16.93	pound (453.592 gram to pound)

<u>Weight per Year</u>

Weight of CH_4	8,897,118	lb/year	1,016 ton/yr

Step 3: Convert Weight to GHG Emissions using Global Warming Potentials

Global warming potentials

GWP CH_4 = 25.00

Global Warming Potential (GWP) for Selected GHG - 40 CFR 98 Subpart A, Table A-1

For CO2e, multiply the GWP by the weight

CH4 =	25,391 ton/yr
Total CO2e	**25,391 ton/yr**

Notes

The volume of nitrogen in LFG is negligable and therefore not included in this calculation

Also, 50-percent methane is a conservative estimate (actual is closer to 44-percent). Calculation used more conservative estimate.

Potential Emission Calculations

Table B16 - HHHW Facility Diesel Engine Emissions (Gen 3)

Emission Point No.	SC-E-2	
Model No.	Detroit Diesel 30DS60	
Engine Power Rating (bhp)	44	
Fuel Type	Distillate #2	
- maximum sulfur content	0.0015%	Ultra low sulfur fuel
Maximum Firing Rate (gals/hr)	3.0	
Maximum Heat Input Rating (Btu/hr)	420,000	
Maximum Hours of Operation	500	
Maximum Firing Rate (gals/yr)	1,500	
Heat Capacity of Fuel (Btu/gal)	140,000	

			Uncontrolled Potential to Emit		
Pollutant	CAS No.	Emission Factor (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM)[1]		0.31	0.13	65	0.033
Total Particulate Matter ($PM_{2.5}$)[2]		0.31	0.13	65	0.033
Particulate Matter (PM10)[3]		0.31	0.13	65	0.033
Nitrogen Oxides (NOx)[4]		4.41	1.85	926	0.46
Sulfur Oxides (SO_2)[5]		0.00152	0.0006	0.318	0.00016
Carbon Monoxide (CO)[4]		0.95	0.40	200	0.10
TOC as VOC[4]		0.35	0.15	74	0.04

			Uncontrolled Potential to Emit					
	CAS Number	Emission Factor (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL	HAP
Benzene	71-43-2	9.33E-04	3.92E-04	1.96E-01	9.80E-05	8.00E-04	Below	HAP
Formaldehyde	50-00-0	1.18E-03	4.96E-04	2.48E-01	1.24E-04	5.10E-04	Below	HAP
Naphthalene	91-20-3	8.48E-05	3.56E-05	1.78E-02	8.90E-06	3.33E+00	Below	HAP
Toluene	108-88-3	4.09E-04	1.72E-04	8.59E-02	4.29E-05	2.50E+01	Below	HAP
o-Xylenes	1330-20-7	2.85E-04	1.20E-04	5.99E-02	2.99E-05	2.90E+01	Below	HAP
Propylene	115-07-1	2.58E-03	1.08E-03	5.42E-01	2.71E-04	NA	NA	HAP
Acetaldehyde	75-07-0	7.67E-04	3.22E-04	1.61E-01	8.05E-05	3.00E-03	Below	HAP
Acrolein	107-02-8	9.25E-05	3.89E-05	1.94E-02	9.71E-06	1.70E-02	Below	HAP
1,3-Butadiene	106-99-0	3.91E-05	1.64E-05	8.21E-03	4.11E-06	2.40E-05	Below	HAP
Acenaphthene	83-32-9	1.42E-06	5.96E-07	2.98E-04	1.49E-07	NA	NA	
Acenaphthylene	203-96-8	5.06E-06	2.13E-06	1.06E-03	5.31E-07	NA	NA	
Anthracene	120-12-7	1.87E-06	7.85E-07	3.93E-04	1.96E-07	NA	NA	
Benz(a)anthracene	56-55-3	1.68E-06	7.06E-07	3.53E-04	1.76E-07	NA	NA	
Benzo(b)fluoranthene	205-99-2	9.91E-08	4.16E-08	2.08E-05	1.04E-08	NA	NA	
Benzo(k)fluoranthene	205-82-3	1.55E-07	6.51E-08	3.26E-05	1.63E-08	NA	NA	
Benzo(g,h,l)perylene	191-24-2	4.89E-07	2.05E-07	1.03E-04	5.13E-08	NA	NA	
Chrysene	218-01-9	3.53E-07	1.48E-07	7.41E-05	3.71E-08	NA	NA	
Dibenzo(a,h)anthracene	53-70-3	5.83E-07	2.45E-07	1.22E-04	6.12E-08	NA	NA	
Indeno(1,2,3-cd)pyrene	193-39-5	3.75E-07	1.58E-07	7.88E-05	3.94E-08	NA	NA	
Benzo(a)pyrene	50-32-8	1.88E-07	7.90E-08	3.95E-05	1.97E-08	NA	NA	
Total PAH			1.65E-06	8.24E-04	4.12E-07	2.00E-06	Below	
Fluoroanthene	206-44-0	7.61E-06	3.20E-06	1.60E-03	7.99E-07	NA	NA	
Fluorene	86-73-7	2.92E-05	1.23E-05	6.13E-03	3.07E-06	NA	NA	
Phenanthrene	85-01-8	2.94E-05	1.23E-05	6.17E-03	3.09E-06	NA	NA	
Pyrene	129-00-0	4.78E-06	2.01E-06	1.00E-03	5.02E-07	NA	NA	
Total HAPS			2.68E-03		6.69E-04			

[1] PM is assumed to equal PM_{10} (AP-42, Table 3.3-1, 10/96)

[2] $PM_{2.5}$ is assumed to equal PM_{10} (AP-42, Table 3.3-1, 10/96)

[3] PM_{10} emission factor (AP-42, Table 3.3-1, 10/96)

[4] NOx, CO and TOC emission factors(Table 3.3-1, 10/96). Note TOC is based on exhaust emission factor for VOC.

[5] SO_2 is based on AP-42, Table 3.4-1, 10/96, multiplied by sulfur content of fuel

Potential Emission Calculations

Table B17 - Scales Emergency Backup Generator (Gen 4)

Emission Point No.	SC-E-2
Model No.	John Deere 4024 HF 285
Engine Power Rating (bhp)	80
Fuel Type	Distillate #2
- maximum sulfur content	0.0015%
Maximum Firing Rate (gals/hr)	4.6
Maximum Heat Input Rating (Btu/hr)	648,000
Maximum Hours of Operation	500
Maximum Firing Rate (gals/yr)	2,314
Heat Capacity of Fuel (Btu/gal)	140,000

Ultra low sulfur fuel

			Uncontrolled Potential to Emit		
Pollutant	CAS No.	Emission Factor (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM)[1]		0.31	0.20	100	0.050
Total Particulate Matter ($PM_{2.5}$)[2]		0.31	0.20	100	0.05
Particulate Matter (PM10)[3]		0.31	0.20	100	0.05
Nitrogen Oxides (NOx)[4]		4.41	2.86	1,429	0.71
Sulfur Oxides (SO_2)[5]		0.00152	0.0010	0.491	0.00025
Carbon Monoxide (CO)[4]		0.95	0.62	308	0.15
TOC as VOC[4]		0.35	0.23	113	0.06

			Uncontrolled Potential to Emit					
	CAS Number	Emission Factor (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL	HAP
Benzene	71-43-2	9.33E-04	6.05E-04	3.02E-01	1.51E-04	8.00E-04	Below	HAP
Formaldehyde	50-00-0	1.18E-03	7.65E-04	3.82E-01	1.91E-04	5.10E-04	Exceeds	HAP
Naphthalene	91-20-3	8.48E-05	5.50E-05	2.75E-02	1.37E-05	3.33E+00	Below	HAP
Toluene	108-88-3	4.09E-04	2.65E-04	1.33E-01	6.63E-05	2.50E+01	Below	HAP
o-Xylenes	1330-20-7	2.85E-04	1.85E-04	9.23E-02	4.62E-05	2.90E+01	Below	HAP
Propylene	115-07-1	2.58E-03	1.67E-03	8.36E-01	4.18E-04	NA	NA	HAP
Acetaldehyde	75-07-0	7.67E-04	4.97E-04	2.49E-01	1.24E-04	3.00E-03	Below	HAP
Acrolein	107-02-8	9.25E-05	5.99E-05	3.00E-02	1.50E-05	1.70E-02	Below	HAP
1,3-Butadiene	106-99-0	3.91E-05	2.53E-05	1.27E-02	6.33E-06	2.40E-05	Exceeds	HAP
Acenaphthene	83-32-9	1.42E-06	9.20E-07	4.60E-04	2.30E-07	NA	NA	
Acenaphthylene	203-96-8	5.06E-06	3.28E-06	1.64E-03	8.20E-07	NA	NA	
Anthracene	120-12-7	1.87E-06	1.21E-06	6.06E-04	3.03E-07	NA	NA	
Benz(a)anthracene	56-55-3	1.68E-06	1.09E-06	5.44E-04	2.72E-07	NA	NA	
Benzo(b)fluoranthene	205-99-2	9.91E-08	6.42E-08	3.21E-05	1.61E-08	NA	NA	
Benzo(k)fluoranthene	205-82-3	1.55E-07	1.00E-07	5.02E-05	2.51E-08	NA	NA	
Benzo(g,h,l)perylene	191-24-2	4.89E-07	3.17E-07	1.58E-04	7.92E-08	NA	NA	
Chrysene	218-01-9	3.53E-07	2.29E-07	1.14E-04	5.72E-08	NA	NA	
Dibenzo(a,h)anthracene	53-70-3	5.83E-07	3.78E-07	1.89E-04	9.44E-08	NA	NA	
Indeno(1,2,3-cd)pyrene	193-39-5	3.75E-07	2.43E-07	1.22E-04	6.08E-08	NA	NA	
Benzo(a)pyrene	50-32-8	1.88E-07	1.22E-07	6.09E-05	3.05E-08	NA	NA	
Total PAH			2.54E-06	1.27E-03	6.35E-07	2.00E-06	Exceeds	
Fluoroanthene	206-44-0	7.61E-06	4.93E-06	2.47E-03	1.23E-06	NA	NA	
Fluorene	86-73-7	2.92E-05	1.89E-05	9.46E-03	4.73E-06	NA	NA	
Phenanthrene	85-01-8	2.94E-05	1.91E-05	9.53E-03	4.76E-06	NA	NA	
Pyrene	129-00-0	4.78E-06	3.10E-06	1.55E-03	7.74E-07	NA	NA	
Total HAPS			**4.13E-03**		**1.03E-03**			

[1] PM is assumed to equal PM_{10} (AP-42, Table 3.3-1, 10/96)

[2] $PM_{2.5}$ is assumed to equal PM_{10} (AP-42, Table 3.3-1, 10/96)

[3] PM_{10} emission factor (AP-42, Table 3.3-1, 10/96)

[4] NOx, CO and TOC emission factors(Table 3.3-1, 10/96). Note TOC is based on exhaust emission factor for VOC.

[5] SO_2 is based on AP-42, Table 3.4-1, 10/96, multiplied by sulfur content of fuel

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: January 26, 2015

TO: Kelli Wetzel, P.E., Permit Writer, Air Program

FROM: Darrin Mehr, Air Quality Analyst, Air Program

PROJECT: P-2009.0001 PROJ 61360 PTC Modification – Facility-wide PTC Including Ada County's Hidden Hollow Landfill and Fortistar Energy's Hidden Hollow Energy sources and Installation of a Hydrogen Sulfide Control System

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs)

1.0 Summary

Ada County Solid Waste Division submitted a Permit to Construct (PTC) application for modifications to the Ada County Landfill (ACLF) PTC, for the facility located near Boise, Idaho. Project-specific air quality impact analyses involving atmospheric dispersion modeling of estimated emissions associated with the proposed modification were submitted to DEQ and performed by DEQ to demonstrate that the proposed modification would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 and 203.03 [Idaho Air Rules Section 203.02 and 203.03]). CH2M HILL, Inc. (CH2M HILL), Ada County's permitting consultant, submitted the analyses and applicable information and data enabling DEQ to evaluate potential impacts to ambient air.

CH2M HILL performed project-specific air quality impact analyses to demonstrate compliance of the proposed project with air quality standards. The project consisted of a PTC modification to Ada County's current PTC for the following:

- Ada County owns and operates the Ada County Landfill (also referred to as the Hidden Hollow Landfill). The landfill currently consists of refuse material storage cells that are capped with overburden and are equipped with vacuum extraction systems to collect landfill gas (LFG) generated from the decomposition of material within the cells. Ada County's gas collection system routes the collected LFG to either or both of two existing permitted enclosed ground level flares or to Hidden Hollow Energy's (HHE's) electrical generator engines.
- Fortistar Methane Group, LLC (Fortistar) owns and operates a facility operating under the title of HHE. HHE consists of 2 existing CAT 3520C landfill gas-fired engines for the purpose of generating electricity. The engines are sited on a small parcel of land leased from Ada County. The leased parcel is entirely enclosed within the ACLF and access is through gates and roadways controlled by Ada County. The landfill gas is supplied by Ada County's ACLF. These engines are regulated under PTC P-2009.0098 PROJ 60803, issued June 19, 2012. Two additional CAT 3520C landfill gas-fired generator engines were permitted to operate under this PTC but were not constructed within the 2-year period allowed by the PTC. Thus, the PTC provisions for Engines No. 3 and No. 4 were voided.
- This project re-applies for the construction of two CAT 3520C landfill gas-fired generator sets. The PTC modification's modeling analyses account for their use in a separate operating scenario.
- The ACLF and HHE will be considered a single facility under this permitting action. All sources of regulated air pollutants have been combined in a single submittal, with Ada County as the

permittee. Potential to emit for all sources is represented in the modeling demonstration under three distinct operating scenarios that vary the total permitted capacity of landfill gas collected of 4,699 standard cubic feet per minute (scfm) to three combinations of the two existing ACLF ground-level enclosed flares and the four CAT 3520C landfill gas-fired flares (two existing and two new engines being permitted with this project). The ambient air boundary for the project will be established at the ACLF boundaries. Areas within the ACLF where the public has access will still be treated as ambient air for the limited number of operating hours, in terms of hours of each day and the days of the week that these areas are open to the public.

- The November 14, 2014 application revision submittal incorporated an emission control system to reduce the levels of hydrogen sulfide (H_2S). Use of the control system was evaluated with a reduction of H_2S from 1,500 parts per million by volume (ppm_v) to a level of 600 ppm_v. A reduction in H_2S in the landfill gas stream sent to the HHE generator engines and the ACLF flares results in reduced quantities of SO_2 emissions, produced when H_2S is combusted in the flares or engines.

The DEQ review summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the pollutant dispersion modeling analyses used to demonstrate that the estimated emissions associated with operation of the proposed facility or modification will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not evaluate compliance with other rules or analyses that do not pertain to the air impact analyses. This review also did not evaluate the accuracy of emissions estimates. Evaluation of emissions estimates is the responsibility of the permit writer.

This memorandum is based on the modeling protocol and initial submittal documents from CH2M HILL, on behalf of ACLF, which were received by DEQ on the following dates:

- August 14, 2013
- September 5, 2013
- September 17, 2013
- September 24, 2013
- October 13, 2013.

The DEQ modeling protocol approval was issued December 12, 2013 and acknowledges each of these submittals.

The following submittals were received in support of the permit application modeling demonstration:

- April 29, 2014: The initial PTC application, modeling report, and modeling files were received by DEQ.

- October 20, 2014: Email from CH2M HILL identifying limits on emergency generator testing.

- October 23, 2014: Email for exhaust parameter documentation on landfill gas-fired generator engines.

- November 14, 2014: A revised modeling demonstration for all pollutants was received, including a final modeling report and electronic modeling files. Revised modeling was needed to correct errors associated with the modeling demonstration's receptor grid, increase H_2S levels from the initial application's concentration of 400 ppm_v to 600 ppm_v in the landfill gas delivered to the flares and landfill gas-fired generator engines, and to more accurately represent the exhaust flow rates and temperatures for the two enclosed flares. SO_2 emission rates were increased accordingly with the increased H_2S concentration limit in the LFG processed.

- December 8, 2014: Revised 1-hour NO_2 modeling analyses, including NO_2 background concentrations in total impacts was received. Ozone background values were also changed.

DEQ also conducted sensitivity analyses to identify the ambient impacts of the facility's 24-hour PM_{10} and $PM_{2.5}$ emissions for Operating Scenario #3 under the partial grid setup reflecting the requested business operating hours used in Operating Scenarios #1 and #2.

The submitted modeling information and air quality impact analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emissions estimates was not within the scope of this DEQ modeling review); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that predicted pollutant concentrations from emissions associated with the modification as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or b) that predicted pollutant concentrations from emissions associated with the modification as modeled, when appropriately combined with co-contributing sources and background concentrations, were below applicable National Ambient Air Quality Standards (NAAQS) at ambient air locations where and when the modification has a significant impact; 5) showed that Toxic Air Pollutant (TAP) emissions increases associated with the modification do not result in increased ambient air impacts exceeding allowable TAP increments. Table 1 presents key assumptions and results to be considered in the development of the permit.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
This project increases the maximum collected landfill gas from the previous permit-allowable rate of 3,350 scfm to a level of 4,699 scfm. All three modeling scenarios assumed a maximum LFG flow of 4,699 scfm based on the following breakdown: **Modeling Scenario 1:** 4,699 scfm LFG going to the two LFG flares. **Modeling Scenario 2:** 1,200 scfm LFG going to two LFG engines, and 3,499 scfm LFG going to the two LFG flares (2,320 scfm LFG to Flare 1 and 1,179 scfm LFG to Flare 2). **Modeling Scenario 3:** 2,400 scfm LFG going to four LFG engines, and 2,299 scfm to Flare 1 only.	All three operating scenarios fully utilize 4,699 scfm in either the LFG-fired generator engines or the enclosed flares. Modeled emissions rates reflect the following maximum LFG throughputs for each emissions unit: • Flare 1 (FLARE1): 2,320 scfm • Flare 2 (FLARE2): 2,379 scfm • LFG Generator 1 (HGEN1): 600 scfm • LFG Generator 2 (HGEN2): 600 scfm • LFG Generator 3 (HGEN3): 600 scfm • LFG Generator 4 (HGEN4): 600 scfm Compliance with the applicable ambient air quality standards will be met regardless of allocation of the maximum allowable 4,699 scfm of LFG to any of the listed emissions units.
All landfill gas combusted in FLARE1, FLARE2, HGEN1, HGEN2, HGEN3, and HGEN4 was modeled based on landfill gas containing a continuous concentration of 600 parts per million by volume (ppm_v) of H_2S. The H_2S contained in the landfill gas is converted to SO_2 through the combustion process in the flares and electrical generator engines. These emissions units control H_2S but emit uncontrolled SO_2 as a result.	A limit of 600 ppm_v for the 4,699 scfm of landfill gas distributed in any combination to the four LFG-fired generator engines and two flares would cause predicted ambient impact at or below the impacts presented in the permit application's modeling demonstration for the 1-hour SO_2 NAAQS. The maximum predicted design impact plus the ambient background due to the landfill fugitive SO_2 emissions and typical SO_2 backgrounds was below the 1-hour SO_2 NAAQS, with a total impact of 176.3 $\mu g/m^3$, 1-hour average, or 90% of the allowable NAAQS.
GEN3 and GEN4 are small emergency generator engines located at the Household Hazardous Waste Collection Building and the Scales Building respectively. GEN3 is a 44 brake horsepower (bhp) diesel engine. GEN4 is an 80 bhp diesel engine. These emissions units were not modeled in the facility-wide modeling. These units are exempted from the 1-hr NO_2 NAAQS demonstration for the testing and maintenance operations per DEQ policy unless DEQ's Director determines these sources must be included to assure compliance with the 1-hour NO_2 NAAQS.	The 1-hour NO_2 SIL and NAAQS modeling exemption policy does not include an exemption from modeling for ambient standards of other pollutants. Testing and maintenance operations confined to a short duration of one hour or less per day limits the ambient impacts from these engines. Based on the size of these generator engines and the limited number of hours of operation, DEQ did not require inclusion of these sources in the NAAQS impact analyses.
The contractor's wood chipper generator engine (CHIPGEN) was modeled at 24 hours per day and 8,760 hours per year at the maximum emission rates without any restrictions for the "Full Ambient Air Boundary" case and for all hours of ACLF business hours for the "Partial Ambient Air Boundary" case.	Hourly and annual emissions were conservatively modeled for all averaging periods for the wood chipper engine.

Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in 40 CFR 51, Appendix W (Guideline on Air Quality Models). Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition. The submitted information and analyses demonstrated to the satisfaction of the Department that operation of the proposed facility or modification will not cause or significantly contribute to a violation of any ambient air quality standard, provided the key conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition.

2.0 Background Information

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality standards and analyses used to demonstrate compliance with air quality standards.

2.1.1 Area Classification

The ACLF facility is located in northern Ada County, which is designated as an attainment or unclassifiable area for lead (Pb), nitrogen dioxide (NO_2), ozone, particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers ($PM_{2.5}$), and sulfur dioxide (SO_2). The area is in attainment but is being managed under a maintenance plan for carbon monoxide (CO) and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}). There are no Class I areas within 10 kilometers of this location.

2.1.2 Modeling Applicability for Criteria Pollutants

Idaho Air Rules Section 203.02 state that a PTC cannot be issued unless the application demonstrates to the satisfaction of DEQ that the new source or modification will not cause or significantly contribute to a NAAQS violation. Atmospheric dispersion modeling is used to evaluate the potential impact of a proposed project to ambient air and demonstrate NAAQS compliance. However, if the emissions associated with a project are very small, project-specific modeling analyses may not be necessary.

If the emissions increase associated with a project are below modeling applicability thresholds established in the *Idaho Air Quality Modeling Guideline* (State of Idaho Guideline for Performing Air Quality Impact Analyses. Doc. ID AQ-011 {September 2013} http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf), then a project-specific analysis is not required. Modeling applicability emissions thresholds were developed by DEQ based on modeling of a hypothetical source designed to reasonably assure that impacts are below the applicable Significant Impact Level (SIL). DEQ has established two threshold levels: Level 1 thresholds are unconditional thresholds, requiring no approval for use by DEQ; Level 2 thresholds are conditional upon DEQ approval, which depends on evaluation of the project and the site, including emissions quantities, stack parameters, number of sources emissions are distributed amongst, distance between the sources and the ambient air boundary, and the presence of sensitive receptors near the ambient air boundary.

2.1.3 Significant and Cumulative NAAQS Impact Analyses

If modeled maximum pollutant impacts to ambient air from the emissions sources associated with a new facility or the emissions increase associated with a modification exceed the significant impact levels (SILs) of Idaho Air Rules Section 006 (referred to as a significant contribution in Idaho Air Rules) or as incorporated by reference as per Idaho Air Rules Section 107.03.b, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02. A cumulative NAAQS impact analysis may also be required for permit revisions driven by compliance/enforcement actions, any correction of emissions limits or other operational parameters that may affect pollutant impacts to ambient air, or other cases where DEQ believes NAAQS may be threatened by the emissions associated with the proposed project.

The SIL analyses for a facility modification involves modeling the increase in allowable or potential emissions that results from the proposed modification. Any decreases in emissions are modeled as negative values to account for the reduction in impacts to ambient air.
A cumulative NAAQS impact analysis for attainment area pollutants involves assessing ambient impacts (typically the design values consistent with the form of the standard) from facility-wide emissions, and emissions from any nearby co-contributing sources, and then adding a DEQ-approved background concentration value to the modeled result that is appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SILs and specifies the modeled design value that must be used for comparison to the NAAQS. NAAQS compliance is evaluated on a receptor-by-receptor basis.

If the cumulative NAAQS impact analysis indicates a violation of the standard, the permit may not be issued if the permitted facility or modification has a significant contribution (exceeding the SIL) to the modeled violation. This evaluation is made specific to both time and space. If the SIL analysis indicates the facility/modification has an impact exceeding the SIL, there may not be a significant contribution to a violation if impacts are below the SIL at the specific receptor showing the violation during time periods when there is a modeled violation.

Compliance with Idaho Air Rules Section 203.02 is demonstrated if : a) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or b) modeled design values of the cumulative NAAQS impact analysis (modeling all emissions from the facility and co-contributing sources, and a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or c) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

NO_2 and SO_2 short-term standards with an averaging period of one hour were promulgated by EPA several years ago. The standards became applicable for permitting purposes in Idaho when they were incorporated by reference *sine die* into Idaho Air Rules (Spring 2011).

The 24-hour and annual average SO_2 primary NAAQS were revoked in 2010. See 75 Federal Register 35520, June 22, 2010.

The $PM_{2.5}$ annual standard was reduced from 15 $\mu g/m^3$ to 12 $\mu g/m^3$ on December 14, 2012. The revised standard became applicable for permitting purposes when it was incorporated *sine die* into Idaho Air Rules in spring of 2014.

Table 2. APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Impact Levels[a] (μg/m³)[b]**	**Regulatory Limit[c] (μg/m³)**	**Modeled Design Value Used[d]**
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.3	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 μg/m³)	75 ppb[p] (196 μg/m³)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 μg/m³)	100 ppb[s] (188 μg/m³)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	75 ppb[w]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration. The NAAQS was revised from 15 μg/m³ to12 μg/m³ on December 14, 2012.
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. Not to be exceeded in any calendar year.
s. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

2.1.4 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permitting requirements for toxic air pollutants (TAPs) from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.

Per Section 210, if the total project-wide emissions increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

Idaho Air Rules Section 210.20 states that if TAP emissions from a specific source are regulated by the Department or EPA under 40 CFR 60, 61, or 63, then a TAP impact analysis under Section 210 is not required for that TAP.

2.2 Background Concentrations

Background concentrations are used in the cumulative NAAQS impact analyses to account for impacts from sources not explicitly modeled. Background concentrations were needed for 1-hour SO_2, 24-hour PM_{10}, 24-hour $PM_{2.5}$, 1-hour and 8-hour CO, 1-hour NO_2 and annual NO_2 standards. Project-specific modeling analyses were not needed for other criteria pollutants because emissions increases associated with the proposed project were below established DEQ modeling applicability thresholds. Lead emissions were not listed in the emission estimate tables or electronic spreadsheet. DEQ modeling staff assumed that potential lead emissions from the facility do not exceed the modeling threshold of 14 pounds per month.

The 1-hour average SO_2 ambient background accounted for fugitive SO_2 emissions from the landfill itself. Section 6.2.1 and Appendix K of the PTC application provides an explanation of the landfill's contribution to the ambient background concentration. The highest predicted fugitive SO_2 emissions occurred during daytime hours. This maximum daytime SO_2 concentration was assumed to be constant for all hours of the day for the fugitive background concentration component. This is a conservative assumption when modeling for compliance with a 1-hour ambient standard.

Table 3 provides ambient background concentrations used in the full impact analyses. NO_2 background values are presented in Table 4.

Table 3. BACKGROUND CONCENTRATIONS		
Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
CO[b]	1-hour	7,060[f]
	8-hour	2,100[g]
SO_2[c]	1-hour	14.8[h] + 15.42[i] = 30.22 total
PM_{10}[d]	24-hour	73[j]
$PM_{2.5}$[e]	24-hour	20[k]
	Annual	6.2[l]

a. Micrograms per cubic meter.
b. Carbon monoxide.
c. Sulfur dioxide.
d. Particulate matter with an aerodynamic diameter of 10 microns or less.
e. Particulate matter with an aerodynamic diameter of 2.5 microns or less.
f. Average value of 2nd high values for 2010, 2011, and 2012 data from Eastman Building, located at 166 N 9th Street, Boise.
g. Average value of 2nd high values for 2010, 2011, and 2012 data from Eastman Building, located at 166 N 9th Street, Boise.
h. Average of 99th percentile values from 2010-2012 data, St. Luke's Meridian site.
i. Estimated SO_2 background contribution from fugitive landfill emissions not accounted for with the St. Luke's Meridian monitoring data. Calculations provided by CH2M HILL, April 24, 2014 PTC application, Appendix K.
j. DEQ Treasure Valley airshed modeling.
k. Average of the 98th percentile 24-hour values from each year of data for 2010, 2011, and 2012. St. Luke's Meridian site.
l. Average of the weighted mean values from each year of 2010-2012. St. Luke's Meridian site.

Background concentrations for 1-hour NO_2 were based on monitoring data collected at the St. Luke's Meridian site by DEQ during January 2009 through January 2011. A separate NO_2 background value was used for each hour of the day, using the 98th percentile value of monitoring data for each hour of the day. Hourly 1-hour NO_2 background concentrations are given in Table 4.

Table 4. BACKGROUND 1-HOUR NO_2 CONCENTRATIONS					
Hour Ending	Concentration ($\mu g/m^3$)[a]	Hour Ending	Concentration ($\mu g/m^3$)[a]	Hour Ending	Concentration ($\mu g/m^3$)[a]
1	43.2	9	54.6	17	11.2
2	41.4	10	43.2	18	15.0
3	33.8	11	32.0	19	30.1
4	32.0	12	26.7	20	54.4
5	30.1	13	17.3	21	56.4
6	37.6	14	11.3	22	58.3
7	43.2	15	11.3	23	58.3
8	48.9	16	11.2	24	54.5

a. micrograms per cubic meter.

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

This section describes the modeling methods used by the applicant's consultant, CH2M HILL, to demonstrate pre-construction compliance with applicable air quality standards for the facility's emission sources.

3.1.1 Overview of Analyses

CH2M HILL performed project-specific air impact analyses that were determined by DEQ to be reasonably representative of the proposed modification and facility-wide potential operations scenario of the combination of ACLF and HHE sources. Results of the submitted analyses demonstrated compliance with applicable air quality standards to DEQ's satisfaction, provided the facility is operated as described in the submitted application and in this memorandum.

Table 5 provides a brief description of parameters used in the modeling analyses.

Table 5. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description
General Facility Location	Near Boise in Northern Ada County	The area is an attainment or unclassified area for all criteria pollutants. .
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 12345.
Meteorological Data	Boise	2008-2012. See Section 3.1.6 of this memorandum.
Terrain	Considered	Receptor, building, and emissions source elevations were determined using a USGS 1 arc second National Elevation Dataset (NED) file.
Building Downwash	Considered	Plume downwash was considered for the structures associated with the facility.
Receptor Grid	**Partial Grid – Receptors within ACLF during business hours (see Figure X)**	
	Grid 1	25-meter spacing along ACLF property boundary and along landfill roadways.
	Grid 2	15-meter spacing locations at areas within the ACLF, including the HHHW collection area, the active cell public access area, and regions areas east of the active areas).
	Grid 3	15-meter spacing in areas along the northern property boundary where relatively high impacts were expected.
	Grid 4	100-meter spacing in a 5,300 meter (x) by 5,900 meter (y) grid centered on Grids 1, 2, and 3.
	Grid 5	500-meter spacing in a 13,500 meter (x) by 14,500-meter (y) grid centered on Grid 4
	Full Ambient Air Boundary—Receptors external to ACLF during all hours	
	Grid 1	25-meter spacing along ACLF property boundary.
	Grid 2	15-meter spacing in areas along the eastern and the northern property boundary where relatively high impacts were expected.
	Grid 3	100-meter spacing in a 6,100 meter (x) by 5,900 meter (y) grid centered on Grids 1 & 2
	Grid 4	500-meter spacing in a 14,500 meter (x) by 14,500-meter (y) grid centered on Grid 3

3.1.2 Modeling Protocol and Methodology

A modeling protocol was submitted to DEQ on August 1, 2013, prior to submittal of the application. The protocol was submitted by CH2M HILL and DEQ provided an electronic protocol approval letter on December 12, 2013.

On September 4, 2013, CH2M HILL submitted a pre-application email requesting clarification of the methods used to calculate emissions for emergency generator engines operating as intermittent sources. On September 5, 2013, DEQ advised CH2M HILL that the two existing emergency generator engines are exempt from modeling for the 1-hour NO_2 NAAQS per DEQ's guidance policy for modeling intermittent sources for 1-hour NO_2 NAAQS compliance demonstrations. Section 3.2.1 describes the DEQ guidance policy and its applicability to the emergency engines.

Project-specific modeling was generally conducted using data and methods described in the protocol and in the *Idaho Air Quality Modeling Guideline*.

3.1.3 Evaluation of Ozone Impacts

Ozone (O_3) differs from other criteria pollutants in that it is not typically emitted directly into the atmosphere. O_3 is formed in the atmosphere through reactions of VOCs, NOx, and sunlight. Emissions of VOCs and NOx from the proposed modification were evaluated for their potential to cause a violation of the 8-hour O_3 NAAQS.

DEQ reviewed facility-wide VOC and NOx emissions, expressed as tons per year (T/yr) based on the post-project controlled potential to emit values in ACLF's emission inventory. Potential emissions were listed at 34.1 T/yr VOC and 57.5 T/yr NOx. Short-term emissions from the testing of emergency generators were not considered because these sources are only intermittently operated.

The following is a simplified summary of the atmospheric chemistry in a VOC rich atmosphere:

$NO_2 + h\upsilon \rightarrow NO + O$
$O + O_2 \rightarrow O_3$
$O_3 + NO \rightarrow NO_2 + O_2$
$HO_2 + NO \rightarrow NO_2 + OH$

Atmospheric dispersion models used in stationary source air permitting analyses (see Section 3.1.4) cannot be used to accurately estimate O_3 impacts resulting from VOC and NOx emissions from an industrial facility. O_3 concentrations resulting from area-wide emissions are predicted by using more complex airshed models such as the Community Multi-Scale Air Quality (CMAQ) modeling system. DEQ has used CMAQ to estimate O_3 concentrations for the Treasure Valley and evaluate potential O_3 control strategies. Use of the CMAQ model is very resource intensive and DEQ asserts that routinely performing a CMAQ analysis for a particular permit application is not a reasonable requirement for air quality permitting, especially for minor source permitting.

DEQ has not typically required minor sources to evaluate potential O_3 impacts as a part of the stationary source air permitting process. This is consistent with EPA regulation and policy. As stated in a letter from Gina McCarthy of EPA to Robert Ukeiley, acting on behalf of the Sierra Club (letter from Gina McCarthy, Assistant Administrator, United States Environmental Protection Agency, to Robert Ukeiley, January 4, 2012):

> *. . . footnote 1 to sections 51.166(I)(5)(I) of the EPA's regulations says the following: "No de minimis air quality level is provided for ozone. However, any net emission increase of 100 tons per year or more of volatile organic compounds or nitrogen oxides subject to PSD would be required to perform an ambient impact analysis, including the gathering of air quality data."*
>
> *The EPA believes it unlikely a source emitting below these levels would contribute to such a violation of the 8-hour ozone NAAQS, but consultation with an EPA Regional Office should still be conducted in accordance with section 5.2.1.c. of Appendix W when reviewing an application for sources with emissions of these ozone precursors below 100 TPY."*

The VOC and NOx emissions from the Ada County Landfill project are below the suggested 100 ton/year threshold to trigger a project-specific O_3 impact applicability evaluation.

3.1.4 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. AERMOD retains the single straight line trajectory of ISCST3, but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD was used for the modeling analyses to evaluate impacts of the facility.

NO_2 1-hour impacts are assessed using a tiered approach to account for $NO/NO_2/O_3$ chemistry. Tier 1 assumes full conversion of NO to NO_2. Tier 2 assumes a 0.80 default ambient ratio of NO_2/NOx. Tier 3 accounts for more refined assessment of the NO to NO_2 conversion, and a supplemental modeling program can be used with AERMOD to better account for $NO/NO_2/O_3$ atmospheric chemistry. Either the Plume Volume Molar Ratio Method (PVMRM) or the Ozone Limiting Method (OLM) can be specified within the AERMOD input file. As stated in EPA guidance (Memorandum: from Tyler Fox, Leader, Air Quality Modeling Group, C439-01, Office of Air Quality Planning and Standards, USEPA; to Regional Air Division Directors. *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard.* March 01, 2011), EPA has not indicated a general preference for one option over the other (PVMRM vs OLM) for particular applications. CH2M HILL elected to use PVMRM for the ACLF project. Section 3.1.5 provides a description of parameters and data used for PVMRM.

3.1.5 Data and Parameters Used for Modeling 1-Hour NO_2 with PVMRM

PVMRM was used with AERMOD to provide a more refined estimate of 1-hour NO_2 concentrations at specific receptors. Table 6 lists the data and parameters used for PVMRM. Hourly O_3 data were used in PVMRM to estimate the conversion of NO to NO_2. O_3 hourly monitoring data were collected from the St. Luke's Meridian site. The O_3 data provided by DEQ to CH2M HILL in a December 13, 2013, modeling protocol approval letter were collected during periods when O_3 is expected to be at its highest levels during the year - generally starting in April or May and extending through September. The data analyzed included: July 27, 2007 – September 30, 2007; May 1 2008 – September 30, 2008; and May 1, 2009 – September 30, 2011.

Monitoring data were analyzed to generate single hourly values for each of the 24 hourly periods within a day. Data were sorted by hour and then the upper 99^{th} percentile was calculated for each hour of the day across all days. For each hour modeled, a background O_3 value equal to the 99^{th} percentile was used as input to PVMRM. This method is very conservative because it does not account for seasonal variation in O_3 concentrations, the data were collected during the time of year when maximum ozone concentrations are expected, and the values used for all days modeled represent the upper 99^{th} percentile of monitored values.

CH2M HILL used an in-stack NO_2/NOx ratio of 0.20 for the diesel-fired engine that powers the contractor's chipper unit. CH2M HILL provided support documentation for the non-default in-stack ratio. DEQ agrees this value is appropriate based on CH2M HILL's in-stack ratio database documentation and the value matches the recommended default value for the NO_2/NOx ratio listed in *Modeling Compliance of the Federal 1-Hour NO_2 NAAQS, CAPCOA Guidance Document*, Appendix C-In-Stack NO_2/NOx Ratios, California Air Pollution Control Officers Association, October 27, 2011. All other NOx sources were modeled with the EPA default ratio of 0.5. DEQ approves of all in-stack ratio assumptions used in the 1-hour NO_2 NAAQS analyses.

Table 6. PARAMETERS AND DATA FOR PVMRM		
Parameter	**Value**	**Source/Comments**
NO_2/NOx ratio for In-Stack Emissions	0.5 for all other sources (HGEN1, HGEN2, HGEN3, HGEN4, FLARE1, and FLARE2. 0.2 for CCHIPGEN (the 990 hp non-road contractor chipper generator engine).	0.5 is an EPA suggested default when source-specific data are not available. HGEN1-HGEN4 are landfill gas-fired generator engines. FLARE1 and FLARE2 combust landfill gas. The CCHIPGEN is fired on diesel and 0.2 is the default CAPCOA in-stack NO_2/NOx ratio.
Ambient Equilibrium for NO_2/NOx	0.90	Default value.
O_3 Concentrations	Value specified for each hour modeled.	DEQ provided values were based on data from the St. Luke's site in Meridian, Idaho.

Table 7 lists hourly O_3 concentrations used in the PVMRM for the 1-hour NO_2 impact analyses. The ozone background concentration values used in the final December 8, 2014, analyses were conservatively high. Background O_3 concentration values provided to CH2M HILL in the December 13, 2013, modeling protocol approval notice incorrectly identified ppb concentration units as $\mu g/m^3$. Review of the modeling files submitted with the application indicated that background O_3 concentration values were correctly included in the modeling analyses as ppb, even though the modeling report indicated they were included as $\mu g/m^3$.

Table 7. BACKGROUND OZONE CONCENTRATIONS					
Hour	**Concentration (ppb)[a]**	**Hour**	**Concentration (ppb)[a]**	**Hour**	**Concentration (ppb)[a]**
1	46.25	9	42.09	17	68.78
2	45.40	10	47.90	18	66.04
3	44.40	11	54.60	19	61.28
4	42.96	12	60.00	20	56.20
5	40.13	13	63.26	21	50.86
6	39.49	14	70.89	22	47.00
7	36.20	15	70.95	23	48.71
8	38.26	16	69.50	24	47.60

a. parts per billion by volume

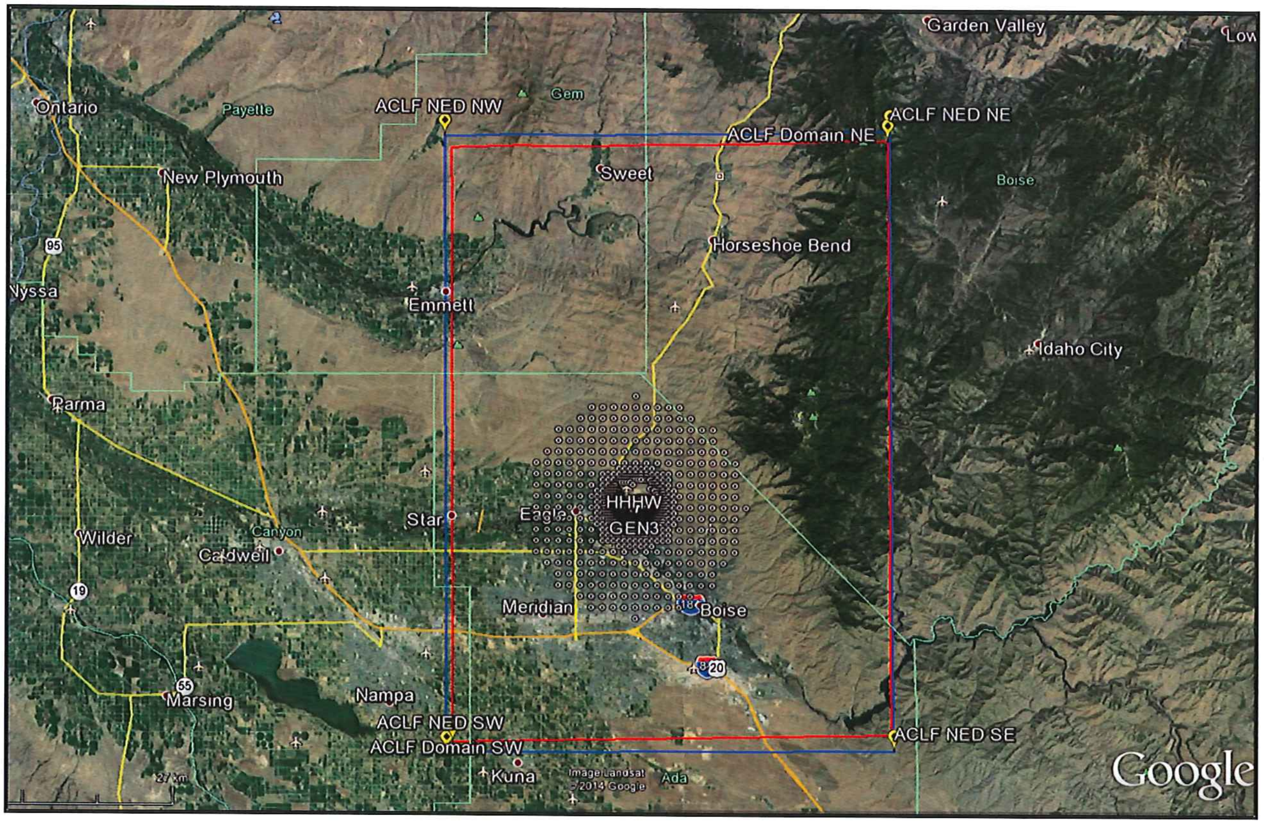
3.1.6 Meteorological Data

DEQ provided CH2M HILL with model-ready meteorological data processed from Boise surface and Boise upper air meteorological data for a consecutive five-year period covering 2008-2012. These data were collected by the National Weather Service at the Boise airport. They were process into AERMOD-ready files using the EPA preprocessing program AERMINUTE Version 11325 and AERMET Version 12345. A 0.5 meter per second lower wind speed threshold was used for processing in AERMET. DEQ determined these data were reasonably representative for the ACLF site. More representative data of sufficient quality for use in dispersion models were not available for the area.

3.1.7 Terrain Effects

CH2M HILL used a 1 arc second National Elevation Dataset (NED) file, in the NAD83 datum, to calculate elevations of receptors. The modeling domain was fully encompassed by the extents of coverage of the NED terrain file. The terrain preprocessor, AERMAP, was used to extract the elevations from the NED files and assign them to receptors in the modeling domain in a format usable by AERMOD. AERMAP also determined the hill-height scale for each receptor. The hill-height scale is an elevation value based on the surrounding terrain which has the greatest effect on that individual receptor. The model AERMOD uses those heights to evaluate whether the emissions plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain. The facility is located in the Boise foothills and terrain effects are anticipated to be an important consideration. See Figure 1 for a view of the modeling domain depicted in a Google earth photographic image.

Figure 1. Modeling Domain (red outline) and USGS Terrain Data File Coverage (blue outline)



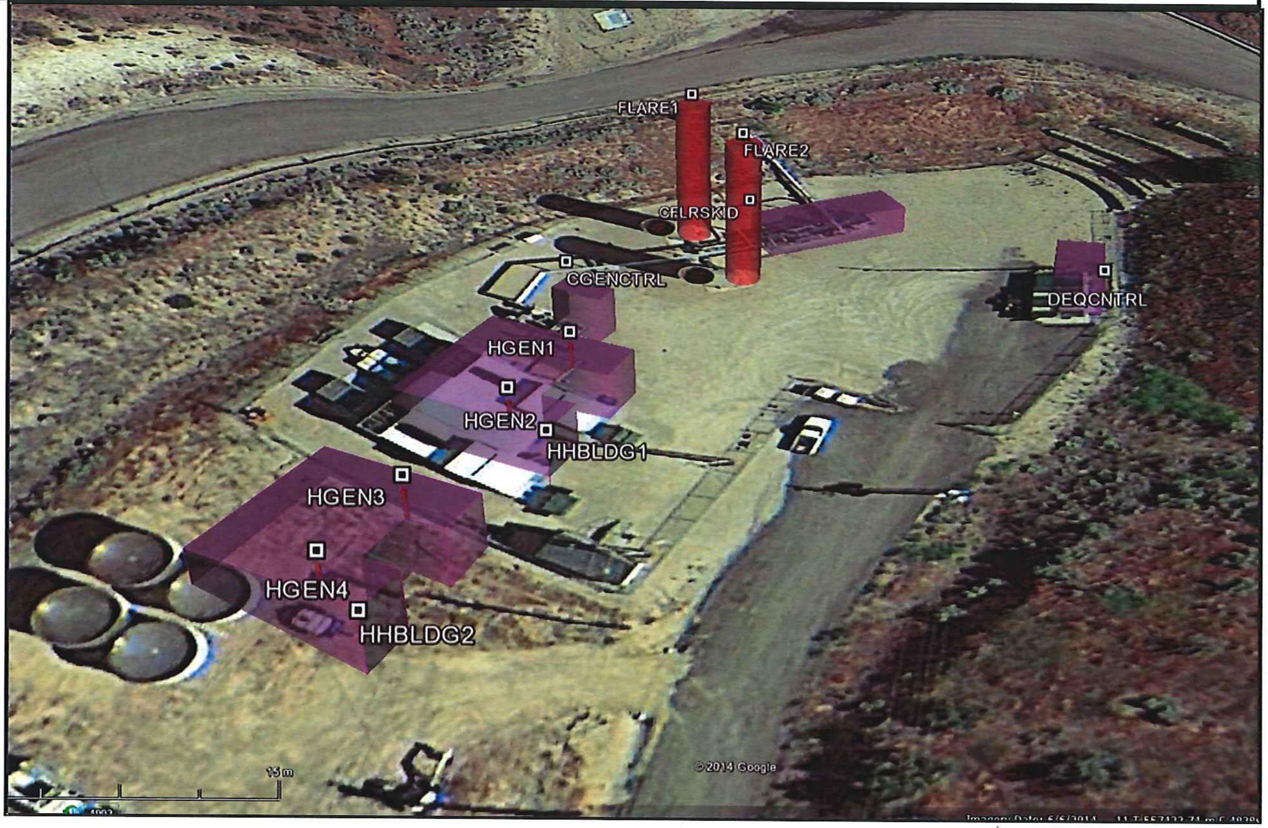
3.1.8 Building Downwash

Potential downwash effects on the emissions plume were accounted for in the model by using building parameters as described by CH2M HILL in the submitted application. The Building Profile Input Program for the PRIME downwash algorithm (BPIP-PRIME) was used to calculate direction-specific dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and release parameters for input to AERMOD.

Figure 2 below shows the 3-dimensional outline of the model setup exported by the Providence/Oris Solutions BEEST graphic user interface to Google earth.

The House Hold Hazardous Waste and Scales Buildings were also appropriately included in the model setup as structures.

Figure 2. Layout of Buildings Near the Primary Sources at the ACLF



3.1.9 Ambient Air Boundary

The ACLF and HHE are considered one facility for the purposes of air quality permitting. Per Idaho DEQ's July 1, 2013, letter[1] the two facilities will be recognized as a single facility for this project, based on DEQ's concurrence that "...ACLF ultimately has control over the fuel supply and fuel distribution to HHE operations. Therefore, the conclusion has been reached that the ACLF ultimately has control over HHE operations."

The ambient air boundary for the project is the same as was used for previous permitting projects for the ACLF. HHE's emission sources are contained within the ambient air boundary and ambient impacts for both ACLF and HHE emission sources are aggregated for the NAAQS compliance demonstrations.

There are areas within the outer property boundary of the ACLF where the general public is allowed access during normal business hours. These active public dumping areas for landfill waste, dumping areas for wood by-product waste, access roadways, parking lots, and structures within the ACLF were treated as ambient air on the days of the week and hours of day considered to be normal business hours when the landfill is open to public entry. Additional details regarding public access and receptor placement are provided in Section 3.1.10 and in the ACLF modeling report. Figures 3 and 4 show outlines of the two ambient air boundaries used in this modeling demonstration.

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[1] Letter regarding "Single-Facility Concurrence Request, Facility ID No. 001-00195, Ada County Landfill, Boise, Morrie Lewis, Permit Writer, DEQ, to Dave Logan, Director, Ada County Operations Department and Suparna Chakladar, Sr. Director, Environmental Services, Hidden Hollow Energy, LLC.

Figure 3. Exterior Ambient Air Boundary – "Full" Case

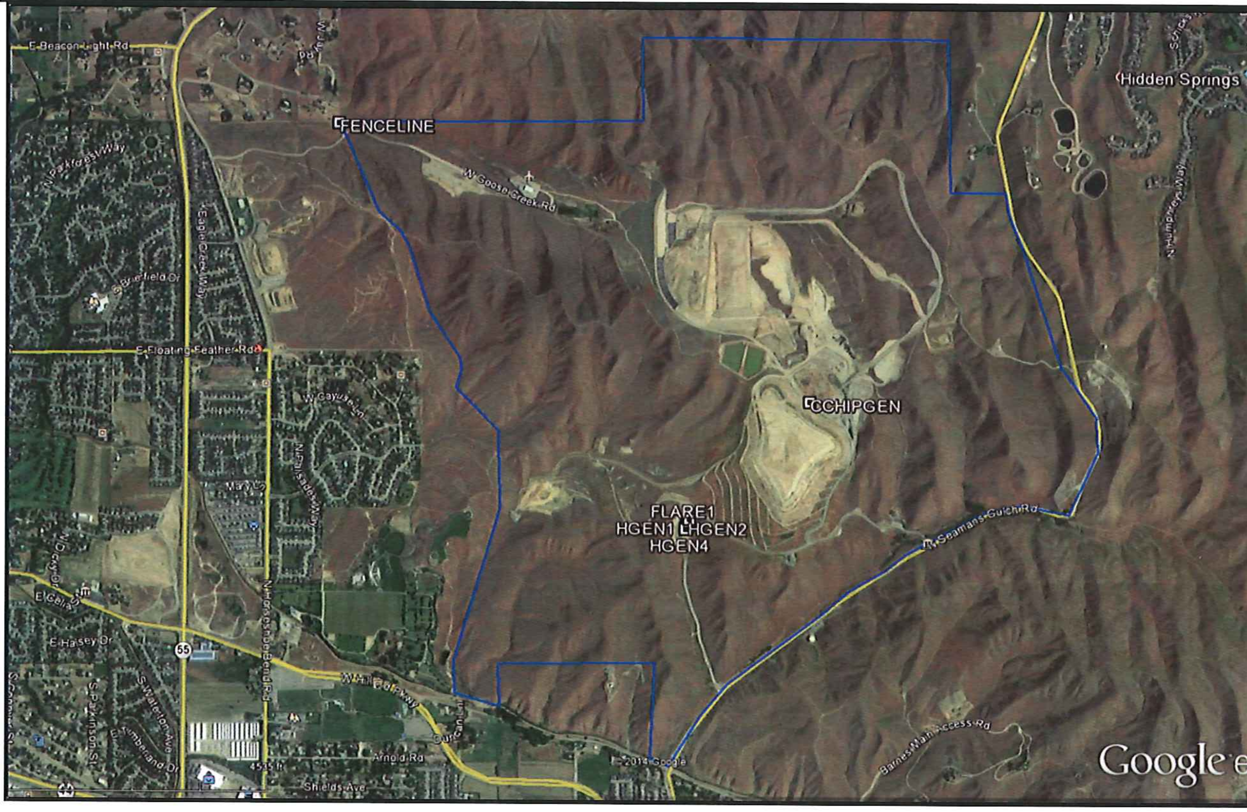
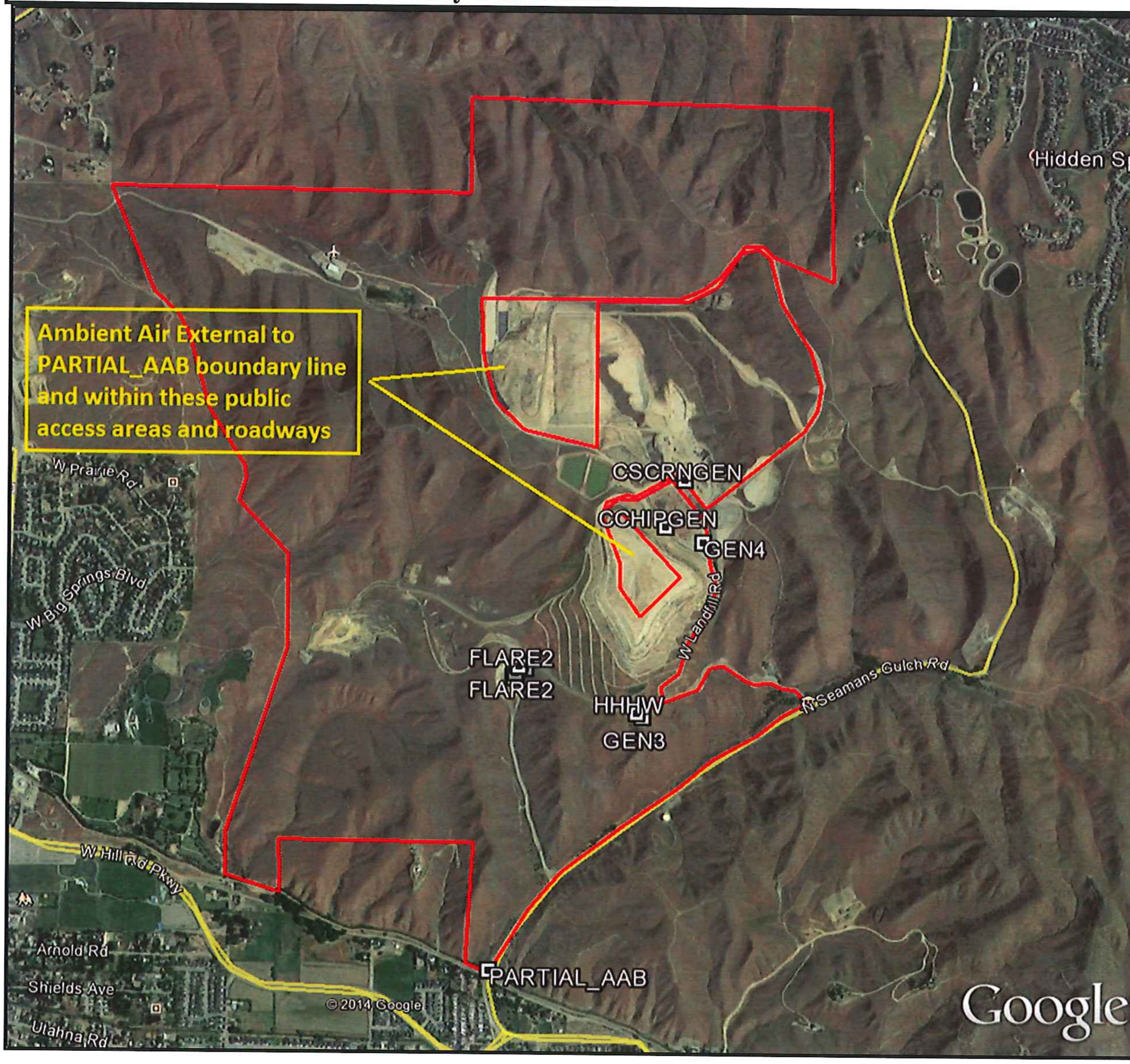


Figure 4. Partial Ambient Air Boundary Case Outline



3.1.10 Receptor Network

Table 5 describes the receptor network used in the submitted modeling analyses. DEQ contends that the receptor network was adequate to reasonably assure compliance with applicable air quality standards at all ambient air locations.

Two receptor networks were used to identify ambient impacts for this project. The "Full AAB" or "full ambient air boundary" set of receptors was used to identify ambient impacts for the ACLF and HHE sources on a 24 hour per day and 8,760 hour per year basis.

The "Partial AAB" or "partial ambient air boundary" in the November 14, 2014, modeling demonstration used all Full AAB receptors external to the outer ACLF property boundary and included receptors within the ACLF along roadways and regions where the public was considered to have access during the business hours of the landfill. Spacing of the receptors within the landfill's public access areas ranged from a few meters to a maximum of 25 meters along the roadway perimeters, with most receptors spaced at 15 meters apart. Partial AAB receptors accounted for impacts only for periods identified as normal business hours. This separate set of conditions used receptors external and internal to the ACLF by applying hour-of-day and day-of-week operating factors to each of the emissions units (generator engines and flares). The hour-of-day operating factors modeled emissions at 100% of model input emission rates were 8 am through 6 pm for days of the week Monday through Saturday. To account for the effects of daylight savings time the hours of operation were initiated one hour earlier for the months of April through October.

The magnitude of modeled impacts is greatly affected by the proximity of receptors relative to emissions points, and impacts are especially affected by terrain in the surrounding area. Consequently, receptor density is an important factor when evaluating the adequacy of the NAAQS and/or TAPs compliance demonstration. The receptor network used in the impact analyses was updated and significantly strengthened in the November 14, 2014, revised modeling demonstration. Receptors were not originally placed along some portions of the ambient air boundary for the Full AAB receptor grid. Ambient air boundary receptors along the eastern and northern regions of the facility were placed outside of the actual ambient air boundary, resulting in analyses that did not account for impacts at all areas considered as ambient air. The November 14, 2014, submittal corrected all receptor coverage issues and the density of receptors was substantially increased. CH2M HILL decreased receptor spacing to 15 meters to enable resolution of maximum impacts in areas where the design value impacts were predicted to occur. Receptor density was also increased in areas of complex terrain and areas closest to the sources where the highest impacts were predicted to occur.

DEQ determined the November 14, 2014, revisions to the receptor grid are appropriate and the 15-meter separation of receptors in the "hot spot" regions adequately resolves maximum impacts for this project. Figures 5, 6, and 7 below show the receptor grids used in the analyses. The regions that appear completely blacked out within Figures 5 and 6 represent the regions where 15-meter spacing was used.

Figure 5. Full Ambient Air Boundary Receptor Coverage

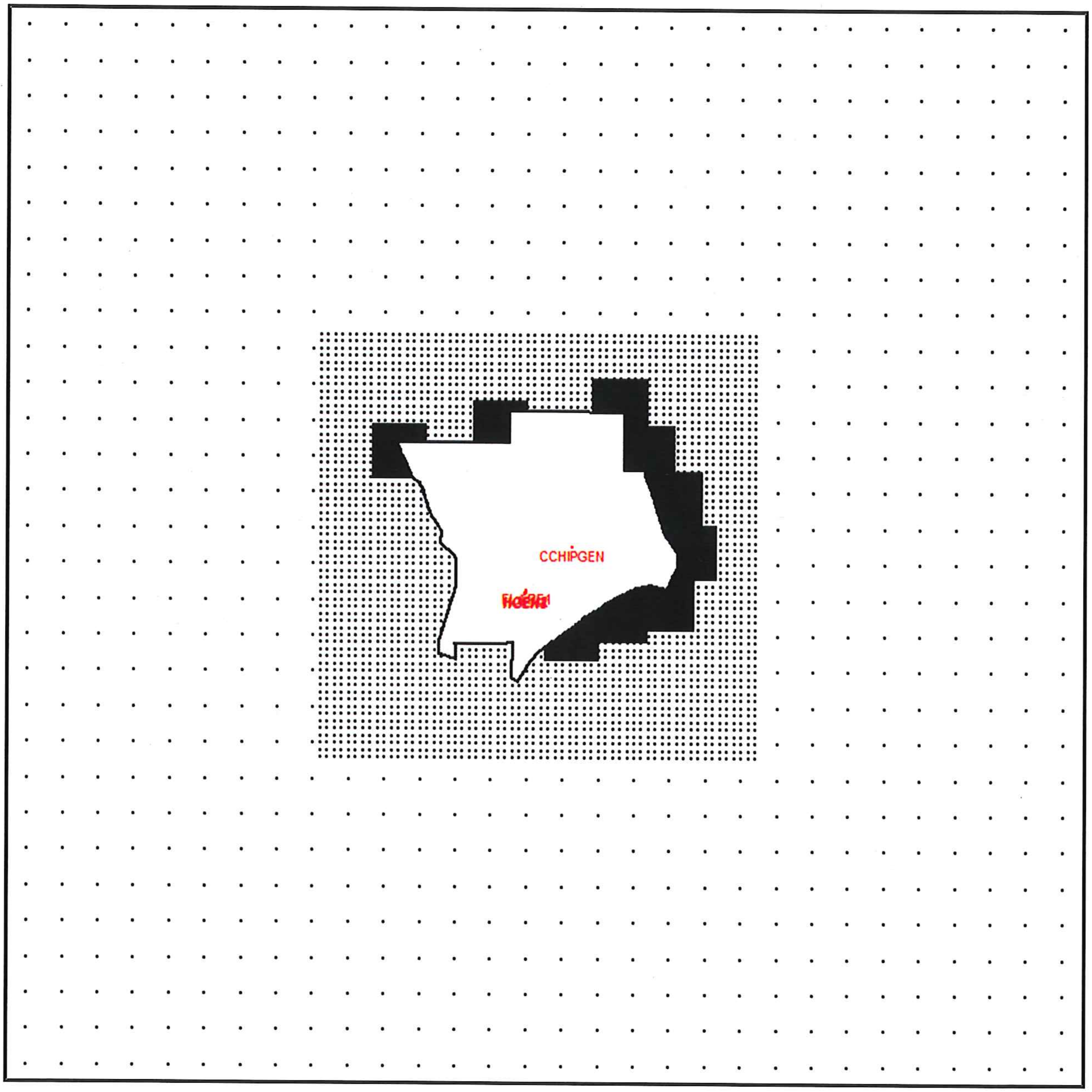


Figure 6. Partial Ambient Air Boundary Receptor Coverage

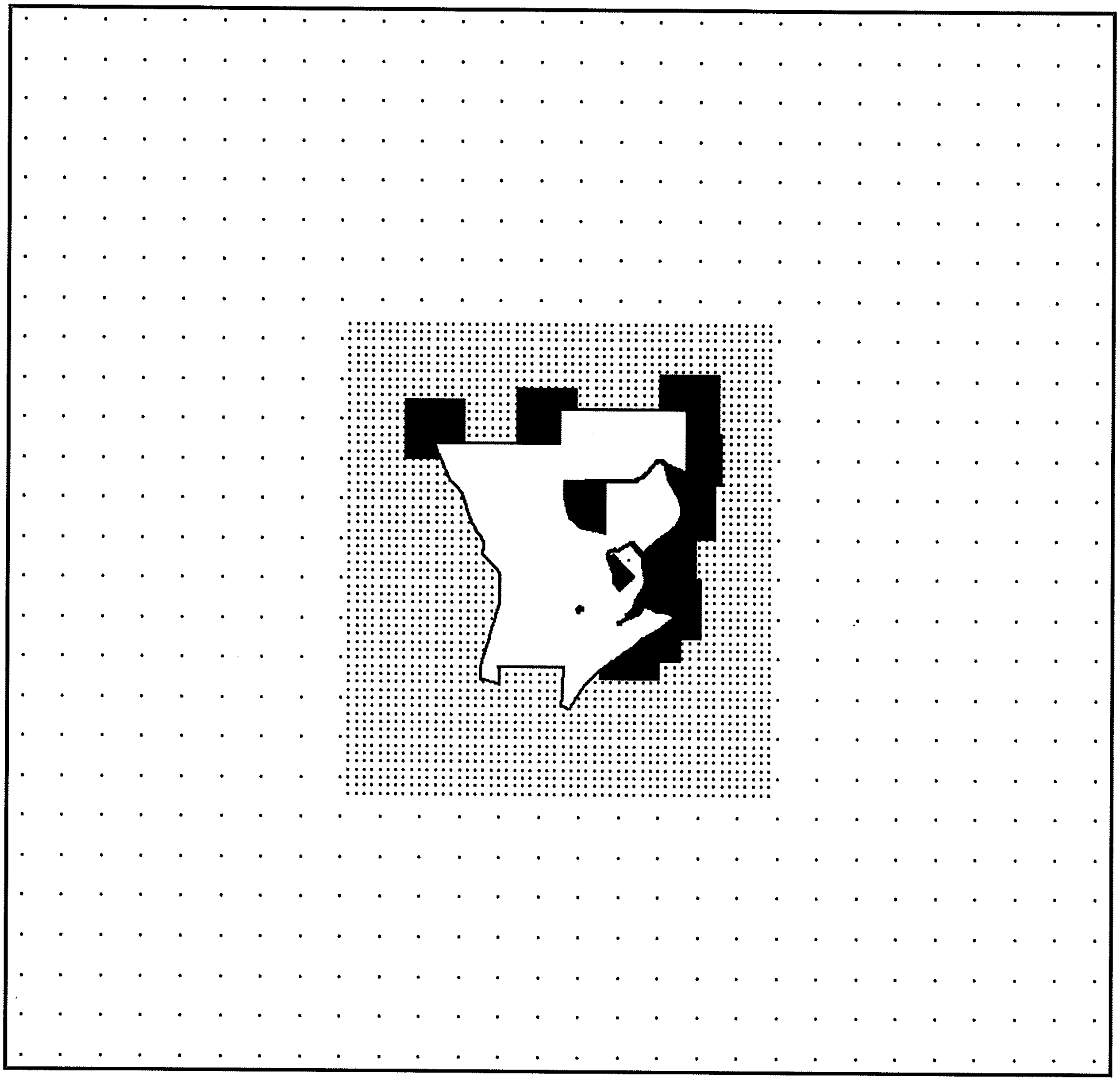
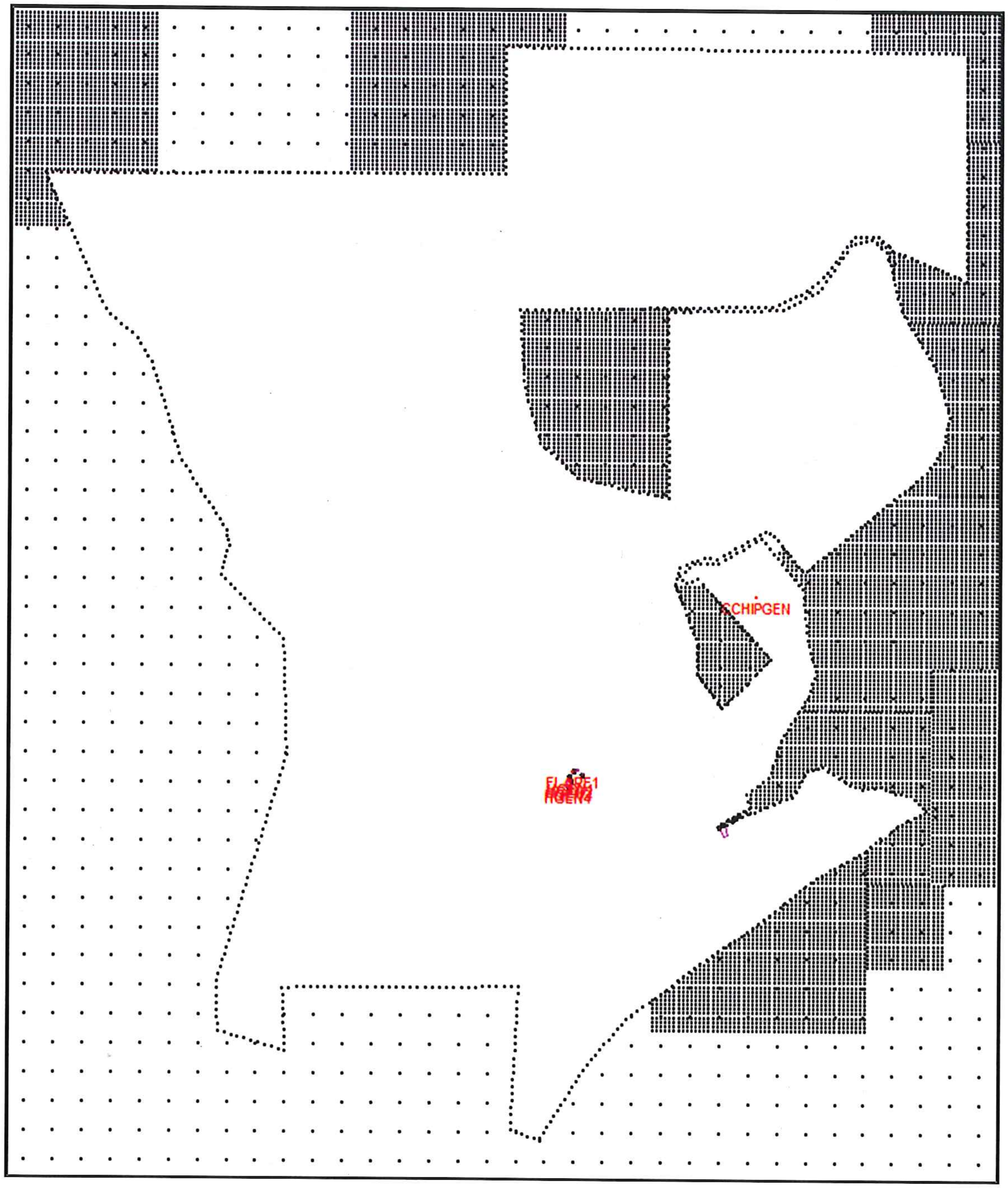


Figure 7. Close-up View of the Partial Ambient Air Boundary Receptors



3.2 Emission Rates

Emissions rates of criteria pollutants and TAPs for the ACLF and HHE sources were provided by the applicant for the applicable averaging periods. DEQ modeling review, described in this memorandum, did not include review of emissions rates for accuracy. Review and approval of estimated emissions was the responsibility of the DEQ permit writer.

3.2.1 Criteria Pollutant Emissions Rate

Table 8 lists criteria pollutant emissions rates used in the project-specific modeling analyses for 1-hour, 8-hour, and/or 24-hour averaging periods. The rates listed represent the maximum allowable rate as averaged over the specified period. Total NO_x emissions were modeled for compliance with the 1-hour NO_2 NAAQS, with the PVMRM algorithms accounting for NOx chemistry.

Table 8. SHORT-TERM ANALYSES
MODELED CRITERIA POLLUTANT EMISSIONS

Source ID	Description	Emission Rates (lb/hr[a])				
		NOx[b]	SO_2[c]	PM_{10}[d]	$PM_{2.5}$[e]	CO[f]
Scenario 1: 4,699 scfm LFG[g] flared						
FLARE1	Enclosed LFG Flare #1	3.04	14.11	1.60	1.60	0.76
FLARE2	Enclosed LFG Flare #2	3.12	14.47	1.64	1.64	0.78
CCHIPGEN	Contractor Diesel-fired Chipper Engine	22.66	0.01	0.41	0.39	6.02
Scenario 2: 1,200 scfm to two LFG generator engines and 3,499 flared						
HGEN1	LFG-fired Generator Engine	2.46	3.65	0.78	0.78	14.77
HGEN2	LFG-fired Generator Engine	2.46	3.65	0.78	0.78	14.77
FLARE1	Enclosed LFG Flare #1	3.04	14.11	1.60	1.60	0.76
FLARE2	Enclosed LFG Flare #2	1.54	7.17	0.81	0.81	0.39
CCHIPGEN	Contractor Diesel-fired Chipper Engine	22.66	0.01	0.41	0.39	6.02
Scenario 3: 2,400 to four LFG generator engines and 2,299 flared						
HGEN1	LFG-fired Generator Engine	2.46	3.65	0.78	0.78	14.77
HGEN2	LFG-fired Generator Engine	2.46	3.65	0.78	0.78	14.77
HGEN3	LFG-fired Generator Engine (new)	2.46	3.65	0.78	0.78	14.77
HGEN4	LFG-fired Generator Engine (new)	2.46	3.65	0.78	0.78	14.77
FLARE1	Enclosed LFG Flare #1	3.01	13.98	1.58	1.58	0.75
CCHIPGEN	Contractor Diesel-fired Chipper Engine	22.66	0.01	0.41	0.39	6.02

a. Pounds per hour.
b. Oxides of nitrogen, 1-hour averaging period.
c. Sulfur dioxide, 1-hour averaging period.
d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers, 24-hour averaging period.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers, 24-hour averaging period.
f. Carbon monoxide, 1-hour averaging period and 8-hour averaging period
g. Landfill gas.

Emissions from the periodic testing of two small emergency generator engines (source IDs GEN3 and GEN4), each less than 100 bhp) are intermittent sources that only operate on an infrequent basis. The internal combustion (IC) engines are only used for emergency conditions and during periodic operational testing. As such, these sources are difficult to model in a way that accounts for impacts in a reasonably accurate but conservative manner.

For air quality standards that use the maximum observed concentration or second highest concentration as the compliance design value, regulatory assessment of pollutant impacts from intermittent sources can be appropriately modeled assuming continual operation. This assumption is appropriate because the source could be reasonably expected to operate during worst-case conditions, and the highest impact is the value used to evaluate compliance. For NAAQS having an averaging period longer than 1 hour (e.g., 8-hour, 24-hour, or annual NAAQS), short-term emissions can often be smeared or distributed over the longer averaging period, calculating an average emissions rate for the period of interest.

The main challenge of accurately modeling intermittent sources to evaluate the potential for violating the 1-hour NO_2 NAAQS arises because of the probabilistic form of the standard. The probabilistic form of the NAAQS causes the operational frequency of an intermittent source to be a key consideration in the compliance evaluation. For example, if the only source at a facility is an intermittent source that operates once every quarter or four times per year, it is nearly impossible for the source to cause or contribute to a violation of the 1-hour NO_2 standard unless the background NO_2 concentration periodically exceeds the standard. For this example, the source does not operate frequently enough (four times each year) to impact the design concentration, which is the 3-year average of the 98^{th} percentile of the annual distribution of daily maximum 1-hour concentrations. The 1-hour NO_2 design value at any specific ambient air location is estimated through dispersion modeling by using the 5-year average of the eighth highest of the daily 1-hour maximum concentrations from each year. However, if the facility has additional substantial NO_2 sources of substantial magnitude, the contribution of the NO_2 emissions from even a very infrequent NO_2 source could measurably affect compliance with the 1-hour NO_2 NAAQS at some downwind locations.

Demonstrating NAAQS compliance for permitting purposes typically involves modeling permit allowable emissions over all allowable operation times, which often is continual operation (8,760 hours per year). If a source is allowed to operate during any particular hour of the year, then modeling is performed by assessing the impacts for each hour of the year. Modeling an intermittent source by assuming continual operation would artificially skew the distribution, thereby over-representing the source's impact. However, specific hours during which an intermittent source will operate are usually unknown.

The US Environmental Protection Agency (EPA) provided guidance on modeling intermittent NO_2 sources in a March 2011 memorandum from Tyler Fox, leader of the air quality modeling group, to regional air directors. The memo identifies the problem with modeling intermittent sources as continuous sources:

> We are concerned that assuming continuous operations for intermittent emissions would effectively impose an additional level of stringency beyond that intended by the level of the standard itself. As a result, we feel that it would be inappropriate to implement the 1-hour NO_2 standard in such a manner and recommend that compliance demonstrations for the 1-hour NO_2 NAAQS be based on emission scenarios that can logically be assumed to be *relatively continuous or which occur frequently enough to contribute significantly to the annual distribution of daily maximum 1-hour concentrations* [emphasis added]. EPA believes that existing modeling guidelines provide sufficient discretion for reviewing authorities to exclude certain types of intermittent emissions from compliance demonstrations for the 1-hour NO_2 standard under these circumstances.

DEQ developed a guidance policy in 2013 on modeling intermittent sources for compliance with the 1-hour NO_2 NAAQS. The following statement was taken from the policy:

> Upon a review of other states' application of the Tyler Fox memo, comments from the public and Idaho industry, an internal review of Idaho sources, NO_2 background levels, and various sample model runs, DEQ has determined that Nitrogen Oxides (NO_x) emissions from the intermittent operational testing of engines powering emergency generators or fire-suppression water pumps may be excluded from the project-specific significant impact level (SIL) analysis and the cumulative NAAQS analysis for 1-hour NO_2, providing the annual hours of operation from testing and maintenance are less than or equal to 100 hours.
>
> This determination is applicable to minor source air permitting projects and is not limited to any specific number of engines present at a facility. The Director may require deviation from this guidance if deemed appropriate to assure compliance with 1-hour NO_2 NAAQS and IDAPA 58.01.01.203 or 01.403. DEQ will determine how emergency engines are included in permits for

major sources, specifically those applicable to the Prevention of Significant Deterioration (PSD) program, on a case-by-case basis.

DEQ also determined that exclusion of ACLF emergency generator intermittent emissions of other criteria pollutants from NAAQS compliance demonstrations is appropriate. This was based on the magnitude of emissions, operational frequency, level of applicable standards relative to emissions, and the potential for public exposures.

Emission rates listed in Table 9 were modeled to demonstrate compliance with annual standards and were modeled for 8,760 hours per year in the Full ambient air boundary case and for 12 hours per day during normal business hours Monday through Saturday for the partial ambient air boundary case.

Table 9. ANNUAL AVERAGE ANALYSES MODELED CRITERIA POLLUTANT EMISSIONS

Source ID	Description	Emission Rates (lb/hr[a])	
		NOx[b]	$PM_{2.5}$[c]
Scenario 1: 4,699 scfm LFG[d] flared			
FLARE1	Enclosed LFG Flare #1	3.04	1.60
FLARE2	Enclosed LFG Flare #2	3.12	1.64
CCHIPGEN	Contractor Diesel-fired Chipper Engine	22.66	0.39
Scenario 2: 1,200 scfm to two LFG generator engines and 3,499 flared			
HGEN1	LFG-fired Generator Engine	2.46	0.78
HGEN2	LFG-fired Generator Engine	2.46	0.78
FLARE1	Enclosed LFG Flare #1	3.04	1.60
FLARE2	Enclosed LFG Flare #2	1.54	0.81
CCHIPGEN	Contractor Diesel-fired Chipper Engine	22.66	0.39
Scenario 3: 2,400 to four LFG generator engines and 2,299 flared			
HGEN1	LFG-fired Generator Engine	2.46	0.78
HGEN2	LFG-fired Generator Engine	2.46	0.78
HGEN3	LFG-fired Generator Engine (new)	2.46	0.78
HGEN4	LFG-fired Generator Engine (new)	2.46	0.78
FLARE1	Enclosed LFG Flare #1	3.01	1.58
CCHIPGEN	Contractor Diesel-fired Chipper Engine	22.66	0.39

a. Pounds per hour.
b. Oxides of nitrogen, annual averaging period.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers, annual averaging period.
d. Landfill gas.

3.2.2 TAP Emissions Rates

CH2M HILL modeled those TAPs where the increase in TAP emissions associated with the proposed modification exceeded the emissions screening levels (ELs) of Idaho Air Rules Section 585 and 586. Only emissions of carcinogenic compounds were expected to exceed ELs specified in Section 586. Emission rates were provided in the permit application's emission calculation spreadsheet. The TAP emissions listed in the table below were presented under tabs "G-5 Flare Toxics" and "Controlled Flares Toxics". The calculations were described as accounting for a total landfill gas flow rate of 4,699 scfm. Only flare emissions were accounted for in the modeled TAPs emissions, and this flow rate should be regarded as a conservative value because the pre-modification PTE had already been established at 3,350 scfm in PTC Number P-2009.0001 Project 60972, issued on September 28, 2012. The TAPs emissions associated with the increase between 3,350 scfm and 4,699 scfm of LFG are subject to Section 210 PTC review for this project. Therefore, the evaluation of TAPs compliance based on the entire requested LFG throughput to the flares is conservative.

TAPs emissions for the LFG generator engines and the diesel-fired contractor chipper engine are exempt from TAPs rules, per Section 210.20 of the Idaho Air Rules, and were not included in the TAPs analyses.

Table 10 provides modeled emissions rates for TAPs. Identical emission rates were modeled for the Full AAB and Partial AAB receptor grid cases.

Table 10. MODELED CARCINOGENIC TOXIC AIR POLLUTANTS EMISSIONS RATES

Pollutant	Chemical Abstract Service Number	Emission Source	
		FLARE1 (lb/hr)[a]	FLARE2 (lb/hr)
Scenario 1			
1,1,2,2 –Tetrachloroethane	79-34-5	1.15E-03	1.18E-03
1,1,2-Trichloroethane	79-00-5	8.20E-05	8.47E-05
Ethylidene dichloride (1,1-dichloroethane)	75-34-3	1.43E-03	1.48E-03
Vinylidene chloride	75-35-4	1.19E-04	1.23E-04
Acrylonitrile	107-13-1	3.11E-04	3.20E-04
Methylene chloride	75-09-2	7.47E-03	7.72E-03
Vinyl chloride	75-01-4	2.80E-03	2.92E-03
Benzene	71-43-2	7.99E-04	8.26E-04
Scenario 2			
1,1,2,2 –Tetrachloroethane	79-34-5	1.15E-03	5.87E-04
1,1,2-Trichloroethane	79-00-5	8.17E-05	4.27E-05
Ethylidene dichloride (1,1-dichloroethane)	75-34-3	1.43E-03[b]	7.32E-04[b]
Vinylidene chloride	75-35-4	1.19E-04	6.10E-05
Acrylonitrile	107-13-1	3.11E-04	1.59E-04
Methylene chloride	75-09-2	7.47E-03	3.84E-03
Vinyl chloride	75-01-4	2.80E-03	1.45E-03
Benzene	71-43-2	7.99E-04	4.09E-04
Scenario 3			
1,1,2,2 –Tetrachloroethane	79-34-5	1.13E-03	0
1,1,2-Trichloroethane	79-00-5	8.31E-05	0
Ethylidene dichloride (1,1-dichloroethane)	75-34-3	1.42E-03[b]	0
Vinylidene chloride	75-35-4	1.18E-04	0
Acrylonitrile	107-13-1	3.06E-04	0
Methylene chloride	75-09-2	7.40E-03	0
Vinyl chloride	75-01-4	2.79E-03	0
Benzene	71-43-2	7.92E-04	0

a. Pounds per hour.

b. These emissions were modeled for the 24-hr avg period rather than the annual averaging period in the submitted modeling.

3.3 *Emission Release Parameters*

Table 11 lists emissions release parameters for sources modeled. All emissions units were modeled as point sources with vertical and uninterrupted releases of the exhaust plumes to atmosphere. Three separate operating scenarios were modeled. Only the flare release parameters were affected by different levels of LFG feed rates.

DEQ issued a modeling protocol approval letter to Ada County on December 13, 2013, which included, in part, a request that the application contain documentation and justification for all stack parameters used in the modeling analyses, clearly showing how stack gas temperatures and flow rates were estimated.

Generally, the final modeling demonstrations used release parameters that appeared to be within normally expected ranges for the source types modeled. An October 23, 2014, email from CH2M HILL to DEQ contained attachments and embedded emails with pertinent exhaust parameter documentation for the two flares and the four LFG-fired generator engines. Support documentation for the diesel-fired contractor wood chipper generator engine was submitted in the initial April 29, 2014, permit application.

Landfill gas-fired generator engines
All LFG-fired generator sets were modeled with identical exhaust parameters. Ada County and CH2M HILL provided manufacturer's specification sheets for the Caterpillar 3520C LFG-fired engines. The 100% load values for exit temperature and flow rate were modeled. Stack height and diameter were confirmed by Fortistar-HHE as representative of point of release to atmosphere conditions.

The October 23, 2014, email submittal provided the support documentation for all four HHE generator engines. Substantiation was provided using the following: Fortistar Energy, HHE's test report for the February 5 and 6, 2013, testing of HGEN1 and HGEN2; the Caterpillar Corporation specification sheets for the Model 3520C CAT LFG-fired engine; Section 3.2 of the June 19, 2012, DEQ modeling memo for the most recent HHE permitting project; and, an email from Fortistar describing the exit diameter and release height of the existing and proposed generator engine exhaust stacks. An exhaust flow rate in units of dry standard cubic feet per minute (dscfm) was provided for each engine in the test. Stack diameter, stack height, exhaust moisture content, and stack pressure were not provided in the source test documentation. The EPA reference methods that determine the information necessary to accurately convert the flow from dry standard cubic feet per minute to the desired units of actual cubic feet per minute, wet basis, were not included in this performance test because they are outside of the scope of the required testing. A partial conversion to acfm, lacking pressure and moisture components, using only the effect of increase in volume at the modeled exit temperature of 898 °F versus standard temperature of 68 °F, yielded an exhaust flow rate value of 11,417 cubic feet per minute (cfm) for HGEN1 while combusting 598 dscfm of LFG, and 11,152 cfm for HGEN2 while combusting 602 dscfm of LFG. Although this is not an "apples to apples" comparison of source test and modeled exhaust flow rates, DEQ believes the modeled flow rates are relatively representative of actual rated capacity flow rates in unit of acfm, provided the exit temperature at the point of the exhaust release to atmosphere is accurate.

ACLF and Fortistar assert that the information provided in the Caterpillar specification sheet represent the exit temperature at release, which is 898°F. The specification sheet flow rate, in units of acfm, was listed as 12,476 acfm, wet basis, plus or minus 6%, at 100% load.

Table 1 – Stack Parameters – of the November 14, 2014 modeling report lists the orientation of the LFG-fired generator engine as vertical and capped. These sources were modeled as uninterrupted release points. Capping the stack or changing the release orientation to horizontal could substantially change impacts, thereby invalidating the impact analyses. However, use of a "flap" type rain cap on a hinged spring that moves out of the exhaust stream during engine operation does not restrict flow and would not change modeled impacts.

Flares 1 and 2
Exit velocities for the two flares (Model IDs FLARE1 and FLARE2) were scaled to landfill gas flow rates for each scenario. Flare exit temperatures were assumed to remain constant for each operating scenario.

The initial modeling submittal for this project appeared to be based on an October 15 and 16, 2008, performance test. From Table 1 of the test report the average exhaust gas flow rates for "Exhaust Gas," in units of "CFM," were 2,320 cfm for Flare 1 at a flare temperature of 1,456 degrees Fahrenheit (°F), and 2,379 cfm for Flare 2 at a flare temperature of 1,448 °F. The initial exhaust flow rate values were based on the flow rate of landfill gas to the flares in units of standard cubic feet per minute (scfm). The October

2008 performance test report did not present all information necessary to convert standard cubic feet per minute to actual cubic feet per minute.

The April 29, 2014, modeling demonstration was revised and superseded by subsequent modeling submittals. The November 14, 2014, and December 8, 2014, submittals use less conservative flow rates for Flares 1 and 2. Although less conservative than the initial flow rates, the revised flow rates are based on DEQ-approved performance test data where all parameters were monitored that allowed for calculation of an exhaust flow rate in units of actual cubic feet per minute, wet basis. Performance test summary data are contained in Attachment A of the November 14, 2014, revised modeling report submittal.

Flare exhaust parameters for the final modeling demonstration were established based on a New Source Performance Standard test (40 CFR 60 Subpart WWW) for testing conducted on March 14 and 15, 2007 on ACLF's Flare 1 and Flare 2. This test provided both standard and actual cubic feet per minute values for the exhaust flow rates. The average flow rates were calculated from three individual test runs with data obtained from test ports located in the flare jacket. The flare jacket essentially acts as a stack. There are three thermocouples located at different heights within the flare jacket to verify good combustion of the LFG is occurring. Notations on the Method 1 data collection chart indicate the test sampling port is located at a height of 5 feet from the top of the flare jacket.

The average exhaust flow rate for Flare 1 was 76,715 acfm at an average LFG flare input flow rate of 1,310.2 scfm. The average temperature at the sampling port was 1,492°F. The average temperature at the top thermocouple was 1,405°F. The average exhaust flow rate for Flare 2 was 81,295 acfm at an average LFG flare input flow rate of 1,315.7 scfm. The average temperature at the sampling port was 1413.2°F. The average temperature at the top thermocouple was 1,407.1°F.

A performance summary created by the enclosed flare manufacturer, John Zink, was included in Attachment B of the November 14, 2014, submittal. The performance summary datasheets confirmed Flares 1 and 2 stack release heights of 40 feet and exit diameters of 10 feet. At a landfill gas flow rate of 2,000 scfm and temperature of 1,400°F, the flow rate was estimated to be 111,114 acfm. This document also placed the sampling port at a height of 5 feet below the exit height of the flare shells. This indicates that ACLF used reasonably conservative flow rates in the final modeling demonstration.

DEQ concludes that the exhaust flow rates for the flares are conservative for the modeling demonstration and are appropriate values for this project's modeling demonstration. The flare exit temperatures used in the modeling are also appropriate for the modeling demonstration, reasonably reflect the conditions that exist at the point the exhaust is released to the atmosphere.

Contractor diesel-fired engine

Exhaust parameter support documentation was provided in Appendix J of the April 29, 2014, PTC application for the 990 horsepower contractor's chipper diesel-fired engine (model ID CCHIPGEN). This support documentation was the Caterpillar manufacturer specification data for a CAT 3412EDITA diesel-fired engine. The modeled exhaust flow rate was 3,439 actual cubic feet per minute, based on a 50 meter per second exit velocity and 8-inch diameter stack. This is a conservative value based on the CAT performance data sheet which listed an exhaust flow rate of 5,717 acfm and an exit temperature of 912°F. Stack height was not included in the supplied documentation, but DEQ contends the 6 foot above grade modeled release height represents a reasonable or conservative value.

DEQ determined the permit application provides adequate documentation of modeled release parameters, and those parameters are appropriate for all emission units represented in the modeling demonstration.

Table 11. EMISSIONS RELEASE PARAMETERS							
Release Point	Source Type	Source Location UTM[g] Coordinates, Zone 11, NAD83		Stack Height (m)[a] (ft)[b]	Modeled Diameter (m) (ft)	Stack Gas Temperature (K)[c] (°F)[d]	Stack Gas Flow Velocity (m/sec)[e] (ft/sec)[f]
		X- coordinate or Easting (m)[a]	Y-coordinate or Northing (m)				
Scenario 1							
FLARE1	Point	557,489.99	4,838,641.83	12.19 (40)	3.05 (10.0)	1084 (1492)	4.96 (16.3)
FLARE2	Point	557,494.64	4,838,635.18	12.19 (40)	3.05 (10.0)	1040 (1413)	5.26 (17.3)
CCHIPGEN	Point	558,118	4,839,245	1.83 (6)	0.20 (0.67)	768.7 (924.0)	50.0 (164.0)
Scenario 2							
HGEN1	Point	557,482.925	4,838,615.04	4.39 (14.4)	0.36 (1.20)	754.3 (898.0)	56.0 (183.6)
HGEN2	Point	557,479.776	4,838,607.42	4.39 (14.4)	0.36 (1.20)	754.3 (898.0)	56.0 (183.6)
FLARE1	Point	557,489.99	4,838,641.83	12.19 (40)	3.05 (10.0)	1084 (1492)	4.96 (16.3)
FLARE2	Point	557,494.64	4,838,635.18	12.19 (40)	3.05 (10.0)	1040 (1413)	2.61 (8.5)
CCHIPGEN	Point	558,118	4,839,245	1.83 (6)	0.20 (0.67)	768.7 (924.0)	50.0 (164.0)
Scenario 3							
HGEN1	Point	557,482.925	4,838,615.04	4.39 (14.4)	0.37 (1.20)	754.3 (898.0)	56.0 (183.6)
HGEN2	Point	557,479.776	4,838,607.42	4.39 (14.4)	0.37 (1.20)	754.3 (898.0)	56.0 (183.6)
HGEN3	Point	557,475.196	4,838,597.17	4.39 (14.4)	0.37 (1.20)	754.3 (898.0)	56.0 (183.6)
HGEN4	Point	557,472.064	4,838,589.82	4.39 (14.4)	0.37 (1.20)	754.3 (898.0)	56.0 (183.6)
FLARE1	Point	557,489.99	4,838,641.83	12.19 (40)	3.05 (10.0)	1084 (1492)	4.92 (16.1)
CCHIPGEN	Point	558,118	4,839,245	1.83 (6)	0.20 (0.67)	768.7 (924.0)	50.0 (164.0)

a. Meters.
b. Feet.
c. Kelvin.
d. Degrees Fahrenheit.
e. Meters per second.
f. Feet per second.
g. Universal Transverse Mercator

3.4 Results for Significant Impact Level Analyses

CH2M HILL did not perform Significant Impact Level (SIL) analyses for this project. DEQ's modeling protocol approval specifically requested facility-wide modeling (cumulative impact analyses) for NAAQS demonstrations associated with this project. Cumulative NAAQS impact analyses involved modeling the entire ACLF facility, consisting of Hidden Hollow Landfill and Hidden Hollow Energy sources, then adding a background concentration value to the result.

3.5 *Results for Cumulative Impact Analyses*

Table 12 provides results for the cumulative NAAQS impact analyses performed for criteria pollutants of 1-hour NO_2, 1-hour SO_2, 1-hour and 8-hour CO, 24-hour PM_{10}, 24-hour $PM_{2.5}$, and annual $PM_{2.5}$.

Modeling was not performed for the 3-hour average secondary SO_2 NAAQS. The 1-hour primary SO_2 NAAQS is substantially more stringent than the 3-hour average secondary SO_2 NAAQS, and DEQ did not require additional modeling to demonstrate compliance with the secondary 3-hour standard based upon compliance with the primary 1-hour standard.

The ambient impacts for the two ambient air boundary configurations are included in the results table below. The full ambient air boundary case includes impacts for receptors along and external to the Ada County Landfill property boundary, with modeled impacts that occur over all hours within a year. The partial ambient air boundary case includes impacts for receptors along the ambient air boundary and within the ACLF along roads and designated areas where the general public is allowed access during specified operating hours. Ambient impacts for the partial ambient air boundary configuration are disregarded for all periods where public access is prohibited. The higher impact for the two configurations is considered the "design value concentration" and is added to the background concentration to provide the total ambient impact for the facility to compare against the allowable NAAQS.

The ambient impacts presented in ACLF's modeling analyses for Operating Scenario 3, with the partial ambient air boundary configuration, were greater than other modeled scenarios for all pollutants and averaging periods except 1-hour SO_2 and 1-hour NO_2. These results are very conservative because they did not account for operational factors adjusting for ACLF business hours when modeling all pollutants other than 1-hour SO_2 and 1-hour NO_2. The values presented in the December 8, 2014, version of Appendix L-1 of the application are ACLF's final submittal of modeling analyses. ACLF demonstrated NAAQS compliance to DEQ's satisfaction, assessing impacts from four LFG-fired generator engines and two enclosed flares incinerating LFG at various load rates.

Table 12. RESULTS FOR CUMULATIVE IMPACT ANALYSES

Pollutant	Averaging Period	Modeled Design Value Concentration (µg/m^3)[a] Full Ambient Air Boundary (All Hours)	Modeled Design Value Concentration (µg/m^3)[a] Partial Ambient Air Boundary (Landfill Operating Hours)	Background Concentration (µg/m^3)	Total Ambient Impact for NAAQS Compliance (µg/m^3)	NAAQS[b] (µg/m^3)	Percent of NAAQS
Scenario 1							
$PM_{2.5}$[c]	24-hour	1.60[f]	**1.97**[f]	20	22.0	35	63%
	Annual	0.10[g]	**0.15**[g]	6.2	6.4	12	53%
PM_{10}[d]	24-hour	1.60[h]	**1.97**[h]	73	75.0	150	50%
NO_2[e]	1-hour	133.9[i]	**140.3**[i]	Included in model[j]	140.3	188	75%
	Annual	2.01[o]	**8.19**[o]	40	48.2	100	48%
SO_2[k]	1-hour	86.4[m]	**106.3**[m]	30.22	136.5	196	70%
CO[l]	1-hour	63[n]	**185**[n]	7,060	7,245	40,000	18%
	8-hour	13[n]	**38**[n]	2,100	2,138	10,000	21%
Scenario 2							
$PM_{2.5}$	24-hour	2.04[f]	**2.50**[f]	20	22.5	35	64%
	Annual	**0.17**[g]	0.15[g]	6.2	6.4	12	53%
PM_{10}[d]	24-hour	2.04	**2.50**[h]	73	75.5	150	50%
NO_2	1-hour	133.9[i]	**140.3**[i]	Included in model[j]	140.3	188	75%
	Annual	2.1[o]	**8.2**[o]	40	48.2	100	48%
SO_2	1-hour	96.2[m]	**107.5**[m]	30.22	137.7	196	70%
CO	1-hour	378[n]	**632**[n]	7,060	7,692	40,000	19%
	8-hour	82[n]	**83**[n]	2,100	2,183	10,000	22%
Scenario 3							
$PM_{2.5}$	24-hour	3.47[f]	**9.48**[f]	20	29.5	35	84%
	Annual	0.26[g]	**0.68**[g]	6.2	6.9	12	58%
PM_{10}	24-hour	3.47[h]	**9.48**[h]	73	82.5	150	55%
NO_2	1-hour	133.9[i]	**140.3**[i]	Included in model[j]	140.3	188	75%
	Annual	2.20[o]	**25.26**[o]	40	65.3	100	65%
SO_2	1-hour	**146.1**[m]	126.5[m]	30.22	176.3	196	90%
CO	1-hour	745[n]	**1340**[n]	7,060	8,400	40,000	21%
	8-hour	164[n]	**295**[n]	2,100	2,395	10,000	24%

a. Micrograms per cubic meter.
b. National ambient air quality standards.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
e. Nitrogen dioxide.
f. Modeled design value is the maximum 5-year mean of 8^{th} highest 24-hour values from each year of a 5-year meteorological dataset. The value used in the compliance demonstration is the highest 1^{st} high value of 5 individual years—a conservative approach.
g. Modeled design value is the maximum 5-year mean of annual average values from each year of a 5-year meteorological dataset.
h. Modeled design value is the maximum of 6^{th} highest 24-hour values from a 5-year meteorological dataset. The design value used in ACLF's demonstration was the highest 1^{st} high value out of 5 individual years of meteorological data—a conservative approach.
i. Modeled design value is the maximum 5-year mean of 8^{th} highest daily 1-hour maximum impacts for each year of a 5-year meteorological dataset.
j. Background NO_2 concentrations are included with the modeled output value. The individual hour background NO_2 values listed in Table 4 of this memorandum for a 24-hour period were used for the NAAQS analysis.
k. Sulfur dioxide.
l. Carbon monoxide.
m. Modeled design value is the maximum 5-year mean value of the 4^{th} highest maximum daily 1-hour impacts for each year of a 5-year meteorological dataset.
n. Modeled design value is the maximum 2^{nd} high impact out of five individual years of meteorological data. ACLF's modeling demonstration uses the maximum 1^{st} high impact out of five individual years of meteorological data—a conservative approach.
o. Modeled design value is the maximum 1^{st} high annual mean impact out of five individual years of meteorological data. ACLF's modeling used the 1^{st} high value based on a 5-year concatenated meteorological data file. Impacts are not near NAAQS and this will not affect the compliance status.

3.6 *Results for Toxic Air Pollutant Analyses*

All modeled TAPs impacts were below the applicable AAC and AACC increments of Idaho Air Rules Section 585 and 586. Emissions subject to TAPs rules and requiring modeling for compliance with TAP increments included emission increases for the two landfill gas flares (increasing allowable LFG combustion from 3,350 scfm to 4,699 scfm). TAPs emitted from internal combustion engines are exempted from modeling TAPs by Idaho Air Rules Section 210.20 if that source's TAPs emissions are regulated under a New Source Performance Standard or National Emission Standard for Hazardous Air Pollutants.

ACLF's TAPs modeling demonstration applied a conservative approach for modeling the flare emissions. Rather than modeling just the increase in TAPs emissions attributed to the increase in LFG combusted in the flares from 3,350 scfm to 4,699 scfm (1,349 scfm), ACLF's modeling demonstration accounts for the entire quantity of LFG for each of the 3 operating scenarios. The worst-case is Scenario 1 with 4,699 scfm total, with 2,320 scfm combusted in Flare 1 and 2,399 scfm in Flare 2. The analyses for Scenarios 2 and 3 account for lower TAPs emissions because less LFG is combusted in the flares for those scenarios, resulting in lower TAPs impacts than for Scenario 1. Table 14 presents the predicted ambient impacts for the TAPs modeling. The larger of the two ambient air receptor cases is regarded as the design concentration for the analyses and are presented in the table below.

All design value impacts occurred under Operating Scenario #1, where maximum emission rates for both flares operating at full capacity were modeled.

The modeling demonstration included modeled impacts for ethylidene dichloride. This project's emission rate of this chemical compound is 2.90E-03 lb/hr, per the November 14, 2014, Revised Modeling Report-Landfill Emissions Calculations – NMOC & TAP Emissions (Controlled H_2S) and Table 7. There is a non-carcinogen, dichloroethane, and a carcinogen, 1,1-dichloroethane, that share the chemical abstract service (CAS) #75-34-3. The impacts results table identifies "ethylidene dichloride" in the impacts result tables of Attachment G-2-Toxic Facility Wide Modeling Results. The November 14, 2014, submitted analyses modeled this TAP with a 24-hour averaging period. The screening emission rate limit (EL) for this chemical compound is 27 lb/hr. The emission rate of 2.90E-03 lb/hr is below the non-carcinogenic EL, thus modeling is not required for the non-carcinogenic compound.

The emission rate of 1,1-dichloroethane of 2.90E-03 lb/hr exceeds the 2.5E-04 lb/hr carcinogenic compound EL. Impacts for carcinogens are determined on an annual averaging period. The latest modeling did not contain annual averaging period modeling. DEQ performed verification runs for the Partial and Full ambient air boundary cases under Operating Scenario 1, which presents the maximum TAPs emissions rates for both flares. Scenarios 2 and 3 will produce lower impacts as evident from review of the impacts listed in Table 14. The verification analysis clearly demonstrates that the potential impacts for this pollutant are well below the allowable ambient carcinogenic increment.

Table 13. RESULTS FOR TOXIC AIR POLLUTANT ANALYSES						
Toxic Air Pollutant	**Chemical Abstract Service Number**	**Averaging Period**	**Maximum Modeled Concentration Partial Ambient Air Boundary[c] ($\mu g/m^3$)[a]**	**Maximum Modeled Concentration Full Ambient Air Boundary[d] ($\mu g/m^3$)**	**AACC Increment[b] ($\mu g/m^3$)**	**Percent of Increment**
Operating Scenario 1						
Ethylidene dichloride (1,1-dichloroethane)	75-34-3	Annual	6E-05[e]	**8E-05[e]**	3.8E-02	0.2%
1,1,2,2 –Tetrachloroethane	79-34-5	Annual	5.00E-05	**6.00E-05**	1.7E-02	0.4%
1,1,2-Trichloroethane	79-00-5	Annual	3.37E-06	**4.33E-06**	6.2E-02	0.007%
Vinylidene chloride	75-35-4	Annual	4.90E-06	**1.00E-05**	2.0E-02	0.05%
Acrylonitrile	107-13-1	Annual	1.00E-05	**2.00E-05**	1.5E-02	0.1%
Methylene chloride	75-09-2	Annual	3.10E-04	**3.90E-04**	2.4E-01	0.2%
Vinyl chloride	75-01-4	Annual	**3.00E-04**	1.50E-04	1.4E-01	0.2%
Benzene	71-43-2	Annual	3.00E-05	**4.00E-05**	1.2E-01	0.03%
Operating Scenario 2						
Ethylidene dichloride (1,1-dichloroethane)	75-34-3	Annual	<6E-05[e]	**<8E-05[e]**	3.8E-02	<0.2%
1,1,2,2 –Tetrachloroethane	79-34-5	Annual	4.00E-05	**5.00E-05**	1.7E-02	0.3%
1,1,2-Trichloroethane	79-00-5	Annual	3.06E-06	**3.59E-06**	6.2E-02	0.006%
Vinylidene chloride	75-35-4	Annual	1.92E-06	**1.00E-05**	2.0E-02	0.05%
Acrylonitrile	107-13-1	Annual	**1.00E-05**	**1.00E-05**	1.5E-02	0.07%
Methylene chloride	75-09-2	Annual	2.70E-04	**3.20E-04**	2.4E-01	0.1%
Vinyl chloride	75-01-4	Annual	1.00E-04	**1.20E-04**	1.4E-01	0.09%
Benzene	71-43-2	Annual	**3.00E-05**	**3.00E-05**	1.2E-01	0.03%
Operating Scenario 3						
Ethylidene dichloride (1,1-dichloroethane)	75-34-3	Annual	<6E-05[e]	**<8E-05[e]**	3.8E-02	<0.2%
1,1,2,2 –Tetrachloroethane	79-34-5	Annual	**2.00E-05**	**2.00E-05**	1.7E-02	0.1%
1,1,2-Trichloroethane	79-00-5	Annual	**2.63E-06**	1.24E-06	6.2E-02	0.004%
Vinylidene chloride	75-35-4	Annual	**2.43E-06**	1.81E-06	2.0E-02	0.01%
Acrylonitrile	107-13-1	Annual	**1.00E-05**	4.68E-06	1.5E-02	0.07%
Methylene chloride	75-09-2	Annual	**1.50E-04**	1.10E-04	2.4E-01	0.06%
Vinyl chloride	75-01-4	Annual	**6.00E-05**	4.00E-05	1.4E-01	0.04%
Benzene	71-43-2	Annual	**2.00E-05**	1.00E-05	1.2E-01	0.02%

a. Micrograms per cubic meter.
b. Acceptable ambient concentration for carcinogens as listed in Idaho Air Rules Section 586
c. Impacts at these receptors accounted for only during official operating hours of the landfill.
d. Impacts at these receptors are accounted for at all times.
e. DEQ sensitivity run ambient impact, highest 1[st] high value, annual averaging period.

3.7 DEQ Sensitivity Analyses

3.7.1 Emergency Generator Engine Testing

Emissions units identified as "GEN3" and "GEN4" are small emergency generator engines located at the Household Hazardous Waste Collection Building and the Scales Building, respectively. GEN3 is a 44 brake horsepower (bhp) diesel engine. GEN4 is an 80 bhp diesel engine. These emissions units were not modeled in the facility-wide impact analyses.

These units are exempted from the 1-hr NO_2 NAAQS demonstration for the testing and maintenance operations per DEQ policy unless DEQ's Director determines such sources must be included to assure NAAQS compliance. The 1-hour NO_2 SIL and NAAQS modeling exemption policy does not include an exemption from modeling for ambient standards of other pollutants.

The application's emission inventory provided the following emission rates at rated capacity. Annual emissions assumed 500 hours per year for operation due to testing and maintenance and incident operations. These points were considered in decision not to require modeling for these emergency generator engines.

- GEN3 emits 0.13 lb/hr and 65 lb/year of PM_{10} and $PM_{2.5}$. For one hour of testing and maintenance operation averaged over 24 hours per day for a 24-hour NAAQS, this equates to 0.0054 lb/hr as a modeling emission rate.
- GEN4 emits 0.20 lb/hr and 100 lb/year of PM_{10} and $PM_{2.5}$. For one hour of testing and maintenance operation averaged over 24 hours per day for a 24-hour NAAQS, this equates to 0.0054 lb/hr as a modeling emission rate.
- Potential SO_2 emissions are limited to 0.0006 lb/hr for GEN3 and 0.0010 lb/hr and for GEN4 using Ultra Low Sulfur distillate fuel, so there would be little effect on 1-hour average SO_2 impacts.
- Potential CO emissions are 0.40 lb/hr for GEN3 and 0.62 lb/hr for GEN4. The margin of compliance with the 1-hour and 8-hour CO NAAQS is large.
- Annual emissions of all criteria pollutants for the 500 hour per year limitation are low enough to conclude there will be negligible effect on annual NAAQS compliance for emission rates that are averaged over 8,760 hours per year for any annual ambient standard.

Testing and maintenance operations which are limited to a short duration of one hour or less will minimize the ambient impacts from these engines. 24-hour average $PM_{2.5}$ and PM_{10} NAAQS demonstrations account for the duration of typical testing of emergency generator engines. If the emergency generator engines are run for a single hour for testing and maintenance, an average hourly emission rate that reflects the total daily emissions spread over the 24-hour averaging period greatly reduces the impacts attributed to these sources, thereby reducing the likelihood of any issues for compliance with those NAAQS.

CH2M HILL, with consultation with ACLF, confirmed that these engines are considered emergency generator engines with typical testing and maintenance operations of 1 hour or less per day (E-mail from Rick McCormick, CH2M HILL to Darrin Mehr, DEQ, dated October 20, 2014). The pertinent text of the email is provided below:

> "Regarding the first topic for the emergency generators, we confirmed with Ada County that any testing and/or maintenance can be limited to 1-hr. The run-times are short for testing and maintenance (each less than 1-hr). For any oil-change or coolant maintenance, the engine is not operating. Please establish enforceable permit conditions for each emergency generator limited to 1-hr for maintenance and testing."

The highest 24-hour $PM_{2.5}$ and PM_{10} ambient impacts presented in the ACLF modeling demonstration were predicted to occur using the partial ambient air boundary for Scenario 3 (all 4 LFG-fired generator sets at full capacity and FLARE1 at 2,299 scfm, or 99% of requested capacity). These impacts were high due to a conservative approach of not applying operational factors for operation of sources only during ACLF business hours. To resolve any question on the margin of compliance with PM_{10} and $PM_{2.5}$ NAAQS for Operating Scenario 3—Partial AAB, DEQ conducted a sensitivity run to identify the ambient impacts of the facility-wide emissions with the appropriate operational factors, the design values allowed by EPA policy, and a 5-year concatenated meteorological data set. The results are listed in Table 14.

Table 14. OPERATING SCENARIO 3 PARTIAL AMBIENT AIR BOUNDARY IMPACTS FOR PM_{10} and $PM_{2.5}$						
Pollutant	Averaging Period	Modeled Design Value Concentration For Entire Project (µg/m³)[a]	Impact Rank	Design Impact Plus Background (µg/m³)	NAAQS[f] (µg/m³)	Impact Contribution to the Design Concentration Available to GEN3 and GEN4 (µg/m³)
$PM_{2.5}$[c]	24-hour	1.27	8th high[e]	1.27 + 20 = 21.3	35	13.7
PM_{10}[d]	24-hour	2.96	6th high[e]	2.96 + 73 = 76.0	150	74

a. Micrograms per cubic meter.
b. Universal Transverse Mercator coordinates, given in meters.
c. Particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers.
d. Particulate matter with an aerodynamic diameter less than or equal to 10 micrometers.
e. Run with a 5-year concatenated meteorological data file.
f. National Ambient Air Quality Standards.

Based on the size of these generator engines, consideration of ACLF's testing and maintenance operations, and the margin of compliance with NAAQS not covered by an exemption policy, DEQ determined additional modeling analyses were not warranted.

3.7.2 Carcinogenic TAP Compliance

DEQ performed a verification analysis for the carcinogenic TAP increment for ethylidene dichloride—also referred to as 1,1-dichloroethane, CAS #75-34-3, which had been evaluated with a 24-hour averaging period instead of an annual averaging period. Dichloroethane is a non-carcinogenic TAP with the same CAS identification number. ACLF's submitted modeling analyses for other TAPs clearly showed that modeling only Operating Scenario 1 would be necessary to assess worst-case ambient impacts and confirm that the project's impacts were well below the increments. Both flares operating at requested capacity are reflected in Operating Scenario 1. Flaring operations—and thus, emissions—are reduced for Scenarios 2 and 3. The results of the verification analysis confirmed annual average impacts were well below the allowable increment and are listed below in Table 15.

Table 15. Ethylidene Dichloride Verification Run Ambient Impacts							
Operating Scenario/ Receptor Grid	Averaging Period	AACC[a] (µg/m³)[b]	Modeled Design Value Concentration (µg/m³)	Impact Rank	Receptor UTM[c] Coordinates, Zone 11		
					X-Easting (m)[d]	Y-Northing (m)	Receptor Elevation (m)
Scenario 1 / Partial AAB Grid	Annual	3.8E-02	6E-05	1st High	558,004.00	4,838,455.00	921.41
Scenario 1 / Full AAB Grid	Annual	3.8E-02	8E-05	1st High	558,662.62	4,838,209.27	946.98

a. Acceptable ambient concentration for carcinogens.
b. Micrograms per cubic meter.
c. Universal Transverse Mercator coordinates.
d. Meters.

4.0 Conclusions

The ambient air impact analyses demonstrated to DEQ's satisfaction that emissions from the proposed project will not cause or significantly contribute to a violation of any ambient air quality standard.

APPENDIX C – FACILITY DRAFT COMMENTS

The following comments were received from the facility on October 6, 2014:

Facility Comment: In Permit Condition 2.1, Hidden Hollow Energy, LLC may operate up to four landfill gas (LFG) engines. Only two are installed currently.

DEQ Response: The Permit Condition has been revised to reflect the current operating scenario.

Facility Comment: In Permit Condition 2.3, the H_2S limit should be 600 ppm.

DEQ Response: The Permit Condition has been revised to reflect that the H_2S concentration of the landfill gas shall not exceed 600 ppm. Modeled concentrations reflect this limit.

Facility Comment: In Permit Condition 2.12, recommend using the word "validated" instead of "calibrated" concerning the H2S analyzer. The analyzer does not have the ability to be field calibrated. It is factory calibrated when new, and can only be "validated" in the field using calibration gas cylinders. It has an automatic validation function built in, so the validation test interval can be set to any length of time, and the validation is automatically run and recorded. If there is a problem detected during validation, an alert can sent to the operator. With this type of analyzer, the calibration does not drift. If the validation is negative, then the unit needs repair and has to be sent to the factory, and a backup analyzer used (GEM unit in this case).

DEQ Response: The Permit Condition has been revised to state the H_2S analyzer be validated no less than quarterly.

Facility Comment: In Permit Condition 6.1, Hidden Hollow Energy, LLC may operate up to four landfill gas (LFG) engines. Only two are installed currently.

DEQ Response: The Permit Condition has been revised to reflect the current operating scenario.

Facility Comment: In Permit Condition 6.3, the H_2S limit should be 600 ppm.

DEQ Response: The Permit Condition has been revised to reflect that the H_2S concentration of the landfill gas shall not exceed 600 ppm. Modeled concentrations reflect this limit.

Facility Comment: In Permit Conditions 7.1 and 8.1, Hidden Hollow Energy, LLC may operate up to four landfill gas (LFG) engines. Only two are installed currently. LFG engines 3 and 4 will be manufactured after July 1, 2010 and have yet to be installed.

DEQ Response: The Permit Conditions have been revised to reflect the current operating scenario.

Facility Comment: In the Statement of Basis under Permitting History, on March 1, 2010 Hidden Hollow Energy, LLC proposed four landfill gas (LFG) engines. Only two are installed currently.

DEQ Response: The Statement of Basis has been revised to reflect the current operating scenario.

Facility Comment: In the Statement of Basis under Permit Conditions Review, Permit Conditions 2.3 and 6.3 should be changed to an H_2S concentration of 600 ppm.

DEQ Response: The Statement of Basis has been revised to reflect the H_2S concentration of 600 ppm.

APPENDIX D – PROCESSING FEE

PTC Fee Calculation

Instructions:
Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

Company:	**Ada County Landfill**
Address:	**10300 North Seamans Gulch Road**
City:	**Boise**
State:	**Idaho**
Zip Code:	**83714**
Facility Contact:	**Dave Logan**
Title:	**Director**
AIRS No.:	**001-00195**

N	Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N
Y	Did this permit require engineering analysis? Y/N
N	Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	7.4	0	7.4
SO_2	36.0	0	36.0
CO	126.7	0	126.7
PM10	5.5	0	5.5
VOC	0.0	7.87	-7.9
TAPS/HAPS	39.0	0	39.0
Total:	0.0	7.87	**206.6**
Fee Due	**$ 7,500.00**		

Comments: