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DEC 14 2011
DEPARTMENT OF ENVIRONMENTAL QUALITY
STATE A Q PROGRAM

CH2MHILL® TRANSMITTAL

To: IDEQ

From: Ada County Solid Waste Management

Attn: Air Quality Program

Date: December 14, 2011

Re: Ada County Landfill Permit-to-Construct Application

We Are Sending You:

Method of shipment: hand delivery

☐ Attached

☐ Under separate cover via

☒ Documents

☐ Copies

☐ Drawings

☐ Specifications

☒ Other:

Quantity	Description
1	PTC Application including DEQ forms, process flow diagram, emission estimates, air dispersion modeling summary
1	PTC application along with emission estimate spreadsheets

If the material received is not as listed, please notify us at once.

Remarks: Ada County Solid Waste Management will submit the application fee on or around December 21, 2011.

Copy To:

Permit to Construct Modification Application
Ada County Landfill

RECEIVED
DEC 14 2011
DEPARTMENT OF ENVIRONMENTAL QUALITY
STATE A Q PROGRAM

Prepared for

Ada County Commissioners

Submitted to

Idaho Department of Environmental Quality

December 2011

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Contents

1 Introduction

Ada County Solid Waste Management Department (Ada County) is requesting a modification to their existing air quality Permit-to-Construct (PTC) No. P-2009.0001 in accordance with Idaho Administrative Procedures Act (IDAPA) 58.01.01.200. The request for a PTC modification is a result of increased levels of hydrogen sulfide (H_2S) concentrations in the landfill gas (LFG) at the Ada County Landfill (ACLF).

LFG is a natural byproduct produced from decomposition of organic material from municipal solid waste and is comprised of methane, carbon dioxide, and trace amounts of nonmethane organic compounds (NMOC) including H_2S.

Sulfur dioxide (SO_2) emissions are dependent on the amount of sulfur entering in the gas stream, typically in the form of H_2S. The operating assumption for the ACLF is that 100% of the H_2S will oxidize into SO_2 when mixed with oxygen.

On June 22, 2010, the Environmental Protection Agency (EPA) published a new 1-hour SO_2 National Ambient Air Quality Standard (NAAQS) in the Federal Register. The standard was adopted by the Idaho Department of Environmental Quality (IDEQ) and became effective in the State of Idaho on January 1, 2011.

The objective of this PTC modification is to establish a maximum hydrogen sulfide (H_2S) concentration in parts per million (ppm) based on the 1-hour SO_2 NAAQS assuming 100% conversion of H_2S oxidized to SO_2.

Additionally, Ada County is requesting that the PTC modification requirements to attain compliance with the new SO_2 1-hour National Ambient Air Quality Standard (NAAQS) of 196 milligrams per cubic meter (mg/m^3) be incorporated into the Tier I Operating Permit (Permit No. T1-060050) in accordance with IDAPA 58.01.01.209.05.c. ACLF currently maintains a Tier I Operating Permit and is classified as a Title V facility.

Idaho Department of Environmental Quality (IDEQ) PTC application forms are included in Appendix A.

2 Process Description

The ACLF is located at 10300 North Seaman's Gulch Road, Boise, Idaho. The facility covers approximately 2,700 acres of land located about 6.5 miles northwest of Boise, Idaho in an attainment area for all criteria pollutants. The ACLF is comprised of the Hidden Hollow Landfill (HHLF) cell and North Ravine Cell (NRC). The HHLF cell encompasses an area of approximately 110 acres with design capacity of 16 million cubic yards and is anticipated to be closed in 2020. The NRC encompasses an area of approximately 260 acres and has a design capacity of 70 million cubic yards and an active life of approximately 90 years. The NRC began accepting municipal solid waste in 2007.

The ACLF operates six stationary emission units, two enclosed flares and four diesel generators. The flares are used as emission control devices to destroy NMOCs at temperatures between 1,400 to 1,800 degrees Fahrenheit and are currently permitted not to exceed flow rates of 2,320 cfm and 2,379 cfm for Flare 1 and Flare 2, respectively. LFG is drawn through a gas collection system under vacuum to the flare control system. Thermocouple sensors 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 ACLF proposes to demonstrate compliance with the new 1-hour SO_2 regulatory standard by establishing a maximum H_2S concentration limit at the main gas collection header. In order to operate below this H_2S limit, ACLF is requesting a limit on the potential LFG flow rate that may be emitted through both flares based on modeling. The current ACLF air permit is based on a potential landfill gas flow rate of 4,699 cfm that may be emitted through both flares.

Hidden Hollow Energy, LLC (HHE) currently utilizes LFG to operate two generators to produce electrical energy with plans to bring two more additional generators on-line in 2012. Fortistar is entirely independent from Ada County Landfill and operates under a separate air quality permit.

Currently, actual LFG flow rate is in the range of 2,400 to 2,700 scfm monitored at the main gas collection header. Actual operations consist of approximately 1,100 scfm of LFG being distributed to the HHE generators (each engine with a rated flow rate of 550 scfm) and the remaining 1,600 scfm directed to the ACLF flares.

Actual LFG flow rates have increased as a result of the well head adjustments. Furthermore, an additional 66 LFG wells are proposed to be installed in the HHLF Cell beginning in the Fall of 2011. Once these additional wells are connected to the gas collection system, an additional increase in LFG flow is expected. Therefore, in anticipation of an expected near term increase in LFG flow, Ada County may need to operate the two flares concurrently, if additional flare capacity is needed. The flares can be operated individually, or concurrently. Propane-fired pilots provide for auto-ignition startup of the LFG flares. Sensors (thermocouples) in the flare stack continuously monitor flare operation. In the event the flame goes out, the integrated control system shuts down the exhausters. Note that these flares are an enclosed – or shielded – type where the flame is not visible under normal operation. System operators are also able to monitor the presence of the flame through sight glasses. In addition, the Start-Up, Shutdown, Malfunction (SSM) Plan will be amended as well to account for this change in operations.

In addition to maintaining two LFG flares, ACLF operates two stationary diesel generators which are used to power the scrap/waste wood chipping operations, and two emergency backup generators for the Scale House and the Household Hazardous Waste facility. The ACLF generators are to use ultra low sulfur diesel (ULSD) containing 15 ppm sulfur. Generator 1 is a 650-horsepower (HP) Caterpillar ® genset which powers the wood chipper. Generator 2 is a 106-HP Deutz ® genset which powers the wood screen. Generator 3 is a 44-HP Detroit Diesel ® genset which provides emergency backup power to the Household Hazardous Waste Facility. Generator 4 is a 80-HP Kohler ® genset with a John Deere ® engine which provides emergency backup power to the Scale House. The two non-emergency generators are permitted to run a maximum of 3,300 hours per any consecutive 12-month period in accordance with permit condition 3.6, PTC No. P-2009.0001. The two emergency backup generators are included in the facility wide emission inventory. PTC exemptions were included for emergency generators 3 and 4 in the Title V renewal application dated October 2011. The ACLF viewed the two emergency generators as separate projects as determined from the installation dates. The PTC exemption determination for emergency generators 3 and 4 are provided in Appendix B.

A scaled plot plan showing property boundary and emission unit locations are included in Figures 1, 2, and 3. A process flow diagram is provided in Appendix C.

Proposed Changes

Based on modeling conducted by IDEQ (see Section 4), the ACLF is requesting a maximum LFG H_2S concentration limit of 600 ppm and a potential LFG flow rate not to exceed 3,350 scfm. The H_2S concentration and flow rate will be monitored in the main LFG header prior to being distributed to the Fortistar generators and the ACLF flares destruction device. Proposed operating conditions include:

Flare No. 1 :

- Maximum LFG flow of 2,320 scfm
- 8,760 hours per year operation

Flare No. 2 :

- Maximum LFG flow of 2,379 scfm
- 8,760 hours per year operation

Flares No.1 and No.2:

- Maximum LFG flow of 3,350 scfm

Generator No. 1 (Caterpillar):

- Maximum annual operation of 3,300 hours

- Operation only during normal business hours (7:00 AM to 6:00 PM Monday through Friday, 8:00 AM to 6:00 PM Saturday, closed Sunday)
- ULSD containing 15 ppm sulfur will be proposed as a new operational permit condition

<u>Generator No. 2 (Deutz):</u>

- Maximum annual operation of 3,300 hours
- Operation only during normal business hours (7:00 AM to 6:00 PM Monday through Friday, 8:00 AM to 6:00 PM Saturday, closed Sunday)
- ULSD containing 15 ppm sulfur will be proposed as a new operational permit condition

<u>Generator No. 3 (Detroit Diesel):</u>

- Emergency backup generator for Household Hazardous Waste facility
- Maximum annual operation of 500 hours
- Operation only during normal business hours (7:00 AM to 6:00 PM Monday through Friday, 8:00 AM to 6:00 PM Saturday, closed Sunday)
- ULSD containing 15 ppm sulfur will be proposed as a new operational permit condition

<u>Generator No. 4 (John Deere):</u>

- Emergency backup generator for Scale House
- Maximum annual operation of 500 hours
- Operation only during normal business hours (7:00 AM to 6:00 PM Monday through Friday, 8:00 AM to 6:00 PM Saturday, closed Sunday)
- ULSD containing 15 ppm sulfur will be proposed as a new operational permit condition

3 Emission Estimates

SO_2 criteria pollutant emission estimates for the combustion of LFG have been prepared assuming a target H_2S concentration limit of 600 ppm and a potential LFG flow rate of 3,350 scfm distributed to the flares. SO_2 emission rates are derived from H_2S concentrations in the LFG (assuming 100% conversion of H_2S to SO_2). SO_2 is not destroyed in the flares so it is assumed that all of the SO_2 generated is released into the atmosphere as uncontrolled emissions. The ACLF gas collection system is currently engineered and permitted at a minimum of 85% collection efficiency. Therefore, the SO_2 emission calculation reflects an 85% gas system collection efficiency.

Additionally, there are no controls for the four diesel generators located at the ACLF. However, emission calculations have been revised for the generators using ULSD fuel containing 15 ppm sulfur. The potential SO_2 emission calculations for the two flare emission units and the four diesel generators are presented in Appendix D. An electronic copy of these emission estimates are also provided on a CD and included with this application.

No toxic air pollutant modeling is proposed for this PTC modification. The increase in the H_2S concentration resulted in an increase in the H_2S emission rate. However, the resulting H_2S emission rate is below the Idaho H_2S emission screening level (refer to H_2S emission calculations in Appendix D).

4 Dispersion Modeling

The IDEQ performed ambient air dispersion modeling for both the ACLF and HHE for quality assurance to ensure assumptions and modeling inputs are consistent. Based on modeling results reported to the ACLF from IDEQ on November 28, 2011, the ACLF will limit the LFG H_2S concentration not to exceed 600 ppm and limit the potential LFG flow rate not to exceed 3,350 scfm for the two flares (assuming the HHE generators are not operating). IDEQ modeling results are provided in Appendix E.

The flares height, diameter, and exhaust flowrate, were provided by manufacturer specification sheets (John Zinc). Generator operating conditions, fuel usage, and stack parameters were taken from manufacturer data sheets for similar generators based on similar horsepower ratings. Manufacturer physical specifications were submitted with the modeling protocol for IDEQ review and are included for reference in Appendix F.

The Ambient air is defined as the portion of the landfill property not accessible to the general public. During normal business hours (7:00 AM to 6:00 PM Monday through Friday, 8:00 AM to 6:00 PM Saturday, closed Sunday), the eastern side of the ambient air boundary was defined as the haul roads and the active portion of the landfill cell as well as the future landfill cell. The southeast portion of the property boundary is defined as Seamans Gulch Road. Hiking trails for general public in the northwest portion of the property are excluded from the ambient air boundary. The rest of the ambient air boundary is defined as the fenceline running along the property boundary (see Figure 2).

During non-business hours, the ambient air boundary is defined by the property boundary excluding the hiking trails in the northwest portion of the property (see Figure 3). No trespassing signs as well as landfill traffic signs are distributed throughout the property and along property boundaries.

A summary of the SO_2 modeling results are included in Table 4-1. Modeling files and final emission estimates are included in the enclosed CD.

TABLE 4-1

IDEQ Modeling Analysis Summary for the ACLF

H2S Concentration (PPMV)	LFG Flow to Flares (scfm)	Full Impact Analysis – Public Access (ug/m^3)	Full Impact Analysis – Non-business Hours (ug/m^3)	Background Concentration (ug/m^3)	Total Ambient Impact – Public Access (ug/m^3)	Total Ambient Impact – Non-business Hours (ug/m^3)
46.9	4,699	---	---	33.1	---	---
180	3,350	32.5	45.3	33.1	65.6	78.4
600	2,700	---	---	33.1	---	---
600	3,350	108	151	33.1	141.1	184.1
600	4,699	149	259	33.1	182.1	292.1

5 Compliance Monitoring

In order to demonstrate compliance with the proposed H_2S limit of 600 PPMV, ACLF is proposing a monitoring program detailed below. The monitoring program will begin once ACLF is issued a final PTC from IDEQ. H_2S monitoring for the ACLF will be collected with a hand held H_2S monitor at the Nova Panel. The H_2S monitor will be maintained and calibrated based upon manufacturer recommendations.

1. Daily monitoring (3 reading average) – proposed 4 week (Monday through Friday) monitoring, minimum three times a day. ACLF will report the average H_2S reading from the three measurements once per day. The H_2S will be collected at various times throughout the work day to establish a "peak time of day" where the H_2S concentration is the highest. Initially, monitoring should be collected during the hottest part of the day and within two hours (before and after) of the hottest part of the day. Daily monitoring will be collected at the peak time interval once it is established. If, during the 4 weeks of monitoring, the ACLF shows NO average exceedances of 600 PPM H_2S limit, the ACLF will begin daily monitoring describe in step 2 below.

2. Daily monitoring (one peak reading) – proposed 4 week (Monday through Friday) monitoring, minimum one time a day during the peak time. If, during the following 4 weeks of monitoring, the ACLF shows NO exceedances of 600 PPM H_2S limit, the ACLF will begin weekly monitoring describe in step 3 below. If there is an exceedance of the 600 PPM H_2S limit, the ACLF will record the exceedance in there monitoring log and take corrective measures to reduce the H_2S concentration. ACLF will then revert back to the daily monitoring in step 1.

3. Weekly monitoring – proposed monitoring if the ACLF shows compliance with step 1 and 2 above. A single monitoring event will occur during the work week (Monday through Friday) during the peak time. If there is an exceedance of the 600 PPM H_2S limit, the ACLF will record the exceedance in their monitoring log and take corrective measures to reduce the H_2S concentration. The ACLF will then revert back to the daily monitoring in step 1.

Records shall include the results of each H_2S measurement and the calculated average of the three separate H_2S measurements used to determine compliance with the H_2S concentration limit described in step 1.

6 Regulatory Analysis

ACLF will comply with the applicable Idaho air quality regulations codified in Idaho Administrative Procedure Act (IDAPA) 58.01.01, as well as US Environmental Protection Agency (EPA) Federal regulations summarized below in Table 6-1. A separate federal regulatory analysis has bee prepared for the two non-emergency diesel generators (GEN1 and GEN2) that power the ACLF wood chipping operations in Appendix G. The federal regulatory review for the two emergency diesel generators (GEN3 and GEN4) are provided in Appendix B.

TABLE 6-1
Regulatory Analysis, Ada County Landfill Gas Flares and Diesel Engine Generators

Regulation (State and Federal)	Regulatory Title	Description
IDAPA 58.01.01.157	Performance Testing	LFG Flare emissions performance testing was completed in March 2007 for flares 1 and 2. The facility is currently in compliance with this requirement.
IDAPA 58.01.01.786	Prevent Excessive Emissions of Particulate Matter from Incinerators	Emission limits of PM are assumed to equal PM_{10}. Compliance has been previously demonstrated.
IDAPA 58.01.01.577	Ambient Air Quality Standards for Specific Air Pollutantants	Modeling analysis demonstrates compliance with the 1-hr SO_2 regulatory limit.
IDAPA 58.01.01.625	Visible Emissions Limitations	Each flare and diesel engine generator exhaust stack are subject to this standard.
IDAPA 58.01.01.676-677	Fuel Burning Equipment	The diesel engine generators are subject to this standard. However, the flare system is not fuel burning equipment as defined in IDAPA 58.01.01.006, and is not subject to this standard. Therefore, ACLF is requesting to remove the opacity monitoring requirement from the existing PTC.
IDAPA 58.01.01.859	Standards of Performance for MSW Landfills	The Ada County Landfill constructed the North Ravine Cell after May 30, 1991 and is subject to this standard.
40 CFR 52.21	Prevention of Significant Deterioration (PSD)	The PSD rules found at 40 DFR 52.21 and IDAPA 58.01.01.205 do not apply to the landfill as the regulated pollutants in the section, after controls, do not equal or exceed the major stationary source threshold of 250 tons per year (40 CFR 52.21(b)(1)(i)(b)).

TABLE 6-1
Regulatory Analysis, Ada County Landfill Gas Flares and Diesel Engine Generators

Regulation (State and Federal)	Regulatory Title	Description
40 CFR 60.18	New Source Performance Standards (NSPS)	Flare is defined in 40 CFR 60 Subpart WWW as an open combustor without enclosure or shroud. The ACLF currently uses two enclosed blower-assisted flares. They are enclosed combustors and not subject to the requirement. Enclosed combustor is defined in 40 CFR 60 Subpart WWW as meaning an enclosed firebox which maintains a relatively constant limited peak temperature generally using a limited supply of combustion air. An enclosed flare is considered an enclosed combustor.
40 CFR 60.18	Subpart A -General Provisions	The flare requirements apply to open flare systems. Ada County Landfill's two existing enclosed flares are not subject to the provisions.
40 CFR 60 Subpart WWW	Standards of Performance for Municipal Solid Waste Landfills	Applies to municipal solid waste landfills that commenced construction, reconstruction or modification on or after May 30, 1991. Therefore, ACLF is subject to this subpart. The landfill operation at the ACLF is subject to 40 CFR 60 Subpart A General Provisions.
40 CFR 63 Subpart AAAA	NESHAP for Municipal Solid Waste Landfill	The ACLF has accepted waste since November 8, 1987 and is an area source landfill that has a design capacity equal to or greater than 2.5 million megagrams and 2.5 million cubic meters. Therefore, ACLF is subject to this subpart. A written Startup, Shutdown, Malfunction (SSM) Plan is required. ACLF will update the SSM Plan to the current operating conditions consistent with this PTC modification.
40 CFR 63 Subpart ZZZZ	NESHAP for Stationary Reciprocating Internal Combustion Engines	The two existing diesel engine generators that power the wood chipping operations and the Household Hazardous Waste emergency backup gernerator are subject to this standard. Refer to Appendix G.
40 CFR 64	Compliance Assurance Monitoring (CAM)	The flares at the ACLF are not subject to enhanced monitoring as found at IDAPA 58.01.01.314.09(iv), later modified to the "Compliance Assurance Monitoring," (CAM) Rule at 40 CFR Part 64. As per this regulation, emission limitations or standards proposed after November 15, 1990, pursuant to Clean Air Act section 111 or 112 are exempt from CAM (40 CFR 64.2(b)(1)). All applicable monitoring requirements from Subpart WWW have been included in the permit. Since Subpart WWW was promulgated on March 1996 under the authority of Clean Air Act Section 111 for New Source Performance Standards (NSPS), This standard is exempt from CAM requirements and no additional monitoring has been incorporated into the permit application.

TABLE 6-1
Regulatory Analysis, Ada County Landfill Gas Flares and Diesel Engine Generators

Regulation (State and Federal)	Regulatory Title	Description
40 CFR 68	Risk Management Plan (RMP) chemical Accident Prevention Provisions	At this time the RMP rules do not apply as no regulated toxic or flammable substances are present in a process at the ACLF above the thresholds found at 40 CFR 68.130.
Facility-Wide Requirements subject to the Ada County Landfill		
IDAPA 58.01.01.650-651	Reasonable Fugitive Control	
IDAPA 58.01.01.775-776	Odors	
IDAPA 58.01.01.130-136	Excess Emissions	
IDAPA 58.01.01.322.07	Monitoring and Recordkeeping	
IDAPA 58.01.01.600-617	Open Burning	
40 CFR 61 Subpart M	National Emission Standard for Asbestos	Standard for active waste disposal sites.
40 CFR 82 Subpart F	Recycling and Emissions Reduction	Regulations pertaining to use and handling of ozone-depleting substances.

Figures

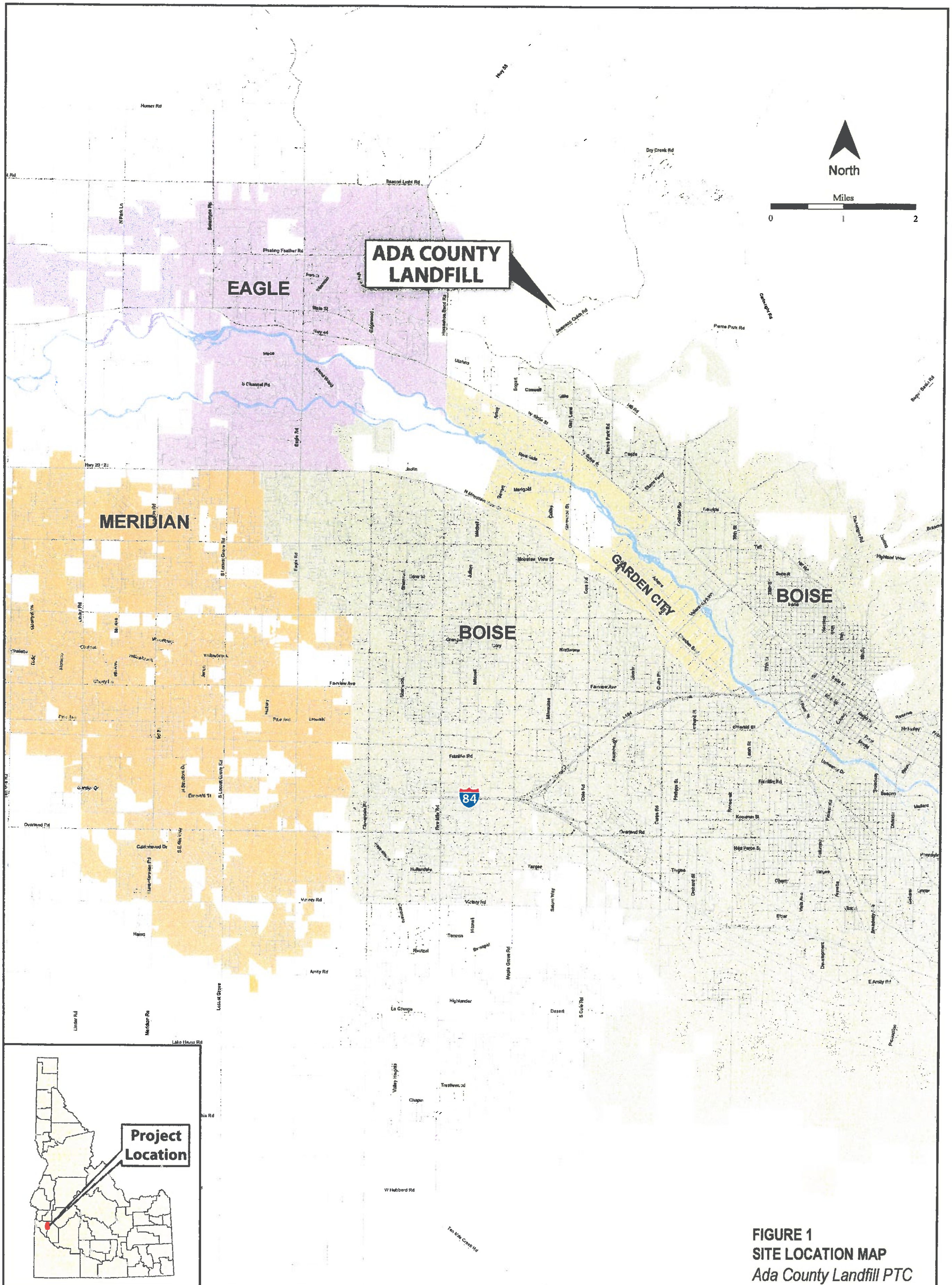

FIGURE 1
SITE LOCATION MAP
Ada County Landfill PTC

ES080211054125BOI Fig2_LocMap_v1.ai

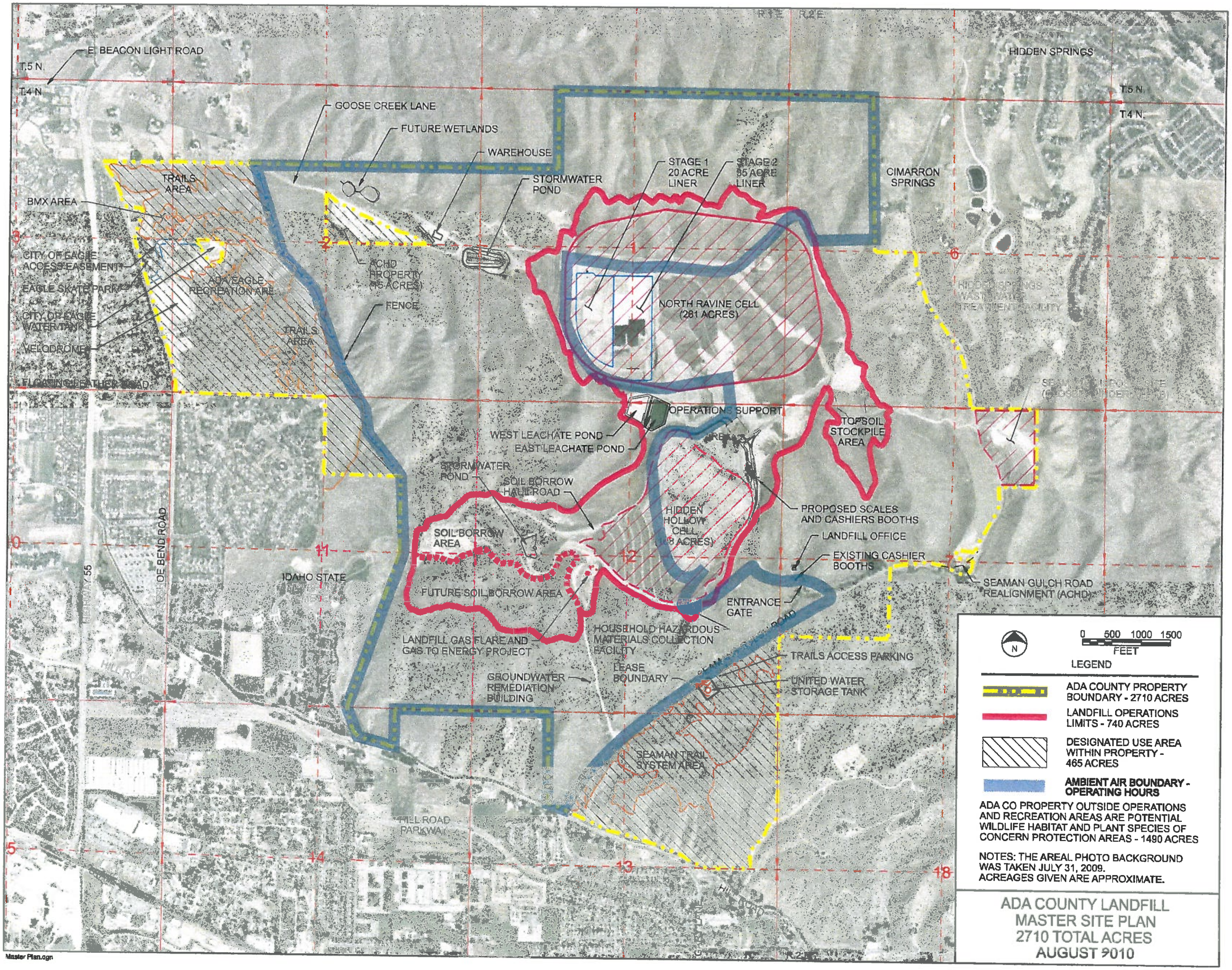

FIGURE 2
AMBIENT AIR BOUNDARY – OPERATING HOURS
Ada County Landfill PTC

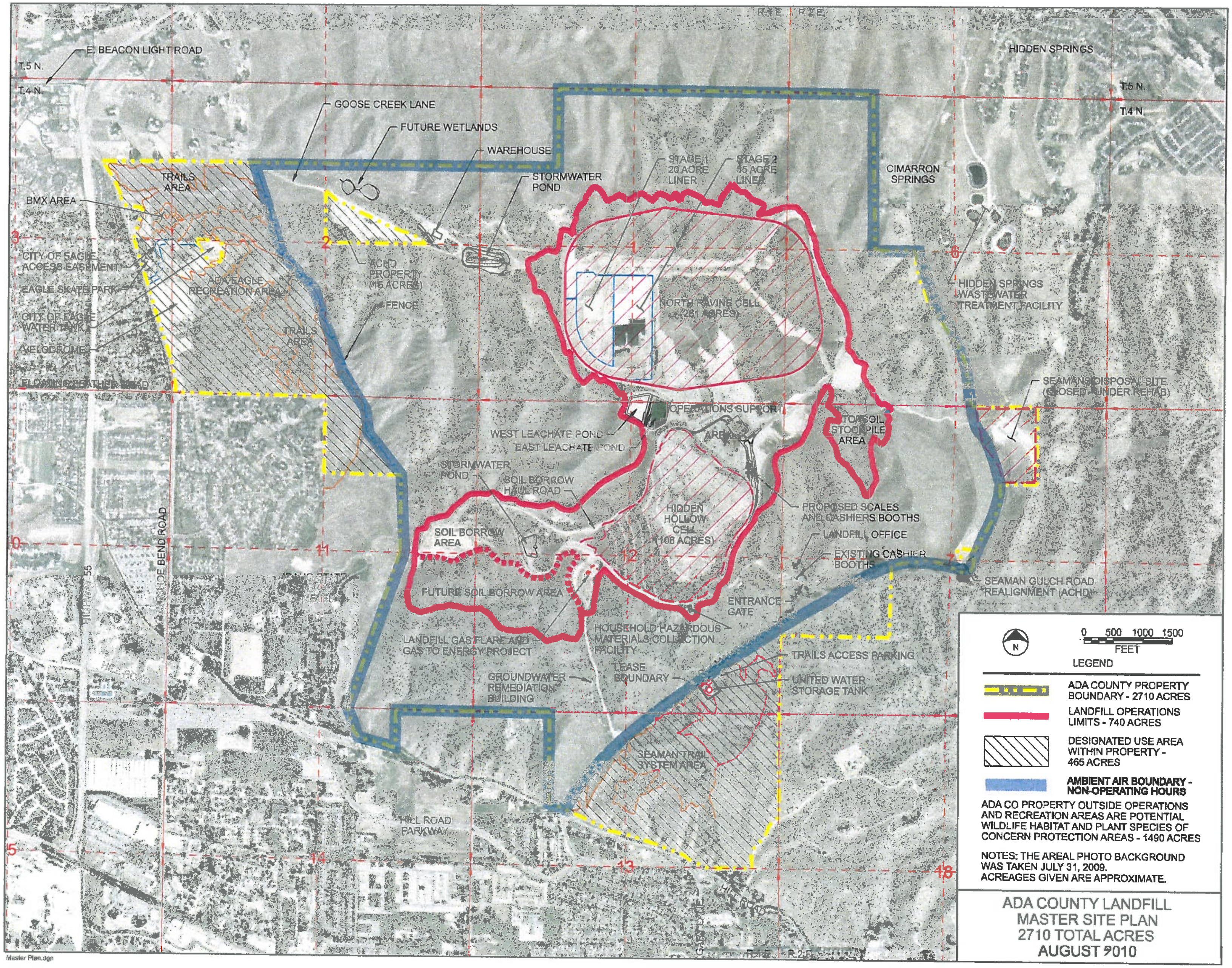

FIGURE 3
AMBIENT AIR BOUNDARY – NON-OPERATING HOURS
Ada County Landfill PTC

Appendix A

IDEQ Permit-to Construct-Application Forms

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Cover Sheet for Air Permit Application – Permit to Construct **Form CSPTC**

Please see instructions on page 2 before filling out the form.

COMPANY NAME, FACILITY NAME, AND FACILITY ID NUMBER

1. Company Name	Ada County Solid Waste Management		
2. Facility Name	Ada County Landfill	3. Facility ID No.	001-00195
4. Brief Project Description - One sentence or less	Updating permit as a result of new regulations		

PERMIT APPLICATION TYPE

5. ☐ New Source ☐ New Source at Existing Facility ☐ PTC for a Tier I Source Processed Pursuant to IDAPA 58.01.01.209.05.c
☐ Unpermitted Existing Source ☐ Facility Emissions Cap ☒ Modify Existing Source: Permit No.: P-2009.0001 Date Issued: 7/24/2009
☐ Required by Enforcement Action: Case No.:____

6. ☒ Minor PTC ☐ Major PTC

FORMS INCLUDED

Included	N/A	Forms		DEQ Verify
☒	☐	Form CSPTC – Cover Sheet		☐
☒	☐	Form GI – Facility Information		☐
☐	☒	Form EU0 – Emissions Units General		☐
☒	☐	Form EU1– Industrial Engine Information	Please specify number of EU1s attached: 2	☐
☐	☒	Form EU2– Nonmetallic Mineral Processing Plants	Please specify number of EU2s attached: ____	☐
☐	☒	Form EU3– Spray Paint Booth Information	Please specify number of EU3s attached: ____	☐
☐	☒	Form EU4– Cooling Tower Information	Please specify number of EU3s attached: ____	☐
☐	☒	Form EU5 – Boiler Information	Please specify number of EU4s attached: ____	☐
☐	☒	Form CBP– Concrete Batch Plant	Please specify number of CBPs attached: ____	☐
☐	☒	Form HMAP – Hot Mix Asphalt Plant	Please specify number of HMAPs attached: ____	☐
☐	☒	PERF – Portable Equipment Relocation Form		☐
☐	☒	Form AO – Afterburner/Oxidizer		☐
☐	☒	Form CA – Carbon Adsorber		☐
☐	☒	Form CYS – Cyclone Separator		☐
☐	☒	Form ESP – Electrostatic Precipitator		☐
☐	☒	Form BCE– Baghouses Control Equipment		☐
☐	☒	Form SCE– Scrubbers Control Equipment		☐
☐	☒	Form VSCE – Venturi Scrubber Control Equipment		☐
☐	☐	Form CAM – Compliance Assurance Monitoring		☐
☒	☐	Forms EI–- Emissions Inventory		☐
☒	☐	PP – Plot Plan		☐
☒	☐	Forms MI1 – MI4 – Modeling	(Excel workbook, all 4 worksheets)	☐
☒	☐	Form FRA – Federal Regulation Applicability		☐

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

General Information **Form GI**
Revision 7
2/18/10

Please see instructions on page 2 before filling out the form.

All information is required. If information is missing, the application will not be processed.

IDENTIFICATION

1. Company Name	2. Facility Name:
Ada County Solid Waste Management	Ada County Landfill

3. Brief Project Description:	Updating permit as a result of new regulations

FACILITY INFORMATION

4. Primary Facility Permit Contact Person/Title	Ted Hutchinson		Director	
5. Telephone Number and Email Address	208-577-4725		thutchinson@adaweb.net	
6. Alternate Facility Contact Person/Title	Rick Schreiber		Environmental Systems Coordinator	
7. Telephone Number and Email Address	208-577-4725		rschreiber@adaweb.net	
8. Address to Which the Permit Should be Sent	10300 north Seamans Gulch Road			
9. City/County/State/Zip Code	Boise	Ada	Idaho	83702
10. Equipment Location Address (if different than the mailing address above)				
11. City/County/State/Zip Code				
12. Is the Equipment Portable?	☐ Yes ☒ No			
13. SIC Code(s) and NAICS Code	Primary SIC: 4953	Secondary SIC: 5093	NAICS: 562212	
14. Brief Business Description and Principal Product	Municipal solid waste landfill for Ada COunty, Idaho			
15. Indentify any adjacent or contiguous facility that this company owns and/or operates				
16. Specify the reason for the application	☒ Permit to Construct (PTC) For Tier I permitted facilities only: If you are applying for a PTC then you must also specify how the PTC will be incorporated into the Tier I permit. ☐ Incorporate the PTC at the time of the Tier I renewal ☐ Co-process the Tier I modification and PTC ☐ Administratively amend the Tier I permit to incorporate the PTC upon your request (IDAPA 58.01.01.209.05.a, b, or c) ☐ Tier I Permit ☐ Tier II Permit ☐ Tier II/Permit to Construct			

CERTIFICATION

In accordance with **IDAPA 58.01.01.123** (Rules for the Control of Air Pollution in Idaho), I certify based on information and belief formed after reasonable inquiry, the statements and information in the document(s) are true, accurate, and complete.

17. Responsible Official's Name/Title	Ted Hutchinson	Director	
18. Responsible Official's Signature	Ted Hutchinson	Date:	12/6/11

19. ☐ Check here to indicate that you would like to review the draft permit prior to final issuance.

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Engine Information **Form EU1**
Revision 8
1/15/10

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name: Ada County Solid Waste Management	2. Facility Name: Ada County Landfill	
3 Brief Project Description:	Tier I permit renewal	

ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

4. Type of Unit: ☒ New Unit ☐ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #:2009-0009 Date Issued: 9/28/09

5. Engine Displacement: 4.4 liters (liters per cylinder) — 6. Ignition Type: ☒ Compression ☐ Spark

7. Use ☒ Emergency ☐ Non-Emergency

8. Engine ID Number: GEN 3	9. Maximum Rated Engine Power: ________ Brake Horsepower (bhp)		
10. Construction Date: 1998	11. Manufacturer: Detroit Diesel	12. Model: 30D560	13. Model Year:
14. Date of Modification (if applicable):	15. Serial Number (if available): 389914	16. Control Device (if any):	

FUEL DESCRIPTION AND SPECIFICATIONS

17. Fuel Type	☒ Diesel Fuel (#2) (gal/hr)	☐ Gasoline Fuel (gal/hr)	☐ Natural Gas (cf/hr)	☐ Other Fuels (unit:)
18. Full Load Consumption Rate	3.0			
19. Actual Consumption Rate	3.0			
20. Sulfur Content wt%	0.0015	N/A	N/A	

OPERATING LIMITS & SCHEDULE

21. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):
4 hours per day, 2 days per year

22. Operating Schedule (hours/day, months/year, etc.):
4 hours per day, 2 days per year

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Engine Information **Form EU1**
Revision 8
1/15/10

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name: Ada County Solid Waste Management	2. Facility Name: Ada County Landfill	
3 Brief Project Description:	Tier I permit renewal	

ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

4. Type of Unit: ☒ New Unit ☐ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #:2009-0009 Date Issued: 9/28/09

5. Engine Displacement: 0.6 (liters per cylinder)

6. Ignition Type: ☒ Compression ☐ Spark

7. Use ☒ Emergency ☐ Non-Emergency

8. Engine ID Number: GEN 4	9. Maximum Rated Engine Power: ________ Brake Horsepower (bhp)		
10. Construction Date: 11/2010	11. Manufacturer: John Deere (engine)	12. Model: 4024 HF 285	13. Model Year: 2010
14. Date of Modification (if applicable):	15. Serial Number (if available): 2325625 (generator)	16. Control Device (if any): Tier III	

FUEL DESCRIPTION AND SPECIFICATIONS

17. Fuel Type	☒ Diesel Fuel (#2) (gal/hr)	☐ Gasoline Fuel (gal/hr)	☐ Natural Gas (cf/hr)	☐ Other Fuels (unit:)
18. Full Load Consumption Rate	4.73			
19. Actual Consumption Rate	4.73			
20. Sulfur Content wt%	0.0015	N/A	N/A	

OPERATING LIMITS & SCHEDULE

21. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):

4 hours per day, 2 days per year

22. Operating Schedule (hours/day, months/year, etc.):

4 hours per day, 2 days per year

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline - 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Ada County Solid Waste Management
Facility Name:	Ada County Landfill
Facility ID No.:	001-00195
Brief Project Description:	Updating permit as a result of new regulations

SUMMARY OF AIR IMPACT ANALYSIS RESULTS - CRITERIA POLLUTANTS

		1.		2.	3.	4.		5.
Criteria Pollutants	**Averaging Period**	**Significant Impact Analysis Results (µg/m3)**	**Significant Contribution Level (µg/m3)**	**Full Impact Analysis Results (µg/m3)**	**Background Concentration (µg/m3)**	**Total Ambient Impact (µg/m3)**	**NAAQS (µg/m3)**	**Percent of NAAQS**
PM_{10}	24-hour		5				150	
	Annual		1				50	
SO_2	1-hr			151.00	33.10	184.10	196	93%
	3-hr		25				1300	
	24-hr		5				365	
NO_2	Annual		1				100	
CO	1-hr		2000				10000	
	8-hr		500				40000	

Instructions for Form MI1

This form is designed to provide the air quality modeler with a summary of the air impact analysis results for the criteria pollutants. This information will be used by IDEQ to determine compliance demonstration with the national ambient air quality standards (NAAQS).

Please fill in the same company name, facility name, facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

Significant Impact Analysis - Evaluates the emissions increase from the proposed project only. This analysis determines whether or not a proposed project has a significant impact on ambient air, and therefore, requires a full impact analysis.

Full Impact Analysis - Only required if the significant impact analysis exceeds the significant contribution level - evaluates the emissions from the facility, including the emissions increase from the proposed project. This analysis determines whether the facility, with the emissions increase, complies with the NAAQS.

1. Provide the results of the significant impact analysis in $\mu g/m^3$.
2. Provide the results of the full impact analysis in $\mu g/m^3$ (if required).
3. List the background concentration in mg/m3. Contact the Stationary Source Modeling Coordinator at (208) 373-0502 for the current background concentrations for the area of interest. (Not needed if full impact analysis is not required.)
4. Provide the total ambient impact in mg/m3. The total ambient impact is the sum of the background concentration and the full impact analysis result.
5. Calculate the percent of the NAAQS that the total ambient impact analysis represents.

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PERMIT TO CONSTRUCT APPLICATION

Revision 3
3/27/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Ada County Solid Waste Management
Facility Name:	Ada County Landfill
Facility ID No.:	001-00195
Brief Project Description:	updating permit as a result of new regulations

POINT SOURCE STACK PARAMETERS

1. Emissions units	2. Stack ID	3a. UTM Easting (m)	3b. UTM Northing (m)	4. Base Elevation (m)	5. Stack Height (m)	6. Modeled Diameter (m)	7. Stack Exit Temperature (K)	8. Stack Exit Flowrate (acfm)	9. Stack Exit Velocity (m/s)	10. Stack orientation (e.g., horizontal, rain cap)
Point Source(s)										
Flare 1	FLARE1	557,492.00	4,838,644.00	897.60	12.19	3.05	1,063.71	12,121.00	0.78	Vertical, no rain cap
Flare 2	FLARE2	557,496.00	4,838,637.00	897.60	12.19	3.05	1,059.82	12,395.00	0.82	Vertical, no rain cap
Generator 1 (Cat - Chipper)	GEN1	558,217.00	4,839,332.00	980.53	1.83	0.20	768.71	6,231.00	90.60	Vertical, no rain cap
Generator 2 (Deutz - Screen)	GEN2	558,236.00	4,839,310.00	982.81	1.83	0.08	797.00	837.00	86.62	Vertical, no rain cap
Generator 3 (Detroit - HHHW)	GEN3	557,984.09	4,838,426.15	926.00	1.78	0.06	852.60	423.00	207.50	Vertical, no rain cap
Generator 4 (Kohler - Scales)	GEN4	558,278.80	4,839,181.50	982.00	1.78	0.06	753.15	549.00	269.30	Vertical, no rain cap
(insert more rows as needed)										

Instructions for Form MI2

This form is designed to provide the air quality modeler with information on the stack characteristics of each point source located at the facility. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Please fill in the same company name, facility name, facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

1. Provide the name of the emission unit. This name should match names on other submittals to IDEQ and within this application.
2. Provide the identification number for the stack which the emission unit exits.
3. Provide the UTM locations for each point source. The UTM Easting and UTM Northing are the coordinates for the center of the point source.
4. Provide the elevation of the base of the stack. This elevation must be calculated by the same method as the buildings and receptor elevation.
5. Provide the height of the stack, from the ground.
6. Provide the stack diameter that is included in the modeling analysis. Refer to the State of Idaho Modeling Guideline for guidance on developing the appropriate diameter.
7. Provide the stack exit temperature. Include documentation and justification for the exit temperature used.
8. Provide the stack exit flowrate. Include documentation and justification for the exit flowrate used.
9. Provide the stack exit velocity. Include documentation and justification for the exit velocity used.
10. Provide the orientation of the stack (horizontal or vertical). Indicate whether there is an obstruction on the stack, such as a raincap.

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PERMIT TO CONSTRUCT APPLICATION
Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Ada County Solid Waste Management
Facility Name:	Ada County Landfill
Facility ID No.:	001-00195
Brief Project Description:	Updating permit as a result of new regulations

FUGITIVE SOURCE PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	7.	8.	9.	10.
Emissions units	**Stack ID**	**UTM Easting (m)**	**UTM Northing (m)**	**Base Elevation (m)**	**Release Height (m)**	**Easterly Length (m)**	**Northerly Length (m)**	**Angle from North (°)**	**Initial Vertical Dimension (m)**	**Initial Horizontal Dimension (m)**
Area Source(s)										
name of the emissions unit1										
name of the emissions unit2										
name of the emissions unit3										
name of the emissions unit4										
name of the emissions unit5										
name of the emissions unit6										
name of the emissions unit7										
name of the emissions unit8										
name of the emissions unit9										
name of the emissions unit10										
Volume Source(s)										
name of the emissions unit11										
name of the emissions unit12										
name of the emissions unit13										
name of the emissions unit14										
name of the emissions unit15										
name of the emissions unit16										
name of the emissions unit17										
name of the emissions unit18										
name of the emissions unit19										
(insert more rows as needed)										

Instructions for Form MI3

This form is designed to provide the air quality modeler with information on the characteristics of each fugitive source located at the facility. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Please fill in the same company name, facility name, facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

Fugitive sources are typically modeled as either area or volume sources. Area sources are used to model fugitives from sources such as roads or parking lots, while volume sources are typically used to model fugitives from piles. Refer to the State of Idaho Air Quality Modeling Guideline for additional guidance on modeling fugitive sources.

1. Provide the name of the fugitive source. This name should match names used on other submittals to IDEQ and within this application.
2. Provide the identification number for the fugitive source.
3. Provide the UTM locations of the fugitive source. The UTM Easting and UTM Northing are the coordinates for the center of the fugitive source.
4. Provide the elevation of the base of the fugitive source. This elevation must be calculated by the same method as the buildings and receptor elevation.
5. Provide the height of the fugitive source, from the ground. This is used for an elevated release. If the fugitive source is at ground level enter zero.
6. Provide the easterly length of the fugitive source.
7. Provide the northly length of the fugitive source.
8. Provide the angle from north, in degrees. This allows for accurate evaluation of the alignment of the fugitive source.
9. Provide the initial vertical dimension of the fugitive source. Refer to the State of Idaho Modeling Guideline for guidance on estimating this value.
10. Provide the initial horizontal dimension of the fugitive source. This parameter is only used for volume sources. Refer to the State of Idaho Modeling Guideline for guidance on estimating this value.

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the **Air Permit Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 3 4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Ada County Solid Waste Management
Facility Name:	Ada County Landfill
Facility ID No.:	001-00195
Brief Project Description:	Updating permit as a result of new regulations

BUILDING AND STRUCTURE INFORMATION

1.	2.	3.	4.	5.	6.	7.
Building ID Number	**Length (ft)**	**Width (ft)**	**Base Elevation (m)**	**Building Height (m)**	**Number of Tiers**	**Description/Comments**
Building 1 ID						
Building 2 ID						
Building 3 ID						
(insert more rows as needed)						

Instructions for Form MI4

This form is designed to provide the air quality modeler with information on the buildings and structures located at the facility. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Please fill in the same company name, facility name, facility ID number, and brief project description in the boxes provided. This is useful in case any pages of the application get separated.

1. Provide the building ID number.
2. Provide the length of the building.
3. Provide the width of the building.
4. Provide the base elevation of the building. This elevation must be calculated by the same method as the sources and receptor elevation.
5. Provide the height of the building, from the ground.
6. Provide the number of tiers on the building. Refer to the State of Idaho Modeling Guideline for guidance on this topic.
7. Provide a description of the building.

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AIR PERMIT APPLICATION

Revision 6
10/7/09

For each box in the table below, CTRL+click on the blue underlined text for instructions and information.

IDENTIFICATION	
1. Company Name: Ada County Solide Waste Management	2. Facility Name: Ada County Landfill
3. Brief Project Description: modifying permit as a result of new regulations	

APPLICABILITY DETERMINATION	
4. List applicable subparts of the New Source Performance Standards (NSPS) (40 CFR part 60). Examples of NSPS affected emissions units include internal combustion engines, boilers, turbines, etc. The applicant must thoroughly review the list of affected emissions units.	List of applicable subpart(s): Subpart www and Subpart IIII (GEN4) ☐ Not Applicable
5. List applicable subpart(s) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) found in 40 CFR part 61 and 40 CFR part 63. Examples of affected emission units include solvent cleaning operations, industrial cooling towers, paint stripping and miscellaneous surface coating. EPA has a web page dedicated to NESHAP that should be useful to applicants.	List of applicable subpart(s): Subpart ZZZZ (GEN1, GEN2, GEN3) ☐ Not Applicable
6. For each subpart identified above, conduct a complete a regulatory analysis using the instructions and referencing the example provided on the following pages. **Note** - Regulatory reviews must be submitted with sufficient detail so that DEQ can verify applicability and document in legal terms why the regulation applies. Regulatory reviews that are submitted with insufficient detail will be determined incomplete.	■ A detailed regulatory review is provided (Follow instructions and example). ☐ DEQ has already been provided a detailed regulatory review. Give a reference to the document including the date.

IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS, CALL THE AIR PERMIT HOTLINE AT 1-877-5PERMIT

It is emphasized that it is the applicant's responsibility to satisfy all technical and regulatory requirements, and that DEQ will help the applicant understand what those requirements are prior to the application being submitted but that DEQ will not perform the required technical or regulatory analysis on the applicant's behalf.

Appendix B

Emergency Generators Exemption Reports

September 30, 2011

Ada County Solid Waste Management
200 West Front Street
Boise, ID 83702

Subject: Permit-To-Construct Exemption
Ada County Solid Waste Management
Ada County Landfill
10300 North Seamans Gulch Road
Boise, Idaho

Introduction

The Ada County Landfill (ACLF), located at 10300 North Seamans Gulch Road in Boise, Idaho, currently owns an emergency backup generator (Generator 3) located at the Household Hazardous Waste (HHHW) facility. The generator is diesel-fired to provide emergency back-up power only during normal day-to-day operations at the affected facility. ACLF is documenting a Permit-to-Construct (PTC) exemption in accordance with the *Rules for the Control of Air Pollution in Idaho,* IDAPA 58.01.01.220 and 222.

Emission Unit Operations:

Generator 3 – HHHW facility (see Attachment A)

Manufacturer:	Detroit Diesel
Model Number:	30DS60
Engine Rating:	33 kW (44 HP)
Fuel:	Diesel (3.9 gallon/hour max fuel usage estimate)
Annual maintenance usage:	4 hours per day/two days per year (testing purposes)
Installed:	1998

A non-resettable hour meter will be installed for the emergency standby generator. The total number of operating hours per year will be monitored and records kept for *emergency* and *non-emergency (i.e., maintenance and testing)* use.

Exemption Requirements

The equipment listed herein satisfies the exemption requirements in accordance with IDAPA 58.01.01.220 and 58.01.01.222.02.c.

The engine rating is approximately 44 horsepower (HP) for the emergency backup generator located at the HHHW.

Applicable exemption criteria for PTC exemptions are discussed below:

220. GENERAL EXEMPTION CRITERIA FOR PERMIT TO CONSTRUCT EXEMPTIONS.

> ***01.** **General Exemption Criteria.** Sections 220 through 223 may be used by owners or operators to exempt certain sources from the requirement to obtain a permit to construct. Nothing in these sections shall preclude an owner or operator from choosing to obtain a permit to construct. For purposes of Sections 220 through 223, the term source means the equipment or activity being exempted. For purposes of Sections 220 through 223, fugitive emissions shall not be considered in determining whether a source meets the applicable exemption criteria unless required by federal law. No permit to construct is required for a source that satisfies all of the following criteria, in addition to the criteria set forth at Sections 221, 222, or 223:*
>
> *a. The maximum capacity of a source to emit an air pollutant under its physical and operational design without consideration of limitations on emission such as air pollution control equipment, restrictions on hours of operation and restrictions on the type and amount of material combusted, stored or processed would not:*
>
> *i. Equal or exceed one hundred (100) tons per year of any regulated air pollutant.*

The ACLF does not exceed 100 tons per year of any regulated air pollutant as defined by IDAPA 58.01.01.008.10.c. (See Attachment B).

> *ii. Cause an increase in the emissions of a major facility that equals or exceeds the significant emissions rates set out in the definition of significant at Section 006.*

No significant emission rates are exceeded per IDAPA 58.01.01.006.106. PTE calculations are less than the significant emission rates for PM_{10}, NOx, SOx, CO, and VOC. (See Appendix B). Note that the PTE calculations are based on EPA AP-42 emission factors for the emergency diesel engine generator.

> *b. Combination. The source is not part of a proposed new major facility or part of a proposed major modification.*

The ACLF is not part of a new major facility or a major modification.

> ***02.** **Record Retention.** Unless the source is subject to and the owner or operator complies with Section 385, the owner or operator of the source, except for those sources listed in Subsections 222.02.a. through 222.02.g., shall maintain documentation on site which shall identify the exemption determined to apply to the source and verify that the source qualified for the identified exemption. The records and documentation shall be kept for a period of time not less than five (5) years from the date the exemption determination has been made or for the life of the source for which the exemption has been determined to apply, which ever is greater, or until such time as a permit to construct or an operating permit is*

issued which covers the operation of the source. The owner or operator shall submit the documentation to the Department upon request.

222. *CATEGORY II EXEMPTION.*

No permit to construct is required for the following sources.

01. Exempt Source. A source that satisfies the criteria set forth in Section 220 and that is specified below: (4-5-00)

c. Stationary internal combustion engines of less than or equal to six hundred (600) horsepower and which are fueled by natural gas, propane gas, liquefied petroleum gas, distillate fuel oils, residual fuel oils, and diesel fuel; waste oil, gasoline, or refined gasoline shall not be used. To qualify for this exemption, the source must be operated in accordance with the following: (5-1-94)

i. One hundred (100) horsepower or less -- unlimited hours of operation.

The engine rating is approximately 44 HP for the emergency backup generator located at the HHHW. Therefore, the ACLF satisfies the Category II exemption criteria per IDAPA 58.01.01.222.01.c.i.

Federal Regulation

New Source Performance Standards—40 CFR Part 60

In 40 CFR Part 60, the EPA established emission performance standards for specific categories of sources. These standards include emission limitations for various regulated pollutants and provide a variety of requirements for monitoring, record keeping, and reporting of emissions and other information. Any stationary source which contains an affected facility constructed after the New Source Performance Standards (NSPS) subpart took effect, must comply with the provisions of 40 CFR 60 Subpart A (codified at 40 CFR 60.1 through 60.18).

There are no applicable NSPS requirements that apply to the 33 kW Detroit diesel emergency generator.

National Emission Standards for Hazardous Air Pollutants - 40 CFR Part 63

The 33 kW Detroit diesel emergency generator will be classified as an area source subject to Subpart ZZZZ, "*NESHAPS for Stationary Reciprocating Internal Combustion Engines (RICE)*, defined as RICE with PTE < 10 tpy for any single HAP or PTE < 25 tpy for total HAPs.

ACLF must comply with the applicable emission limitations and operating limitations no later than May 3, 2013.

The applicable requirements are provided below for the diesel-fired *emergency* engine < 100 HP:

- **During Startup**
  - Minimize engine idle time to period needed for appropriate and safe loading, not to exceed 30 minutes

- **Work Practice Standards Except During Startup**
  - Change oil and filter every 500 hours of operation or annually, whichever comes first
  - Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first
  - Inspect hoses and belts every 500 hours of operation or annually, whichever comes first
- **Operating Limitations**
  - Maintenance and readiness checks limited to 100 hours/year
  - Can operate engine for 50 hours/year for non-emergency purposes, but counted towards maintenance and readiness. The 50 hours cannot be used to generate income for a facility, except 15 hours/year is allowed as part of an emergency demand response program
- **Fuel Requirements (for engines with displacement < 30 liters/cylinder)**
  - None
- **Demonstrating Compliance**
  - Operate and maintain the stationary RICE according to manufacturer's instructions or implement a maintenance plan that provides for the maintenance and operation in a manner consistent with good air pollution control practices for minimizing emissions
  - Install a non-resettable hour meter
- **Testing**
  - None

Conclusion

The PTE from 33 kW Detroit diesel generator is below the significant emission rates for the regulated pollutants. Additionally, the Detroit diesel engine rating is approximately 44 HP. Therefore, the ACLF satisfies the Category II exemption criteria per IDAPA 58.01.01.222.01.c.i. The ACLF will keep a copy of this exemption evaluation on file.

Certification

I, Ted Hutchinson, certify that the statements and information in this document are true, accurate, and complete in accordance with IDAPA 58.01.01.123-124.

Ted Hutchinson

Ted Hutchinson, Director
Ada County Landfill

Appendices

Attachment A – Manufacturer Information
Attachment B – PTE Calculations

Attachment A – Manufacturer Information

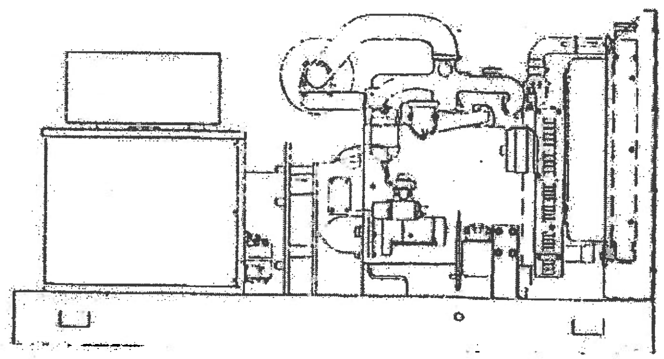
SPECTRUM®
DETROIT DIESEL

Model: 30DS
Diesel

ISO 9001

Standard Features

- Spectrum® product distributors provide one-source responsibility for the generating system and accessories.
- All generator sets and components are prototype tested, factory built, and production tested.
- A one-year limited warranty covers all systems and components. Two-, five-, and ten-year extended warranties are available.
- Generator features:
  - Brushless, rotating-field generator has broadrange reconnectability.
  - A permanent magnet-excited generator (PMG) provides superior short-circuit capability.
- Other features:
  - Controllers are available to meet all applications. See controller features inside.
  - Low coolant level shutdown protects generator set from overheating.
  - Integral vibration isolation eliminates the need for installation of vibration spring isolators under the unit.



Generator Ratings

Model Series	Voltage Code	Voltage	Standby Amps	Phase	Hz	Generator Model	Standby kW/kVA	Prime kW/kVA
30DS60	01	120/240	105	3	60	4P5	35/44	32/40
30DS60	51	139/240	102	3	60	4P5	34/43	31/39
30DS60	51	127/220	112	3	60	4P5	34/43	31/39
30DS60	61	120/240	138	1	60	4P5	33/33	30/30
30DS60	71	277/480	51	3	60	4P5	34/43	31/39
30DS60	71	220/380	67	3	60	4P5	35/44	32/40
30DS60	81	120/208	121	3	60	4P5	35/44	32/40
30DS60	91	347/600	40	3	60	4P5	33/41	30/38
30DS50	01	110/220	89	3	50	4P5	27/34	25/31
30DS50	51	110/190	103	3	50	4P5	27/34	25/31
30DS50	61	110/220	118	1	50	4P5	26/26	24/24
30DS50	71	220/380	51	3	50	4P5	27/34	25/31
30DS50	71	230/400	47	3	50	4P5	26/33	24/30
30DS50	71	240/416	45	3	50	4P5	26/33	23/29
30DS50	81	120/208	90	3	50	4P5	26/33	23/29

RATINGS: Standby ratings are continuous for the duration of any power outage. No overload capacity is specified at this rating. Prime ratings are continuous per BS 5514, DIN 6271, ISO-3046, and IEC 34-1 with 10% overload capacity one hour in twelve hours. All single-phase units are rated at 1.0 power factor. All 3-phase units are rated at 0.8 power factor. Contact the factory for ratings of city water-cooled and remote radiator models. Larger generators may be used to meet special application requirements. Availability is subject to change without notice. The manufacturer of Spectrum products reserves the right to change the design or specifications without notice and without any obligaion or liability whatsoever. Contact your local Spectrumproducts distributor for availability. DERATION: Maximum altitude before generator deration, ft. (m): 500 (152). Altitude deration factor, % per 1000 ft. (305 m): 2.0. Maximum intake air temperature before generator deration, °F (°C): 104 (40). Temperature deration factor, % per 18°F (10°C): 2.5.

Alternator Specifications

Type	4-Pole, Rotating Field
Exciter type	Brushless, Permanent Magnet
Number of leads	12, Reconnectable
Voltage regulator	Solid State, Volts/Hz
Insulation: NEMA MG1-1.66,	
Material	Class H
Temperature rise	130°C, Standby
Bearing, number, type	1, Sealed
Coupling	Flexible Disc
Amortissour windings	Full
Voltage regulation, no load to full load	±2%
One-step load acceptance per NFPA 110	100% of Rating
Peak motor starting kVA:	(35% dip for 480 V, 60 Hz and 380 V, 50 Hz)
4P5	140 (60Hz), 95 (50Hz)
4P7	195 (60Hz), 135 (50Hz)

- Compliance with NEMA, IEEE, and ANSI standards for temperature rise.
- Sustained short-circuit current up to 300% of rated current for up to 10 seconds.
- Sustained short-circuit capability enabling downstream circuit breakers to trip without collapsing the generator field.
- Self-ventilation and drip-proof construction.
- Vacuum-impregnated windings with fungus-resistant epoxy varnish for dependability and long life.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.
- A solid-state, volts-per-hertz voltage regulator with ±2% no-load to full-load regulation.
- A brushless alternator with brushless exciter for excellent load response.

Application Data

Engine

Engine Specifications	60 Hz	50 Hz
Supplier	Detroit Diesel	
Engine, model, type	4.236, 4-Cycle Natural Aspiration	
Cylinder arrangement	4 In-line	
Displacement, cu. in. (L)	236 (3.870)	
Bore and stroke, in. (mm)	3.875 x 5.0 (98.4 x 127)	
Compression ratio	16.0:1	
Piston speed, ft/min. (m/sec.)	1500 (7.62)	1248 (6.35)
Main bearings: number, type	5, Replaceable Insert	
Rated rpm	1800	1500
Max. power at rated rpm, hp (kW)	64.0 (47.7)	56.0 (41.8)
Cylinder head material	Cast Iron	
Crankshaft material	Forged Steel	
Valve material:		
Intake	Carbon Steel	
Exhaust	Chromium Steel	
Governor, type, make/model	Mechanical, Stanadyne/ DB2	
Frequency regulation, no load to full load	5%	
Frequency regulation, steady state	±0.5%	
Air cleaner type, all models	Dry, Paper Element	

Exhaust

Exhaust System	60 Hz	50 Hz
Exhaust flow at rated kW, cfm (m^3/min.)	270 (7.6)	220 (6.2)
Exhaust temperature at rated kW, dry exhaust, °F (°C)	1075 (579)	1060 (571)
Maximum allowable back pressure, in. Hg (kPa)	3 (10.2)	
Exhaust outlet size at hookup, in. (mm)	2.50 O.D. (63.5)	

Engine Electrical

Engine Electrical System	60 Hz	50 Hz
Battery charging alternator:		
Ground (negative/positive)	Negative	
Volts (DC)	12	
Ampere rating	66	
Starter motor rated voltage (DC)	12	
Recommended battery cold cranking amps (CCA) rating for 0°F	800	
Quantity of batteries	1	
Battery voltage (DC)	12	
Rolling current at 32°F	-	

Fuel

Fuel System	60 Hz	50 Hz
Fuel supply line, min. ID, in. (mm)	0.25 (6)	
Fuel return line, min. ID, in. (mm)	0.25 (6)	
Max. lift, engine-driven fuel pump, ft. (m)	6.0 (1.8)	
Max. fuel flow, g/h (L/h)	4.7 (17.8)	4.3 (16.1)
Fuel prime pump	Manual	
Fuel filter	Primary and Secondary	
Recommended fuel	#2 Diesel, min. 45 Cetane	

Lubrication

Lubricating System	60 Hz	50 Hz
Type	Full Pressure	
Oil pan capacity, qts. (L)	7.5 (7.1)	
Oil pan capacity with filter, qts. (L)	8.6 (8.1)	
Oil filter, quantity, type	1, Cartridge	
Oil cooler	-	

Application Data

Cooling (Standard Radiator)

Cooling System	60 Hz	50 Hz
Ambient temperature °F (°C)	122 (50)	
Engine jacket water capacity, gal. (L)	2.5 (9.5)	
Radiator system capacity, including engine, gal. (L)	3.6 (13.6)	
Engine jacket water flow, gpm (Lpm)	24 (91)	20 (76)
Heat rejected to cooling water at rated kW, dry exhaust Btu/min.	1400	1040
Water pump type	Centrifugal	
Fan diameter, including blades, in. (mm)	19.0 (482.6)	
Fan hp (kW)	3.5 (2.6)	2.0 (1.5)
Max. restriction of cooling air, intake and discharge side of rad., in. H_2O (in. Hg)	0.5 (0.037)	

Cooling (Optional Systems)

Remote Radiator System	60 Hz	50 Hz
Exhaust manifold type	Dry	
Connection sizes:		
Water inlet, in. (mm)	1.88 (48)	
Water outlet, in. (mm)	1.50 (38)	
Remote radiator:		
Make	Modine	
Model	M2VR2P1.5	
Mounting	Vertical	
Discharge	Horizontal	
Fan motor: phase, hp (kW)	3, 1.5, (1.1)	
Radiator capacity, gal. (L)	3.5 (13.2)	
Static head allowable above engine, ft. (m)	10.7 (3.8)	7.5 (2.3)
Tank top (inlet), in.	1.5 NPT	
Bottom tank (outlet), in.	1.5 NPT	
Dry weight, lb. (kg)	320 (145)	

City Water Cooling System	60 Hz	50 Hz
Exhaust manifold type	Dry	
System capacity, gal. (L)	2.9 (10.9)	
City water consumption,* gpm (Lpm) at 50°F (10°C)	2.3 (8.7)	1.9 (7.2)
Connection sizes:*		
Water inlet, in.	1/2 NPT	
Water outlet, in.	1/2 NPT	

* Data based on Thermal Transfer Products B-702-84 heat exchanger with thermostatically controlled water-saver valve, electric solenoid valve, and surge tank.

Operation Requirements

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, cfm (m³/min.)	5500 (156)	4100 (116)
Cooling air required for gen. set when equipped with CWC or remote radiator, based on 25°F (14°C) rise and ambient temp. of 85°F (29°C), cfm (m³/min.)	2000 (56.6)	1400 (39.6)
Combustion air, cfm (m³/min.)	102 (2.9)	88 (2.5)
Heat rejected to ambient air:		
Engine BTU/min.	520	380
Generator BTU/min.	320	220

Fuel Consumption	60 Hz	50 Hz
Diesel, gph (Lph) at % load		
100%	3.0 (11.2)	2.2 (8.3)
75%	2.3 (8.5)	1.7 (6.4)
50%	1.7 (6.3)	1.3 (4.9)
25%	1.2 (4.5)	0.9 (3.4)

Controllers

Standard Controller and Features

- Type: 16-light microprocessor (NFPA 110, level 1)
- Power source, with circuit protection: 12-volt DC
- Panel lamps (2)
- Analog Meters:
  - AC meters, 2.5 in. (64 mm) 2% full-scale accuracy on voltmeter and ammeter, 0.5% full-scale accuracy on frequency meter
  - DC meters, 2 in. (51 mm), 2% full-scale accuracy (volts, engine water temperature, oil pressure)
  - Running time meter
- Switches and Controls:
  - Alarm horn and silencing switch
  - Cyclic cranking
  - Engine cooldown timer, 5-minute
  - Front-mounted voltage-adjusting rheostat ±5%
  - Lamp test switch
  - Local emergency stop button switch (optional)
  - Meter phase selector switch, 7 position
  - Overvoltage protection shutdown
  - Prime power mode
  - Run/off-reset/auto switch (engine start), local/remote two-wire
- Fault and Condition Lamps:
  - Air damper (red) (200-1600 kW diesel only)
  - Auxiliary fault (red)
  - Auxiliary prealarm (yellow)*
  - Battery charger fault (red)*
  - Emergency stop (red)*
  - Generator switch not in auto (red)
  - High engine temperature safety shutdown (red)
  - Low battery voltage (red)*
  - Low coolant level shutdown (auxiliary)
  - Low fuel (red)*
  - Low oil pressure safety shutdown (red)
  - Low water temperature (red)*
  - Overcrank safety shutdown (red)
  - Overspeed safety shutdown (red)
  - Prealarm high engine temperature (yellow)*
  - Prealarm low oil pressure (yellow)*
  - System ready (green)

* Requires optional kit or user-provided device for lamp to function.

Optional Controllers

- Engine gauge box for paralleling controller (switchgear)
- Manual controller
- Manual paralleling microprocessor controller
- Oversized meterbox controller
- 7-light controller (NFPA 110, level 2)

(For optional controller features, see controller spec sheet.)

SPECTRUM®
DETROIT DIESEL

SPECTRUM, N7650 County Trunk LS, Sheboygan, Wisconsin 53083 U.S.A.
Phone 414-459-1877
Fax 414-459-1825 (U.S.A. Sales), Fax 414-459-1614 (International)

Accessories

Enclosed Unit

- ○ Exhaust Silencer, Critical or Industrial
- ○ Silencer Mounting Kit for Housing
- ○ Sound Shield Enclosure
- ○ Tail Pipe and Rain Cap Kit
- ○ Weather Housing

Open Unit

- ○ Exhaust Silencer, Critical or Industrial
- ○ Flexible Exhaust Connector, Stainless Steel

Cooling System

- ○ Block Heater
- ○ City Water Cooling
- ○ Radiator Duct Flange
- ○ Remote Radiator Cooling

Fuel System

- ○ Auxiliary Fuel Pump
- ○ Day Tanks
- ○ Flexible Fuel Lines
- ○ Fuel Pressure Gauge
- ○ Subbase Fuel Tanks

Electrical System

- ○ Battery
- ○ Battery Charger, Equalize/Float Type
- ○ Battery Charger, Trickle Type
- ○ Battery Heater
- ○ Battery Rack and Cables

Engine and Generator

- ○ Air Cleaner, Heavy Duty
- ○ Air Cleaner Restriction Indicator
- ○ Bus Bar Kits
- ○ CSA Certification
- ○ Electronic Isochronous Governor
- ○ Generator Strip Heater
- ○ Line Circuit Breaker
- ○ Line Circuit Breaker with Shunt Trip
- ○ NFPA 110 Literature
- ○ Oil Drain Extension with Valve Kit
- ○ Optional Generators
- ○ Rated Power Factor Testing
- ○ Safeguard Breaker
- ○ Voltage Regulation, 1%
- ○ Voltage Regulator Sensing, Three-Phase

Paralleling System

- ○ Load-Sharing Module
- ○ Reactive Droop Compensator
- ○ Remote Speed Adjust Potentiometer/Electronic Governor
- ○ Voltage Adjust Potentiometer
- ○ Voltage Regulator Relocation Kit

Maintenance

- ○ General Maintenance Literature Kit
- ○ Maintenance Kit (includes air, oil, and fuel filters)
- ○ Overhaul Literature Kit

Controller (Standard Controller)

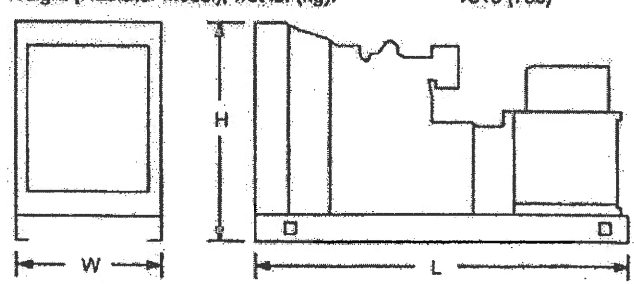
- ○ Common Failure Relay Kit
- ○ Customer Connection Kit
- ○ Dry Contact Kit (Isolated Alarm)
- ○ Extension Wiring Harness for Remote Mounting of Controller
- ○ FASTCHECK® Diagnostic Fault Detector
- ○ Prealarm Sender Kit (NFPA 110)
- ○ Remote Annunciator Panel
- ○ Remote Audio/Visual Alarm Panel
- ○ Remote Emergency Stop Kit
- ○ Run Relay Kit
- ○ Tachometer Kit/Oversize Meterbox
- ○ Wattmeter Kit/Oversize Meterbox

Miscellaneous Accessories

- ○ ______________________
- ○ ______________________
- ○ ______________________
- ○ ______________________
- ○ ______________________
- ○ ______________________
- ○ ______________________
- ○ ______________________
- ○ ______________________

WEIGHTS AND DIMENSIONS

Overall Size, L x W x H, in. (mm):	82.00 x 29.00 x 43.40 (2083 x 737 x 1102)
Weight (Radiator Model), wet lb. (kg):	1615 (733)



NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

DISTRIBUTED BY:

Attachment B – PTE Calculations

Ada County Landfill - HHHW Facility
Emergency Generator

Generator Manufacturer	**Detroit Diesel**
Engine Manufacturer	**Detroit Diesel**
Engine Model No.	**30DS60**
Engine Power Rating (hp)	44
Fuel Type	Distillate #2
- maximum sulfur content	0.0015%
Maximum fuel consumption (gals/hr)	3.0
Maximum Heat Input Rating (Btu/hr)	420,000
Maximum Hours of Operation	26
Maximum Firing Rate (gals/yr)	78
Annual Operation Limit (hrs/yr)	26
Annual Firing Rate (gals/yr)	78
Heat Value of Fuel (Btu/gal)	140,000

			Uncontrolled Potential to Emit		
Criteria '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	3.39	0.0017
Total Particulate Matter ($PM_{2.5}$)[2]		0.31	0.13	3.39	0.0017
Particulate Matter (PM10)[3]		0.31	0.13	3.39	0.0017
Nitrogen Oxides (NOx)[4]		4.41	1.85	48.16	0.024
Sulfur Oxides (SO_2)[5]		0.00152	0.00	0.02	0.0000
Carbon Monoxide (CO)[4]		0.95	0.40	10.37	0.0052
TOC as VOC[4]		0.35	0.15	3.82	0.0019

Notes:

[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

September 30, 2011

Ada County Solid Waste Management
200 West Front Street
Boise, ID 83702

Subject: Permit-To-Construct Exemption
Ada County Solid Waste Management
Ada County Landfill
10300 North Seamans Gulch Road
Boise, Idaho

Introduction

The Ada County Landfill (ACLF), located at 10300 North Seamans Gulch Road in Boise, Idaho, currently owns an emergency backup engine generator (Generator 4) located at the newly constructed scales. The engine generator is diesel-fired to provide emergency back-up power only during normal day-to-day operations at the affected facility. ACLF is documenting a Permit-to-Construct (PTC) exemption in accordance with the *Rules for the Control of Air Pollution in Idaho*, IDAPA 58.01.01.220 and 222.

Emission Unit Operations:

Generator 4 – Scales (see Attachment A)

Manufacturer:	Kohler
Model Number:	40 RE02JC
Engine Manufacturer	John Deere
Engine Model Number:	4024 HF 285
Engine Rating:	60 kW (80 HP)
Emission Rating:	Tier III
Fuel:	Diesel (4.73 gallon/hour max fuel usage)
Annual maintenance usage:	4 hours per day/two days per year (testing purposes)
Installed:	August 2011

A non-resettable hour meter will be installed for the emergency standby generator. The total number of operating hours per year will be monitored and records kept for *emergency* and *non-emergency (i.e., maintenance and testing)* use.

Exemption Requirements

The equipment listed herein satisfies the exemption requirements in accordance with IDAPA 58.01.01.220 and 58.01.01.222.02.c.

The engine rating is approximately 80 horsepower (HP) for the emergency backup generator located at the scale house.

Applicable exemption criteria for PTC exemptions are discussed below:

220. GENERAL EXEMPTION CRITERIA FOR PERMIT TO CONSTRUCT EXEMPTIONS.

01. General Exemption Criteria. *Sections 220 through 223 may be used by owners or operators to exempt certain sources from the requirement to obtain a permit to construct. Nothing in these sections shall preclude an owner or operator from choosing to obtain a permit to construct. For purposes of Sections 220 through 223, the term source means the equipment or activity being exempted. For purposes of Sections 220 through 223, fugitive emissions shall not be considered in determining whether a source meets the applicable exemption criteria unless required by federal law. No permit to construct is required for a source that satisfies all of the following criteria, in addition to the criteria set forth at Sections 221, 222, or 223:*

a. The maximum capacity of a source to emit an air pollutant under its physical and operational design without consideration of limitations on emission such as air pollution control equipment, restrictions on hours of operation and restrictions on the type and amount of material combusted, stored or processed would not:

i. Equal or exceed one hundred (100) tons per year of any regulated air pollutant.

The ACLF does not exceed 100 tons per year of any regulated air pollutant as defined by IDAPA 58.01.01.008.10.c. (See Attachment B).

ii. Cause an increase in the emissions of a major facility that equals or exceeds the significant emissions rates set out in the definition of significant at Section 006.

No significant emission rates are exceeded per IDAPA 58.01.01.006.106. PTE calculations are less than the significant emission rates for PM_{10}, NOx, SOx, CO, and VOC. (See Appendix B). Note that the PTE calculations are based on EPA AP-42 emission factors for the emergency diesel engine generator.

b. Combination. The source is not part of a proposed new major facility or part of a proposed major modification.

The ACLF is not part of a new major facility or a major modification.

02. Record Retention. *Unless the source is subject to and the owner or operator complies with Section 385, the owner or operator of the source, except for those sources listed in Subsections 222.02.a. through 222.02.g., shall maintain documentation on site which shall identify the exemption determined to apply to the source and verify that the source qualified for the identified exemption. The records and documentation shall be kept for a period of time not less than five (5) years from the date the exemption determination has been made or for the life of the source for which the exemption has been determined to apply, which ever is greater, or until such time as a permit to construct or an operating permit is* *issued which covers the operation of the source. The owner or operator shall submit the documentation to the Department upon request.*

222. *CATEGORY II EXEMPTION.*

No permit to construct is required for the following sources.

***01.** **Exempt Source.** A source that satisfies the criteria set forth in Section 220 and that is specified below: (4-5-00)*

c. Stationary internal combustion engines of less than or equal to six hundred (600) horsepower and which are fueled by natural gas, propane gas, liquefied petroleum gas, distillate fuel oils, residual fuel oils, and diesel fuel; waste oil, gasoline, or refined gasoline shall not be used. To qualify for this exemption, the source must be operated in accordance with the following: (5-1-94)

i. One hundred (100) horsepower or less -- unlimited hours of operation.

The engine rating is approximately 80 horsepower (HP) for the emergency backup generator located at the scale house. Therefore, the ACLF satisfies the Category II exemption criteria per IDAPA 58.01.01.222.01.c.i.

Federal Regulation

New Source Performance Standards—40 CFR Part 60

In 40 CFR Part 60, the EPA established emission performance standards for specific categories of sources. These standards include emission limitations for various regulated pollutants and provide a variety of requirements for monitoring, record keeping, and reporting of emissions and other information. Any stationary source which contains an affected facility constructed after the New Source Performance Standards (NSPS) subpart took effect, must comply with the provisions of 40 CFR 60 Subpart A (codified at 40 CFR 60.1 through 60.18).

The NSPS requirements of Subpart IIII -*Standards of Performance for Stationary Compressor Ignition Internal Combustion Engines* apply to the 60 kW Kohler diesel emergency generator installed in August 2011.

The applicable requirements are provided below for the Tier III diesel-fired *emergency* engine:

- **The engine will be certified by the manufacturer** – Although the rule allows for engines to be certified by the owner or operator, it is expected that most engines subject to this rule will be certified by the manufacturer. It is essential that manufacturer certification is received from the engine manufacturer. The John Deere emergency standby diesel engine is EPA nonroad Tier III.

- **Comply with the Tier III emission standards -** NHMC + NOx = 4.7 g/kw-hr; CO = 5.0 g/kw-hr; PM= 0.40 g/kw-hr (per Table 1 per 40 CFR 89.112)

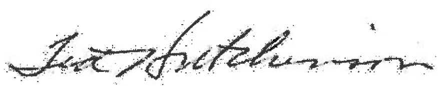
- **Emission requirements for emergency generators** - Maintenance and testing hours of operation for emergency stationary CI ICE will not exceed 100 hours per year. ACLF proposes to take a self-proposed maintenance limit of 8 hours per year.
- **Monitoring requirements for emergency generators** - A non-resettable hour meter is required to be installed for each *emergency* stationary CI ICE.
- **An initial engine notification is not required.**
- **No controls are required.**

Conclusion

The PTE from 60 kW John Deere engine is below the significant emission rates for the regulated pollutants. Additionally, the John Deere engine rating is approximately 80 HP. Therefore, the ACLF satisfies the Category II exemption criteria per IDAPA 58.01.01.222.01.c.i. The ACLF will keep a copy of this exemption evaluation on file.

Certification

I, Ted Hutchinson, certify that the statements and information in this document are true, accurate, and complete in accordance with IDAPA 58.01.01.123-124.



Ted Hutchinson, Director
Ada County Landfill

Appendices

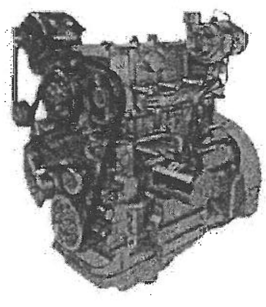
Attachment A – Manufacturer Information
Attachment B – PTE Calculations

Attachment A – Manufacturer Information

PowerTech E
4024H Diesel Engine

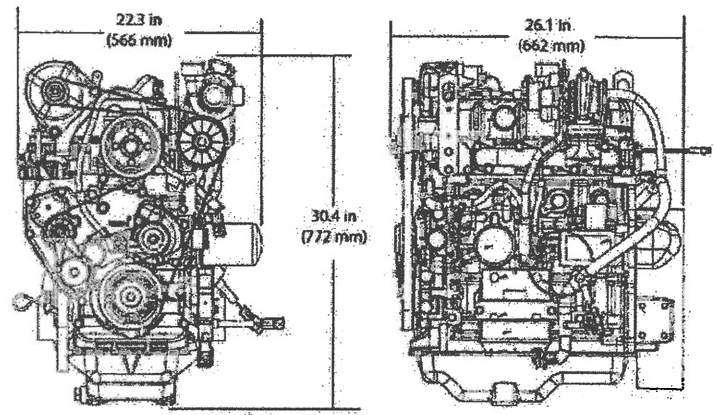
Generator Drive Engine Specifications

JOHN DEERE



4024H shown

Dimensions



Certifications

CARB

EPA Tier 3

General data

Model	4024HF285
Number of cylinders	4
Displacement - L (cu in)	2.4 (146)
Bore and Stroke-- mm (in)	86 x 105 (3.39 x 4.13)
Compression Ratio	18.2:1
Engine Type	In-line, 4-Cycle

Aspiration	Turbocharged and air-to-air aftercooled
Length - mm (in)	662 (26.1)
Width - mm (in)	566 (22.3)
Height-- mm (in)	772 (30.4)
Weight, dry-- kg (lb)	251 (553)

Performance data

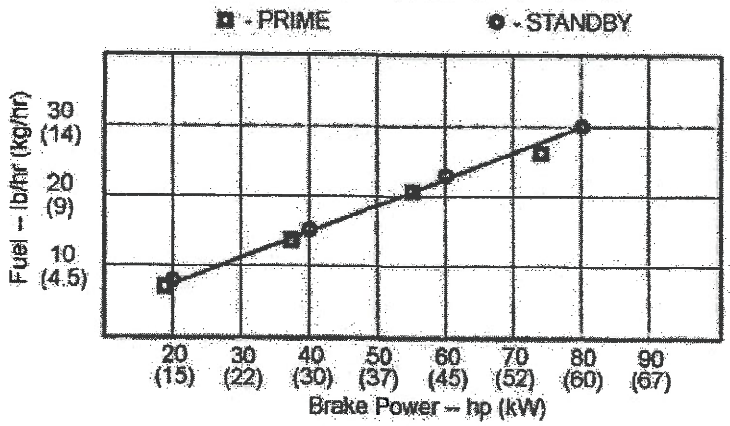
Prime power at 60 Hz (1800 rpm)	55 kW (74 hp)
Standby power at 60 Hz (1800 rpm)	60 kW (80 hp)

The prime power gen-set engine rating is the nominal power an engine is capable of delivering with a variable load for an unlimited number of hours per year with normal maintenance intervals observed. This rating incorporates a 10% overload capability which is available for up to 2 hours at a time. Operating time between 100% and 110% of the prime power rating is not to exceed 8% of the total engine operating time. This rating conforms to ISO 8528-1 "prime power (PRP)". The permissible average power for the prime or PRP rating is not to exceed 70% of rated prime power when calculated per ISO 8528-1.

The standby gen-set engine rating is the nominal engine power available at varying load factors for up to 200 hours per year with normal maintenance intervals observed. No overload capability is available for this rating. This rating conforms to ISO 8528-1 "Emergency Standby Power (ESP)". The permissible average power for the standby or ESP rating is calculated per ISO 8528-1.

Photographs may show non-standard equipment.

Performance curve



Performance data

Hz (rpm)	Generator efficiency %	Rated fan power		Power factor	Calculated generator set output			
					Prime		Standby	
		kW	hp		kWe	kVA	kWe	kVA
60 (1800)	88-92	3.6	4.8	0.8	45-47	56-59	50-52	63-65

Features and benefits

2-Valve Cylinder Head

- U-flow head design provides excellent breathing from a lower-cost 2-valve cylinder head

Electronic Unit Pump (EUP) Fuel System

- Regulated rated speed flexibility and improved cold-start and warm-up control

Fixed Geometry Turbocharger

- Fixed geometry turbochargers are precisely matched to the power level and application

Air-to-Air Aftercooled

- This is the most efficient method of cooling intake air to help reduce engine emissions while maintaining low-speed torque, transient response time, and peak torque. It enables an engine to meet emissions regulations with better fuel economy and the lowest installed costs

John Deere Electronic Engine Controls

- Electronic engine controls monitor critical engine functions, providing warning and/or shutdown to prevent costly engine repairs and eliminate the need for add-on governing components, all lowering total installed costs

Compact Size

- Mounting points are the same as previous engine models

Engine Performance

- Block loading capability provided with standard electronic governor control

Additional Features

- Self-adjusting poly-vee fan drive
- Forged-steel connecting rods
- Either-side service
- 500-hour oil change
- Gear driven auxiliary drive
- Glow plugs
- Optional balancer shafts

John Deere Power Systems
3801 W. Ridgeway Ave.
PO Box 5100
Waterloo, IA 50704-5100
Phone: 1-800-533-6446
Fax: 319.292.5075

John Deere Power Systems
Usine de Saran
La Foulonnerie - B.P. 11.13
45401 Fleury les Aubrais Cedex
France
Phone: 33.2.38.82.61.19
Fax: 33.2.38.82.60.00

All values at rated speed and power with standard options unless otherwise noted. Specifications and design subject to change without notice.

Attachment B – PTE Calculations

Ada County Landfill - Scale House
Emergency Generator

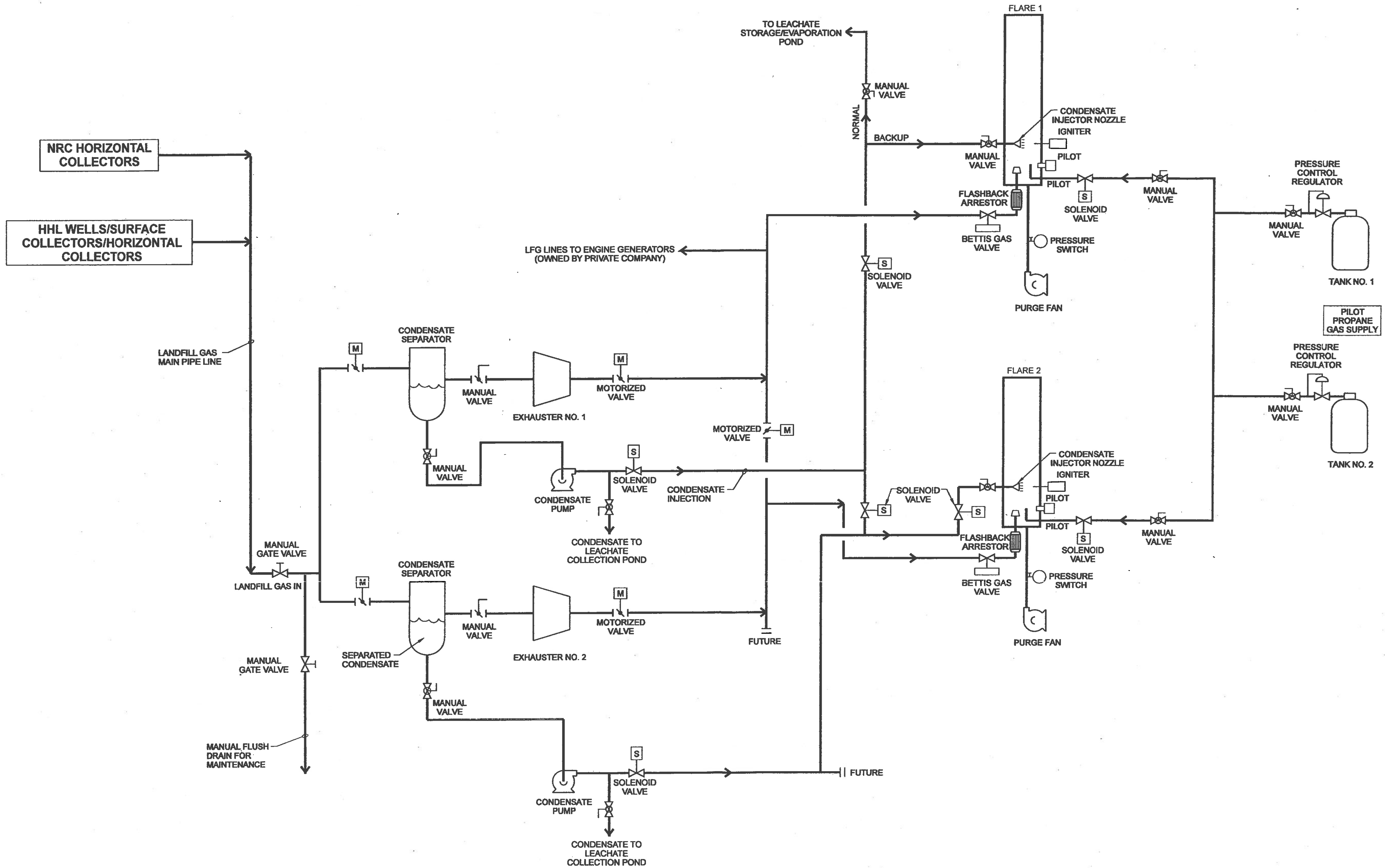
Generator Manufacturer Engine Manufacturer	**Kohler** **John Deere**
Engine Model No.	**4024 HF 285**
Engine Power Rating (hp)	80
Fuel Type	Distillate #2
- maximum sulfur content	0.0015%
Maximum fuel consumption (gals/hr)	4.6
Maximum Heat Input Rating (Btu/hr)	644,000
Maximum Hours of Operation	26
Maximum Firing Rate (gals/yr)	120
Annual Operation Limit (hrs/yr)	26
Annual Firing Rate (gals/yr)	120
Heat Value of Fuel (Btu/gal)	140,000

			Uncontrolled Potential to Emit		
Criteria 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	5.19	0.0026
Total Particulate Matter ($PM_{2.5}$)[2]		0.31	0.20	5.19	0.0026
Particulate Matter (PM10)[3]		0.31	0.20	5.19	0.0026
Nitrogen Oxides (NOx)[4]		4.41	2.84	73.84	0.037
Sulfur Oxides (SO_2)[5]		0.00152	0.00	0.03	0.0000
Carbon Monoxide (CO)[4]		0.95	0.61	15.91	0.0080
TOC as VOC[4]		0.35	0.23	5.86	0.0029

Notes:
[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 C

Process Flow Diagram



PROCESS FLOW DIAGRAM – LANDFILL COLLECTION GAS COLLECTION AND CONTROL

Ada County Landfill PTC

CH2MHILL

ES080211054125BOI

Appendix D

Emission Estimates

Potential Emission Estimates Summary

Table D1

Emissions Unit	$PM_{2.5}$		PM_{10}		SO_2		NOx		CO		VOC		Lead	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
Point Sources														
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	0	0
Flare 2	1.64	7.19	1.64	7.19	10.35	45.33	3.13	13.70	0.78	3.43	4.77	20.90	0	0
Wood chipper generator (Gen 1)	0.30	0.49	0.30	0.50	0.01	0.01	5.36	8.84	0.95	1.57	0.12	0.20	0	0
Power screen generator (Gen 2)	0.27	0.44	0.27	0.44	0.001	0.002	3.79	6.25	0.82	1.35	0.30	0.50	0	0
HHHW Generator (Gen 3)	0.13	0.033	0.13	0.033	0.0006	0.00016	1.85	0.46	0.40	0.10	0.15	0.04	0	0
Scales Generator (Gen 4)	0.20	0.050	0.20	0.050	0.001	0.00025	2.86	0.71	0.62	0.15	0.23	0.06	0	0
Fugitive Sources														
Wood chipper	0.521	0.859	0.521	0.859										
Power screen	0.0046	0.0075	0.0302	0.050										
Wood chipper storage piles	0.0015	0.0025	0.010	0.017										
Unpaved roads	2.02	3.40	27.06	45.54										
Paved roads	2.33	3.86	9.49	15.71										
Landfill operations-dozing	0.07	0.08	0.47	0.58										
Landfill-operations -grading	0.05	0.07	0.92	1.40										
Totals	**9.13**	**23.45**	**42.63**	**79.34**	**20.38**	**89.23**	**20.02**	**43.23**	**4.33**	**9.92**	**10.19**	**41.94**	**-**	**-**

Notes:

Paved roads is new

Facility Wide PTE Emission Inventory

Table D2 ACLF Facility Wide PTE Criteria Emissions

Criteria Pollutant	C-18 Generator Gen 1 (lb/hr)	C-18 Generator Gen 1 (ton/yr)	Deutz Generator Gen 2 (lb/hr)	Deutz Generator Gen 2 (ton/yr)	Kohler Generator Gen 4 (lb/hr)	Kohler Generator Gen 4 (ton/yr)	Detroit Diesel Generator Gen 3 (lb/hr)	Detroit Diesel Generator Gen 3 (ton/yr)	Flare 1 (lb/hr)	Flare 1 (ton/yr)	Flare 2 (lb/hr)	Flare 2 (ton/yr)
PM	0.37	0.61	0.27	0.44	0.201	0.0502	0.13	0.0326	1.59	6.97	1.64	7.19
PM_{10}	0.30	0.50	0.27	0.44	0.201	0.0502	0.13	0.0326	1.59	6.97	1.64	7.19
$PM_{2.5}$	0.30	0.49	0.27	0.44	0.201	0.0502	0.13	0.0326	1.59	6.97	1.64	7.19
CO	0.95	1.57	0.82	1.35	2.86	0.714	1.85	0.463	0.76	3.32	0.78	3.43
SO_2	0.008	0.01	0.001	0.002	0.0010	0.000245	0.0006	0.000159	10.02	43.89	10.35	45.33
NO_X	5.36	8.84	3.79	6.25	0.62	0.1539	0.40	0.0998	3.03	13.27	3.13	13.70
VOC	0.12	0.20	0.30	0.50	0.23	0.0567	0.15	0.0368	4.62	20.24	4.77	20.90

Table D3 ACLF Facility Wide PTE Hazardous Air Pollutant Emissions

HAPS	C-18 Generator Gen 1 (lb/hr)	C-18 Generator Gen 1 (ton/yr)	Deutz Generator Gen 2 (lb/hr)	Deutz Generator Gen 2 (ton/yr)	Kohler Generator Gen 4 (lb/hr)	Kohler Generator Gen 4 (ton/yr)	Detroit Diesel Generator Gen 3 (lb/hr)	Detroit Diesel Generator Gen 3 (ton/yr)	Flare 1 (lb/hr)	Flare 1 (ton/yr)	Flare 2 (lb/hr)	Flare 2 (ton/yr)	Total (lb/hr)	Total (ton/yr)	IDAPA 585/586 EL (lb/hr)	Exceeds EL (Yes or NO)
1,1,1-Trichloroethane									3.92E-04	1.72E-03	4.05E-04	1.77E-03	7.97E-04	3.49E-03	1.27E+02	No
1,1,2,2-Tetrachloroethane									1.14E-03	5.00E-03	1.18E-03	5.16E-03	2.32E-03	1.02E-02	1.10E-05	Yes
1,1,2-Trichloroethane									8.17E-05	3.58E-04	8.44E-05	3.70E-04	1.66E-04	7.27E-04	4.20E-04	Yes
1,1-Dichloroethane (ethylidene dichloride)									1.42E-03	6.24E-03	1.47E-03	6.44E-03	2.90E-03	1.27E-02	2.50E-04	Yes
1,1-Dichloroethene (vinylidene chloride)									1.19E-04	5.20E-04	1.23E-04	5.37E-04	2.41E-04	1.06E-03	1.30E-04	Yes
1,2-Dichloroethane (ethylene dichloride)									2.48E-04	1.09E-03	2.57E-04	1.12E-03	5.05E-04	2.21E-03	2.50E-04	Yes
1,2-Dichloropropane (propylene dichloride)									1.25E-04	5.46E-04	1.29E-04	5.63E-04	2.53E-04	1.11E-03	2.31E+01	No
Acrylonitrile									3.09E-04	1.35E-03	3.19E-04	1.40E-03	6.27E-04	2.75E-03	6.53E+01	No
Benzene	4.13E-03	6.81E-03	8.01E-04	1.32E-03	6.05E-04	1.51E-04	3.92E-04	9.80E-05	1.37E-04	6.00E-04	1.42E-04	6.20E-04	6.20E-03	9.60E-03	8.00E-04	Yes
Carbon disulfide									4.06E-05	1.78E-04	4.19E-05	1.83E-04	8.24E-05	3.61E-04	2.00E+00	No
Carbon tetrachloride									3.77E-06	1.65E-05	3.89E-06	1.70E-05	7.66E-06	3.36E-05	4.40E-04	No
Carbonyl sulfide									7.21E-05	3.16E-04	7.45E-05	3.26E-04	1.47E-04	6.42E-04	2.70E-02	No
Chlorobenzene									1.72E-04	7.55E-04	1.78E-04	7.79E-04	3.50E-04	1.53E-03	2.33E+01	No
Chloroethane (ethyl chloride)									4.94E-04	2.16E-03	5.10E-04	2.23E-03	1.00E-03	4.40E-03	1.76E+02	No
Chloroform									2.19E-05	9.61E-05	2.26E-05	9.92E-05	4.46E-05	1.95E-04	2.80E-04	No
Chloromethane (methylchloride)									3.74E-04	1.64E-03	3.86E-04	1.69E-03	7.60E-04	3.33E-03	NA	NA
Dichlorobenzene									1.89E-04	8.28E-04	1.95E-04	8.55E-04	3.84E-04	1.68E-03	2.00E+01	No
Dichloromethane (methylene chloride)									7.44E-03	3.26E-02	7.68E-03	3.36E-02	1.51E-02	6.62E-02	1.60E-03	Yes
Ethylbenzene									4.50E-04	1.97E-03	4.64E-04	2.03E-03	9.14E-04	4.00E-03	2.90E+01	No
Ethylene dibromide									1.15E-06	5.04E-06	1.19E-06	5.20E-06	2.34E-06	1.02E-05	3.00E-05	No
Formaldehyde	4.20E-04	6.93E-04	1.01E-03	1.67E-03	7.65E-04	1.91E-04	4.96E-04	1.24E-04					2.69E-03	2.68E-03	5.10E-04	Yes
Hexane									5.20E-04	2.28E-03	5.37E-04	2.35E-03	1.06E-03	4.63E-03	1.20E+01	No
Mercury (total)									1.79E-05	7.86E-05	1.85E-05	8.11E-05	3.65E-05	1.60E-04	7.00E-03	No
Methyl ethyl ketone (MEK)									4.70E-04	2.06E-03	4.85E-04	2.12E-03	9.55E-04	4.18E-03	3.93E+01	No
Methyl isobutyl ketone (MIBK)									1.72E-04	7.54E-04	1.78E-04	7.78E-04	3.50E-04	1.53E-03	1.37E+01	No
Naphthalene	6.92E-04	1.14E-03	7.28E-05	1.20E-04	5.50E-05	1.37E-05	3.56E-05	8.90E-06					8.55E-04	1.28E-03	3.33E+00	No
Perchloroethylene (tetrachloroethylene)									3.79E-03	1.66E-02	3.91E-03	1.71E-02	7.70E-03	3.37E-02	1.30E-02	Yes
Toluene	1.49E-03	2.47E-03	3.51E-04	5.79E-04	2.65E-04	6.63E-05	1.72E-04	4.29E-05	3.33E-03	1.46E-02	3.43E-03	1.50E-02	9.04E-03	3.28E-02	2.50E+01	No
Trichoroethylene									2.27E-03	9.94E-03	2.34E-03	1.03E-02	4.61E-03	2.02E-02	1.79E+01	No
Vinyl chloride									2.81E-03	1.23E-02	2.90E-03	1.27E-02	5.71E-03	2.50E-02	9.40E-04	Yes
Xylenes									1.18E-03	5.17E-03	1.22E-03	5.34E-03	2.40E-03	1.05E-02	2.90E+01	No
Hydrochloric Acid									4.65E-01	2.04E+00	4.80E-01	2.10E+00	9.45E-01	4.14E+00	NA	NA
o-Xylenes	1.03E-03	1.69E-03	2.45E-04	4.04E-04	1.85E-04	4.62E-05	1.20E-04	2.99E-05					1.58E-03	2.17E-03	2.90E+01	No
Propylene			2.22E-03	3.66E-03	1.67E-03	4.18E-04	1.08E-03	2.71E-04					4.97E-03	4.34E-03	NA	NA
Acetaldehyde	1.34E-04	2.21E-04	6.59E-04	1.09E-03	4.97E-04	1.24E-04	3.22E-04	8.05E-05					1.61E-03	1.51E-03	3.00E-03	No
Acrolein	4.19E-05	6.92E-05	7.94E-05	1.31E-04	5.99E-05	1.50E-05	3.89E-05	9.71E-06					2.20E-04	2.25E-04	1.70E-02	No
1,3-Butadiene			3.36E-05	5.54E-05	2.53E-05	6.33E-06	1.64E-05	4.11E-06					7.53E-05	6.58E-05	2.40E-05	Yes
Total HAPs										4.38						

Potential Landfill Emissions Calculations

Table D4 - Flares

Assume potential LFG flow of 4699 scfm

$Q_{CH4\ Max}$ = 3.497E+07 m^3/yr Design maximum; w/ 50% methane content

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} =	3.497E+07	m^3/yr
	1.23E+09	ft^3/yr
Qr_{Total} =	76,969,620	Lower flare heat release (BTU/hr)

CM_{PM10} =	***3.23***	***lb/hr***	***14.16***	***tons/yr***	Combined

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

CM_{PM10} =	17	lb/MMdscf

CM_{PM10} =	***2.40***	***lb/hr***	***10.50***	***tons/yr***	Combined

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

Potential Landfill Emissions Calculations

Table D5 - Flares

Given:

$Q_{CH4\ Max}$ = *3.497E+07* *m^3/yr* Design maximum; w/ 50% methane content

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)
$Q_{CH4\ Max}$ =	3.497E+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 = ***12,066 m^3/yr*** ***NMOC = 0.81 cfm NMOC*** Combined Flares

Uncontrolled Mass Emissions Rate

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

UM_P =		Uncontrolled mass emission rate of pollutant P (kg/yr)
Q_P =	12,066	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 = ***43,253 kg/yr*** ***NMOC = 10.86 lb/hr NMOC*** Combined Flares
47.7 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} =	6.400E+07	Uncontrolled mass emissions of carbon dioxide (kg/yr); Design Maximum value
$UM_{CH4\ Max}$ =	2.333E+07	Uncontrolled mass emissions of methane (kg/yr); Design maximum value
n_{col} =	85.0%	Gas collection system control efficiency

CM_{CO2} = ***118,527,486 kg/yr*** ***CO_2 = 29,767.18 lb/hr NMOC*** Combined Flares
130,617 Tons/yr CO_2

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

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

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

Sulfur Dioxide Emissions

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

$C_S = Sigma\ (C_P * S_P)$ 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

$Q_{CH4\ Max}$ =	3.497E+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 = 3,280 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 = 4,375 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 =	4,375	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 $_{SO2}$ =	*7,437*	*kg/yr*	*SO_2*			Combined Flares
	8.2	*Tons/yr*	*SO_2 =*	*1.87*	*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
$Q_{CH4\ Max}$ =	3.497E+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} = 2,938 ppmv Chloride, Cl⁻

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

UM_{Cl} = 4,332 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} =	4,332	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 $_{HCl}$ =	*3,755*	*kg/yr*	*HCl*			Combined Flares
	4.1	*Tons/yr*	*HCl =*	*0.94*	*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
$Q_{CH4\ Max}$ =	3.50E+07	m^3/yr
	1.23E+09	ft3/yr 2.35E+03
Q_{rTotal} =	76,969,620	Total flare heat release (BTU/hr)

CM $_{NOx}$ =	*4.62*	*lb/hr @1,600°F*	*20.23*	*tons/yr*	Combined
	6.16	*lb/hr @1,800°F*	*26.97*	*tons/yr*	Combined
CM $_{CO}$ =	*1.54*	*lb/hr @1,600°F*	*6.74*	*tons/yr*	Combined
	1.15	*lb/hr @1,800°F*	*5.06*	*tons/yr*	Combined

Landfill Emissions Calculations - NMOC & TAP Emissions

Table D6 - Flares

Note: Values already corrected for air infiltration
Uncontrolled Pollutant Concentrations (AP-42 Table 2.4-1, 11/98)

Year: 2011
$Q_{CH4\ Max}$ = 3.497E+07 m^3/yr Design maximum for all pollutants except H2S and S02 (Existing Permit Conditions)
$Q_{CH4\ Max}$ = 2.493E+07 m^3/yr Design maximum for H2S and SO2
Collection system efficiency: 85.0%
Landfill Temp: 20 C

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		
		(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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
Hydrogen sulfide	7783-06-4	34.08	600	2.99E+04	4.24E+04	9.35E+04	1.07E+01	2.88E+02	7.48E+02	8.54E-02	0.933	0.7		Below	99.2%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
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%
Carbon monoxide	630-08-0	28.01	141	9.86E+03	1.15E+04	2.53E+04	2.89E+00	4.20E+04	9.25E+04	1.06E+01	NA	NA	NA		12,000

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

Pollutant	CAS No.	MW	Concentration	Uncontrolled		Uncontrolled		Flare	Flare		IDAPA 58.01.01.585/586 Standards			Total - Controlled	
		(g/gmol)	(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
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%
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%
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%
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%
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%
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%
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%

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

Landfill Emissions Calculations

Table D7 - Potential Summary of Emissions - Maximum Flow

Based on Design Maximum rates

	Flare - Controlled		Flare1 - Controlled		Flare 2- C
	(Tons/yr)	(lb/hr)	(Tons/yr)	(lb/hr)	(Tons/yr)
Sulfur Dioxide	**88.0**	**20.09**	**43.30**	**9.89**	**44.71**
Nitrogen Oxides	**26.97**	**6.16**	**13.27**	**3.03**	**13.70**
Carbon Monoxide	**6.74**	**1.54**	**3.32**	**0.76**	**3.43**
PM10	**14.16**	**3.23**	**6.97**	**1.59**	**7.19**

HAP/VOC		Flare - Controlled		Flare1 - Controlled		Flare 2- C
		(Tons/yr)	(lb/hr)	(Tons/yr)	(lb/hr)	(Tons/yr)
HAP	1,1,1-Trichloroethane	3.49E-03	7.97E-04	1.72E-03	3.92E-04	1.77E-03
HAP/VOC	1,1,2,2-Tetrachloroethane	1.02E-02	2.32E-03	5.00E-03	1.14E-03	5.16E-03
HAP/VOC	1,1,2-Trichloroethane	7.27E-04	1.66E-04	3.58E-04	8.17E-05	3.70E-04
HAP/VOC	1,1-Dichloroethane (ethylidene dichloride)	1.27E-02	2.90E-03	6.24E-03	1.42E-03	6.44E-03
HAP/VOC	1,1-Dichloroethene (vinylidene chloride)	1.06E-03	2.41E-04	5.20E-04	1.19E-04	5.37E-04
HAP/VOC	1,2-Dichloroethane (ethylene dichloride)	2.21E-03	5.05E-04	1.09E-03	2.48E-04	1.12E-03
HAP/VOC	1,2-Dichloropropane (propylene dichloride)	1.11E-03	2.53E-04	5.46E-04	1.25E-04	5.63E-04
VOC	2-Propanol (isopropyl alcohol)	2.46E-02	5.62E-03	1.21E-02	2.77E-03	1.25E-02
*	Acetone	3.33E-03	7.60E-04	1.64E-03	3.74E-04	1.69E-03
HAP/VOC	Acrylonitrile	2.75E-03	6.27E-04	1.35E-03	3.09E-04	1.40E-03
VOC	Bromodichloromethane	2.80E-02	6.38E-03	1.38E-02	3.14E-03	1.42E-02
VOC	Butane	2.39E-03	5.46E-04	1.18E-03	2.69E-04	1.21E-03
HAP/VOC	Carbon disulfide	3.61E-04	8.24E-05	1.78E-04	4.06E-05	1.83E-04
HAP/VOC	Carbon tetrachloride	3.36E-05	7.66E-06	1.65E-05	3.77E-06	1.70E-05
HAP/VOC	Carbonyl sulfide	6.42E-04	1.47E-04	3.16E-04	7.21E-05	3.26E-04
HAP/VOC	Chlorobenzene	1.53E-03	3.50E-04	7.55E-04	1.72E-04	7.79E-04
VOC	Chlorodifluoromethane	6.13E-03	1.40E-03	3.02E-03	6.88E-04	3.11E-03
HAP/VOC	Chloroethane (ethyl chloride)	4.40E-03	1.00E-03	2.16E-03	4.94E-04	2.23E-03
HAP/VOC	Chloroform	1.95E-04	4.46E-05	9.61E-05	2.19E-05	9.92E-05
HAP/VOC	Chloromethane (methylchloride)	3.33E-03	7.60E-04	1.64E-03	3.74E-04	1.69E-03
HAP/VOC	Dichlorobenzene	1.68E-03	3.84E-04	8.28E-04	1.89E-04	8.55E-04
VOC	Dichlorodifluoromethane	1.03E-01	2.36E-02	5.09E-02	1.16E-02	5.26E-02
VOC	Dichlorofluoromethane	1.47E-02	3.36E-03	7.23E-03	1.65E-03	7.47E-03
HAP	Dichloromethane (methylene chloride)	6.62E-02	1.51E-02	3.26E-02	7.44E-03	3.36E-02
VOC	Dimethyl sulfide (methyl sulfide)	1.06E-02	2.42E-03	5.21E-03	1.19E-03	5.38E-03
VOC	Ethane	2.19E-01	4.99E-02	1.08E-01	2.46E-02	1.11E-01
VOC	Ethanol	1.03E-02	2.34E-03	5.04E-03	1.15E-03	5.21E-03
VOC	Ethyl mercaptan (ethanethiol)	1.16E-03	2.64E-04	5.70E-04	1.30E-04	5.89E-04
HAP/VOC	Ethylbenzene	4.00E-03	9.14E-04	1.97E-03	4.50E-04	2.03E-03
HAP/VOC	Ethylene dibromide	1.02E-05	2.34E-06	5.04E-06	1.15E-06	5.20E-06
VOC	Fluorotrichloromethane	5.69E-03	1.30E-03	2.80E-03	6.39E-04	2.89E-03
HAP/VOC	Hexane	4.63E-03	1.06E-03	2.28E-03	5.20E-04	2.35E-03
*	Hydrogen sulfide	3.74E-01	8.54E-02	1.84E-01	4.20E-02	1.90E-01
HAP	Mercury (total)	1.60E-04	3.65E-05	7.86E-05	1.79E-05	8.11E-05
HAP/VOC	Methyl ethyl ketone (MEK)	4.18E-03	9.55E-04	2.06E-03	4.70E-04	2.12E-03
HAP/VOC	Methyl isobutyl ketone (MIBK)	1.53E-03	3.50E-04	7.54E-04	1.72E-04	7.78E-04
VOC	Methyl mercaptan	9.80E-04	2.24E-04	4.82E-04	1.10E-04	4.98E-04
VOC	Pentane	1.94E-03	4.43E-04	9.55E-04	2.18E-04	9.86E-04
HAP/VOC	Perchloroethylene (tetrachloroethylene)	3.37E-02	7.70E-03	1.66E-02	3.79E-03	1.71E-02
VOC	Propane	4.00E-03	9.14E-04	1.97E-03	4.50E-04	2.03E-03
*	trans-1,2-Dichloroethene	1.50E-02	3.43E-03	7.38E-03	1.69E-03	7.63E-03
HAP/VOC	Trichoroethylene	2.02E-02	4.61E-03	9.94E-03	2.27E-03	1.03E-02
HAP/VOC	Vinyl chloride	2.50E-02	5.71E-03	1.23E-02	2.81E-03	1.27E-02
HAP/VOC	Xylenes	1.05E-02	2.40E-03	5.17E-03	1.18E-03	5.34E-03
HAP	Hydrochloric Acid	4.14E+00	9.45E-01	2.04E+00	4.65E-01	2.10E+00
HAP/VOC	Benzene					
	No or unknown co-disposal	1.22E-03	2.79E-04	6.00E-04	1.37E-04	6.20E-04
VOC	NMOC (as hexane)					
	Site-Specific Value	4.05E+01	9.25E+00	1.99E+01	4.55E+00	2.06E+01
HAP/VOC	Toluene					
	No or unknown co-disposal	2.96E-02	6.76E-03	1.46E-02	3.33E-03	1.50E-02
	Total TAPS	**4.83**	**1.10**	2.38E+00	5.42E-01	2.45E+00
	Total HAPS	**4.32**	**0.99**	2.12E+00	4.85E-01	2.19E+00
	Total VOCS	**41.14**	**9.39**	2.02E+01	4.62E+00	2.09E+01

	Flare 1		**Flare 2**	
	Tons/yr	**lb/hr**	**Tons/yr**	**lb/hr**
Total TAPS	**2.38**	**0.54**	**2.45**	**0.56**
Total HAPS	**2.12**	**0.49**	**2.19**	**0.50**
Total VOCS	**20.24**	**4.621**	**20.90**	**4.771**

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)

Table D8

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

Assumptions:

34 MW of H2S
32 MW of Sulfur
64 MW of SO2
1.07E+01 lb/hr H2S

Assume 100% H2S conversion for SO2

10.05 lb/hr S
0.31 lb-mol S
20.09 lb/hr SO2

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

CM_{SO2} =		Controlled mass emissions of sulfur dioxide (lb/hr)	
UM_{S} =	10.05	lb/hr S	
n_{col} =	2	Gas collection system control efficiency	

CM_{SO2} =	***20.09***	***lb/hr***	***SO_2***	Combined Flares
	88.0	***Tons/yr***	***SO_2***	
CM_{SO2} =	***20.37***	***lb/hr***	***SO_2***	IDEQ calculated results (November 2011)
	89.2	***Tons/yr***	***SO_2***	

Current SO2 Limits:

1.87 lb/hr SO2 Combined Flares
0.92 lb/hr SO2 Flare 1
0.95 lb/hr SO2 Flare 2

SO2 Net Increase:

18.22 lb/hr SO2 Combined Flares
8.965 lb/hr SO2 Flare 1
9.257 lb/hr SO2 Flare 2

Based on IDEQ calculated results

SO2 Total Flares (facility wide modeling)

20.37 lb/hr SO2 Combined Flares
10.022 lb/hr SO2 Flare 1
10.348 lb/hr SO2 Flare 2

89.22 Ton/yr SO2 Combined Flares
43.89 Ton/yr SO2 Flare 1
45.33 Ton/yr SO2 Flare 2

Potential Emission Calculations

Table D9 - ACLF - Wood Chipper Diesel Engine Emissions (Gen 1)

Emission Point No.	**SC-E-1**	
Model No.	**CAT C18**	
Engine Power Rating (bhp)	650	
Fuel Type	Distillate #2	
- maximum sulfur content	0.0015%	Ultra low sulfur fuel
Maximum Firing Rate (gals/hr)	38.0	
Maximum Heat Input Rating (Btu/hr)	5,320,000	
(hp)	2,090	*Large Engine*
Maximum Hours of Operation	3,300	
Maximum Firing Rate (gals/yr)	125,400	
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]		0.0697	0.37	1,224	0.61
Total Particulate Matter ($PM_{2.5}$)[2]		0.0556	0.30	976	0.49
Particulate Matter (PM_{10})[3]		0.0573	0.30	1,006	0.50
Sulfur Oxides (SO_2)[4]		0.00152	0.0081	26.60	0.013
Nitrogen Oxides (NOx)[5]			**5.36**	17,688	8.84
Carbon Monoxide (CO)[5]			**0.95**	3,135	1.57
HC as VOC[5]			**0.12**	396	0.20

			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	7.76E-04	4.13E-03	1.36E+01	6.81E-03	8.00E-04	**Exceeds**	HAP
Formaldehyde	50-00-0	7.89E-05	4.20E-04	1.39E+00	6.93E-04	5.10E-04	Below	HAP
Naphthalene	91-20-3	1.30E-04	6.92E-04	2.28E+00	1.14E-03	3.33E+00	Below	HAP
Toluene	108-88-3	2.81E-04	1.49E-03	4.93E+00	2.47E-03	2.50E+01	Below	HAP
o-Xylenes	1330-20-7	1.93E-04	1.03E-03	3.39E+00	1.69E-03	2.90E+01	Below	HAP
Acetaldehyde	75-07-0	2.52E-05	1.34E-04	4.42E-01	2.21E-04	3.00E-03	Below	HAP
Acrolein	107-02-8	7.88E-06	4.19E-05	1.38E-01	6.92E-05	1.70E-02	Below	HAP
Acenaphthene	83-32-9	4.68E-06	2.49E-05	8.22E-02	4.11E-05	#N/A	#N/A	
Acenaphthylene	203-96-8	9.23E-06	4.91E-05	1.62E-01	8.10E-05	#N/A	#N/A	
Anthracene	120-12-7	1.23E-06	6.54E-06	2.16E-02	1.08E-05	#N/A	#N/A	
Benz(a)anthracene	56-55-3	6.22E-07	3.31E-06	1.09E-02	5.46E-06	#N/A	#N/A	
Benzo(b)fluoranthene	205-99-2	1.11E-06	5.91E-06	1.95E-02	9.74E-06	#N/A	#N/A	
Benzo(k)fluoranthene	205-82-3	2.18E-07	1.16E-06	3.83E-03	1.91E-06	#N/A	#N/A	
Benzo(g,h,I)perylene	191-24-2	5.56E-07	2.96E-06	9.76E-03	4.88E-06	#N/A	#N/A	
Chrysene	218-01-9	1.53E-06	8.14E-06	2.69E-02	1.34E-05	#N/A	#N/A	
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	1.84E-06	6.07E-03	3.04E-06	#N/A	#N/A	
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	2.20E-06	7.27E-03	3.63E-06	#N/A	#N/A	
Benzo(a)pyrene	50-32-8	2.57E-07	1.37E-06	4.51E-03	2.26E-06	#N/A	#N/A	
Total PAH			2.69E-05	8.87E-02	4.44E-05	2.00E-06	**Exceeds**	
Fluoroanthene	206-44-0	4.03E-06	2.14E-05	7.08E-02	3.54E-05	#N/A	#N/A	
Fluorene	86-73-7	1.28E-05	6.81E-05	2.25E-01	1.12E-04	#N/A	#N/A	
Phenanthrene	85-01-8	4.08E-05	2.17E-04	7.16E-01	3.58E-04	#N/A	#N/A	
Pyrene	129-00-0	3.71E-06	1.97E-05	6.51E-02	3.26E-05	#N/A	#N/A	
Propylene	115-07-1	2.79E-03	1.48E-02	4.90E+01	2.45E-02	#N/A	#N/A	
Total HAPS			**7.94E-03**		**1.31E-02**			

[1] Total PM emission factor (AP-42, Table 3.4-2, 10/96)

[2] Total $PM_{2.5}$ emission factor based on filterable particulate < 3 um plus condensable particulate (AP-42, Table 3.4-2, 10/96)

[3] PM_{10} emission factor is the sum of filterable and condensible PM10 emission factors (AP-42,Table 3.4-2, 10/96)

[4] SO_2 emission factor multiplied by sulfur content of fuel (Ap-42, Table 3.4.1, 10/96)

[5] Manufacturer (Caterpillar) provided worst case emission estimates "Not to exceed data" for NOx, CO, and HC.

Potential Emission Calculations

Table D10 - ACLF - Power Wood Screen Diesel Engine Emissions (Gen 2)

Emission Point No.	**SC-E-2**	
Model No.	**Deutz BF4L913**	
Engine Power Rating (bhp)	106	
Fuel Type	Distillate #2	
- maximum sulfur content	0.0015%	Ultra low sulfur fuel
Maximum Firing Rate (gals/hr)	6.1	
Maximum Heat Input Rating (Btu/hr)	858,600	
(hp)	337	*Small Engine*
Maximum Hours of Operation	3,300	
Maximum Firing Rate (gals/yr)	20,238	
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	0.27	878	0.44
Total Particulate Matter ($PM_{2.5}$)[2]		0.31	0.27	878	0.44
Particulate Matter (PM10)[3]		0.31	0.27	878	0.44
Nitrogen Oxides (NOx)[4]		4.41	3.79	12,495	6.25
Sulfur Oxides (SO_2)[5]		0.00152	0.0013	4.293	0.002
Carbon Monoxide (CO)[4]		0.95	0.82	2,692	1.35
TOC as VOC[4]		0.35	0.30	992	0.50

			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	8.01E-04	2.64E+00	1.32E-03	8.00E-04	**Exceeds**	HAP
Formaldehyde	50-00-0	1.18E-03	1.01E-03	3.34E+00	1.67E-03	5.10E-04	**Exceeds**	HAP
Naphthalene	91-20-3	8.48E-05	7.28E-05	2.40E-01	1.20E-04	3.33E+00	Below	HAP
Toluene	108-88-3	4.09E-04	3.51E-04	1.16E+00	5.79E-04	2.50E+01	Below	HAP
o-Xylenes	1330-20-7	2.85E-04	2.45E-04	8.08E-01	4.04E-04	2.90E+01	Below	HAP
Propylene	115-07-1	2.58E-03	2.22E-03	7.31E+00	3.66E-03	NA	NA	HAP
Acetaldehyde	75-07-0	7.67E-04	6.59E-04	2.17E+00	1.09E-03	3.00E-03	Below	HAP
Acrolein	107-02-8	9.25E-05	7.94E-05	2.62E-01	1.31E-04	1.70E-02	Below	HAP
1,3-Butadiene	106-99-0	3.91E-05	3.36E-05	1.11E-01	5.54E-05	2.40E-05	**Exceeds**	HAP
Acenaphthene	83-32-9	1.42E-06	1.22E-06	4.02E-03	2.01E-06	NA	NA	
Acenaphthylene	203-96-8	5.06E-06	4.34E-06	1.43E-02	7.17E-06	NA	NA	
Anthracene	120-12-7	1.87E-06	1.61E-06	5.30E-03	2.65E-06	NA	NA	
Benz(a)anthracene	56-55-3	1.68E-06	1.44E-06	4.76E-03	2.38E-06	NA	NA	
Benzo(b)fluoranthene	205-99-2	9.91E-08	8.51E-08	2.81E-04	1.40E-07	NA	NA	
Benzo(k)fluoranthene	205-82-3	1.55E-07	1.33E-07	4.39E-04	2.20E-07	NA	NA	
Benzo(g,h,l)perylene	191-24-2	4.89E-07	4.20E-07	1.39E-03	6.93E-07	NA	NA	
Chrysene	218-01-9	3.53E-07	3.03E-07	1.00E-03	5.00E-07	NA	NA	
Dibenzo(a,h)anthracene	53-70-3	5.83E-07	5.01E-07	1.65E-03	8.26E-07	NA	NA	
Indeno(1,2,3-cd)pyrene	193-39-5	3.75E-07	3.22E-07	1.06E-03	5.31E-07	NA	NA	
Benzo(a)pyrene	50-32-8	1.88E-07	1.61E-07	5.33E-04	2.66E-07	NA	NA	
Total PAH			3.37E-06	1.11E-02	5.56E-06	2.00E-06	**Exceeds**	
Fluoroanthene	206-44-0	7.61E-06	6.53E-06	2.16E-02	1.08E-05	NA	NA	
Fluorene	86-73-7	2.92E-05	2.51E-05	8.27E-02	4.14E-05	NA	NA	
Phenanthrene	85-01-8	2.94E-05	2.52E-05	8.33E-02	4.17E-05	NA	NA	
Pyrene	129-00-0	4.78E-06	4.10E-06	1.35E-02	6.77E-06	NA	NA	
Total HAPS			**5.47E-03**		**9.02E-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

Potential Emission Calculations

Table D11 - ACLF - 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	
(hp)	165	*Small Engine*
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 D12 - ACLF - 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%	Ultra low sulfur fuel
Maximum Firing Rate (gals/hr)	4.6	
Maximum Heat Input Rating (Btu/hr)	648,000	
(hp)	255	*Small Engine*
Maximum Hours of Operation	500	
Maximum Firing Rate (gals/yr)	2,314	
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	0.20	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

Potential Emission Calculations

Table D13 - ACLF - Wood Chipper

Fugitive Dust Emissions - based on log debarking EF and material transfer equation

Assumptions

Wood Chips/Sawdust Production Rate: *Based on grinder loading*

Wood Chips/Sawdust Production Rate:	150,150	tons/yr	
Annual Operating Hours:	11.0	hours/day	6 days/week
			50 wk/yr

Actual Average: 45.5 tons/hour

Emission Factors

Log Debarking	1.10E-02	lb PM_{10}/ton	FIRE Database, SCC30700801	
Material Transfer	E_{PM10}	lb PM_{10}/ton	AP-42, Section 13.2.4, Eqn. (1)	

E_{PM10} = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4

Where:

k = particle size multiplier; 0.35 for < 10 micron particles

U = mean wind speed (mph)

= 9 mph (Ref: Climatic Wind Data for the United States, Nov. 1998)

M = material moisture content (%)

= 11 %

E_{PM10} = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4

= 2.21E-04 lb PM_{10}/ton

Revised Fugitive Emission Estimates:

Wood Chipper Emissions: 5.0050E-01 lb PM_{10}/hr *- based on log debarking factor*

Transfer Point Emissions = 2.0119E-02 lb PM_{10}/hr *- based on material transfer factor*

- assume two transfer points

Total Wood Chipper Fugitive PM_{10} Emissions:

0.521 lb PM_{10}/hr ***- based on log debarking factor***

Annual Total: 0.8590 tons/year ***- based on log debarking factor***

Note:

Assume PM10 is equal to PM2.5

Potential Emission Calculations

Table D14 - ACLF - Power Screen

Fugitive Dust Emissions - Based on material transfer equation

Assumptions

Wood Chips/Sawdust Production Rate:			*Based on grinder loading*
	150,150	tons/yr	
Annual Operating Hours:	11.0	hours/day	6 days/week
			50 wk/yr
Actual Average:	45.5	tons/hour	- as an annual hourly average (based on actual 2010 data)

Emission Factors

Material Transfer $E_{PM2.5}$ lb PM2.5/ton | AP-42, Section 13.2.4, Eqn. (1)

$E_{PM2.5}$ = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4

Where:

k = particle size multiplier; 0.053 for < 2.5 micron particles

U = mean wind speed (mph)

= 9 mph (Ref: Climatic Wind Data for the United States, Nov. 1998)

M = material moisture content (%)

= 11 %

$E_{PM2.5}$ = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4

= 3.35E-05 lb/ton PM2.5

Revised Fugitive Emission Estimates:

Power Screen Emissions: **1.52E-03 lb/hr PM2.5** *- based on material transfer factor*

Transfer Point Emissions = **3.05E-03 lb/hr PM2.5** *- based on material transfer factor*
- assume two transfer points

Total Power Screen Fugitive PM2.5 Emissions:

0.0046 lb/hr PM2.5 ***- based on material transfer factor***

Annual Total: **0.0075 tons/year** ***- based on material transfer factor***

Potential Emission Calculations

Table D15 - ACLF - Power Screen

Fugitive Dust Emissions - Based on material transfer equation

Assumptions

Wood Chips/Sawdust Production Rate: *Based on grinder loading*

Annual Operating Hours:	11.0 hours/day	6 days/week	
	3300 Hours/year	50 wk/yr	
Maximum:	45.5 tons/hour		
	150,150 tons/yr		

Emission Factors

Material Transfer E_{PM10} lb PM_{10}/ton | AP-42, Section 13.2.4, Eqn. (1)

E_{PM10} = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4

Where:

k = particle size multiplier; 0.35 for < 10 micron particles

U = mean wind speed (mph)

= 9 mph (Ref: Climatic Wind Data for the United States, Nov. 1998)

M = material moisture content (%)

= 11 %

E_{PM10} = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4

= 2.21E-04 lb/ton PM10

Revised Fugitive Emission Estimates:

Power Screen Emissions: **0.010 lb/hr PM10** *- based on material transfer factor*

Transfer Point Emissions = **0.020 lb/hr PM10** *- based on material transfer factor*
- assume two transfer points

Total Power Screen Fugitive PM_{10} Emissions:

0.0302 lb/hr PM10 ***- based on material transfer factor***

Annual Total: **0.0498 tons/year** ***- based on material transfer factor***

Potential Emission Calculations

Table D16 - ACLF - Storage Piles

Fugitive Dust Emissions - Based on material transfer equation

Assumptions

Wood Chips/Sawdust Production Rate: *Based on grinder loading*

Operation Schedule:	11.0 hours/day	6 days/week
Annual Maximum Hours	3300	50 weeks/year
Annual Maximum	150,150 tons/yr	
Maximum:	45.5 tons/hour	

Emission Factors

Material Transfer $E_{PM2.5}$ lb PM2.5/ton | AP-42, Section 13.2.4, Eqn. (1) dated 11/06

$E_{PM2.5}$ = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4

Where:

k = particle size multiplier; 0.053 for < 10 micron particles

U = mean wind speed (mph)

= 9 mph (Ref: Climatic Wind Data for the United States, Nov. 1998)

M = material moisture content (%)

= 11 %

$E_{PM2.5}$ = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4

= 3.35E-05 lb/ton PM2.5

Revised Fugitive Emission Estimates:

Storage Pile Emissions = **1.52E-03 lb/hr PM2.5** *- based on material transfer factor*

Total Storage Pile Fugitive PM2.5 Emissions:

0.0015 lb/hr PM2.5 ***- based on material transfer factor***

Annual Total: **0.0025 tons/year PM2.5** ***- based on material transfer factor***

Note:

Assume actual emissions are equal to potential emissions

Potential Emission Calculations

Table D17 - ACLF - Storage Piles

Fugitive Dust Emissions - Based on material transfer equation

Assumptions

Wood Chips/Sawdust Production Rate:		*Based on grinder loading*
Operation Schedule:	11.0 hours/day	6 days/week
Annual Maximum Hours	3300	50 weeks/year
Annual Maximum	150,150 tons/yr	
Maximum:	45.5 tons/hour	

Emission Factors

Material Transfer E_{PM10} lb PM_{10}/ton | AP-42, Section 13.2.4, Eqn. (1) dated 11/06

E_{PM10} = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4

Where:

k = particle size multiplier; 0.35 for < 10 micron particles

U = mean wind speed (mph)

= 9 mph (Ref: Climatic Wind Data for the United States, Nov. 1998)

M = material moisture content (%)

= 11 %

E_{PM10} = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4

= 2.21E-04 lb/ton PM10

Revised Fugitive Emission Estimates:

Storage Pile Emissions = **1.01E-02 lb/hr PM10** *- based on material transfer factor*

Total Storage Pile Fugitive PM_{10} Emissions:

0.0101 lb/hr PM10 ***- based on material transfer factor***

Annual Total: **0.0166 tons/year PM10** ***- based on material transfer factor***

Actual and Potential Emissions for Paved and Unpaved Haul Roads at the ACLF
D18 - Unpaved Roads Worksheet

Unpaved road emission factor to HHLF Cell (Operations Staging Area to working face)

$$E = \frac{k\,(s/12)^a (S/30)^d - C}{(M/0.5)^c}$$ (AP 42 Equation 13.2.2-3 (1b)) (November 2006)

	k - PM10 (lb/VMT)	k - PM2.5 (lb/VMT)	s (%)	S (MPH)	C - PM10 (lb/VMT)	C - PM2.5 (lb/VMT)	M (%)	a	c	d	E - PM10 (lb/VMT)	E - PM2.5 (lb/VMT)
Standard Pickup	1.8	0.18	6.4	15	0.00047	0.00036	15	1	0.2	0.5	0.343	0.034
Large Pickup/trailer	1.8	0.18	6.4	15	0.00047	0.00036	15	1	0.2	0.5	0.343	0.034
3 axel or more truck	1.8	0.18	6.4	15	0.00047	0.00036	15	1	0.2	0.5	0.343	0.034

Notes:
- E Size-specific emission factor
- s Surface material silt content, AP-42 Table 13.2.2-1
- M Surface material moisture content
- S Mean Vehicle speed
- C Emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear, AP4-42 Table 13.2.2-4
- k Empirical constant for PM_{10}, AP-42 Table 13.2.2-2
- a Empirical constant for PM_{10}, AP-42 Table 13.2.2-2
- c Empirical constant for PM_{10}, AP-42 Table 13.2.2-2
- d Empirical constant for PM_{10}, AP-42 Table 13.2.2-2

	Haul truck load (tons/truck)	Day open per year	Amount hauled (per year)	Percentage trucked	Amount hauled (per day)	Hauling hours (per day)	Amount hauled (per hour)	Haul road round trip (miles)	Round trips (per hour)	round trips (per year)	VMT (per hour)	VMT (annual)
Standard Pickup	0.5	306	66389	60%	216.96	11.00	19.72	1.00	39.45	132,777.60	39.45	132,778
Large Pickup/trailer	2	306	22130	20%	72.32	11.00	6.57	1.00	3.29	11,064.90	3.29	11,065
3 axel or more truck	5	306	22129	20%	72.32	11.00	6.57	1.00	1.31	4,425.84	1.31	4,426
		Total	110648	100%	361.59		32.87		44.05	148,268.34	44.05	148,268

With the addition of rain and watering the unpaved haul roads

$$Eext = E\,[(365 - P)/365]$$

	E (PM_{10})	E ($PM_{2.5}$)	P	Eext (PM_{10})	Eext ($PM_{2.5}$)	PM10 Emissions (lb/hr)	PM10 Emissions (ton/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (ton/yr)
Standard Pickup	0.343	0.034	90	0.259	0.026	13.54	22.8	1.01	1.70
Large Pickup/trailer	0.343	0.034	90	0.259	0.026	1.13	1.9	0.084	0.14
3 axel or more truck	0.343	0.034	90	0.259	0.026	0.45	0.8	0.034	0.06
				Total		15.12	25.5	1.13	1.9

Notes:
P = number of days in a year with rainfall accumulation no less than 0.01 inches. AP-42 Figure13.2.2-1

Unpaved road emission factor for NRC

$$E = \frac{k\,(s/12)^a (S/30)^d - C}{(M/0.5)^c}$$ (AP 42 Equation 13.2.2-3 (1b)) (November 2006)

	k - PM10 (lb/VMT)	k - PM2.5 (lb/VMT)	s (%)	S (MPH)	C - PM10 (lb/VMT)	C - PM2.5 (lb/VMT)	M (%)	a	c	d	E - PM10 (lb/VMT)	E - PM2.5 (lb/VMT)
Standard Pickup	1.8	0.18	6.4	15	0.00047	0.00036	15	1	0.2	0.5	0.343	0.034
Large Pickup/trailer	1.8	0.18	6.4	15	0.00047	0.00036	15	1	0.2	0.5	0.343	0.034
3 axel or more truck	1.8	0.18	6.4	15	0.00047	0.00036	15	1	0.2	0.5	0.343	0.034

Notes:
- E Size-specific emission factor
- s Surface material silt content, AP-42 Table 13.2.2-1
- M Surface material moisture content
- S Mean Vehicle speed
- C Emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear, AP4-42 Table 13.2.2-4
- k Empirical constant for PM_{10}, AP-42 Table 13.2.2-2
- a Empirical constant for PM_{10}, AP-42 Table 13.2.2-2
- c Empirical constant for PM_{10}, AP-42 Table 13.2.2-2
- d Empirical constant for PM_{10}, AP-42 Table 13.2.2-2

	Haul truck load (tons/truck)	Day open per year	Amount hauled (per year)	Percentage trucked	Amount hauled (per day)	Hauling hours (per day)	Amount hauled (per hour)	Haul road round trip (miles)	Round trips (per hour)	round trips (per year)	VMT (per hour)	VMT (annual)
Standard Pickup	0.5	306	44259	60%	144.64	11	13.15	1	26.30	88518	26.30	88518.40
Large Pickup/trailer	2	306	14753	20%	48.21	11	4.38	1	2.19	7377	2.19	7376.60
3 axel or more truck	5	306	14753	20%	48.21	11	4.38	1	0.88	2951	0.88	2950.56
		Total	**73765**	**100%**	**241.06**		**21.91**		**29.37**	**98846**	**29.37**	**98845.56**

With the addition of rain and watering the unpaved haul roads

Eext = E [(365 - P)/365]

	$E (PM_{10})$	$E (PM_{2.5})$	P	$Eext (PM_{10})$	$Eext (PM_{2.5})$	PM10 Emissions (lb/hr)	PM10 Emissions (ton/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (ton/yr)
Standard Pickup	0.343	0.034	90	0.259	0.026	9.03	15.2	0.67	1.13
Large Pickup/trailer	0.343	0.034	90	0.259	0.026	0.75	1.3	0.056	0.09
3 axel or more truck	0.000	0.000	90	0.000	0.000	0.00	0.0	0.000	0.00
				Total		**9.78**	**16.5**	**0.73**	**1.2**
Notes:									
P = number of days in a year with rainfall accumulation no less than 0.01 inches. AP-42 Figure13.2.2-1									

Unpaved road emission factor for Wood Chipper

$$E= \frac{k\,(s/12)^a (S/30)^d - C}{(M/0.5)^c}$$

(AP 42 Equation 13.2.2-3 (1b)) (November 2006)

	k - PM10 (lb/VMT)	k - PM2.5 (lb/VMT)	s (%)	S (MPH)	C - PM10 (lb/VMT)	C - PM2.5 (lb/VMT)	M (%)	a	c	d	E - PM10 (lb/VMT)	E - PM2.5 (lb/VMT)
Standard Pickup	1.8	0.18	6.4	15	0.00047	0.00036	15	1	0.2	0.5	0.343	0.034
Large Pickup/trailer	1.8	0.18	6.4	15	0.00047	0.00036	15	1	0.2	0.5	0.343	0.034
3 axel or more truck	1.8	0.18	6.4	15	0.00047	0.00036	15	1	0.2	0.5	0.343	0.034

Notes:

E Size-specific emission factor
s Surface material silt content, AP-42 Table 13.2.2-1
M Surface material moisture content
S Mean Vehicle speed
C Emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear, AP4-42 Table 13.2.2-4
k Empirical constant for PM_{10}, AP-42 Table 13.2.2-2
a Empirical constant for PM_{10}, AP-42 Table 13.2.2-2
c Empirical constant for PM_{10}, AP-42 Table 13.2.2-2
d Empirical constant for PM_{10}, AP-42 Table 13.2.2-2

	Haul truck load (tons/truck)	Day open per year	Amount hauled (per year)	Percentage trucked	Amount hauled (per day)	Hauling hours (per day)	Amount hauled (per hour)	Haul road round trip (miles)	Round trips (per hour)	round trips (per year)	VMT (per hour)	VMT (annual)
Standard Pickup	0.5	306	44259	60%	144.64	11	13.15	0.22	26.30	88518	5.79	19474.05
Large Pickup/trailer	2	306	14753	20%	48.21	11	4.38	0.22	2.19	7377	0.48	1622.85
3 axel or more truck	5	306	14753	20%	48.21	11	4.38	0.22	0.88	2951	0.19	649.12
		Total	**73765**	**100%**	**241.06**		**21.91**		**29.37**	**98846**	**6.46**	**21746.02**

With the addition of rain and watering the unpaved haul roads

Eext = E [(365 - P)/365]

	$E (PM_{10})$	$E (PM_{2.5})$	P	$Eext (PM_{10})$	$Eext (PM_{2.5})$	PM10 Emissions (lb/hr)	PM10 Emissions (ton/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (ton/yr)
Standard Pickup	0.343	0.034	90	0.259	0.026	1.99	3.3	0.15	0.25
Large Pickup/trailer	0.343	0.034	90	0.259	0.026	0.17	0.3	0.012	0.02
3 axel or more truck	0.000	0.000	90	0.000	0.000	0.00	0.0	0.000	0.00
				Total		**2.15**	**3.62**	**0.16**	**0.27**
Notes:									
P = number of days in a year with rainfall accumulation no less than 0.01 inches. AP-42 Figure13.2.2-1									

Actual and Potential Emissions for Paved and Unpaved Haul Roads at the ACLF
D19 - Paved Roads Worksheet

Paved road emission factor to Household hazardous waste building

$E = k(sL)^{0.91}(W)^{1.02}$ AP-42 Equation 13.2.1.3 (1) (January 2011)

	k - PM10 (lb/VMT)	k - PM2.5 (lb/VMT)	sL (g/m2)	W (tons)	E - PM10 (lb/VMT)	E - PM2.5 (lb/VMT)
Standard Pickup	0.0022	0.00054	7.4	2.5	0.035	0.0085

Notes:
E = Particulate emission factor
k = Particle size multiplier for particle size range and units of interest, AP-42 Table 13.2.1-1
sL = road surface silt loading, AP-42 Table 13.2.1-3
W = Average weight of the vehicles traveling the road

	Days open per year	Amount hauled (Trips per year)	Percentage trucked	Amount hauled (Trips per day)	Hauling hours (per day)	Amount hauled (trips per hour)	Haul road round trip (miles)	VMT (per hour)	VMT (annual)	PM10 (lb/hr)	PM10 (ton/yr)	PM2.5 (lb/hr)	PM2.5 (ton/yr)
Standard Pickup	100	6700	100%	67.00	11	6.09	1.08	6.58	7236.00	0.228	0.13	0.056	0.031
Total		**6700**	**100%**	**67.00**		**6.09**		**6.58**	**7236.00**	**0.228**	**0.13**	**0.056**	**0.031**

Paved road emission factor to Operations Staging Area (HHLF Cell)

$E = k(sL)^{0.91}(W)^{1.02}$ AP-42 Equation 13.2.1.3 (1) (January 2011)

	k - PM10 (lb/VMT)	k - PM2.5 (lb/VMT)	sL (g/m2)	W (tons)	E - PM10 (lb/VMT)	E - PM2.5 (lb/VMT)
Standard Pickup	0.0022	0.00054	7.4	2.5	0.035	0.0085
Large Pickup/trailer	0.0022	0.00054	7.4	5	0.070	0.017
3 axel or more truck	0.0022	0.00054	7.4	13	0.186	0.046

Notes:
E = Particulate emission factor
k = Particle size multiplier for particle size range and units of interest, AP-42 Table 13.2.1-1
sL = road surface silt loading, AP-42 Table 13.2.1-3
W = Average weight of the vehicles traveling the road

	Haul truck load (tons/truck)	Day open per year	Amount hauled (per year)	Percentage trucked	Amount hauled (per day)	Hauling hours (per day)	Amount hauled (per hour)	Haul road round trip (miles)	Round trips (per hour)	round trips (per year)	VMT (per hour)	VMT (annual)	PM10 (lb/hr)	PM10 (ton/yr)	PM2.5 (lb/hr)	PM2.5 (ton/yr)
Standard Pickup	0.5	306	66389	60%	216.96	11	19.72	2	39.45	132778	78.89	265555	2.731	4.60	0.670	1.128
Large Pickup/trailer	2	306	22130	20%	72.32	11	6.57	2	3.29	11065	6.57	22130	0.462	0.78	0.113	0.191
3 axel or more truck	5	306	22129	20%	72.32	11	6.57	2	1.31	4426	2.63	8852	0.489	0.82	0.120	0.202
		Total	**110648**	**100%**	**361.59**		**32.87**		**44.05**	**148268**	**88.10**	**296537**	**3.68**	**6.20**	**0.90**	**1.52**

Paved road emission factor to new NRC

$E = k(sL)^{0.91}(W)^{1.02}$ AP-42 Equation 13.2.1.3 (1) (January 2011)

	k - PM10 (lb/VMT)	k - PM2.5 (lb/VMT)	sL (g/m2)	W (tons)	E - PM10 (lb/VMT)	E - PM2.5 (lb/VMT)
Standard Pickup	0.0022	0.00054	7.4	2.5	0.035	0.0085

Large Pickup/trailer	0.0022	0.00054	7.4	5	0.070	0.017
3 axel or more truck	0.0022	0.00054	7.4	13	0.186	0.046

Notes:
E = Particulate emission factor
k = Particle size multiplier for particle size range and units of interest, AP-42 Table 13.2.1-1
sL = road surface silt loading, AP-42 Table 13.2.1-3
W = Average weight of the vehicles traveling the road

	Haul truck load (tons/truck)	Day open per year	Amount hauled (per year)	Percentage trucked	Amount hauled (per day)	Hauling hours (per day)	Amount hauled (per hour)	Haul road round trip (miles)	Round trips (per hour)	round trips (per year)	VMT (per hour)	VMT (annual)	PM10 (lb/hr)	PM10 (ton/yr)	PM2.5 (lb/hr)	PM2.5 (ton/yr)
Standard Pickup	0.5	306	44259	60%	144.64	11	13.15	4.5	26.30	88518	118.34	398333	4.097	6.90	1.006	1.692
Large Pickup/trailer	2	306	14753	20%	48.21	11	4.38	4.5	2.19	7377	9.86	33195	0.692	1.17	0.170	0.286
3 axel or more truck	5	306	14753	20%	48.21	11	4.38	4.5	0.88	2951	3.94	13278	0.734	1.24	0.180	0.303
		Total	**73765**	**100%**	**241.06**		**21.91**		**29.37**	**98846**	**132.15**	**444805**	**5.52**	**9.30**	**1.36**	**2.28**

Paved road emission factor to the landfill office

$$E= k(sL)^{0.91}(W)^{1.02}$$ AP-42 Equation 13.2.1.3 (1) (January 2011)

	k - PM10 (lb/VMT)	k - PM2.5 (lb/VMT)	sL (g/m2)	W (tons)	E - PM10 (lb/VMT)	E - PM2.5 (lb/VMT)
Standard Pickup	0.0022	0.00054	7.4	2.5	0.035	0.0085

Notes:
E = Particulate emission factor
k = Particle size multiplier for particle size range and units of interest, AP-42 Table 13.2.1-1
sL = road surface silt loading, AP-42 Table 13.2.1-3
W = Average weight of the vehicles traveling the road

	Days open per year	Trips (per year)	Percentage trucked	Trips (per day)	Hauling hours (per day)	Trips (per hour)	Haul road round trip (miles)	VMT (per hour)	VMT (annual)	PM10 (lb/hr)	PM10 (ton/yr)	PM2.5 (lb/hr)	PM2.5 (ton/yr)
Standard Pickup	306	2400	100%	7.84	11	0.71	0.26	0.19	624.00	0.006	0.01	0.002	0.003
	Total	**2400**	**100%**	**7.84**		**0.71**		**0.19**	**624.00**	**0.006**	**0.01**	**0.002**	**0.003**

Paved road emission factor to the wood chipping

$$E= k(sL)^{0.91}(W)^{1.02}$$ AP-42 Equation 13.2.1.3 (1) (January 2011)

	k - PM10 (lb/VMT)	k - PM2.5 (lb/VMT)	sL (g/m2)	W (tons)	E - PM10 (lb/VMT)	E - PM2.5 (lb/VMT)
Standard Pickup	0.0022	0.00054	7.4	2.5	0.035	0.0085

Notes:
E = Particulate emission factor
k = Particle size multiplier for particle size range and units of interest, AP-42 Table 13.2.1-1
sL = road surface silt loading, AP-42 Table 13.2.1-3
W = Average weight of the vehicles traveling the road

	Days open per year	Trips (per year)	Percentage trucked	Trips (per day)	Hauling hours (per day)	Trips (per hour)	Haul road round trip (miles)	VMT (per hour)	VMT (annual)	PM10 (lb/hr)	PM10 (ton/yr)	PM2.5 (lb/hr)	PM2.5 (ton/yr)
Standard Pickup	306	2400	100%	7.84	11	0.71	2	1.43	4800.00	0.049	0.08	0.012	0.020
	Total	**2400**	**100%**	**7.84**		**0.71**		**1.43**	**4800.00**	**0.049**	**0.08**	**0.012**	**0.020**

Actual Emission Calculations

Table D20 - Summary for Paved Roads

Destination	Annual Trips	Annual PM10 (lb/hr)	Annual PM10 (ton/yr)	Annual PM.5 (lb/hr)	Annual PM.5 (ton/yr)
Landfill office	2,400	0.0064	0.011	0.0016	0.003
Household hazardous waste	6,700	0.23	0.13	0.056	0.03
HHLF	148,268	3.68	6.20	0.90	1.52
NRC	98,846	5.52	9.30	1.36	2.28
Wood Chipping	2,400	0.049	0.08	0.012	0.02
Total	**256,214**	**9.49**	**15.71**	**2.33**	**3.86**

Table D21 - Summary for Unpaved Roads

Destination	Annual Trips	Annual PM10 Emissions w/water suppressant (lb/hr)	Annual PM10 Emissions w/water suppressant (ton/yr)	Annual PM2.5 Emissions w/water suppressant (lb/hr)	Annual PM2.5 Emissions w/water suppressant (ton/yr)
HHLF	148,268	15.12	25.45	1.13	1.90
NRC	98,846	9.78	16.46	0.73	1.23
Wood Chipping	73,765	2.15	3.62	0.16	0.27
Total	**247114**	**27.06**	**45.54**	**2.02**	**3.40**

Note:
Assume actual emissions are equal to potential emissions

Actual Emission Calculations
D22 - Landfill Operations (Fugitive Dust Emissions)

Assumptions:

Emission Factors Equations were derived from AP-42, *Section 11.9 - Western Surface Coal Mining, Table 11.9-1, dated 10/98*

Bulldozing (Overburden Material) - Particulate Matter $\leq$ 15 um: Table 11.9-1, Overburden
BEF = $1.0(s)^{1.5}/(M)^{1.4} * (0.105)^{a}$ where: [a] = Multiply the $\leq$ 15 um equation by the TSP scaling factor $\leq$ 2.5 um BEF = Bulldozing emission factor (lb/hr) s = Material silt content, % (assumed s = 6.9%) M = Material moisture content, % (assumed M = 7.9%) Days of operation: 6 days/wk*52 wk/yr - 6 holidays = 306 days/yr Hours of operation (dozing/scraping) = 8 hr/day Annual hours of operation: 306 days/yr* 8hr/day = 2,448 hr/yr

Grading - Particulate Matter $\leq$ 15 um: Table 11.9-1
GEF = $0.051(S)^{2.0} * (0.031)^{a}$ where: [a] = Multiply the $\leq$ 15 um equation by the TSP scaling factor $\leq$ 2.5 um GEF = Grader emission factor (lb/VMT) - Note: VMT = vehicle miles traveled = 0.77 lb/VMT S = Average vehicle speed, km/hr (assume S = 5 mi/hr) Estimated grader miles traveled during the year = 3,672 VMT/yr Days of operation: 6 days/wk*52 wk/yr - 6 holidays = 306 days/yr Hours of operation (dozing/scraping) = 10 hr/day Annual hours of operation: 306 days/yr* 10 hr/day = 3,060 hr/yr

Landfill Activity	$PM_{2.5}$ lb/hr	$PM_{2.5}$ ton/yr
Bulldozing	0.07	0.08
Grading	0.05	0.07

Note:
Actual emissions are assumed to equal potential emissions

Actual Emission Calculations
D23 - Landfill Operations (Fugitive Dust Emissions)

Assumptions:

Emission Factors Equations were derived from AP-42, *Section 11.9 - Western Surface Coal Mining, Table 11.9-1, dated 10/98*

Bulldozing (Overburden Material) - Particulate Matter ≤ 15 um: Table 11.9-1, Overburden
$BEF = 1.0(s)^{1.5}/(M)^{1.4} * (0.75)^a$ where: ^{a} = Multiply the ≤ 15 um equation by this fraction to determine emissions for scaling ≤ 10 um BEF = Bulldozing emission factor (lb/hr) s = Material silt content, % (assumed s = 6.9%) M = Material moisture content, % (assumed M = 7.9%) Days of operation: 6 days/wk*52 wk/yr - 6 holidays = 306 days/yr Hours of operation (dozing/scraping) = 8 hr/day Annual hours of operation: 306 days/yr* 8hr/day = 2,448 hr/yr

Grading - Particulate Matter ≤ 15 um: Table 11.9-1
$GEF = 0.051(S)^{2.0} * (0.60)^a$ where: ^{a} = Multiply the ≤ 15 um equation by this fraction to determine emissions for scaling ≤ 10 um GEF = Grader emission factor (lb/VMT) - Note: VMT = vehicle miles traveled = 0.77 lb/VMT S = Average vehicle speed, km/hr (assume S = 5 mi/hr) Estimated grader miles traveled during the year = 3,672 VMT/yr Days of operation: 6 days/wk*52 wk/yr - 6 holidays = 306 days/yr Hours of operation (dozing/scraping) = 10 hr/day Annual hours of operation: 306 days/yr* 10 hr/day = 3,060 hr/yr

Landfill Activity	PM_{10} lb/hr	PM_{10} ton/yr
Bulldozing	0.47	0.58
Grading	0.92	1.40

Note:
Actual emissions are assumed to equal potential emissions

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM - DRAFT

DATE: November 20, 2011

TO: Eric Clark, EIT, Permit Engineer, Air Quality Division

FROM: Cheryl Robinson, P.E., Air Quality Engineer/Modeling Analyst, Air Quality Division

PROJECT NUMBER: P-2009.0098, Project 60803 (HHE) and [Project No. TBD, ACLF]

SUBJECT: DEQ Modeling for Hidden Hollow Energy, LLC, Facility ID 001-00214, and Ada County Landfill, Facility ID 001-00195, Boise, Idaho
Project: Increased H_2S in Landfill Gas combusted in HHE Engines and ACLF Flares

1.0 Summary

In mid-2011, Hidden Hollow Energy, LLC (HHE), a wholly-owned subsidiary of Fortistar, identified a potential issue with previous analyses submitted in support of their current Permit to Construct (PTC) for their landfill gas-to-energy facility located within the boundaries of the Ada County Landfill (ACLF) near Boise, Idaho. Previous analyses for HHE 1 (engine generators 1/2) and HHE 2 (engine generators 3/4) presumed a maximum H_2S concentration of 150 parts per million by volume (ppmv) in the landfill gas (LFG), while grab sample testing of the landfill gas in the early summer of 2011 indicated that the H_2S concentration can be considerably higher. After tuning the landfill gas collection system, maximum H_2S concentrations in the landfill gas are expected to be in the range of 600 ppmv. In late October 2011, HHE proposed installing an H_2S treatment system upstream of the two enclosed flares operated by the landfill and the HHE engine generators.

The landfill gas collection system is currently providing about 2,700 scfm of LFG. More than 60 new extraction wells are scheduled to be installed during December 2011. The wells will be capped until ready to be connected to the existing collection and treatment system. The total landfill gas collected is anticipated to rise to about 3,350 scfm when these new wells are connected during the spring of 2012. Ada County is expected to submit an application at the end of November 2011, requesting a reduction from 4,699 scfm to about 3,350 scfm in the allowable amount of LFG collected in the system that must then be combusted in either the engine generators or the flares before being released to the atmosphere.

The purpose of this modeling evaluation is to conduct significance and (if needed) full impact analyses to:

1) <u>Change the allowable SO_2 emission rate for HHE1 and HHE2</u>. Determine the maximum allowable increase in pound-per-hour SO_2 emissions from HHE's four permitted engine generators at LFG collection rates of 3,350 scfm. Conduct atmospheric dispersion modeling to demonstrate that the increase will not cause or significantly contribute to a violation of the 1-hour or annual SO_2 NAAQS, in accordance with Idaho Air Rules Section 203.02 (IDAPA 58.01.01.203.02).
2) <u>Change the allowable SO_2 emission rate for ACLF Flare 1 and Flare 2</u>. Determine the ambient impact associated with increasing the H_2S concentration in the landfill gas combusted in the ACLF flares from the values used in the analysis for ACLF permit to construct P-2009.001 to "x" ppmv (where "x" is determined in step 1 above), presuming an LFG collection rate of 3,350 scfm. Conduct atmospheric dispersion modeling to demonstrate that this increase will not cause or significantly contribute to a violation of the 1-hour or annual SO_2 NAAQS, in accordance with Idaho Air Rules Section 203.02 (IDAPA 58.01.01.203.02).
3) <u>Characterize the 1-hour SO_2 ambient impacts from operation of the engines and flares prior to installation of an H_2S treatment system</u>, presuming LFG collection rates of 2,700 scfm, 3,350 scfm, and 4,699 scfm, with an H_2S concentration of 600 ppmv. Presume Hidden Hollow Energy 1 (HH1, existing engines 1/2) and Hidden Hollow Energy 2 (HH2, permitted engines 3/ 4 which have not yet

been constructed) are operating at a maximum feed rate of 600 scfm LFG in each engine, with the remaining LFG flared in Ada County's Flare 1 and Flare 2.

Because of the time-critical nature of this project and its close association with the modeling analyses needed to modify Ada County Landfill's existing permit, DEQ developed a final emissions inventory based on input from both HHE and Ada County Landfill and conducted the dispersion modeling analyses. [DEQ received HHE's concurrence on the emission estimates as part of their review of the draft permit and DEQ modeling report].

The analyses 1) utilized appropriate methods and models; 2) were conducted using reasonably accurate or conservative model parameters and input data; 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 facility were below significant contribution levels (SCLs) or other applicable regulatory thresholds; or b) that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all locations outside of the facility's leased property boundary.

Key assumptions used in the modeling analyses and the impact of these assumptions on the compliance demonstration are shown in Table 1.

TABLE 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
Hidden Hollow Energy 1 and 2 Maximum SO_2 emissions: From each generator = 1.09 lb/hr From all four generators = 4.36 lb/hr = 19.1 TPY* Based on: H_2S concentration in the landfill gas is 180 ppmv, and LFG feed rate to each engine is 600 scfm. *Assumes generator operations 8,760 hr/year	At these lb/hr emission rates, significant impacts occurred only at receptors located within the portion of the ACLF that is not accessible to the public. The maximum SO_2 ambient impact (design value) from HHE's four generators at any of these receptors was 99.0% of the 1-hour SO_2 NAAQS. At 180 ppmv H_2S, the increase in SO_2 emissions from all four HHE engine generators is: 0.17 lb/hr x 4 x 8760 hr/yr / 2000 = 3 TPY. The modeling threshold of 1.2 TPY is designed to ensure that the ambient impacts from this increase are less than significant. Based on this, and the very low annual impacts (~2.2% of the annual NAAQS) predicted for operating all four engines (2,400 scfm) and Flare 1 at 950 scfm, modeling was not conducted for the annual averaging period.
Ada County Landfill Flares 1 and 2 All LFG is combusted in the flare(s). Based on: H_2S concentration in the landfill gas is 600 ppmv, and LFG feed rate of 3,350 scfm is split evenly between Flare 1 and Flare 2.	If tuning the LFG collection system keeps the H_2S concentrations consistently below 600 ppmv, no further treatment of the LFG is required for ACLF to demonstrate compliance with the 1-hr SO_2 NAAQS for total LFG flow rates up to 3,350 scfm. The maximum ambient impact (design value) for this case is 93.9% of the 1-hour SO_2 NAAQS. Given the stringency of the 1-hr SO_2 NAAQS compared to the annual value, modeling was not conducted for the annual averaging period.
2,400 scfm of LFG is combusted in the four HHE engines, with the remainder combusted in the flare(s). Based on: H_2S concentration in the landfill gas is 600 ppmv, and Total LFG available is 3,350 scfm LFG feed rate to each of four engines is 600 scfm LFG feed rate to Flare 1 is 950 scfm.	If tuning the LFG collection system keeps the H_2S concentrations consistently below 600 ppmv, no further treatment of the LFG is required for ACLF to demonstrate compliance with the 1-hr SO_2 NAAQS for total LFG flow rates up to 3,350 scfm. The maximum ambient impact (design value) for this case is 73.0% of the 1-hour SO_2 NAAQS. Using a full receptor grid for on and off-site impacts, the maximum annual SO_2 impact is 2.2% of the NAAQS

2.0 Background Information

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance for this facility located at the Ada County Landfill at 10300 Seamans Gulch Road in the foothills above Boise, Idaho. Approximate UTM coordinates for this parcel are 557.5 km Easting and 4838.6 km Northing, in UTM Zone 11 (Datum NAD83).

2.1.1 Area Classification

The Hidden Hollow Energy facility is located within 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 oxides (SO_x). 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 DEQ Modeling Thresholds

Modeling is typically not required if the changes in estimated criteria pollutant emission rates for a proposed project are below DEQ's modeling thresholds, shown in Table 2. "Case-by-case" thresholds may be used only with prior DEQ approval. The only pollutant of interest for this project is SO_2, and due to the relatively short stacks and the presence of elevated terrain, "Threshold I" values must be used for this project.

TABLE 2. DEQ CRITERIA POLLUTANT MODELING THRESHOLDS

Criteria Pollutant	Averaging Period	DEQ Modeling Threshold			
		Threshold I		Threshold II (case-by-case)	
SO_2	1-hr	0.21	lb/hr	2.5	lb/hr
	Annual	1.2	T/yr	14	T/yr

2.1.3 Significant and Cumulative NAAQS Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources associated with the existing unpermitted facility exceed the significant contribution levels (SCLs) of Section 006 of IDAPA 58.01.01, Rules for the Control of Air Pollution in Idaho (Idaho Air Rules), then a cumulative impact analysis is necessary to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) and Idaho Air Rules Section 203.02 for Permits to Construct and Section 204.02 for Tier II Operating Permits. A cumulative NAAQS impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions, and emissions from any nearby co-contributing sources, to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 3. The SCLs and the modeled value that must be used for comparison to the NAAQS are also listed in Table 3.

Table 3. APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Contribution Levels[c] (µg/m³)[d]**	**Regulatory Limit[e] (µg/m³)**	**Modeled Value Used[h, i]**
Sulfur Dioxide (SO_2)	Annual	1.0	80[f]	Maximum 1[st] highest
	1-hour[o]	EPA Interim: 3 ppb[n, p] (~7.8 µg/m³)[q]	0.075 ppm[o, p] (~196 µg/m³)[q]	Maximum 4[th] highest[o, p]

[c] SCLs are defined in Idaho Air Rules Section 006. Class II $PM_{2.5}$ SCLs (signed 9/30/10, 75 FR 64864, October 20, 2010).
[d] Micrograms per cubic meter.
[e] Federal NAAQS (see 40 CFR 50) in effect as of July 1 of each year are incorporated by reference during the legislative session the following spring. See Idaho Air Rules Section 107.
[f] Never expected to be exceeded in any calendar year.
[h] Concentration at any modeled receptor.
[i] The maximum 1[st] highest modeled value is always used for significant impact analyses.
[o] SO_2 concentration at any modeled receptor when using five consecutive years of meteorological data. Compliance is based on the 3-year average of the annual 99[th] percentile of 1-hour daily maximum concentrations. EPA Interim SIL, Page memo, dated August 23, 2010.
[p] EPA's February 10, 2010 1-hour NO_2 standard (75 FR 6474) and June 22, 2010 1-hour SO_2 standard (75 FR 35520) were incorporated by reference (IBR'd) in Idaho's NSR program when the Idaho Legislature adjourned *sine die* on April 7, 2011.

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 revised for all areas of Idaho by DEQ in March 2003[1] and are currently being updated. Background concentrations in areas where no monitoring data were available are based on monitoring data from areas with similar population density, meteorology, and emissions sources. Recommended background concentrations for this project are shown in Table 4.

TABLE 4. BACKGROUND CONCENTRATIONS			
Pollutant	**Averaging Period**	**Background (µg/m³)[a]**	**Source**
Sulfur dioxide (SO_2)	Annual	2.6	Fargo ND/Moorhead MN monitoring data, 2004-2008, All non-zero values meeting 75% completeness criteria are 0.001 ppm = 2.6 µg/m³
	1-hour	33.1	Fargo ND/Moorhead MN monitoring data, 2006-2008, 1[st] high value plus one standard deviation of values meeting 75% completeness criteria.

[a] Micrograms per cubic meter.

[1] Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

This section describes the modeling methods used to demonstrate compliance with applicable air quality standards.

3.1.1 Overview of Analyses

A brief description of parameters used in the modeling analyses is provided in Table 5.

Table 5. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description[a]
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 11103.
Meteorological data	Boise: 2001-2005	National Weather Service surface data and upper air data from the Boise airport. Data processed through AERMET (version 06341) was used for this project.
Terrain	Considered	DEQ used AERMAP (version 11103) to extract building, emission source, and receptor elevations and determine the controlling hill height elevation from a National Elevation Dataset (NED) digital elevation model (DEM) 1- arc-second (30-meter resolution) tiff file. Default rural dispersion was used.
Building downwash	Considered	Building downwash parameters were calculated using the BPIP PRIME algorithm (version 04274).
Receptor Grid	Receptors	Receptor locations were defined in UTM coordinates (NAD83).
	Fenceline Grid	25-meter spacing along the leased property boundary.
	Grid 1	HHE: 50-meter spacing in a square grid out to 1,000 meters (1 kilometer (km)). ACLF: 50-meter spacing in a circular grid out to 2 km.
	Grid 2	HHE: 100-meter spacing in a square grid between 1 km and 2 km.
	Grid 3	HHE: 250--meter spacing in a square grid between 2 km and 3 km. ACLF: 100-meter spacing in a circular grid between 2 km and 3 km.
	Grid 4	HHE: 500--meter spacing in a square grid between 3 km and 4 km. ACLF: 500-meter spacing in a circular grid between 3 km and 4 km.
	Grid 5	HHE: 1000--meter spacing in a square grid between 4 km and 5 km. ACLF: 1000--meter spacing in a circular grid between 4 km and 10 km.
	Grid 6	50-meter spacing in the publicly-accessible area of the Ada County Landfill.

3.1.2 Modeling Protocol and Methodology

Modeling was generally conducted using data described in submissions received from HHE and ACLF and methods described in the *State of Idaho Air Quality Modeling Guideline*.

3.1.3 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. EPA provided a one-year transition period during which either ISCST3 or AERMOD could be used at the discretion of the permitting agency. AERMOD must be used for all air impact analyses, performed in support of air quality permitting, conducted after November 2006.

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 offers the following improvements over ISCST3:

- Improved dispersion in the convective boundary layer and the stable boundary layer.
- Improved plume rise and buoyancy calculations.
- Improved treatment of terrain effects on dispersion.
- New vertical profiles of wind, turbulence, and temperature.

AERMOD was used for the submitted analyses for this project.

3.1.4 Meteorological Data

The Hidden Hollow Energy facility is located within the Ada County Landfill, which is about 10.1 miles north-northwest of the National Weather Service station at the Boise airport. For the refined AERMOD analyses, DEQ determined that the existing AERMOD-ready data set based on National Weather Service surface and upper air meteorological data collected from 2001 through 2005 at the Boise airport were the best representative data available at this time. These meteorological data were previously processed through AERSURFACE version 08009 and AERMET version 06341.

3.1.5 Terrain Effects

Terrain effects on dispersion were considered in these site-specific analyses. DEQ used AERMAP (version 11103) to extract building, emission source, and receptor elevations and determine the controlling hill height elevation from a National Elevation Dataset (NED) digital elevation model (DEM) 1 arc-second (30-meter resolution) tiff file. The domain included the area between 43.3528 and 44.0450 degrees latitude and -116.5656 to -115.8947 degrees longitude (NAD83), as shown in Figure 3-1. Default rural dispersion was used.

Figure 3-1. HIDDEN HOLLOW ENERGY & ACLF MODELING, EXTRACTED TERRAIN DATA

3.1.6 Facility Layout

The facility layout is shown in Figure 3-2, along with the estimated leased property boundary for all four HHE engine generators.

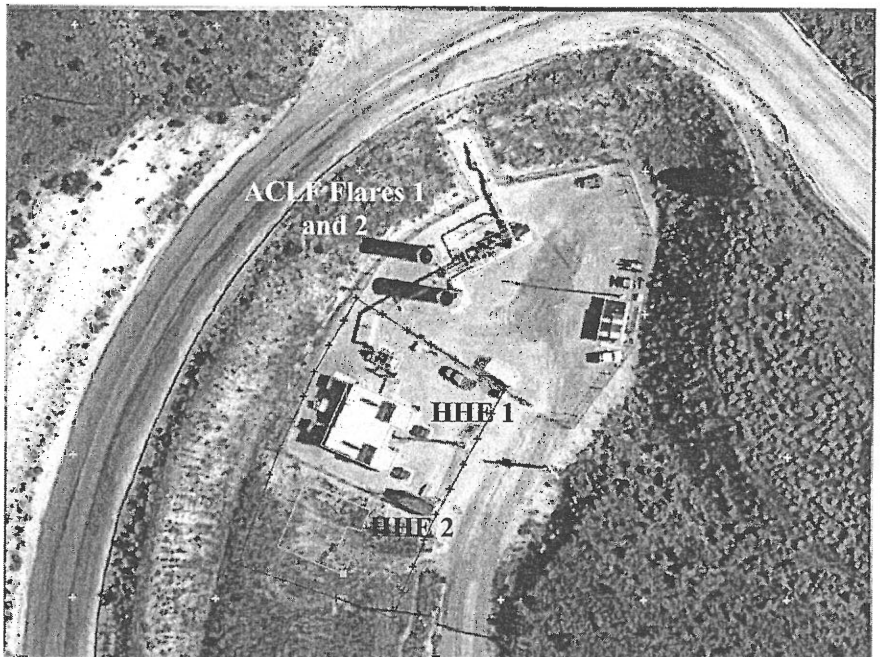


Figure 3-2. HIDDEN HOLLOW ENERGY GENERATORS AND ACLF FLARES

3.1.7 Building Downwash

Plume downwash effects caused by structures present at the facility were accounted for in the submitted modeling analyses. The Building Profile Input Program with Plume RIse Model Enhancements (BPIP-PRIME) was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emission release parameters for input to AERMOD. Building parameters are summarized in Table 6.

Table 6. BUILDING PARAMETERS

Building	Building Height	Base Elevation (m)	UTM Zone 11 (NAD83)		UTM Zone 11 (NAD83)	
			Easting, X (m)	Northing, Y (m)	Easting, X (m)	Northing, Y (m)
HHBLDG1 (HHE 1)	12 ft	873	557482.9	4838604.1	557486.0	4838611.7
			557484.4	4838607.7	557487.5	4838615.5
	3.66 m		557481.8	4838608.7	557476.1	4838620.2
			557483.4	4838612.6	557471.2	4838609.0
HHBLDG2 (HHE 2)	12 ft	873	557475.3	4838586.4	557478.4	4838594.0
			557476.8	4838590.0	557479.9	4838597.8
	3.66 m		557474.2	4838591.0	557468.5	4838602.5
			557475.8	4838594.9	557463.6	4838591.3
CGENCTRL HH Generator Control Pad	12 ft	874	557481.0	4838626.0	557484.0	4838622.0
	3.66 m		557480.0	4838624.0	557485.0	4838624.0
ACLFCTRL Flare Control Bldg	10 ft	874	557523.5	4838627.0	557521.0	4838634.9
	3.048 m		557524.9	4838634.4	557519.6	4838627.6
CFLRSKID Flare Skid	8 ft	873	557495.0	4838643.0	557509.0	4838645.0
	2.4384 m		557497.0	4838639.0	557507.0	4838649.0

3.1.8 Ambient Air Boundary

Ambient air is defined in Section 006 of the Idaho Air Rules as "that portion of the atmosphere, external to buildings, to which the general public has access". The Hidden Hollow Energy facility is located on a small leased parcel within the Ada County Landfill. In situations involving leased land, the EPA has interpreted "ambient air" to mean the following:[2]

"When two (or more) companies operate separate sources on property owned by one company and leased in part to the other, and the lessor retains control over public access to the entire property and actually maintains a physical barrier around it to preclude public access:

- The air over the entire property (including the leased portion) is not ambient air to the lessor.
- The air over the non-leased portion of the property is ambient air to the lessee.
- The air over the leased portion is ambient air to the lessee unless the lessee undertakes its own separate action to preclude public access."

For the purposes of air quality permitting, DEQ has determined that Ada County Landfill and Hidden Hollow Energy are two separate facilities. ACLF maintains fencing and signage around the perimeter of the landfill property, allows public access only through the main gate off Seamans Gulch Road, and limits public access within the landfill during operating hours by means of gates, signs, and monitoring by ACLF staff. The landfill is open to the public during the hours from 7:00 a.m. to 6 p.m., Monday through Friday, and Saturdays from 8 a.m. to 6 p.m.

Areas considered "ambient air" for Ada County Landfill and for Hidden Hollow Energy are shown in Figure 3-3. Modeling for Hidden Hollow Energy presumed that ambient air was all areas outside the

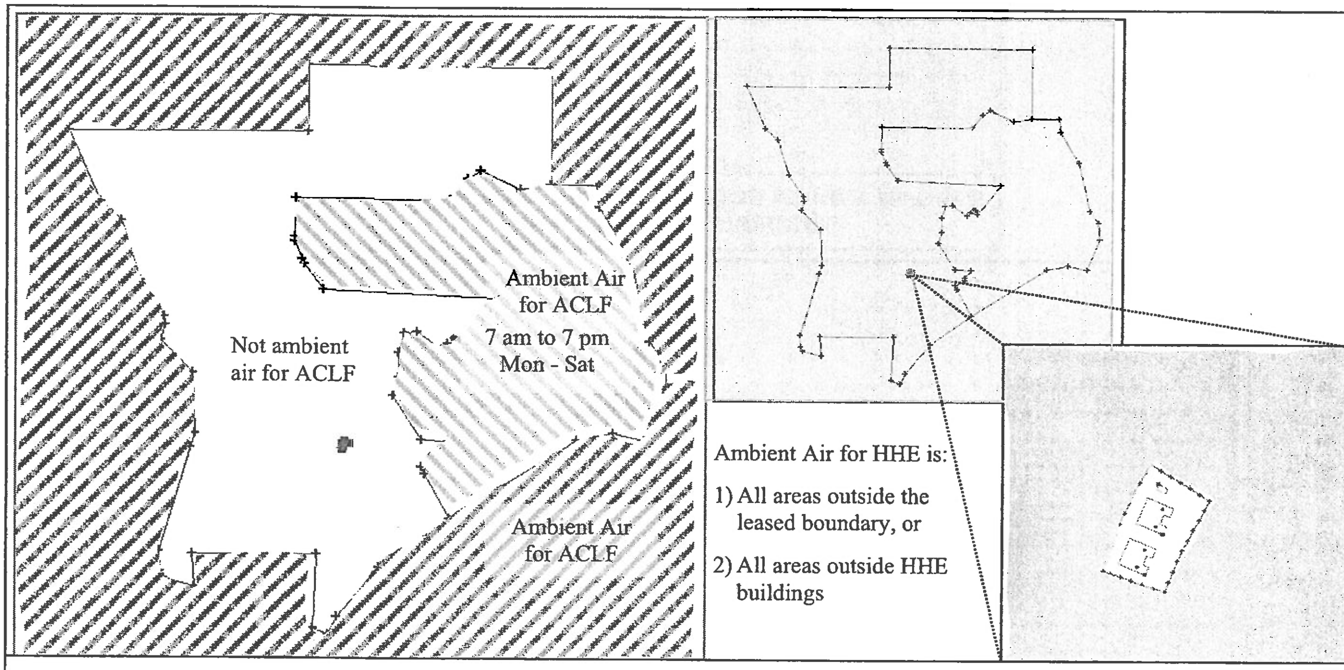


Figure 3-3. "AMBIENT AIR" FOR HIDDEN HOLLOW ENERGY AND ACLF

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[2] Interpretation of "Ambient Air" in Situations Involving Leased Land Under the Regulations for Prevention of Significant Deterioration (PSD), Memorandum from Steven D. Page, EPA Office of Air Quality Planning and Standards, to Regional Air Division Directors, EPA Regions I-X, June 22, 2007, accessible at http://www.epa.gov/region7/air/nsr/nsrmemos/leaseair.pdf

leased property boundary, because HHE maintains a fence around its engine generator buildings except for a space near the flares. Because of the elevated terrain, maximum ambient impacts do not occur at the leased property, but occur up the hill from the HHE facility. It is reasonable to presume that the modeling results would not be different had ambient air been defined as all areas outside of HHE structures.

3.1.9 Receptor Network

The receptor grids used for the significance modeling analyses are summarized in Table 3 and shown graphically in Figure 3-4 for Hidden Hollow Energy and Figure 3-5 for Ada County Landfill. The grid receptor spacing meets the recommended spacing criteria in the *State of Idaho Air Quality Modeling Guideline*. Only receptors with high 1st high ambient impacts greater than or equal to the EPA Interim significant contribution level (SCL) of 3 parts per billion (ppb), equivalent to about 7.8 $\mu g/m^3$, were carried forward for the full impact analyses.

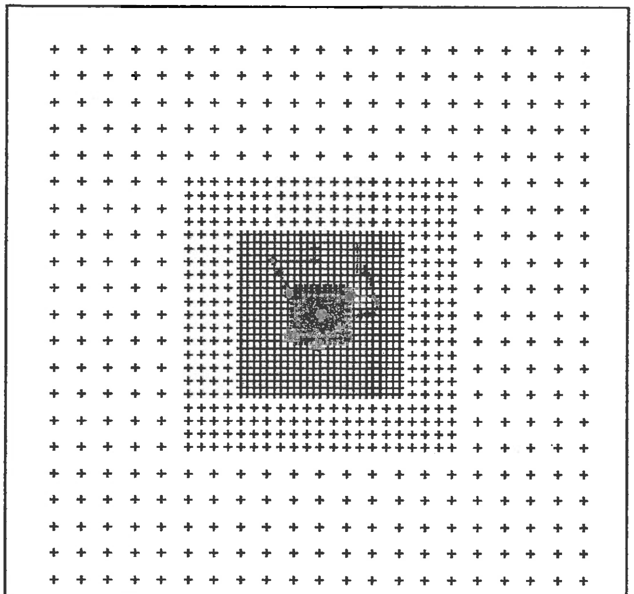


Figure 3-4. HIDDEN HOLLOW ENERGY RECEPTORS (SIGNIFICANCE ANALYSES)

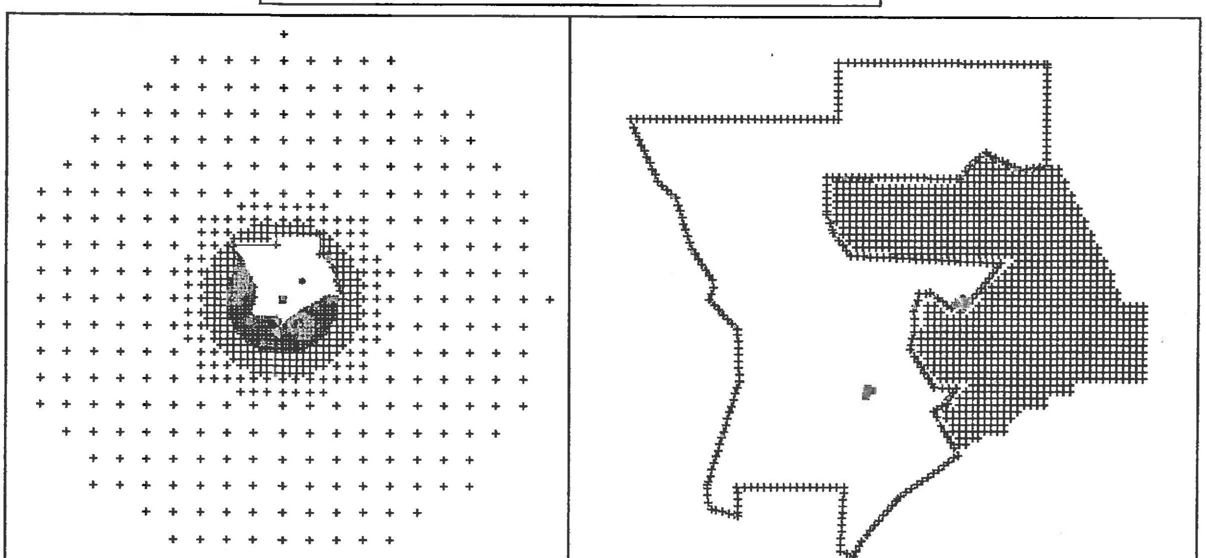


Figure 3-5. ACLF RECEPTORS, "OFFACLF" AND "ONACLF" (SIGNIFICANCE ANALYSES)

3.2 Emission Release Parameters

The stack parameters for the HHE engine generators and ACLF enclosed flares are shown in Table 7. The exit velocities for the flares are dependent upon the LFG feed rate to each flare. All stacks were modeled as vertical and uncapped.

Table 7. EMISSION RELEASE PARAMETERS

Source ID	Source Description	UTM Zone 11 (NAD83) Easting (X, m)[a]	UTM Zone 11 (NAD83) Northing (Y, m)[a]	Base Elev. (m)	Stack Height (ft)[b]	Stack Temp. (°F)[c]	Stack Diameter (ft)	Exit Velocity (m/s)[d]
HGEN1	HHE1 – Gen1	557482.925	4838615.043	873	14.4 (4.39 m)	898 (754.2 K)	1.2 (0.366 m)	56
HGEN2	HHE1 – Gen1	557479.776	4838607.429	873	14.4 (4.39 m)	898 (754.2 K)	1.2 (0.366 m)	56
HGEN3	HHE2 – Gen3	557475.196	4838597.178	873	14.4 (4.39 m)	898 (754.2 K)	1.2 (0.366 m)	56
HGEN4	HHE2 – Gen4	557472.064	4838589.827	873	14.4 (4.39 m)	898 (754.2 K)	1.2 (0.366 m)	56
FLARE1	ACLF Flare 1	557489.99	4838641.83	873.88	40 (12.2 m)	1455.5 (1064 K)	10 (3.048m)	Varies
FLARE2	ACLF Flare 2	557494.64	4838635.18	872.9	40 (12.2 m)	1448.3 (1060 K)	10 (3.048m)	Varies
CCHIPGEN	ACLF Chipper Generator	558217	4839332	991	6 (1.83 m)	370 (460.9 K)	8-in (0.2033 m)	50
CSCRNGEN	ACLF Screener Generator	558236	4839310	991	6 (1.83 m)	248 (393.2 K)	3-in (0.076 m)	50

[a] m = meters [b] ft = feet [c] °F = degrees Fahrenheit, K = Kelvin [d] m/sec = meters per second

3.3 Sulfur Dioxide (SO2) Emissions Rates

Calculations of SO_2 emissions for previous HHE and ACLF permitting actions were done separately by different consultants, using different assumptions for landfill gas methane concentrations and gas heating values. For the purposes of this project, total SO_2 emissions were calculated based on the total LFG flow rate and H_2S concentration, then apportioned to each source based on the LFG feed rate for that source. This ensures that the emissions rates used for full impact analyses have all been calculated using a consistent set of assumptions.

The difference or "delta" for each HHE engine generator was calculated based on the difference between the previously modeled emission rate of 0.92 lb/hr and the "full impact analysis" emission rate calculated based on the H_2S concentration presuming a 600 scfm LFG feed rate to each engine. Modeled emission rates for the HHE engine generators are shown in Table 8.

Table 8. SO_2 EMISSION RATES – HHE ENGINE GENERATORS

Emissions Unit	Full Impact Analyses HGEN1 (lb/hr)	Full Impact Analyses HGEN2 (lb/hr)	Full Impact Analyses HGEN3 (lb/hr)	Full Impact Analyses HGEN4 (lb/hr)	Delta (lb/hr)	Significant Impact Analyses HGEN1 (lb/hr)	Significant Impact Analyses HGEN2 (lb/hr)	Significant Impact Analyses HGEN3 (lb/hr)	Significant Impact Analyses HGEN4 (lb/hr)
Base Case	0.92	0.92	0.92	0.92	---	---	---	---	---
H_2S = 180 ppmv	1.09	1.09	1.09	1.09	1.09 – 0.92 =	0.17	0.17	0.17	0.17
H_2S = 200 ppmv	1.22	1.22	1.22	1.22	1.22 – 0.92 =	0.30	0.30	0.30	0.30
H_2S = 600 ppmv	3.65	3.65	3.65	3.65	3.65 – 0.92 =	2.73	2.73	2.73	2.73

The previously modeled emission rates for ACLF Flares 1 and 2 were 0.13 lb/hr and 0.15 lb/hr, respectively. These values represented the estimated SO_2 emission rates when operating with LFG feed rates of 2,320 scfm to Flare 1 and 2,379 scfm to Flare 2. Because 1) the previously modeled emission rates are small compared to the "full impact analysis" emission rates, 2) exhaust parameters for flares may vary considerably depending on the LFG flow rate and quality, and 3) the ambient air boundary for the flares is some distance away, the "full impact analysis" SO_2 emission rates were also used for the significance analyses for the flares. Except for cases run using the current allowable LFG collection rate of 4,699 scfm, LFG flow was split evenly between the two flares. Modeled SO_2 emission rates and exhaust velocities for the flares are shown in Table 9.

Table 9. SO_2 EMISSION RATES – ALL LFG ROUTED TO THE ACLF FLARES

H_2S Concentration (ppmv)	Total LFG (scfm)	LFG Flow Rate		Exhaust Velocity		Full Impact Analyses		Significant Impact Analyses	
		Flare 1 (scfm)	Flare 2 (scfm)	Flare 1 (m/sec)	Flare 2 (m/sec)	Flare 1 (lb/hr)	Flare 2 (lb/hr)	Flare 1 (lb/hr)	Flare 2 (lb/hr)
Base Case	4,699	2,320	2,379	0.78	0.80	---	---	---	---
H_2S = 180 ppmv	3,350	1,675	1,675	0.566	0.564	3.06	3.06	3.06	3.06
H_2S = 600 ppmv	2,700	1,350	1,350	0.456	0.455	8.21	8.21	8.21	8.21
H_2S = 600 ppmv	3,350	1.675	1.675	0.566	0.564	10.2	10.2	10.2	10.2
H_2S = 600 ppmv	4,699	2,320	2,320	0.78	0.80	14.1	14.5	14.1	14.5

For full impact analyses, each of the generators is presumed to use 600 scfm of the available LFG, with any remaining LFG combusted in the flare(s). SO_2 emission rates for operating two or four of the HHE engines at various total LFG flow rates and H_2S concentrations are shown in Table 10.

Table 10. SO_2 EMISSION RATES – HHE ENGINES, ACLF FLARES, AND ACLF DIESEL ENGINES

H_2S Concentration (ppmv)	Total LFG (scfm)	Total SO_2 (lb/hr)	HGEN1	HGEN2	HGEN3	HGEN4	Flare1		Flare2	
			(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(m/sec)	(lb/hr)	(m/sec)
Operate HHE Generators 1 and 2 at full load with remaining LFG combusted in the flare(s)										
H_2S = 180 ppmv	3,350	6.11	1.09	1.09	---	---	3.92	0.73	---	---
H_2S = 200 ppmv	3,350	6.79	1.22	1.22	---	---	4.36	0.73	---	---
H_2S = 600 ppmv	2,400	14.59	3.65	3.65	---	---	7.30	0.41	---	---
H_2S = 600 ppmv	2,700	16.42	3.65	3.65	---	---	9.12	0.51	---	---
H_2S = 600 ppmv	3,350	20.37	3.65	3.65	---	---	13.07	0.73	---	---
H_2S = 600 ppmv	4,699	28.57	3.65	3.65	---	---	10.6	0.59	10.6	0.59
Operate HHE Generators 1, 2, 3, 4 at full load with remaining LFG combusted in the flare(s)										
H_2S = 180 ppmv	3,350	6.11	1.09	1.09	1.09	1.09	1.73	0.32	---	---
H_2S = 200 ppmv	3,350	6.79	1.22	1.22	1.22	1.22	1.93	0.32	---	---
H_2S = 600 ppmv	2,400	14.59	3.65	3.65	3.65	3.65	---	---	---	---
H_2S = 600 ppmv	2,700	16.42	3.65	3.65	3.65	3.65	1.82	0.10	---	---
H_2S = 600 ppmv	3,350	20.37	3.65	3.65	3.65	3.65	5.78	0.32	---	---
H_2S = 600 ppmv	4,699	28.57	3.65	3.65	3.65	3.65	6.99	0.39	6.99	0.39
ALCF Non-Emergency Diesel Engine Generators										
CCHIPGEN	---	0.00101	---	---	---	---	---	---	---	---
CSCRNGEN	---	0.00013	---	---	---	---	---	---	---	---

3.4 Results for Significance Analyses

The first step in the modeling analyses for increases in SO_2 emissions from the HHE engines and the ACLF flares is to determine where the high 1st high ambient impacts associated with the increase exceed the EPA interim significant concentration level (SCL) of 3 parts per billion (ppb) or about 7.8 μg/m^3. As noted above, only receptors with high 1st high ambient impacts greater than or equal to the EPA Interim significant contribution level (SCL) of 3 parts per billion (ppb)—equivalent to about 7.8 μg/m^3—were carried forward for the full impact analyses.

3.4.1 Hidden Hollow Energy Significant Impacts

Receptors with significant impacts for operating two (HH12) or four (HH1234) HHE engine generators are shown in Figure 3-6.

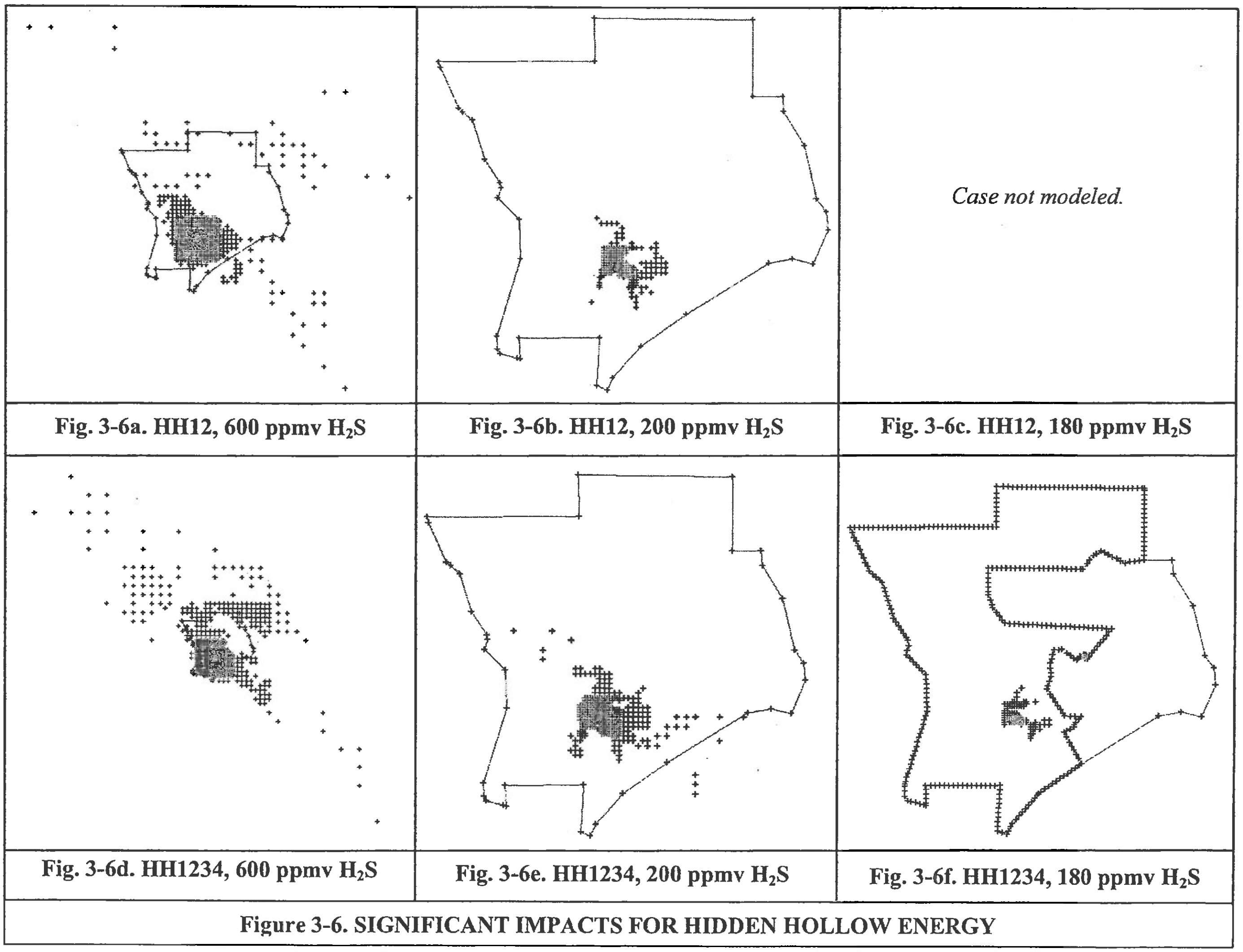


Fig. 3-6a. HH12, 600 ppmv H_2S | **Fig. 3-6b. HH12, 200 ppmv H_2S** | **Fig. 3-6c. HH12, 180 ppmv H_2S**

Fig. 3-6d. HH1234, 600 ppmv H_2S | **Fig. 3-6e. HH1234, 200 ppmv H_2S** | **Fig. 3-6f. HH1234, 180 ppmv H_2S**

Figure 3-6. SIGNIFICANT IMPACTS FOR HIDDEN HOLLOW ENERGY

3.4.2 ACLF Flare Significant Impacts – Combust All LFG in the Flare(s)

Receptors with significant impacts for combusting all LFG in the ACLF Flares are shown in Figure 3-7. Note that for the flares, modeling for significant impacts was split into two runs: 1) Receptors outside of the ACLF property boundary (OFFACLF), and 2) Receptors located in the areas of the ACLF that are accessible to the public (ACLFPUBL). Flare SO_2 emissions were presumed to impact OFFACLF receptors 24 hours per day, all year. Flare SO_2 emissions were presumed to impact the public areas of the landfill from 7 a.m. to 7 p.m. LST, Monday through Saturday. The average start and end dates of daylight savings time during 2001-2005 were April 4th and October 28th, respectively. AERMOD does not account for the shifts between MST and MDT during the year. Modeled hours for the publicly accessible portion of ACLF were set to 7 a.m. to 7 p.m. from November through March, and 6 a.m. to 6 p.m. from April through October of each year.

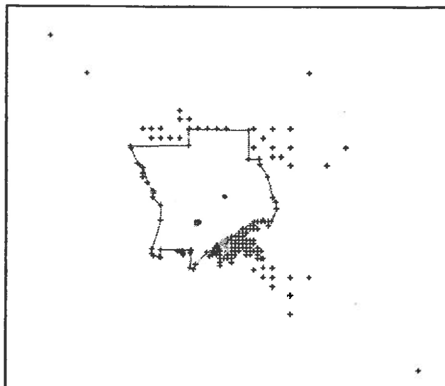


Fig. 3-7a. Flare12, 180 ppmv H_2S, OFFACLF 3,350 scfm LFG

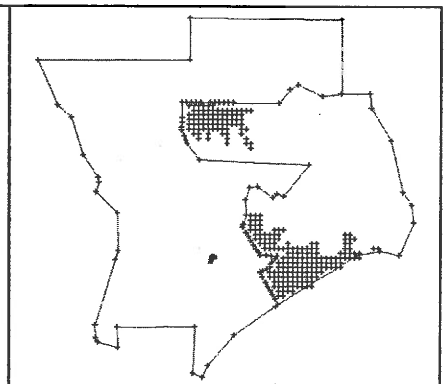


Fig. 3-7b. Flare12, 180 ppmv H_2S, ACLFPUBL 3,350 scfm LFG

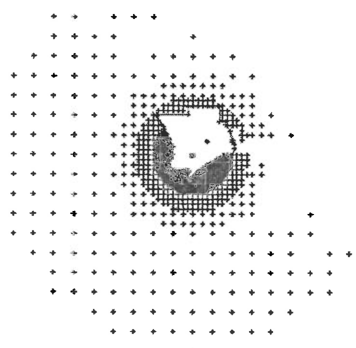


Fig. 3-7c. Flare12, 600 ppmv H_2S, OFFACLF 3,350 scfm LFG

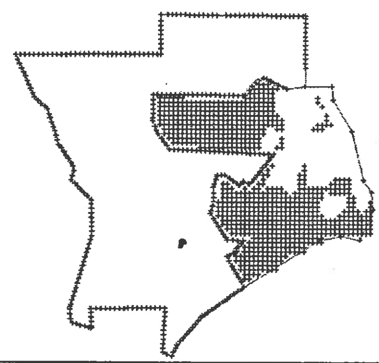


Fig. 3-7d. Flare12, 600 ppmv H_2S, ACLFPUBL 3,350 scfm LFG

Case not modeled.

Fig. 3-7e. Flare12, 600 ppmv H_2S, OFFACLF 4,699 scfm LFG

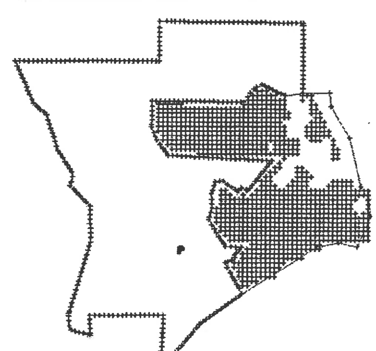


Fig. 3-7f. Flare12, 600 ppmv H_2S, ACLFPUBL 4,699 scfm LFG

Figure 3-7. SIGNIFICANT IMPACTS FOR ACLF FLARES

3.4.3 ACLF Flare Significant Impacts – Running HHE Generators

Receptors with significant impacts when running the HHE engine generators at full capacity with the remaining LFG combusted in the ACLF Flares are shown in Figure 3-8. Note that for the flares, modeling for significant impacts was split into two runs: 1) Receptors outside of the ACLF property boundary (OFFACLF), and 2) Receptors located in the areas of the ACLF that are accessible to the public (ACLFPUBL). Flare SO_2 emissions were presumed to impact OFFACLF receptors 24 hours per day, all year. Flare SO_2 emissions were presumed to impact the public areas of the landfill from 7 a.m. to 7 p.m. LST, Monday through Saturday. The average start and end dates of daylight savings time during 2001-2005 were April 4th and October 28th, respectively. AERMOD does not account for the shifts between MST and MDT during the year. Modeled hours for the publicly accessible portion of ACLF were set to 7 a.m. to 7 p.m. from November through March, and 6 a.m. to 6 p.m. from April through October of each year.

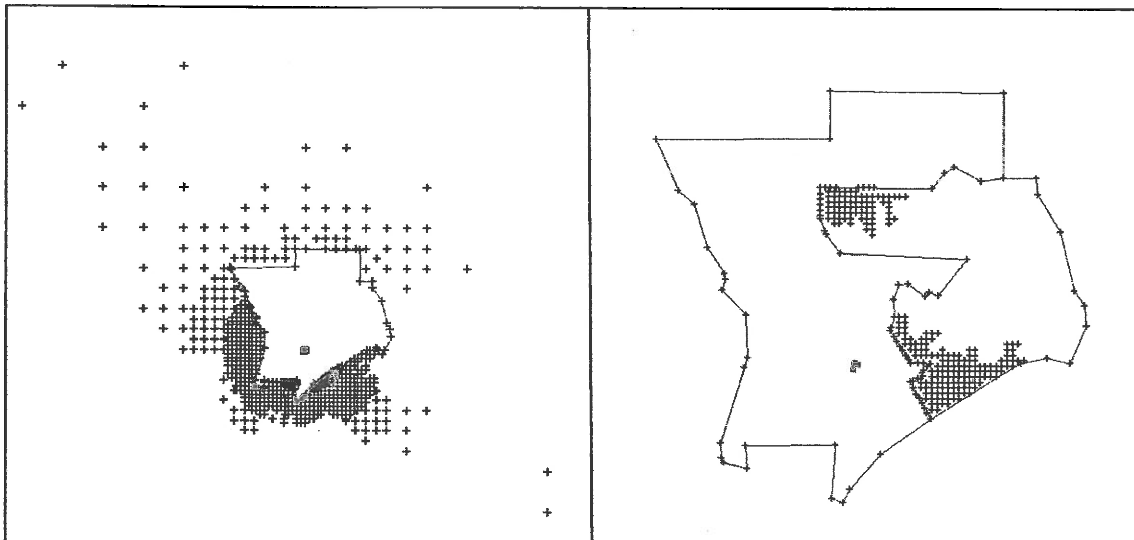


Fig. 3-8a. Flare1, 600 ppmv H_2S, ACLFPUBL 950 scfm LFG

Fig. 3-8b. Flare1, 600 ppmv H_2S, ACLFPUBL 950 scfm LFG

Figure 3-8. SIGNIFICANT IMPACTS FOR ACLF FLARE1

3.5 Results for Full Impact Analyses

The determination of co-contributing sources for full impact analyses for HHE's engine generators and for ACLF's flares reflect the definition of "ambient boundary" discussed above. Modeled co-contributing sources for each analysis are summarized in Table 11.

Table 11. CO-CONTIRBUTING SOURCES FOR FULL IMPACT ANALYSES

	Modeled Sources			
Full Impact Analysis for:	**OFFACLF Public Access 8760 hr/yr**	**ONACLF No Public Access 8760 hr/yr**	**ONACLF12 No Public Access 7 p.m. – 7 a.m. LST, Mon – Sat and all day Sunday**	**ACLFPUBL12 Public Access 7 a.m. – 7 p.m. LST, Mon - Sat**
HGEN12	HHGEN12, Flare(s) and ACLF non-emergency generators	HHGEN12	HHGEN12	HHGEN12, Flare(s) and ACLF non-emergency generators

Table 11. CO-CONTIRBUTING SOURCES FOR FULL IMPACT ANALYSES				
	Modeled Sources			
Full Impact Analysis for:	OFFACLF Public Access 8760 hr/yr	ONACLF No Public Access 8760 hr/yr	ONACLF12 No Public Access 7 p.m. – 7 a.m. LST, Mon – Sat and all day Sunday	ACLFPUBL12 Public Access 7 a.m. – 7 p.m. LST, Mon - Sat
HGEN1234	HHGEN1234, Flare(s) and ACLF non-emergency generators	HHGEN123	HHGEN123	HHGEN1234, Flare(s) and ACLF non-emergency generators
FLARES	Flares, HGEN12 or HGEN1234 and ACLF non-emergency generators	None	None	Flares, HGEN12 or HGEN1234 and ACLF non-emergency generators

The landfill also has installed two new diesel generators to provide emergency power for the scale and at the hazardous waste handling building. Each of these generators is subject to 40 CFR 60, Subpart IIII (an NSPS), and area source MACT provisions contained in 40 CFR 63 Subpart ZZZZ. These generators are allowed to burn only ultra-low sulfur diesel fuel with maximum 0.0015% sulfur by weight. Modeling for these two sources would be limited to negligible amounts of SO_2 emitted during routine testing and maintenance. Based on the negligible modeled ambient impacts associated with operating the non-emergency generators serving the wood chipper and screening unit, emissions from the emergency generators were not included in the modeling analyses.

Three cases were run to characterize the ambient impacts to personnel working at the landfill if all the LFG is combusted in the flares rather than feeding LFG first to HHE's engine generators and combusting any remaining LFG in the flare(s) prior to installing an H_2S treatment system. The full impact results—using a full receptor grid within the ACLF property boundary—are shown in Table 12.

Table 12. FULL IMPACT WITHIN ACLF BOUNDARY FOR FLARES BURNING 600 PPM H_2S LFG							
Total LFG (scfm)	LFG Flow Rate, Each Flare (scfm)	Full Impact Analysis: SO2 Emissions, Each Flare (lb/hr)	Stack Height (ft)	Ambient Impact (4th High) (μg/m³)	Background Concentration (μg/m³)	Total Ambient Impact (μg/m³)	Percent of 196 μg/m³ NAAQS
2,700	1,350	8.21	40	1,160	33.1	1193	609%
3,350	1,675	10.19	40	1,310	33.1	1343	685%
4,699	2,320 / 2,379	14.1 / 14.5	40	1,580	33.1	1613	823%

Full impact analysis results for increased SO_2 emissions from Hidden Hollow Energy's engine generators and from ACLF's flares are shown in Table 13 and Table 14, respectively.

Table 13. RESULTS OF FULL IMPACT ANALYSES FOR HHE ENGINE GENERATORS															
H_2S Concen-tration (ppmv)	Total LFG (scfm)	SO_2 Emissions from Each Engine (lb/hr)	SO_2 Modeled Ambient Impact (µg/m^3)				Back-ground Conc. (µg/m^3)	Total Ambient Impact (µg/m^3)				Percent of 196 µg/m^3 NAAQS			
			Off-ACLF*	On-ACLF	On-ACLF12	ACLF-PUBL12*		Off-ACLF*	On-ACLF	On-ACLF12	ACLF-PUBL12*	Off-ACLF*	On-ACLF	On-ACLF12	ACLF-PUBL12*
HHE Base Case															
150	---	0.92	---	---	---	---	---	---	---	---	---	---	---	---	---
Run just the two existing Hidden Hollow Energy engine generators, "OnACLF" means all significant receptors located within the ACLF boundary.															
180	3,350	1.09	*Not run*	*Not run*			33.1	*Not run*	*Not run*			*Not run*	*Not run*		
200	3,350	1.22	*Not run*	146			33.1	*Not run*	179			*Not run*	91%		
600	2,700	3.65	108	437			33.1	141	470			72.0%	240%		
600	3,350	3.65	139	437			33.1	172	470			87.8%	240%		
600	4,699	3.65	188	437			33.1	221	470			113%	240%		
Run all four Hidden Hollow Energy engine generators, "OnACLF' means the significant receptors located where public access is denied 24/7															
180	**3,350**	**1.09**	nr	**161**	nr	nr	**33.1**	nr	**194**	nr	nr	nr	**99.0%**	nr	nr
200 14.4 ft	3,350	1.22	41.9	181	*Not run*	*Not run*	33.1	75	214	*Not run*	*Not run*	38.3%	109%	*Not run*	*Not run*
200 35 ft**	3,350	1.22	*Not run*	160/ 178	*Not run*	*Not run*	33.1	---	211	*Not run*	*Not run*	*Not run*	107%	*Not run*	*Not run*
600	2,700	3.65	102	541	*Not run*	*Not run*	33.1	135	574	*Not run*	*Not run*	68.9%	293%	*Not run*	*Not run*
600	3,350	3.65	125	541	*Not run*	*Not run*	33.1	158	574	*Not run*	*Not run*	80.7%	293%	*Not run*	*Not run*
600	4,699	3.65	171	541	179	129	33.1	204	574	212	162	104%	293%	108%	83%

* Includes ACLF co-contributions: Flare(s)and two non-emergency generators in the wood chipping/recycling area of the landfill

** The as-built stack height is 14.4 feet. This case was run to determine the potential reduction in ambient impacts for a 35-foot stack height.

nr = no significant receptors

Table 14. RESULTS OF FULL IMPACT ANALYSES FOR ACLF FLARES													
H_2S Concentration (ppmv)	**Total LFG (scfm)**	**LFG Flow Rate (scfm)**		**SO_2 Emissions (lb/hr)**		**SO_2 Modeled Ambient Impact (μg/m³)**		**Background Conc. (μg/m³)**	**Total Ambient Impact (μg/m³)**		**Percent of 196 μg/m³ NAAQS**	
		Flare 1	**Flare 2**	**Flare 1**	**Flare 2**	**Off-ACLF***	**ACLF-PUBL12***		**Off-ACLF***	**ACLF-PUBL12***	**Off-ACLF***	**ACLF-PUBL12***
ACLF Base Case												
46.9	4,699	2,320	2,379	0.13	0.15	---	---	---	---	---	---	---
All LFG Combusted in ACLF Flares												
180	**3,350**	**1,675**	**1,675**	**3.06**	**3.06**	**45.3**	**32.5**	**33.1**	**78.4**	**65.6**	**40.0%**	**33.5%**
600	2,700	1,350	1,350	8.21	8.21	*Not run*	*Not run*	33.1	*Not run*	*Not run*	*Not run*	*Not run*
600	3,350	1,675	1,675	10.2	10.2	151	108	33.1	184.1	141.1	93.9%	72.0%
600	4,699	2,320	2,379	14.1	14.5	259	149	33.1	292.1	182.1	149.0%	92.9%
Run all four Hidden Hollow Energy engine generators (2,400 scfm LFG), with remaining gas routed to ACLF Flare(s)												
600	3,350	950	- 0 -	5.78	- 0 -	56.2	110	33.1	89.3	143.1	45.6%	73.0%
600 ANNUAL	3,350	950	- 0 -	5.78	- 0 -	Full Grid 1.68	Full Grid 1.09	2.6	4.3	3.69	2.2%	1.9%

* Includes ACLF and HHE co-contributions: HHE Engine Generators and two non-emergency generators in the wood chipping/recycling area of the landfill.
nr = no significant receptors

4.0 Conclusions

The ambient air impact analyses demonstrated to DEQ's satisfaction that increasing the SO_2 emissions from each HHE engine generator to 1.09 lb/hr for a total of 4.36 lb/hr from all four permitted engine generators will not cause or significantly contribute to a violation of any SO_2 NAAQS, for total LFG collection rates of 3,350 scfm. This SO_2 emission rate corresponds to an H_2S concentration in the LFG of about 180 ppmv.

The ambient air impact analyses demonstrated to DEQ's satisfaction that SO_2 emissions from combusting all LFG in the ACLF flares will not cause or significantly contribute to a violation of any SO_2 NAAQS, for total LFG collection rates of 3,350 scfm and H_2S concentrations of 600 ppmv or less..

The ambient air impact analyses demonstrated to DEQ's satisfaction that SO_2 emissions from combusting most of the LFG in HHE's engine generators, with remaining LFG combusted in the ACLF flare(s) will not cause or significantly contribute to a violation of any SO_2 NAAQS, for total LFG collection rates of 3,350 scfm and H_2S concentrations of 600 ppmv or less

Appendix F

Manufacturer Specifications

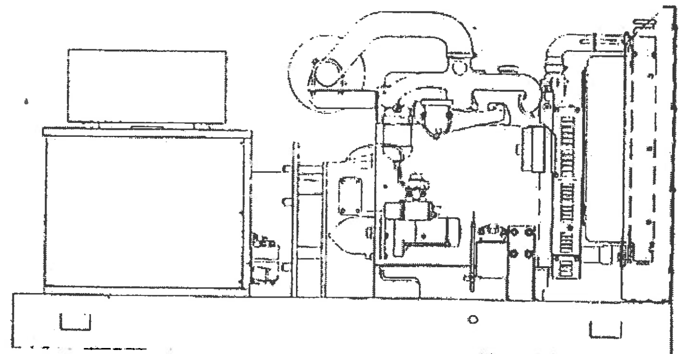
SPECTRUM®
DETROIT DIESEL

Model: 30DS
Diesel

ISO 9001
INTERNATIONALLY REGISTERED
SPECTRUM®

Standard Features

- Spectrum® product distributors provide one-source responsibility for the generating system and accessories.
- All generator sets and components are prototype tested, factory built, and production tested.
- A one-year limited warranty covers all systems and components. Two-, five-, and ten-year extended warranties are available.
- Generator features:
  - Brushless, rotating-field generator has broadrange reconnectability.
  - A permanent magnet-excited generator (PMG) provides superior short-circuit capability.
- Other features:
  - Controllers are available to meet all applications. See controller features inside.
  - Low coolant level shutdown protects generator set from overheating.
  - Integral vibration isolation eliminates the need for installation of vibration spring isolators under the unit.



Generator Ratings

Model Series	Voltage Code	Voltage	Standby Amps	Phase	Hz	Generator Model	Standby kW/kVA	Prime kW/kVA
30DS60	01	120/240	105	3	60	4P5	35/44	32/40
30DS60	51	139/240	102	3	60	4P5	34/43	31/39
30DS60	51	127/220	112	3	60	4P5	34/43	31/39
30DS60	61	120/240	138	1	60	4P5	33/33	30/30
30DS60	71	277/480	51	3	60	4P5	34/43	31/39
30DS60	71	220/380	67	3	60	4P5	35/44	32/40
30DS60	81	120/208	121	3	60	4P5	35/44	32/40
30DS60	91	347/600	40	3	60	4P5	33/41	30/38
30DS50	01	110/220	89	3	50	4P5	27/34	25/31
30DS50	51	110/190	103	3	50	4P5	27/34	25/31
30DS50	61	110/220	118	1	50	4P5	26/26	24/24
30DS50	71	220/380	51	3	50	4P5	27/34	25/31
30DS50	71	230/400	47	3	50	4P5	26/33	24/30
30DS50	71	240/416	45	3	50	4P5	26/33	23/29
30DS50	81	120/208	90	3	50	4P5	26/33	23/29

RATINGS: Standby ratings are continuous for the duration of any power outage. No overload capacity is specified at this rating. Prime ratings are continuous per BS 5514, DIN 6271, ISO-3046, and IEC 34-1 with 10% overload capacity one hour in twelve hours. All single-phase units are rated at 1.0 power factor. All 3-phase units are rated at 0.8 power factor. Contact the factory for ratings of city water-cooled and remote radiator models. Larger generators may be used to meet special application requirements. Availability is subject to change without notice. The manufacturer of Spectrum products reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Spectrumproducts distributor for availability. DERATION: Maximum altitude before generator deration, ft. (m): 500 (152). Altitude deration factor,% per 1000 ft. (305 m): 2.0. Maximum intake air temperature before generator deration, °F (°C): 104 (40). Temperature deration factor, % per 18°F (10°C): 2.5.

Alternator Specifications

Type	4-Pole, Rotating Field
Exciter type	Brushless, Permanent Magnet
Number of leads	12, Reconnectable
Voltage regulator	Solid State, Volts/Hz
Insulation: NEMA MG1-1.66,	
Material	Class H
Temperature rise	130°C, Standby
Bearing, number, type	1, Sealed
Coupling	Flexible Disc
Amortisseur windings	Full
Voltage regulation, no load to full load	±2%
One-step load acceptance per NFPA 110	100% of Rating
Peak motor starting kVA:	(35% dip for 480 V, 60 Hz and 380 V, 50 Hz)
4P5	140 (60Hz), 95 (50Hz)
4P7	195 (60Hz), 135 (50Hz)

- Compliance with NEMA, IEEE, and ANSI standards for temperature rise.
- Sustained short-circuit current up to 300% of rated current for up to 10 seconds.
- Sustained short-circuit capability enabling downstream circuit breakers to trip without collapsing the generator field.
- Self-ventilation and drip-proof construction.
- Vacuum-impregnated windings with fungus-resistant epoxy varnish for dependability and long life.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.
- A solid-state, volts-per-hertz voltage regulator with ±2% no-load to full-load regulation.
- A brushless alternator with brushless exciter for excellent load response.

Application Data

Engine

Engine Specifications	60 Hz	50 Hz
Supplier	Detroit Diesel	
Engine, model, type	4.236, 4-Cycle Natural Aspiration	
Cylinder arrangement	4 In-line	
Displacement, cu. in. (L)	236 (3.870)	
Bore and stroke, in. (mm)	3.875 x 5.0 (98.4 x 127)	
Compression ratio	16.0:1	
Piston speed, ft/min. (m/sec.)	1500 (7.62)	1248 (6.35)
Main bearings: number, type	5, Replaceable Insert	
Rated rpm	1800	1500
Max. power at rated rpm, hp (kW)	64.0 (47.7)	56.0 (41.8)
Cylinder head material	Cast Iron	
Crankshaft material	Forged Steel	
Valve material:		
Intake	Carbon Steel	
Exhaust	Chromium Steel	
Governor, type, make/model	Mechanical, Stanadyne/ DB2	
Frequency regulation, no load to full load	5%	
Frequency regulation, steady state	±0.5%	
Air cleaner type, all models	Dry, Paper Element	

Exhaust

Exhaust System	60 Hz	50 Hz
Exhaust flow at rated kW, cfm (m^3/min.)	270 (7.6)	220 (6.2)
Exhaust temperature at rated kW, dry exhaust, °F (°C)	1075 (579)	1060 (571)
Maximum allowable back pressure, in. Hg (kPa)	3 (10.2)	
Exhaust outlet size at hookup, in. (mm)	2.50 O.D. (63.5)	

Engine Electrical

Engine Electrical System	60 Hz	50 Hz
Battery charging alternator:		
Ground (negative/positive)	Negative	
Volts (DC)	12	
Ampere rating	66	
Starter motor rated voltage (DC)	12	
Recommended battery cold cranking amps (CCA) rating for 0°F	800	
Quantity of batteries	1	
Battery voltage (DC)	12	
Rolling current at 32°F	-	

Fuel

Fuel System	60 Hz	50 Hz
Fuel supply line, min. ID, in. (mm)	0.25 (6)	
Fuel return line, min. ID, in. (mm)	0.25 (6)	
Max. lift, engine-driven fuel pump, ft. (m)	6.0 (1.8)	
Max. fuel flow, g/h (L/h)	4.7 (17.8)	4.3 (16.1)
Fuel prime pump	Manual	
Fuel filter	Primary and Secondary	
Recommended fuel	#2 Diesel, min. 45 Cetane	

Lubrication

Lubricating System	60 Hz	50 Hz
Type	Full Pressure	
Oil pan capacity, qts. (L)	7.5 (7.1)	
Oil pan capacity with filter, qts. (L)	8.6 (8.1)	
Oil filter, quantity, type	1, Cartridge	
Oil cooler	-	

Application Data

Cooling (Standard Radiator)

Cooling System	60 Hz	50 Hz
Ambient temperature °F (°C)	122 (50)	
Engine jacket water capacity, gal. (L)	2.5 (9.5)	
Radiator system capacity, including engine, gal. (L)	3.6 (13.6)	
Engine jacket water flow, gpm (Lpm)	24 (91)	20 (76)
Heat rejected to cooling water at rated kW, dry exhaust Btu/min.	1400	1040
Water pump type	Centrifugal	
Fan diameter, including blades, in. (mm)	19.0 (482.6)	
Fan hp (kW)	3.5 (2.6)	2.0 (1.5)
Max. restriction of cooling air, intake and discharge side of rad., in. H_2O (in. Hg)	0.5 (0.037)	

Cooling (Optional Systems)

Remote Radiator System	60 Hz	50 Hz
Exhaust manifold type	Dry	
Connection sizes:		
Water inlet, in. (mm)	1.88 (48)	
Water outlet, in. (mm)	1.50 (38)	
Remote radiator:		
Make	Modine	
Model	M2VR2P1.5	
Mounting	Vertical	
Discharge	Horizontal	
Fan motor: phase, hp (kW)	3, 1.5, (1.1)	
Radiator capacity, gal. (L)	3.5 (13.2)	
Static head allowable above engine, ft. (m)	10.7 (3.8)	7.5 (2.3)
Tank top (inlet), in.	1.5 NPT	
Bottom tank (outlet), in.	1.5 NPT	
Dry weight, lb. (kg)	320 (145)	

City Water Cooling System	60 Hz	50 Hz
Exhaust manifold type	Dry	
System capacity, gal. (L)	2.9 (10.9)	
City water consumption,* gpm (Lpm) at 50°F (10°C)	2.3 (8.7)	1.9 (7.2)
Connection sizes:*		
Water inlet, in.	1/2 NPT	
Water outlet, in.	1/2 NPT	

* Data based on Thermal Transfer Products B-702-B4 heat exchanger with thermostatically controlled water-saver valve, electric solenoid valve, and surge tank.

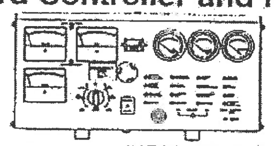
Operation Requirements

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, cfm (m^3/min.)	5500 (156)	4100 (116)
Cooling air required for gen. set when equipped with CWC or remote radiator, based on 25°F (14°C) rise and ambient temp. of 85°F (29°C), cfm (m^3/min.)	2000 (56.6)	1400 (39.6)
Combustion air, cfm (m^3/min.)	102 (2.9)	88 (2.5)
Heat rejected to ambient air:		
Engine BTU/min.	520	380
Generator BTU/min.	320	220

Fuel Consumption	60 Hz	50 Hz
Diesel, gph (Lph) at % load		
100%	3.0 (11.2)	2.2 (8.3)
75%	2.3 (8.5)	1.7 (6.4)
50%	1.7 (6.3)	1.3 (4.9)
25%	1.2 (4.5)	0.9 (3.4)

Controllers

Standard Controller and Features



- Type: 16-light microprocessor (NFPA 110, level 1)
- Power source, with circuit protection: 12-volt DC
- Panel lamps (2)
- Analog Meters:
  - AC meters, 2.5 in. (64 mm) 2% full-scale accuracy on voltmeter and ammeter, 0.5% full-scale accuracy on frequency meter
  - DC meters, 2 in. (51 mm), 2% full-scale accuracy (volts, engine water temperature, oil pressure)
  - Running time meter
- Switches and Controls:
  - Alarm horn and silencing switch
  - Cyclic cranking
  - Engine cooldown timer, 5-minute
  - Front-mounted voltage-adjusting rheostat ±5%
  - Lamp test switch
  - Local emergency stop button switch (optional)
  - Meter phase selector switch, 7 position
  - Overvoltage protection shutdown
  - Prime power mode
  - Run/off-reset/auto switch (engine start), local/remote two-wire
- Fault and Condition Lamps:
  - Air damper (red) (200-1600 kW diesel only)
  - Auxiliary fault (red)
  - Auxiliary prealarm (yellow)*
  - Battery charger fault (red)*
  - Emergency stop (red)*
  - Generator switch not in auto (red)
  - High engine temperature safety shutdown (red)
  - Low battery voltage (red)*
  - Low coolant level shutdown (auxiliary)
  - Low fuel (red)*
  - Low oil pressure safety shutdown (red)
  - Low water temperature (red)*
  - Overcrank safety shutdown (red)
  - Overspeed safety shutdown (red)
  - Prealarm high engine temperature (yellow)*
  - Prealarm low oil pressure (yellow)*
  - System ready (green)

* Requires optional kit or user-provided device for lamp to function.

Optional Controllers

- Engine gauge box for paralleling controller (switchgear)
- Manual controller
- Manual paralleling microprocessor controller
- Oversized meterbox controller
- 7-light controller (NFPA 110, level 2)
  (For optional controller features, see controller spec sheet.)

SPECTRUM®
DETROIT DIESEL

SPECTRUM, N7650 County Trunk LS, Sheboygan, Wisconsin 53083 U.S.A.
Phone 414-459-1877
Fax 414-459-1825 (U.S.A. Sales), Fax 414-459-1614 (International)

Accessories

Enclosed Unit
- ○ Exhaust Silencer, Critical or Industrial
- ○ Silencer Mounting Kit for Housing
- ○ Sound Shield Enclosure
- ○ Tail Pipe and Rain Cap Kit
- ○ Weather Housing

Open Unit
- ○ Exhaust Silencer, Critical or Industrial
- ○ Flexible Exhaust Connector, Stainless Steel

Cooling System
- ○ Block Heater
- ○ City Water Cooling
- ○ Radiator Duct Flange
- ○ Remote Radiator Cooling

Fuel System
- ○ Auxiliary Fuel Pump
- ○ Day Tanks
- ○ Flexible Fuel Lines
- ○ Fuel Pressure Gauge
- ○ Subbase Fuel Tanks

Electrical System
- ○ Battery
- ○ Battery Charger, Equalize/Float Type
- ○ Battery Charger, Trickle Type
- ○ Battery Heater
- ○ Battery Rack and Cables

Engine and Generator
- ○ Air Cleaner, Heavy Duty
- ○ Air Cleaner Restriction Indicator
- ○ Bus Bar Kits
- ○ CSA Certification
- ○ Electronic Isochronous Governor
- ○ Generator Strip Heater
- ○ Line Circuit Breaker
- ○ Line Circuit Breaker with Shunt Trip
- ○ NFPA 110 Literature
- ○ Oil Drain Extension with Valve Kit
- ○ Optional Generators
- ○ Rated Power Factor Testing
- ○ Safeguard Breaker
- ○ Voltage Regulation, 1%
- ○ Voltage Regulator Sensing, Three-Phase

Paralleling System
- ○ Load-Sharing Module
- ○ Reactive Droop Compensator
- ○ Remote Speed Adjust Potentiometer/Electronic Governor
- ○ Voltage Adjust Potentiometer
- ○ Voltage Regulator Relocation Kit

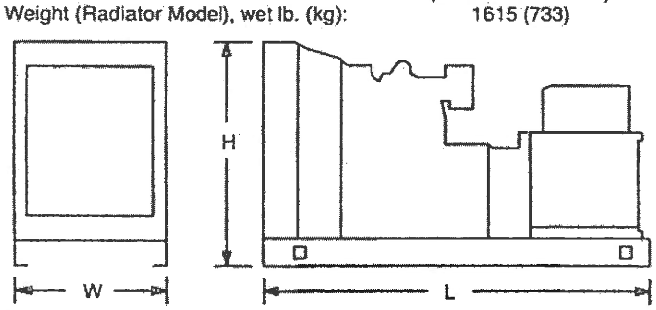
Maintenance
- ○ General Maintenance Literature Kit
- ○ Maintenance Kit (includes air, oil, and fuel filters)
- ○ Overhaul Literature Kit

Controller (Standard Controller)
- ○ Common Failure Relay Kit
- ○ Customer Connection Kit
- ○ Dry Contact Kit (Isolated Alarm)
- ○ Extension Wiring Harness for Remote Mounting of Controller
- ○ FASTCHECK® Diagnostic Fault Detector
- ○ Prealarm Sender Kit (NFPA 110)
- ○ Remote Annunciator Panel
- ○ Remote Audio/Visual Alarm Panel
- ○ Remote Emergency Stop Kit
- ○ Run Relay Kit
- ○ Tachometer Kit/Oversize Meterbox
- ○ Wattmeter Kit/Oversize Meterbox

Miscellaneous Accessories
- ○ ________________
- ○ ________________
- ○ ________________
- ○ ________________
- ○ ________________
- ○ ________________
- ○ ________________
- ○ ________________
- ○ ________________

WEIGHTS AND DIMENSIONS

Overall Size, L x W x H, in. (mm):	82.00 x 29.00 x 43.40 (2083 x 737 x 1102)
Weight (Radiator Model), wet lb. (kg):	1615 (733)



NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

DISTRIBUTED BY:

Converting SCFM to ACFM

$ACFM = SCFM * (P_{std} / P_{act}) * (T_{act} / T_{std})$

Where

ACFM = Actual cubic feet per minute
SCFM = Standard cubic feet per minute
Pstd = Standard absolute air pressure (psia)
Pact = Absolute pressure at the actual level (psia)
Tact = Actual ambient air temperature (°R)
Tstd = Standard temperature (°R)

Generator 3 - Detroit Diesel

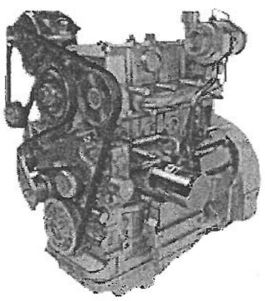
SCFM =	270.00	Maximum Flow		
SCFM =	135.00	50% load		
Pstd =	14.7	psia		
Pact =	13.42	psia (3,000 ft elevation)		
Tact =	1075	°F (exhaust)	1535	°R
Tstd =	77	°F	537	°R

GEN3 ACFM 423

PowerTech E
4024H Diesel Engine

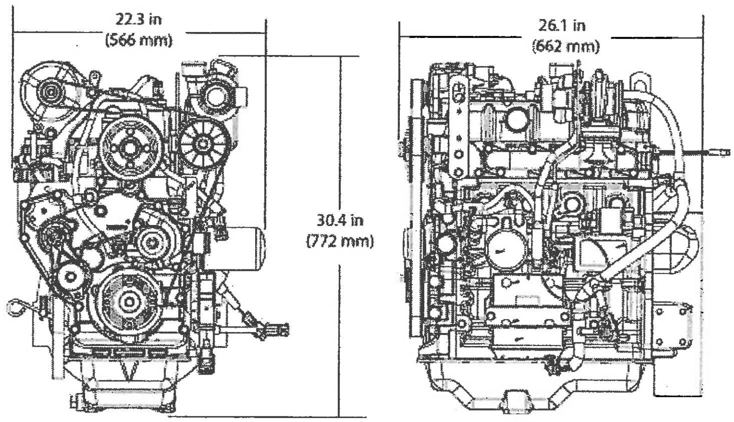
Generator Drive Engine Specifications

JOHN DEERE



4024H shown

Dimensions



Certifications

CARB

EPA Tier 3

General data

Model	4024HF285
Number of cylinders	4
Displacement - L (cu in)	2.4 (146)
Bore and Stroke-- mm (in)	86 x 105 (3.39 x 4.13)
Compression Ratio	18.2:1
Engine Type	In-line, 4-Cycle

Aspiration	Turbocharged and air-to-air aftercooled
Length - mm (in)	662 (26.1)
Width - mm (in)	566 (22.3)
Height-- mm (in)	772 (30.4)
Weight, dry-- kg (lb)	251 (553)

Performance data

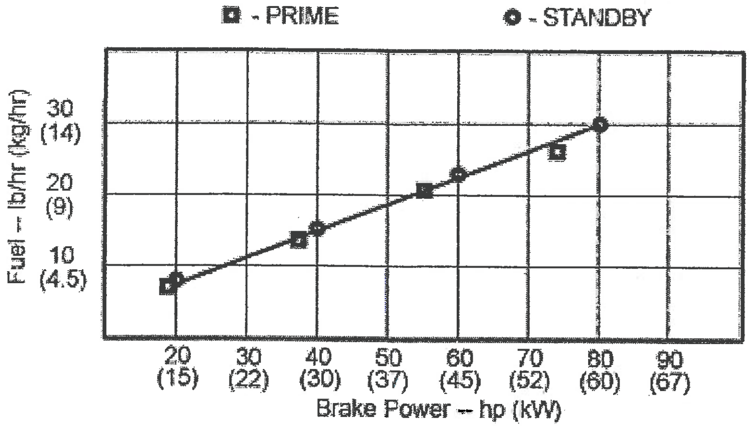
Prime power at 60 Hz (1800 rpm)	55 kW (74 hp)
Standby power at 60 Hz (1800 rpm)	60 kW (80 hp)

The prime power gen-set engine rating is the nominal power an engine is capable of delivering with a variable load for an unlimited number of hours per year with normal maintenance intervals observed. This rating incorporates a 10% overload capability which is available for up to 2 hours at a time. Operating time between 100% and 110% of the prime power rating is not to exceed 8% of the total engine operating time. This rating conforms to ISO 8528-1 "prime power (PRP)". The permissible average power for the prime or PRP rating is not to exceed 70% of rated prime power when calculated per ISO 8528-1.

The standby gen-set engine rating is the nominal engine power available at varying load factors for up to 200 hours per year with normal maintenance intervals observed. No overload capability is available for this rating. This rating conforms to ISO 8528-1 "Emergency Standby Power (ESP)". The permissible average power for the standby or ESP rating is calculated per ISO 8528-1.

Photographs may show non-standard equipment.

Performance curve



Performance data

Hz (rpm)	Generator efficiency %	Rated fan power		Power factor	Calculated generator set output			
					Prime		Standby	
		kW	hp		kWe	kVA	kWe	kVA
60 (1800)	88-92	3.6	4.8	0.8	45-47	56-59	50-52	63-65

Features and benefits

2-Valve Cylinder Head

- U-flow head design provides excellent breathing from a lower-cost 2-valve cylinder head

Electronic Unit Pump (EUP) Fuel System

- Regulated rated speed flexibility and improved cold-start and warm-up control

Fixed Geometry Turbocharger

- Fixed geometry turbochargers are precisely matched to the power level and application

Air-to-Air Aftercooled

- This is the most efficient method of cooling intake air to help reduce engine emissions while maintaining low-speed torque, transient response time, and peak torque. It enables an engine to meet emissions regulations with better fuel economy and the lowest installed costs

John Deere Electronic Engine Controls

- Electronic engine controls monitor critical engine functions, providing warning and/or shutdown to prevent costly engine repairs and eliminate the need for add-on governing components, all lowering total installed costs

Compact Size

- Mounting points are the same as previous engine models

Engine Performance

- Block loading capability provided with standard electronic governor control

Additional Features

- Self-adjusting poly-vee fan drive
- Forged-steel connecting rods
- Either-side service
- 500-hour oil change
- Gear driven auxiliary drive
- Glow plugs
- Optional balancer shafts

John Deere Power Systems
3801 W. Ridgeway Ave.
PO Box 5100
Waterloo, IA 50704-5100
Phone: 1-800-533-6446
Fax: 319.292.5075

John Deere Power Systems
Usine de Saran
La Foulonnerie - B.P. 11.13
45401 Fleury les Aubrais Cedex
France
Phone: 33.2.38.82.61.19
Fax: 33.2.38.82.60.00

All values at rated speed and power with standard options unless otherwise noted. Specifications and design subject to change without notice.

60 kW John Deere Engine

Model: 4014 HF 285

Serial: 2325625

Tier III

Manufacture Date: 11/2010

Stack Diameter: 2.5″

Stack Height: 70″

From conversation with Frank Grover with EC Power in Boise, Idaho on 9/7/2011:

- Flow = 549 scfm
- Exhaust Temp = 896 F
- Fuel usage = 4.73 gal/hr

MEASURING RANGE AND RESOLUTION:

	Range	Resolution
CO	999 ppm	1 ppm
H_2S	499 ppm	1 ppm
NO_2	99.9 ppm	0.1 ppm
SO_2	99.9 ppm	0.1 ppm
O_2	30.0 %	0.1 %
Cl_2	50.0 ppm	0.1 ppm
NO*	499 ppm	1 ppm
NH_3*	200 ppm	1 ppm
HCN	30.0 ppm	0.1 ppm
HCl*	30.0 ppm	0.1 ppm
PH_3	1.00 ppm	0.01 ppm
H_2	999 ppm	1 ppm
O_3	1.00 ppm	0.01 ppm
ClO_2	1.00 ppm	0.01 ppm
Comb (%LEL)	100%LEL	1% LEL
Comb (%vol)	5.0% Vol	0.1% Vol
Comb (ppm)	10,000 ppm	50 ppm

** bias sensor*

TEMPERATURE AND HUMIDITY RANGE:

Operating Temperature Range:
-20° to +50° C (-4° to 122° F), typical toxic/oxygen
0° to +40° C (32° to 104° F), for LEL sensor only per C22.2 No. 152

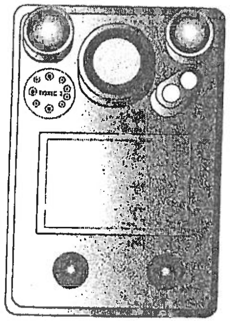
Operating Humidity Range:
15 – 95% RH, typical
0 – 99% RH, intermittent, non-condensing

Storage Temperature Range:
0° to +20° C (32° to 68° F)

REPLACEMENT PARTS LIST

ITEM.	PART NO.	DESCRIPTION
1.	17102484	iTX Main PCB Version 2.X (17088667 for Version 1.X)
2.	17105255	iTX Sensor PCB Version 2.X (17090473 for Version 1.X)
3.	17102526	iTX Interface PCB Version 2.X (17090481 for Version 1.X)
5.	17104266	iTX Keypad Version 2.X (17091307 for Version 1.X)
6.	17096389	iTX Case top assembly
7.	17096082	iTX Case bottom
8.	17091083	iTX Case gasket
10	17098450	iTX Battery cover assembly
11	17091901	Battery cover gasket
12	17092651	Battery insulator
13.	17092693	Screw retainer
14	17095332	Battery cover screws
18	17092198	iTX Chassis
19	17091620	Pump contact module
20	17091869	Pump contact gasket
21	17091588	Pump contact clip
22	17096371	iTX Water barrier kit
27	17092685	Screw, captive, #4x1.125
28	17086935	Screw, 2-56 x 0.31
29	17050453	Screw, 2-56x .188
30	17052558	Screw, 2-28 x .250
32	17049876	Wrist strap
35	17092776	RFI screen
36	17092750	Conductive adhesive
37	17084542	LCD holder
38	17084673	LCDisplay
39	17092743	Insulator pad
40	17099860	i-Button® insulator
41	17028374	External alarm jack
42	17029273	Alarm jack plug
43	17050277	O-ring .250 ID

Changing Gas Sensors



iTX sensors are designed to be changed and replaced by the user in the field without the need for factory service. To replace a sensor in the iTX remove the battery from the instrument as described above. Remove the three screws that hold the instrument case top in place and remove the case top. Be careful not to tear the cable that connects the keypad to the display board. Grasp the sensor firmly and remove from the instrument. Plug the new sensor into the open sensor port and press firmly into place. Some toxic gas sensors are shipped with a shorting wire in place on the bottom of the sensor identification board. This shorting wire must be removed prior to installing the sensor in the instrument in order for the sensor to function properly. Once the sensor has been installed, replace the instrument case top and battery pack. New sensors installed in the instrument will be recognized automatically. If a new sensor type was installed in the instrument, the display will prompt the user to calibrate the instrument before further use. After installing any of the bias sensors (NH3, NO, HCl), you must turn on the instrument so the iTX identifies that a bias sensor is installed and recognizes the need to supply a bias voltage. Then turn off the unit and put it on charge for 24 to 48 hours to allow the sensor to stabilize before calibration.

The iTX should be calibrated prior to use to ensure accuracy after a sensor has been changed in the unit.

Toxic Sensor Cross Sensitivity Chart

Industrial Scientific has designed the iTX to respond as specifically as possible to the target toxic gas. Realistically, total specificity cannot be achieved in all cases. The following chart demonstrates typical cross sensitivity responses for a given sensor when exposed to a different gas.

iTX Sensor Cross Interference Table

Sensor	CO	H_2S	SO_2	NO_2	Cl_2	ClO_2	HCN	HCl	PH_3	NO	H_2
Gas											
CO	100	2	1	-5	0	0	0	1000	0	0	1
H_2S	10	100	1	-8	-3	0	400	25	3	35	20
SO_2	0	10	100	0	0	0		0		0	0
NO_2	-20	-20	-100	100	12		-12			30	0
Cl_2	-10	-20	-35	-100	100	0	-20	20	-10	0	0
ClO_2					20	100					
HCN	15	50	50	1	0	0	100	5	1	0	30
HCl	3	0	0	0	2	0	0	100	0	15	0
PH_3						100	0	300	100		
NO	10	1	1	0						100	30
H_2	60	0.05	0.5	0	0	0	0	0	0	0	100

The table above reflects the percentage response provided by the sensor listed across the top of the chart when exposed to a known concentration of the target gas listed in the left hand column.

Specifications

Size: 4.75" x 3.19" x 1.68" (121mm x 81mm x 43mm)

Weight: 18.5oz (with Li-ion battery pack)
524.5 grams (with Li-ion battery pack)

Display: 128 X 64 Graphic Dot-Matrix LCD with backlighting for low light conditions. Display protected by clear lens. RFI/EMI shielding screen mounted over display area.

Run Time: Run times are specified under the following conditions: A fully charged Li-ion pack / new alkaline pack; all sensors installed; room temperature; and no alarms activated.

Alkaline batteries, without parasitic pump 12hr

Alkaline batteries, with parasitic pump 6hr

Lithium-ion battery, without parasitic pump 24hr

Lithium-ion battery, with parasitic pump 15hr

Appendix G

Regulatory Analysis(Generators 1 and 2)

Title 40: Protection of Environment
Part 63, Subpart ZZZZ—National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

§ 63.6580 What is the purpose of subpart ZZZZ?

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.

§ 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.

(c) An area source of HAP emissions is a source that is not a major source.

The facility maintains and operates two non-emergency internal combustion engines. A Caterpillar D398 with an engine power rating of 650 bhp, installed prior to June 12, 2006. A Deutz with an engine power rating of 106 bhp, installed prior to June 12, 2006. This facility is classified as an area source of HAP emissions defined as potential-to-emit (PTE) 10 tons per year (tpy) or less for any single HAP or PTE less than 25 tpy for total HAPs.

(d) If you are an owner or operator of an area source subject to this subpart, your status as an entity subject to a standard or other requirements under this subpart does not subject you to the obligation to obtain a permit under 40 CFR part 70 or 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 as applicable.

(e) If you are an owner or operator of a stationary RICE used for national security purposes, you may be eligible to request an exemption from the requirements of this subpart as described in 40 CFR part 1068, subpart C.

§ 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.

(iii) For stationary RICE located at an area source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006.

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

(a) *Affected sources.* (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.

§ 63.6603 What emission limitations and operating limitations must I meet if I own or operate an existing stationary RICE located at an area source of HAP emissions?

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.

(a) If you own or operate an existing stationary RICE located at an area source of HAP emissions, you must comply with the requirements in Table 2d to this subpart and the operating limitations in Table 1b and Table 2b to this subpart that apply to you.

Non-Emergency CI RICE (≤ 300 hp)[a]:

- **Change oil and filter every 1,000 hr of operation or annually, whichever comes first.[b]**
- **Inspect air cleaner every 1,000 hr of operation or annually, whichever comes first.**
- **Inspect all hoses and belts every 500 hr of operation or annually, whichever comes first, and replace as necessary.**

[a] *Deutz power screen generator, engine rating of 106 bhp*

[b] *Sources have the option to utilize an oil analysis program as described in §63.6625(i) in order to extend the specified oil change requirement in Table 2d of this subpart.*

Non-Emergency CI RICE (> 500 hp)[a]:

- **Limit concentration of CO in the stationary RICE exhaust to 23 ppmvd at 15% O_2; or**
- **Reduce CO emissions by 70 percent or more.**

[a] *Caterpillar wood chipper generator, engine rating of 650 bhp*

§ 63.6604 What fuel requirements must I meet if I own or operate an existing stationary CI RICE?

If you own or operate an existing non-emergency, non-black start CI stationary RICE with a site rating of more than 300 brake HP with a displacement of less than 30 liters per cylinder that uses diesel fuel, you must use diesel fuel that meets the requirements in 40 CFR 80.510(b) for nonroad diesel fuel. Existing non-emergency CI stationary RICE located in Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or at area sources in areas of Alaska not accessible by the FAHS are exempt from the requirements of this section.

Applicable for the Caterpillar wood chipper engine

§ 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.

§ 63.6612 By what date must I conduct the initial performance tests or other initial compliance demonstrations if I own or operate an existing 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 stationary RICE located at an area source of HAP emissions?

If you own or operate an existing 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 stationary RICE located at an area source of HAP emissions you are subject to the requirements of this section.

(a) You must conduct any initial performance test or other initial compliance demonstration according to Tables 4 and 5 to this subpart that apply to you within 180 days after the compliance date that is specified for your stationary RICE in §63.6595 and according to the provisions in §63.7(a)(2).

Table 4 -Non-Emergency CI RICE:

- **Reduce CO emissions** – measure O_2 at inlet and outlet of the control device – use a portable CO and O_2 analyzer

Table 5 -Non-Emergency CI RICE (> 500 hp)[a]:

- **Limit concentration of CO using an oxidation catalyst, and using a CPMS; or**
- **Reduce CO emissions not using an oxidation catalyst; or** – must achieve the required CO percent reduction from initial performance test, install a CPMS to continuously monitor operating parameters
- **Limit the concentration of CO not using an oxidation catalyst** – the average CO concentration must be less than or equal to the CO emission limit as determined by the initial performance test, install a CPMS to continuously monitor operating parameters

[a] *Caterpillar wood chipper generator, engine rating of 650 bhp*

§ 63.6620 What performance tests and other procedures must I use?

(a) You must conduct each performance test in Tables 3 and 4 of this subpart that applies to you.

(b) Each performance test must be conducted according to the requirements that this subpart specifies in Table 4 to this subpart. If you own or operate a non-operational stationary RICE that is subject to performance testing, you do not need to start up the engine solely to conduct the performance test. Owners and operators of a non-operational engine can conduct the performance test when the engine is started up again.

(c) [Reserved]

(d) You must conduct three separate test runs for each performance test required in this section, as specified in §63.7(e)(3). Each test run must last at least 1 hour.

(e)(1) You must use Equation 1 of this section to determine compliance with the percent reduction requirement:

$$\frac{C_i - C_o}{C_i} \times 100 = R \qquad \text{(Eq. 1)}$$

Where:

C_i= concentration of CO or formaldehyde at the control device inlet,

C_o= concentration of CO or formaldehyde at the control device outlet, and

R = percent reduction of CO or formaldehyde emissions.

(2) You must normalize the carbon monoxide (CO) or formaldehyde concentrations at the inlet and outlet of the control device to a dry basis and to 15 percent oxygen, or an equivalent percent carbon dioxide (CO_2). If pollutant concentrations are to be corrected to 15 percent oxygen and CO_2concentration is measured in lieu of oxygen concentration measurement, a CO_2correction factor is needed. Calculate the CO_2correction factor as described in paragraphs (e)(2)(i) through (iii) of this section.

(i) Calculate the fuel-specific $F_o$value for the fuel burned during the test using values obtained from Method 19, section 5.2, and the following equation:

$$F_o = \frac{0.209\ F_d}{F_c} \qquad \text{(Eq. 2)}$$

Where:

F_o= Fuel factor based on the ratio of oxygen volume to the ultimate CO_2volume produced by the fuel at zero percent excess air.

0.209 = Fraction of air that is oxygen, percent/100.

F_d= Ratio of the volume of dry effluent gas to the gross calorific value of the fuel from Method 19, dsm^3 /J (dscf/10^6 Btu).

F_c= Ratio of the volume of CO_2produced to the gross calorific value of the fuel from Method 19, dsm^3 /J (dscf/10^6 Btu).

(ii) Calculate the CO_2correction factor for correcting measurement data to 15 percent oxygen, as follows:

$$X_{CO_2} = \frac{5.9}{F_o} \quad \text{(Eq. 3)}$$

Where:

X_{co2}= CO_2correction factor, percent.

5.9 = 20.9 percent O_2−15 percent O_2, the defined O_2correction value, percent.

(iii) Calculate the $NO_X$and SO_2gas concentrations adjusted to 15 percent O_2using CO_2as follows:

$$C_{adj} = C_d \frac{X_{CO_2}}{\%CO_2} \quad \text{(Eq. 4)}$$

Where:

$\%CO_2$= Measured CO_2concentration measured, dry basis, percent.

(f) If you comply with the emission limitation to reduce CO and you are not using an oxidation catalyst, if you comply with the emission limitation to reduce formaldehyde and you are not using NSCR, or if you comply with the emission limitation to limit the concentration of formaldehyde in the stationary RICE exhaust and you are not using an oxidation catalyst or NSCR, you must petition the Administrator for operating limitations to be established during the initial performance test and continuously monitored thereafter; or for approval of no operating limitations. You must not conduct the initial performance test until after the petition has been approved by the Administrator.

(g) If you petition the Administrator for approval of operating limitations, your petition must include the information described in paragraphs (g)(1) through (5) of this section.

(1) Identification of the specific parameters you propose to use as operating limitations;

(2) A discussion of the relationship between these parameters and HAP emissions, identifying how HAP emissions change with changes in these parameters, and how limitations on these parameters will serve to limit HAP emissions;

(3) A discussion of how you will establish the upper and/or lower values for these parameters which will establish the limits on these parameters in the operating limitations;

(4) A discussion identifying the methods you will use to measure and the instruments you will use to monitor these parameters, as well as the relative accuracy and precision of these methods and instruments; and

(5) A discussion identifying the frequency and methods for recalibrating the instruments you will use for monitoring these parameters.

(h) If you petition the Administrator for approval of no operating limitations, your petition must include the information described in paragraphs (h)(1) through (7) of this section.

(1) Identification of the parameters associated with operation of the stationary RICE and any emission control device which could change intentionally (*e.g.,* operator adjustment, automatic controller adjustment, etc.) or unintentionally (*e.g.,* wear and tear, error, etc.) on a routine basis or over time;

(2) A discussion of the relationship, if any, between changes in the parameters and changes in HAP emissions;

(3) For the parameters which could change in such a way as to increase HAP emissions, a discussion of whether establishing limitations on the parameters would serve to limit HAP emissions;

(4) For the parameters which could change in such a way as to increase HAP emissions, a discussion of how you could establish upper and/or lower values for the parameters which would establish limits on the parameters in operating limitations;

(5) For the parameters, a discussion identifying the methods you could use to measure them and the instruments you could use to monitor them, as well as the relative accuracy and precision of the methods and instruments;

(6) For the parameters, a discussion identifying the frequency and methods for recalibrating the instruments you could use to monitor them; and

(7) A discussion of why, from your point of view, it is infeasible or unreasonable to adopt the parameters as operating limitations.

(i) The engine percent load during a performance test must be determined by documenting the calculations, assumptions, and measurement devices used to measure or estimate the percent load in a specific application. A written report of the average percent load determination must be included in the notification of compliance status. The following information must be included in the written report: the engine model number, the engine manufacturer, the year of purchase, the manufacturer's site-rated brake horsepower, the ambient temperature, pressure, and humidity during the performance test, and all assumptions that were made to estimate or calculate percent load during the performance test must be clearly explained. If measurement devices such as flow meters, kilowatt meters, beta analyzers, stain gauges, etc. are used, the model number of the measurement device, and an estimate of its accurate in percentage of true value must be provided.

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

(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;

(3) An existing emergency or black start stationary RICE located at an area source of HAP emissions;

(4) An existing non-emergency, non-black start stationary CI RICE with a site rating less than or equal to 300 HP located at an area source of HAP emissions;

(5) An existing non-emergency, non-black start 2SLB stationary RICE located at an area source of HAP emissions;

(6) An existing non-emergency, non-black start landfill or digester gas stationary RICE located at an area source of HAP emissions;

(7) An existing non-emergency, non-black start 4SLB stationary RICE with a site rating less than or equal to 500 HP located at an area source of HAP emissions;

(8) An existing non-emergency, non-black start 4SRB stationary RICE with a site rating less than or equal to 500 HP located at an area source of HAP emissions;

(9) An existing, non-emergency, non-black start 4SLB stationary RICE with a site rating greater than 500 HP located at an area source of HAP emissions that is operated 24 hours or less per calendar year; and

(10) An existing, non-emergency, non-black start 4SRB stationary RICE with a site rating greater than 500 HP located at an area source of HAP emissions that is operated 24 hours or less per calendar year.

(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.

(g) If you own or operate an existing non-emergency, non-black start CI engine greater than or equal to 300 HP that is not equipped with a closed crankcase ventilation system, you must comply with either paragraph (g)(1) or paragraph (g)(2) of this section. Owners and operators must follow the manufacturer's specified maintenance requirements for operating and maintaining the open or closed crankcase ventilation systems and replacing the crankcase filters, or can request the Administrator to approve different maintenance requirements that are as protective as manufacturer requirements. Existing CI engines located at area sources in areas of Alaska not accessible by the FAHS do not have to meet the requirements of paragraph (g) of this section.

(1) Install a closed crankcase ventilation system that prevents crankcase emissions from being emitted to the atmosphere, or

(2) Install an open crankcase filtration emission control system that reduces emissions from the crankcase by filtering the exhaust stream to remove oil mist, particulates, and metals.

(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.

(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.

(j) If you own or operate a stationary SI engine that is subject to the work, operation or management practices in items 6, 7, or 8 of Table 2c to this subpart or in items 5, 6, 7, 9, or 11 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 Acid Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Acid Number increases by more than 3.0 milligrams of potassium hydroxide (KOH) per gram from Total Acid 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.

§ 63.6630 How do I demonstrate initial compliance with the emission limitations and operating limitations?

(a) You must demonstrate initial compliance with each emission and operating limitation that applies to you according to Table 5 of this subpart.

Table 5 -Non-Emergency CI RICE (> 500 hp)[a]:

- **Limit concentration of CO using an oxidation catalyst, and using a CPMS; or**
- **Reduce CO emissions not using an oxidation catalyst; or** – must achieve the required CO percent reduction from initial performance test, install a CPMS to continuously monitor operating parameters
- **Limit the concentration of CO not using an oxidation catalyst** – the average CO concentration must be less than or equal to the CO emission limit as determined by the initial performance test, install a CPMS to continuously monitor operating parameters

[a] *Caterpillar wood chipper generator, engine rating of 650 bhp*

(b) During the initial performance test, you must establish each operating limitation in Tables 1b and 2b of this subpart that applies to you.

(c) You must submit the Notification of Compliance Status containing the results of the initial compliance demonstration according to the requirements in §63.6645.

§ 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.

§ 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.

(c) [Reserved]

(d) For new, reconstructed, and rebuilt stationary RICE, deviations from the emission or operating limitations that occur during the first 200 hours of operation from engine startup (engine burn-in period) are not violations. Rebuilt stationary RICE means a stationary RICE that has been rebuilt as that term is defined in 40 CFR 94.11(a).

(e) You must also report each instance in which you did not meet the requirements in Table 8 to this subpart that apply to you. If you own or operate a new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions (except new or reconstructed 4SLB engines greater than or equal to 250 and less than or equal to 500 brake HP), a new or reconstructed stationary RICE located at an area source of HAP emissions, or any of the following 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 requirements in Table 8 to this subpart: An existing 2SLB stationary RICE, an existing 4SLB stationary RICE, an existing emergency stationary RICE, an existing limited use stationary RICE, or an existing stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis. If you own or operate any of the following 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 requirements in Table 8 to this subpart, except for the initial notification requirements: a new or reconstructed stationary RICE that combusts landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, a new or reconstructed emergency stationary RICE, or a new or reconstructed limited use stationary RICE.

§ 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;

(1) An existing stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions.

(2) An existing stationary RICE located at an area source of HAP emissions.

(3) A stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions.

(4) A new or reconstructed 4SLB stationary RICE with a site rating of greater than or equal to 250 HP located at a major source of HAP emissions.

(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.

(b) As specified in §63.9(b)(2), if you start up your stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions before the effective date of this subpart, you must submit an Initial Notification not later than December 13, 2004.

(c) 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 on or after August 16, 2004, you must submit an Initial Notification not later than 120 days after you become subject to this subpart.

(d) As specified in §63.9(b)(2), if you start up your stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions before the effective date of this subpart and you are required to submit an initial notification, you must submit an Initial Notification not later than July 16, 2008.

(e) If you start up your new or reconstructed stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions on or after March 18, 2008 and you are required to submit an initial notification, you must submit an Initial Notification not later than 120 days after you become subject to this subpart.

(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).

(g) If you are required to conduct a performance test, you must submit a Notification of Intent to conduct a performance test at least 60 days before the performance test is scheduled to begin as required in §63.7(b)(1).

(h) If you are required to conduct a performance test or other initial compliance demonstration as specified in Tables 4 and 5 to this subpart, you must submit a Notification of Compliance Status according to §63.9(h)(2)(ii).

(1) For each initial compliance demonstration required in Table 5 to this subpart that does not include a performance test, you must submit the Notification of Compliance Status before the close of business on the 30th day following the completion of the initial compliance demonstration.

(2) For each initial compliance demonstration required in Table 5 to this subpart that includes a performance test conducted according to the requirements in Table 3 to this subpart, you must submit the Notification of Compliance Status, including the performance test results, before the close of business on the 60th day following the completion of the performance test according to §63.10(d)(2).

§ 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.

A compliance report is required semiannually for the Caterpillar wood chipper generator

(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.

(6) For annual 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 December 31.

(7) For annual Compliance reports, the first Compliance report must be postmarked or delivered no later than January 31 following the end of the first calendar year after the compliance date that is specified for your affected source in §63.6595.

(8) For annual Compliance reports, each subsequent Compliance report must cover the annual reporting period from January 1 through December 31.

(9) For annual Compliance reports, each subsequent Compliance report must be postmarked or delivered no later than January 31.

(c) The Compliance report must contain the information in paragraphs (c)(1) through (6) of this section.

(1) Company name and address.

(2) Statement by a responsible official, with that official's name, title, and signature, certifying the accuracy of the content of the report.

(3) Date of report and beginning and ending dates of the reporting period.

(4) If you had a malfunction during the reporting period, the compliance report must include the number, duration, and a brief description for each type of malfunction which occurred during the reporting period and which caused or may have caused any applicable emission limitation to be exceeded. The report must also include a description of actions taken by an owner or operator during a malfunction of an affected source to minimize emissions in accordance with §63.6605(b), including actions taken to correct a malfunction.

(5) If there are no deviations from any emission or operating limitations that apply to you, a statement that there were no deviations from the emission or operating limitations during the reporting period.

(6) If there were no periods during which the continuous monitoring system (CMS), including CEMS and CPMS, was out-of-control, as specified in §63.8(c)(7), a statement that there were no periods during which the CMS was out-of-control during the reporting period.

(d) For each deviation from an emission or operating limitation that occurs for a stationary RICE where you are not using a CMS to comply with the emission or operating limitations in this subpart, the Compliance report must contain the information in paragraphs (c)(1) through (4) of this section and the information in paragraphs (d)(1) and (2) of this section.

(1) The total operating time of the stationary RICE at which the deviation occurred during the reporting period.

(2) Information on the number, duration, and cause of deviations (including unknown cause, if applicable), as applicable, and the corrective action taken.

(e) For each deviation from an emission or operating limitation occurring for a stationary RICE where you are using a CMS to comply with the emission and operating limitations in this subpart, you must include information in paragraphs (c)(1) through (4) and (e)(1) through (12) of this section.

(1) The date and time that each malfunction started and stopped.

(2) The date, time, and duration that each CMS was inoperative, except for zero (low-level) and high-level checks.

(3) The date, time, and duration that each CMS was out-of-control, including the information in §63.8(c)(8).

(4) The date and time that each deviation started and stopped, and whether each deviation occurred during a period of malfunction or during another period.

(5) A summary of the total duration of the deviation during the reporting period, and the total duration as a percent of the total source operating time during that reporting period.

(6) A breakdown of the total duration of the deviations during the reporting period into those that are due to control equipment problems, process problems, other known causes, and other unknown causes.

(7) A summary of the total duration of CMS downtime during the reporting period, and the total duration of CMS downtime as a percent of the total operating time of the stationary RICE at which the CMS downtime occurred during that reporting period.

(8) An identification of each parameter and pollutant (CO or formaldehyde) that was monitored at the stationary RICE.

(9) A brief description of the stationary RICE.

(10) A brief description of the CMS.

(11) The date of the latest CMS certification or audit.

(12) A description of any changes in CMS, processes, or controls since the last reporting period.

(f) Each affected source that has obtained a title V operating permit pursuant to 40 CFR part 70 or 71 must report all deviations as defined in this subpart in the semiannual monitoring report required by 40 CFR 70.6 (a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A). If an affected source submits a Compliance report pursuant to Table 7 of this subpart along with, or as part of, the semiannual monitoring report required by 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A), and the Compliance report includes all required information concerning deviations from any emission or operating limitation in this subpart, submission of the Compliance report shall be deemed to satisfy any obligation to report the same deviations in the semiannual monitoring report. However, submission of a Compliance report shall not otherwise affect any obligation the affected source may have to report deviations from permit requirements to the permit authority.

(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.

§ 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.

(1) A copy of each notification and report that you submitted to comply with this subpart, including all documentation supporting any Initial Notification or Notification of Compliance Status that you submitted, according to the requirement in §63.10(b)(2)(xiv).

(2) Records of the occurrence and duration of each malfunction of operation (*i.e.,* process equipment) or the air pollution control and monitoring equipment.

(3) Records of performance tests and performance evaluations as required in §63.10(b)(2)(viii).

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

(5) Records of actions taken during periods of malfunction to minimize emissions in accordance with §63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.

(b) For each CEMS or CPMS, you must keep the records listed in paragraphs (b)(1) through (3) of this section.

(1) Records described in §63.10(b)(2)(vi) through (xi).

(2) Previous (*i.e.,* superseded) versions of the performance evaluation plan as required in §63.8(d)(3).

(3) Requests for alternatives to the relative accuracy test for CEMS or CPMS as required in §63.8(f)(6)(i), if applicable.

(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;

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

(2) An existing stationary emergency RICE.

(3) An existing stationary RICE located at an area source of HAP emissions subject to management practices as shown in Table 2d to this subpart.

(f) If you own or operate any of the stationary RICE in paragraphs (f)(1) or (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 engines are used for demand response operation, the owner or operator must keep records of the notification of the emergency situation, and the time the engine was operated as part of demand response.

(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.

(2) An existing emergency stationary RICE located at an area source of HAP emissions that does not meet the standards applicable to non-emergency engines.

§ 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).