Lu
G60-C075
025-00109

# Application for General Permit G60-C

**for Construction, Modification, Relocation,
Administrative Update and Operation of**

# Two (2) Emergency Electrical Generators

**Prepared for:**

**Greenbrier Valley Medical Center
202 Maplewood Avenue
Ronceverte, WV 24970**

**Prepared by:**

**Amec Foster Wheeler Environment & Infrastructure, Inc.
271 Mill Road
Chelmsford, Massachusetts 01824**
**Amec Foster Wheeler Project No. 7362152182**

**March 2015**

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## Table of Contents

# APPLICATION FOR GENERAL PERMIT REGISTRATION

WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY
601 - 57th Street
Charleston, WV 25304
Phone: (304) 926-0475 ▫ *www.dep.wv.gov/daq*

# APPLICATION FOR GENERAL PERMIT REGISTRATION

*CONSTRUCT, MODIFY, RELOCATE OR ADMINISTRATIVELY UPDATE A STATIONARY SOURCE OF AIR POLLUTANTS*

☒ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION** ☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **CLASS II ADMINISTRATIVE UPDATE**

**CHECK WHICH TYPE OF GENERAL PERMIT REGISTRATION YOU ARE APPLYING FOR:**

- ☐ **G10-D** – Coal Preparation and Handling
- ☐ **G20-B** – Hot Mix Asphalt
- ☐ **G30-D** – Natural Gas Compressor Stations
- ☐ **G33-A** – Spark Ignition Internal Combustion Engines
- ☐ **G35-A** – Natural Gas Compressor Stations (Flare/Glycol Dehydration Unit)
- ☐ **G40-C** – Nonmetallic Minerals Processing
- ☐ **G50-B** – Concrete Batch
- ☒ **G60-C** - Class II Emergency Generator
- ☐ **G65-C** – Class I Emergency Generator
- ☐ G70-A – Class II Oil and Natural Gas Production Facility

## SECTION I. GENERAL INFORMATION

1. NAME OF APPLICANT (AS REGISTERED WITH THE WV SECRETARY OF STATE'S OFFICE):
**Greenbrier Valley Medical Center**

2. FEDERAL EMPLOYER ID NO. (FEIN):
**75-2887493**

3. APPLICANT'S MAILING ADDRESS:
**Greenbrier Valley Medical Center**
**202 Maplewood Avenue**
**Ronceverte, WV 24970**

4. APPLICANT'S PHYSICAL ADDRESS:
**Greenbrier Valley Medical Center**
**202 Maplewood Avenue**
**Ronceverte, WV 24970**

5. IF APPLICANT IS A SUBSIDIARY CORPORATION, PLEASE PROVIDE THE NAME OF PARENT CORPORATION:
**Community Health Systems Professional Services Corporation**

6. **WV BUSINESS REGISTRATION.** IS THE APPLICANT A RESIDENT OF THE STATE OF WEST VIRGINIA? ☒ **YES** ☐ **NO**

- IF **YES,** PROVIDE A COPY OF THE **CERTIFICATE OF INCORPORATION / ORGANIZATION / LIMITED PARTNERSHIP** (ONE PAGE) INCLUDING ANY NAME CHANGE AMENDMENTS **OR** OTHER ***BUSINESS CERTIFICATE*** AS **ATTACHMENT A.**
- IF **NO,** PROVIDE A COPY OF THE **CERTIFICATE OF AUTHORITY / AUTHORITY OF L.L.C. / REGISTRATION** (ONE PAGE) INCLUDING ANY NAME CHANGE AMENDMENTS **OR** OTHER ***BUSINESS CERTIFICATE*** AS **ATTACHMENT A.**

## SECTION II. FACILITY INFORMATION

7. Type of plant or facility (stationary source) to be constructed, modified, relocated or administratively updated (e.g., coal preparation plant, primary crusher, etc.).
**Standby/Emergency Generators at a General Medical/Surgical Hospital**

8a. Standard Industrial Classification (**SIC**) Code:
**8062**

8b. North American Industry Classification System (**NAICS**) for the facility:
**622110**

9. DAQ plant ID No. (for an existing facility:
**N/A**

10. List all current 45CSR13 and other General permit numbers associated with this process (for existing facility only):
**N/A**

## *A: PRIMARY OPERATING SITE INFORMATION*

| 11A. Name of primary operating site: | 12A. Address of primary operating site: |
|---|---|
| **Greenbrier Valley Medical Center** | **202 Maplewood Avenue<br>Ronceverte, WV 24970** |

13A. Does the applicant own, lease, have an option to buy, or otherwise have control of the *proposed site*? ☒ **YES** ☐ **NO**

- IF **YES**, PLEASE EXPLAIN: OWNER
- IF **NO**, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.

14A. - For **MODIFICATIONS or ADMINISTRATIVE UPDATES** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction or Relocation permits**, please provide directions to *the proposed new site location* from the nearest state road.

**From the south, take Rte. 219 North and bear left on County Rte. 37. Continue on Rte. 37 by Bear left at the stop sign. Take a right on Maplewood Avenue.**

**From the north, take Rte. 219 South and take a right on Maplewood Avenue.**

Include a **Map as Attachment F.**

| 15A. Nearest city or town: | 16A. County: | 17A. UTM Coordinates: |
|---|---|---|
| **Ronceverte** | **Greenbrier** | **Northing (km): 4180.825**<br>**Easting (km): 546.649**<br>**Zone: 17** |

| 18A. Briefly describe the proposed new operation or change (s) to the facility: | 19A. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): |
|---|---|
| **Permitting of two existing diesel-fired emergency generators.** | Latitude: **37.77357**<br>Longitude: **-80.47030** |

## *B: 1ST ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits)*

| 11B. Name of 1st alternate operating site: | 12B. Address of 1st alternate operating site: |
|---|---|
| **N/A** | |

13B. Does the applicant own, lease, have an option to buy, or otherwise have control of the *proposed site*? ☐ **YES** ☐ **NO**

- If **YES**, please explain:
- If **NO**, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.

14B. - For **modifications or administrative updates,** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;

- For **construction or relocation permits**, please provide directions to *the proposed new site location* from the nearest state road. Include a **MAP** as **Attachment F.**

| 15B. Nearest city or town: | 16B. County: | 17B. UTM Coordinates:<br>Northing (km):<br>Easting (km):<br>Zone: |
|---|---|---|
| 18B. Briefly describe the proposed new operation or change (s) to the facility: | | 19B. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):<br>Latitude:<br>Longitude: |

***B: 2nd ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits)***

| 11C. Name of 2ND alternate operating site:<br>**N/A** | 12C. Address of 2ND alternate operating site: |
|---|---|

13C. Does the applicant own, lease, have an option to buy, or otherwise have control of the *proposed site*? ☐ **YES** ☐ **NO**

- If **YES**, please explain:

- If **NO**, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.

14C. - For **modifications or administrative updates,** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;

- For **construction or relocation permits**, please provide directions to *the proposed new site location* from the nearest state road. Include a **MAP** as **Attachment F.**

| 15C. Nearest city or town: | 16C. County: | 17C. UTM Coordinates:<br>Northing (km):<br>Easting (km):<br>Zone: |
|---|---|---|
| 18C. Briefly describe the proposed new operation or change (s) to the facility: | | 19C. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):<br>Latitude:<br>Longitude: |

| 20. Provide the date of anticipated installation or change:<br><br>☒ If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: November 1992 (Kohler generator) and September 2004 (Cummins generator) | 21. Date of anticipated start- up if registration is granted:<br><br>**N/A** |
|---|---|

22. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:

Hours per day: **24** Days per week: **3** Weeks per year: **7** Percentage of operation: **5.7**

**Note: The anticipated maximum operations are < 500 hours per year per generator and will be approximately 52 hours per year per generator under non-emergency situations.**

## SECTION III. ATTACHMENTS AND SUPPORTING DOCUMENTS

23. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

24. Include a **Table of Contents** as the first page of your application package.

All of the required forms and additional information can be found under the Permitting Section (General Permits) of DAQ's website, or requested by phone.

Please check all attachments included with this permit application. Please refer to the appropriate reference document for an explanation of the attachments listed below.

- ☒ **ATTACHMENT A : CURRENT BUSINESS CERTIFICATE**
- ☒ **ATTACHMENT B: PROCESS DESCRIPTION**
- ☐ **ATTACHMENT C: DESCRIPTION OF FUGITIVE EMISSIONS**
- ☒ **ATTACHMENT D: PROCESS FLOW DIAGRAM**
- ☒ **ATTACHMENT E: PLOT PLAN**
- ☒ **ATTACHMENT F: AREA MAP**
- ☒ **ATTACHMENT G: EQUIPMENT DATA SHEETS AND REGISTRATION SECTION APPLICABILITY FORM**
- ☐ **ATTACHMENT H: AIR POLLUTION CONTROL DEVICE SHEETS**
- ☒ **ATTACHMENT I: EMISSIONS CALCULATIONS**
- ☒ **ATTACHMENT J: CLASS I LEGAL ADVERTISEMENT**
- ☒ **ATTACHMENT K: ELECTRONIC SUBMITTAL**
- ☒ **ATTACHMENT L: GENERAL PERMIT REGISTRATION APPLICATION FEE**
- ☐ **ATTACHMENT M: SITING CRITERIA WAIVER**
- ☒ **ATTACHMENT N: MATERIAL SAFETY DATA SHEETS (MSDS)**
- ☒ **ATTACHMENT O: EMISSIONS SUMMARY SHEETS**
- ☐ **OTHER SUPPORTING DOCUMENTATION NOT DESCRIBED ABOVE (Equipment Drawings, Aggregation Discussion, etc.)**

Please mail an original and two copies of the complete General Permit Registration Application with the signature(s) to the DAQ Permitting Section, at the address shown on the front page of this application. Please DO NOT fax permit applications. For questions regarding applications or West Virginia Air Pollution Rules and Regulations, please refer to the website shown on the front page of the application or call the phone number also provided on the front page of the application.

**SECTION IV. CERTIFICATION OF INFORMATION**

This General Permit Registration Application shall be signed below by a Responsible Official. A Responsible Official is a President, Vice President, Secretary, Treasurer, General Partner, General Manager, a member of a Board of Directors, or Owner, depending on business structure. A business may certify an Authorized Representative who shall have authority to bind the Corporation, Partnership, Limited Liability Company, Association, Joint Venture or Sole Proprietorship. Required records of daily throughput, hours of operation and maintenance, general correspondence, Emission Inventory, Certified Emission Statement, compliance certifications and all required notifications must be signed by a Responsible Official or an Authorized Representative. If a business wishes to certify an Authorized Representative, the official agreement below shall be checked off and the appropriate names and signatures entered. Any administratively incomplete or improperly signed or unsigned Registration Application will be returned to the applicant.

FOR A CORPORATION (domestic or foreign)

- I certify that I am a President, Vice President, Secretary, Treasurer or in charge of a principal business function of the corporation

FOR A PARTNERSHIP

- I certify that I am a General Partner

FOR A LIMITED LIABILITY COMPANY

- I certify that I am a General Partner or General Manager

FOR AN ASSOCIATION

- I certify that I am the President or a member of the Board of Directors

FOR A JOINT VENTURE

- I certify that I am the President, General Partner or General Manager

FOR A SOLE PROPRIETORSHIP

- I certify that I am the Owner and Proprietor

- *I hereby certify that* (please print or type) Jaime Light
  *is an Authorized Representative and in that capacity shall represent the interest of the business (e.g., Corporation, Partnership, Limited Liability Company, Association Joint Venture or Sole Proprietorship) and may obligate and legally bind the business. If the business changes its Authorized Representative, a Responsible Official shall notify the Director of the Office of Air Quality immediately, and/or,*

*I hereby certify that all information contained in this General Permit Registration Application and any supporting documents appended hereto is, to the best of my knowledge, true, accurate and complete, and that all reasonable efforts have been made to provide the most comprehensive information possible*

**Signature** _____ _____
(please use blue ink) Responsible Official Date

**Name & Title** Jaime Light, Director of Plant Operations
(please print or type)

**Signature** _____ 3-30-15
(please use blue ink) Authorized Representative (if applicable) Date

**Applicant's Name** Greenbrier Valley Medical Center

**Phone & Fax** (304) 647-6035 (304) 793-2293
Phone Fax

**Email:** Jaime.light@gvmc.com

# Attachments and Supporting Documents

# Attachment A: Current Business Certificate

If the registrant is a resident of the State of West Virginia the registrant should provide a copy of the registrant's current Business Registration Certificate issued to them from the West Virginia State Tax Department. If the registrant is not a resident of the State of West Virginia, the registrant should provide a copy of the Certificate of Authority/Authority of LLC/Registration.

**See attached Business Certificate**

# WEST VIRGINIA
# STATE TAX DEPARTMENT
# BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
**GREENBRIER VMC LLC**
**202 MAPLEWOOD AVE**
**RONCEVERTE, WV 24970-1334**

BUSINESS REGISTRATION ACCOUNT NUMBER: **1051-3931**

This certificate is issued on: **08/24/2011**

*This certificate is issued by*
*the West Virginia State Tax Commissioner*
*in accordance with Chapter 11, Article 12, of the West Virginia Code*

*The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.*

**This certificate is not transferrable and must be displayed at the location for which issued.**

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them. CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

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# Attachment B: Process Description

Provide a detailed written description of the operation, plant and/or affected facilities. The Process Description is used in conjunction with the Process Flow Diagram to provide the reviewing engineer a complete understanding of the activity at the operation or plant. Describe in detail and order the complete process.

Use the following guidelines to ensure a complete Process Description:

1. The Process Flow Diagram should be prepared first and used as a guide when preparing the Process Description. The written description shall follow the logical order of the Process Flow Diagram.
2. All sources, affected facilities, and air pollution control devices must be included in the Process Description.
3. When modifications are proposed, describe the modifications and the effect the changes will have on affected facilities, equipment or operation.
4. Proper Source Identification Numbers are used consistently in the Process Description.
5. Additional information that may facilitate the reviewer's understanding of the Process Flow Diagram and/or Process Description is included.

**Greenbrier Valley Medical Center installed a diesel-fired Kohler standby/emergency generator (EG-1) in 1992 for the purpose of producing emergency electrical power at Greenbrier Valley Medical Center located in Ronceverte, West Virginia. The Kohler emergency electrical generator is driven by a Detroit Diesel 2-cycle, turbocharged and aftercooled engine as shown in Attachment D and as provided in the attached manufacturers' specifications.**

**Greenbrier Valley Medical Center installed a diesel-fired Cummins standby/emergency generator (EG-2) in 2004 for the purpose of producing emergency electrical power at Greenbrier Valley Medical Center located in Ronceverte, West Virginia. The Cummins emergency electrical generator is driven by a Cummins 4-cycle, turbocharged and aftercooled engine as shown in Attachment D and as provided in the attached manufacturers' specifications.**

**There is one 5,000-gallon underground tank which stores diesel fuel to supply both of the emergency generators. Additionally, the Kohler generator has its own 50-gallon diesel fuel day tank and the Cummins generator has its own 40-gallon diesel fuel day tank.**

# Attachment D: Process Flow Diagram

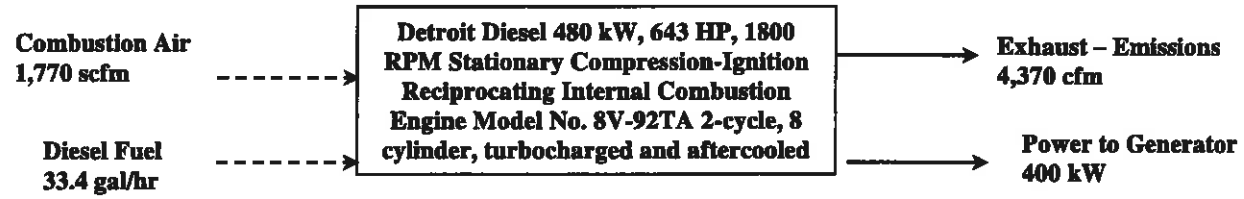
Provide a diagram or schematic that supplements the Process Description of the operation or plant. The Process Flow Diagram shall show all sources, components or facets of the operation or plant in an understandable line sequence of operation. Appropriate sizing and specifications of equipment should also be shown on the Process Flow Diagram. For a proposed modification, clearly identify the process areas, affected facilities and equipment that will be modified or added, and specify the nature and extent of the modification.

Use the following guidelines to ensure a complete Process Flow Diagram:

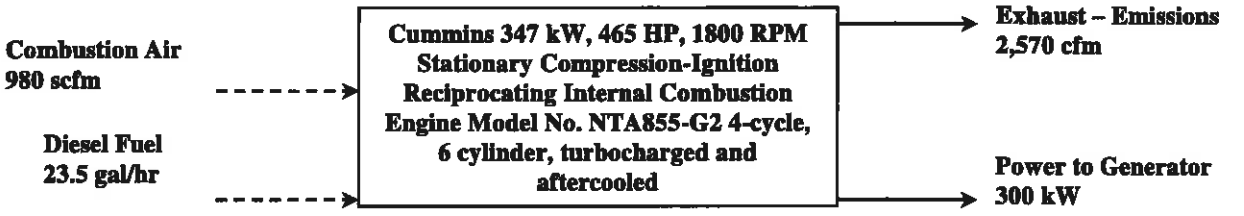
1. The Process Flow Diagram shall logically follow the entire process from beginning to end.
2. Identify each source, air pollution control device and transfer point with proper and consistent Source Identification Numbers, Control Device Identification Numbers and Transfer Point Identification Numbers.
3. Include material handling rates for all lines of the Process Flow Diagram. If applicable, include pre- and post-modification material handling rates and identify accordingly.
4. Transfer Point Identification Numbers, consistent with assignments in any emission calculation sheet, should be shown at each transfer point.
5. The process flow lines may appear different for clarity. For example, dot-dash-dot for raw material, and a solid line for finished product. Refuse flow may be identified by a dotted line
6. The process flow lines may be color coded. For example, new or modified equipment may be red, old or existing equipment may be blue; different stages of preparation such as raw material may be green and finished product or refuse another color.

## PROCESS FLOW DIAGRAM

### EG-1




### EG-2



# Attachment E: Plot Plan

Provide an accurately scaled and detailed Plot Plan showing the locations of all process equipment and/or affected facilities and air pollution control devices. Show all equipment, affected facilities, enclosures, buildings and plant entrances and exits from the nearest public road(s) as appropriate. Note height, width and length of proposed or existing buildings and structures.

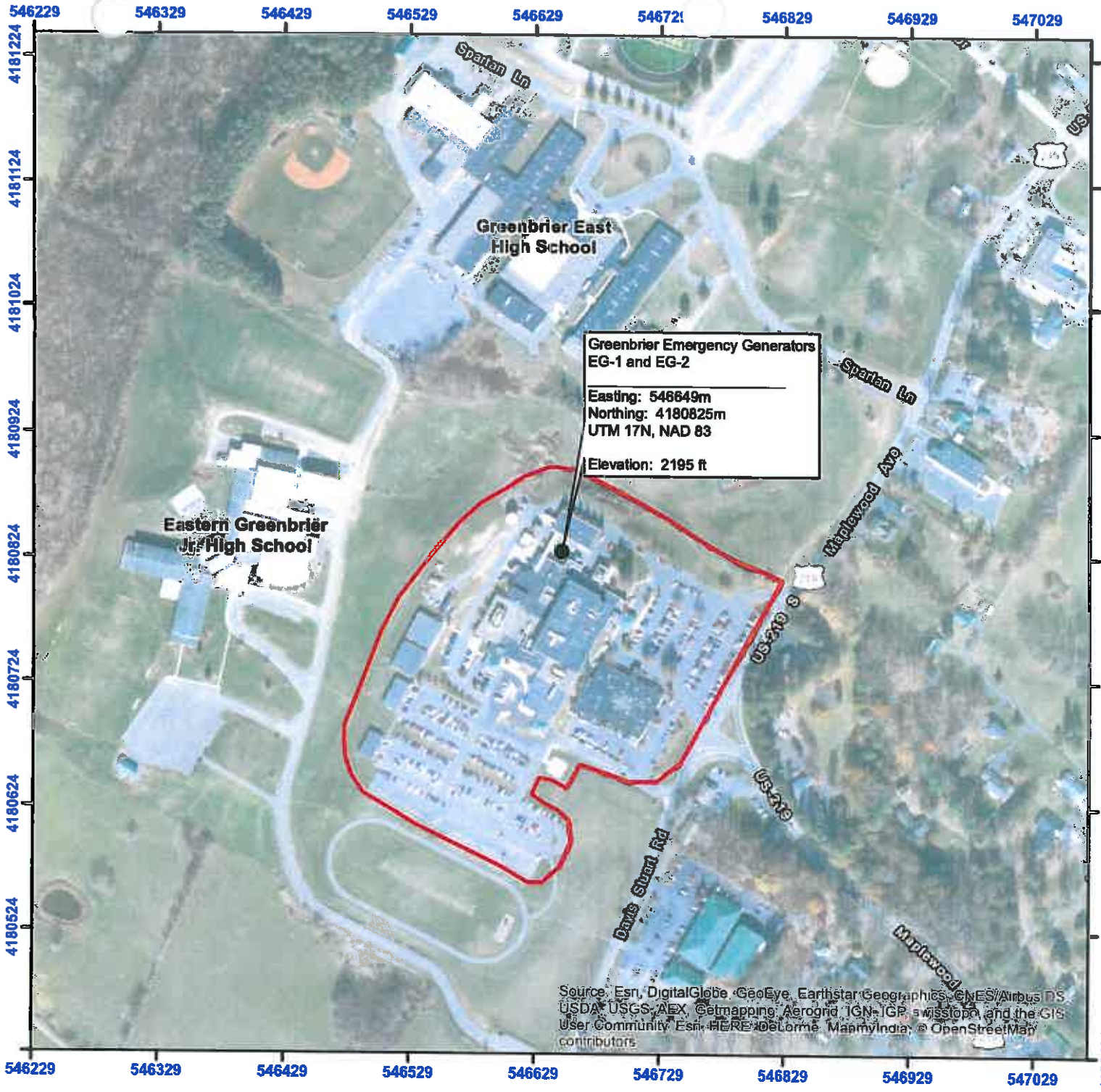
A scale between 1"=10' and 1"=200' should be used with the determining factor being the level of detail necessary to show operation or plant areas, affected facilities, sources, transfer points, etc. An overall small scale plot plan (e.g., 1"=300') should be submitted in addition to larger scale plot plans for process or activity areas (e.g., 1"=50') if the plant is too large to allow adequate detail on a single plot plan. Process or activity areas may be grouped for the enlargements as long as sufficient detail is shown.

Use the following guidelines to ensure a complete Plot Plan:

1. Operation, plant or facility name
2. Company name
3. Company ID number
4. Plot scale, north arrow, date drawn, and submittal date.
5. Fence lines
6. Property lines
7. Base elevation
8. UTM reference coordinates from the Area Map and corresponding reference point elevation
9. Location of all sources labeled with proper and consistent Source Identification numbers

This information is required for all sources regardless of whether it is a construction, modification, or administrative update.

**See attached Figures 1 and 2**




# PLOT PLAN

## Greenbrier Valley Medical Center

**Figure 1**

**Legend**

- Emergency Generators
- Greenbrier Valley Medical Center Boundary

0 100 Meters

0 350 Feet

1 in = 350 ft

**Prepared For:**

GREENBRIER VALLEY

N W E S

**Prepared By:**

amec foster wheeler


Amec Foster Wheeler
Environment & Infrastructure, Inc.
271 Mill Road
Chelmsford, MA 01824
(978) 692-9090


Imagery: ESRI, 2012.
Projection: NAD 1983 UTM Zone 17N
Drawn by: AKN, Submitted: 03-17-2015

546614


546614

4180793

# PLOT PLAN

## Greenbrier Valley Medical Center

**Figure 2**

**Legend**

- Emergency Generators

0 10 Meters

0 30 Feet

1 in = 30 ft

**Prepared For:**

GREENBRIER VALLEY MEDICAL CENTER

N W E S

**Prepared By:**

amec foster wheeler


Amec Foster Wheeler
Environment & Infrastructure, Inc.
271 Mill Road
Chelmsford, MA 01824
(978) 692-9090


Imagery: ESRI, 2012.
Projection: NAD 1983 UTM Zone 17N
Drawn by: AKN, Submitted: 03-17-2015

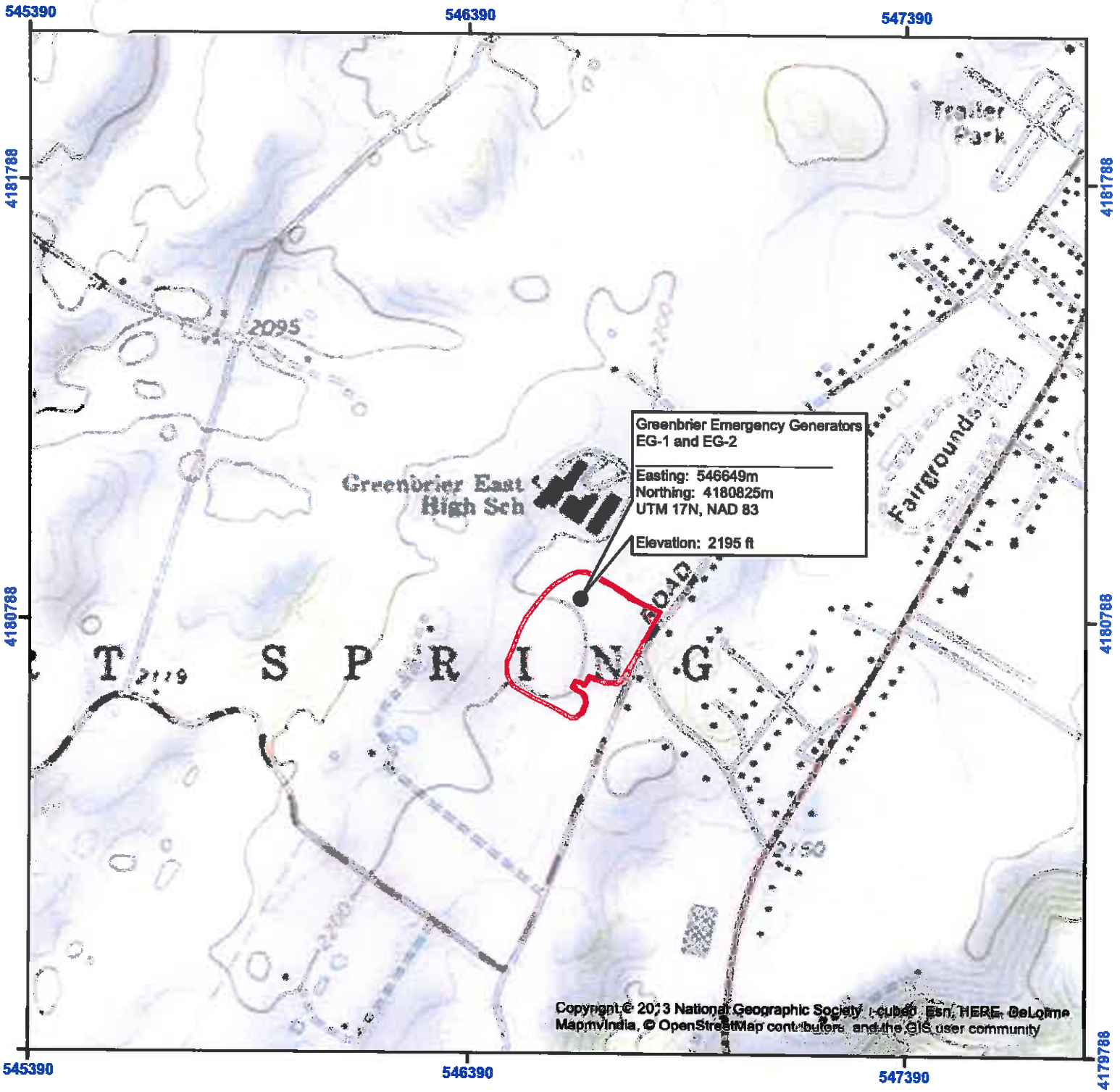
# Attachment F: Area Map

Provide a USGS 7.5 minute topographic Area Map showing the current or proposed location of the operation or plant. On this map, identify plant or operation property lines, access roads and any adjacent dwelling, business, public building, school, church, cemetery, community or institutional building or public park.

Mark and reference UTM coordinates (not latitude and longitude) and the corresponding elevation above mean sea level for the operation or plant. UTM coordinates may be acquired from the USGS 7.5" topographical map. UTM coordinates are marked as blue tick marks along the outside edges of the map. These coordinates must be provided for a point inside the plant boundary near the center of the property and be accurate to within fifty meters.

This information is required for all sources regardless of whether it is a construction, modification, or administrative update.

**See attached Figure 3**




# AREA MAP

## Greenbrier Valley Medical Center

**Figure 3**

**Legend**

- Emergency Generators
- Greenbrier Valley Medical Center Boundary

0 375 Meters

0 1,000 Feet

1 in = 1,000 ft

**Prepared For:**

GREENBRIER VALLEY

N W E S

**Prepared By:**

amec foster wheeler

Amec Foster Wheeler
Environment & Infrastructure, Inc.
271 Mill Road
Chelmsford, MA 01824
(978) 692-9090

Imagery: ESRI, 2013.
Projection: NAD 1983 UTM Zone 17N
Drawn by: AKN, Submitted: 03-17-2015

# Attachment G: General Permit G60-C Registration Section Applicability Form

General Permit G60-C was developed to allow qualified registrants to seek registration for emergency generator(s).

General Permit G60-C allows the registrant to choose which sections of the permit that they wish to seek registration under. Therefore, please mark which sections that you are applying for registration under. Please keep in mind, that if this registration is approved, the issued registration will state which sections will apply to your affected facility.

| | | |
|---|---|---|
| Section 5 | Reciprocating Internal Combustion Engines (R.I.C.E.)* | ☒ |
| Section 6 | Tanks | ☒ |
| Section 7 | Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (40CFR60 Subpart IIII) | ☐ |
| Section 8 | Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (40CFR60 Subpart JJJJ) | ☐ |

* **Affected facilities that are subject to Section 5 may also be subject to Sections 7 or 8. Therefore, if the applicant is seeking registration under both sections, please select both.**

# Attachment H: Air Pollution Control Device Data Sheet

This information is not required for General Permit G60-C.

**Not Applicable.**

# Attachment I: Emissions Calculations

Provide detailed emission calculations which lists the plant or operation's potential to emit (PTE) for criteria and hazardous/toxic pollutants.

Use the following guidelines to ensure complete emission calculations

1. All emission sources are included in the emission calculations, as well as all methods used in the emissions calculations.
2. Proper Source Identification Numbers and Control Device Identification Numbers are used consistently in the Emission Calculations.
3. A printout of the Emission Summary Sheets is attached to the Registration Application.

## Emission Calculations for Diesel Generators < 600 HP
## Greenbrier Valley Medical Center

**Emission Calculations for Diesel Generators < 600 HP**

| Emission Unit | Generating Unit | Gross Engine Power Output | |
|---|---|---|---|
| | | (kw) | (hp) |
| EG-1 | Detroit Diesel 8V-92TA | 480 | 643 |
| **Total:** | | **480** | **643** |

| | | |
|---|---|---|
| Oil Firing Rate | 33.4 | gal/hr |
| Heat content of fuel - | 140,000 | BTU/gal |

**Emission Factors for Criteria Pollutants from Vendor Data and AP-42, Section 3.3, Table 3.3-1**

| Constituent | Emission Factor[1] |
|---|---|
| CO | 3,450 g/hr |
| NOx | 8,400 g/hr |
| PM-10 | 0.0022 lb/hp-hr |
| $SO_2$ | 1,090 g/hr |
| VOC | 74 g/hr |

[1] The CO, NOx, $SO_2$, and VOC factors were provided by the manufacturer. The PM emission factor is from AP-42.

**GHG Emission factors from Vendor Data and Table C-1 and C-2 to Subpart C of 40 CFR 98**

| Constituent | Emission Factor | |
|---|---|---|
| $CO_2$ | 346,000 | g/hr |
| $CH_4$ | 3.0E-03 | kg/MMBtu |
| $N_2O$ | 6.0E-04 | kg/MMBtu |

[1] The $CO_2$ factor was provided by the manufacturer. The $CH_4$ and $N_2O$ emission factors are from 40 CFR 98.

**Calculation of Criteria Pollutant Emissions**

| Constituent | Emergency Gen. Hourly PTE (lb/hr) | Annual Restricted Potential to Emit[1] TPY | Annual Unrestricted Potential to Emit TPY |
|---|---|---|---|
| CO | 7.61 | 1.90 | 33.3 |
| NOx | 14.11 | 3.53 | 61.8 |
| PM-10 | 1.42 | 0.35 | 6.2 |
| $SO_2$ | 2.40 | 0.60 | 10.5 |
| VOC | 0.16 | 0.04 | 0.7 |
| $CO_2$ | 762.79 | 190.70 | 3,341.0 |
| $CH_4$ | 0.03 | 0.01 | 0.1 |
| $N_2O$ | 0.01 | 0.002 | 0.03 |

(1) Annual restricted potential to emit is based on 500 hr/yr for emergency generators.

***Calculation of Hourly PTE:***
Emission Factor (g-hr) / 453.6 g/lb = Emissions (lb/hr)
Emission Factor (lb/hp-hr) x Generator Rating (hp) = Emissions (lb/hr)
Emission Factor (kg/mmBtu) x 2.205 lb/kg x Heat Content of Fuel (mmBtu/gal) x Oil Firing Rate (gal/hr) = Emissions (lb/hr)

***Calculation of Annual Restricted PTE:***
Hourly PTE (lb/hr) x 500 hr/yr = Emissions (lb/hr)

***Calculation of Annual Unrestricted PTE:***
Hourly PTE (lb/hr) x 8,760 hr/yr = Emissions (lb/hr)

**Calculation of HAP Emissions**
HAP constituent emission factors obtained from AP-42, Section 3.4, Table 3.4-3

| Constituent | Emission Factor (lb/MMBtu) | Emergency Gen: Hourly PTE (lb/hr) | Annual Restricted Potential to Emit[1] TPY | Annual Unrestricted Potential to Emit TPY |
|---|---|---|---|---|
| Acetaldehyde | 2.52E-05 | 1.18E-04 | 2.96E-05 | 5.16E-04 |
| Acrolein | 7.88E-06 | 3.68E-05 | 9.21E-06 | 1.61E-04 |
| Benzene | 7.76E-04 | 3.63E-03 | 9.07E-04 | 1.59E-02 |
| Formaldehyde | 7.89E-05 | 3.69E-04 | 9.22E-05 | 1.62E-03 |
| Naphthalene | 1.30E-04 | 6.08E-04 | 1.52E-04 | 2.66E-03 |
| Toluene | 2.81E-04 | 1.31E-03 | 3.28E-04 | 5.76E-03 |
| Xylenes | 1.93E-04 | 9.02E-04 | 2.26E-04 | 3.95E-03 |
| **Total:** | | **0.01** | **0.002** | **0.03** |

[1] Annual restricted potential to emit is based on 500 hr/yr for emergency generators.

***Calculation of Hourly PTE:***
Emission Factor (lb/MMBtu) x Heat Content of Fuel (MMBtu/gal) x Fuel Firing Rate (gal/hr) = Emissions (lb/hr)

***Calculation of Annual Restricted PTE:***
Hourly PTE (lb/hr) x 500 hr/yr = Emissions (lb/hr)

***Calculation of Annual Unrestricted PTE:***
Hourly PTE (lb/hr) x 8,760 hr/yr = Emissions (lb/hr)

# Emission Calculations for Diesel Generators < 600 HP
## Greenbrier Valley Medical Center

**Emission Calculations for Diesel Generators < 600 HP**

| Emission Unit | Generating Unit | Gross Engine Power Output (kw) | Gross Engine Power Output (hp) |
|---|---|---|---|
| EG-2 | Cummins NTA855-G2 | 347 | 465 |
| Total: | | 347 | 465 |

| | | |
|---|---|---|
| Oil Firing Rate | 23.5 | gal/hr |
| Heat content of fuel - | 140,000 | BTU/gal |

**Emission Factors from Cummins Exhaust Emission Data Sheet**

| Constituent | Emission Factor | |
|---|---|---|
| CO | 1.20 | g/hp-hr |
| NOx | 8.87 | g/hp-hr |
| PM | 0.30 | g/hp-hr |
| $SO_2$ | 0.83 | g/hp-hr |
| VOC | 0.07 | g/hp-hr |

**GHG Emission factors, from Table C-1 and C-2 to Subpart C of 40 CFR 98**

| Constituent | Emission Factor | |
|---|---|---|
| $CO_2$ | 73.96 | kg/MMBtu |
| $CH_4$ | 3.0E-03 | kg/MMBtu |
| $N_2O$ | 6.0E-04 | kg/MMBtu |

**Calculation of Criteria Pollutant Emissions**

| Constituent | Emergency Gen. Hourly PTE (lb/hr) | Annual Restricted Potential to Emit[1] TPY | Annual Unrestricted Potential to Emit TPY |
|---|---|---|---|
| CO | 1.23 | 0.31 | 5.4 |
| NOx | 9.10 | 2.27 | 39.9 |
| PM-10 | 0.31 | 0.08 | 1.3 |
| $SO_2$ | 0.65 | 0.16 | 2.8 |
| VOC | 0.07 | 0.02 | 0.3 |
| $CO_2$ | 536.54 | 134.13 | 2,350.0 |
| $CH_4$ | 0.02 | 0.01 | 0.1 |
| $N_2O$ | 0.00 | 0.001 | 0.02 |

(1) Annual potential to emit is based on 500 hr/yr for emergency generators.

***Calculation of Hourly PTE:***
Emission Factor (g/hp-hr) x Engine Power Output (hp) / 453.6 g/lb = Emissions (lb/hr)
Emission Factor (kg/mmBtu) x 2.205 lb/kg x Heat Content of Fuel (mmBtu/gal) x Oil Firing Rate (gal/hr) = Emissions (lb/hr)

***Calculation of Annual Restricted PTE:***
Hourly PTE (lb/hr) x 500 hr/yr = Emissions (lb/hr)

***Calculation of Annual Unrestricted PTE:***
Hourly PTE (lb/hr) x 8,760 hr/yr = Emissions (lb/hr)

**Calculation of HAP Emissions**
HAP constituent emission factors obtained from AP-42, Section 3.4, Table 3.4-3

| Constituent | Emission Factor (lb/MMBtu) | Emergency Gen: Hourly PTE (lb/hr) | Annual Restricted Potential to Emit[1] TPY | Annual Unrestricted Potential to Emit TPY |
|---|---|---|---|---|
| Acetaldehyde | 2.52E-05 | 8.29E-05 | 2.07E-05 | 3.63E-04 |
| Acrolein | 7.88E-06 | 2.59E-05 | 6.48E-06 | 1.14E-04 |
| Benzene | 7.76E-04 | 2.55E-03 | 6.38E-04 | 1.12E-02 |
| Formaldehyde | 7.89E-05 | 2.60E-04 | 6.49E-05 | 1.14E-03 |
| Naphthalene | 1.30E-04 | 4.28E-04 | 1.07E-04 | 1.87E-03 |
| Toluene | 2.81E-04 | 9.24E-04 | 2.31E-04 | 4.05E-03 |
| Xylenes | 1.93E-04 | 6.35E-04 | 1.59E-04 | 2.78E-03 |
| Total: | | 0.005 | 0.001 | 0.02 |

[1] Annual restricted potential to emit is based on 500 hr/yr for emergency generators.

***Calculation of Hourly PTE:***
Emission Factor (lb/MMBtu) x Heat Content of Fuel (MMBtu/gal) x Fuel Firing Rate (gal/hr) = Emissions (lb/hr)

***Calculation of Annual Restricted PTE:***
Hourly PTE (lb/hr) x 500 hr/yr = Emissions (lb/hr)

***Calculation of Annual Unrestricted PTE:***
Hourly PTE (lb/hr) x 8,760 hr/yr = Emissions (lb/hr)

| Summary of Stationary Source Potential Emissions<br>Greenbrier Valley Medical Center | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Annual Potential Emissions[1] (tons/yr) | | | | | | |
| Activities | CO | NOx | PM | $SO_2$ | VOCs | HAPs | $CO_{2e}$ |
| **Combustion Sources** | | | | | | | |
| EG-1 Diesel-Fired Emergency Generator < 600 HP | 1.90 | 3.53 | 0.35 | 0.60 | 0.04 | 0.002 | 191.3 |
| EG-2 Diesel-Fired Emergency Generator < 600 HP | 0.31 | 2.27 | 0.08 | 0.16 | 0.02 | 0.001 | 134.6 |
| **Total, Stationary Sources, ton/yr** | **2.21** | **5.80** | **0.43** | **0.76** | **0.06** | **0.003** | **325.9** |

[1] Potential emissions are based on 500 hours per year for the emergency generators

# Attachment J: Class I Legal Advertisement

Publication of the below Class I legal advertisement is a requirement of the application process and will be submitted to the West Virginia Daily News (or other newspaper with largest local circulation) for publication.

# AIR QUALITY PERMIT NOTICE
## Notice of Application

**Notice is given that Greenbrier Valley Medical Center has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a General Permit Registration for two existing emergency generators located on 202 Maplewood Avenue in Ronceverte, in Greenbrier County, West Virginia. The latitude and longitude coordinates are 37.774 °N and -80.470 °E.**

**The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: 5.8 tons per year nitrogen oxides, 2.2 tons per year carbon monoxide, 325.9 tons per year carbon dioxide equivalent emissions, 0.06 tons per year volatile organic compounds, 0.4 tons per year particulate matter, 0.8 tons per year sulfur dioxide, and 0.003 tons per year hazardous air pollutants.**

**Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.**

**Any questions regarding this permit application should be directed to the Division of Air Quality at (304) 926-0499, extension 1227, during normal business hours.**

**Dated this the 24th day of March 2015.**

**By: Greenbrier Valley Medical Center**
**Jaime Light**
**Director of Plant Operations**
**202 Maplewood Avenue**
**Ronceverte, West Virginia 24970**

# Attachment K: Electronic Submittal (Optional)

Provide an Electronic Submittal Diskette(s) for all files that are available electronically. The Electronic Submittal Diskette should have the following files in their respective formats (if available):

1. Registration Application file (Microsoft Word or Word Perfect format)
2. Affected Source Sheets (Microsoft Word or Word Perfect format)
3. Process Flow Diagram file
4. Process Description file (Microsoft Word or Word Perfect format)
5. Area Map file
6. Plot Plan file
7. Emission Calculations Spreadsheet (Microsoft Excel format)
8. Air Pollution Control Device Sheet, if required (Microsoft Word or Word Perfect format)

**Not Applicable.**

# Attachment L: General Permit Registration Application Fee

A person submitting a Class II General Permit Registration Application to construct, modify, relocate or administratively update an emergency generator shall pay a Class II General Permit registration fee pursuant to 45CSR13. The registration fee shall be paid by a negotiable instrument (check, draft, warrant or money order) to DEP - Division of Air Quality. The fees associated with General Permit G60-C include:

a. $500.00 for Class II General Permit Registrations (Construction/Modification)
b. $300.00 for Class II administrative updates
c. $1000.00 for New Source Performance Standard (NSPS) fee for applicable emergency generators.

Any submitted Registration Application shall not be deemed to have been received nor administratively complete unless payment of the proper Class II General Permit registration fee(s) is (are) included (45CSR22);

Any General Permit registration fee paid hereunder is not refundable (45CSR22).

**General Permit Levels**
**Construction, Modification, Relocation, Administrative Update**

Class II General Permits – G10-C (Coal Preparation and Handling), G20-B (Hot Mix Asphalt), G30-D (Natural Gas Compressor Stations), G35-A (Natural Gas Compressor Stations with Flares/Glycol Dehydration Units), G40-B (Nonmetallic Minerals Processing), G50-B (Concrete Batch Plant), G60-C (Emergency Generators), and Class I General Permit - G65-C (Emergency Generators)

| General Permit | Public Notice | Review Period as per 45CSR13 | Application Fee | Criteria | Application Type |
|---|---|---|---|---|---|
| Class II General Permit (Construction ) | 30 days (applicant) | 90 days | $500 + applicable NSPS fees | 6 lb/hr and 10 tpy of any regulated air pollutant OR 144 lb/day of any regulated air pollutant, OR 2 lb/hr of any hazardous air pollutant OR 5 tpy of aggregated HAP OR 45CSR27 TAP (10% increase if above BAT triggers or increase to BAT triggers) or subject to applicable standard or rule, but subject to specific eligibility requirements | Registration Application |
| Class II General Permit (Modification) | 30 days (applicant) | 90 days | $500 + applicable NSPS fees | Same as Class II General Permit (Construction) but subject to specific eligibility requirements | Registration Application |
| Administrative Update (Class I) | None | 60 days | None | Decrease in emissions or permanent removal of equipment OR more stringent requirements or change in MRR that is equivalent or superior | Registration Application or Written Request |
| Administrative Update (Class II) | 30 days (applicant) | 60 days | $300 + applicable NSPS fees | No change in emissions or an increase less than Class II Modification levels | Registration Application |
| Relocation | 30 days (applicant) | 45 days | $500 + applicable NSPS fees | No emissions increase or change in facility design or equipment | Registration Application |
| Class I General Permit | None | 45 days | $250 | Same as Class II General Permit (Construction) but subject to specific eligibility requirements | Registration Application |

## Fees applicable to this Application:

a. $500 for Class II General Permit Registration
b. $1,000 for New Source Performance Standard (NSPS) fee for emergency generators

# Attachment M: Siting Criteria Waiver

If registrant is seeking a waiver from the siting criteria in G60-C Section 2.1, please complete the siting criteria waiver. This waiver needs to be completed by the registrant and person(s) granting the waiver, and notarized by an authorized West Virginia Notary Public. The waiver is only good for the submitted registration application. Therefore, any further modification or administrative update requiring public notice will require a new waiver.

**Not Applicable.**

# Attachment N: Material Safety Data Sheet (MSDS)

# SAFETY DATA SHEET

## SECTION 1 ◆ IDENTIFICATION

| | | |
|---|---|---|
| Explorer Pipeline Company<br>6120 South Yale Ave., Suite 100<br>Tulsa, OK 74136 | | FOR EMERGENCY SOURCE INFORMATION CONTACT:<br>➢ (918) 493 - 5100 |
| GHS PRODUCT IDENTIFIER: Diesel Fuels All Grades, Diesel Fuel No. 2, Fuel Oil No. 2, High Sulfur Diesel Fuel, Low Sulfur Diesel Fue , Ultra Low Sulfur Diesel Fuel, Off-Road Diesel fuel, Dyed Diesel Fuel, X Grade Diesel Fuel, X-1 Diesel Fuel. EPL Code: 70 - 79 | CHEMICAL FAMILY:<br>Petroleum<br>Hydrocarbon | PRODUCT USES: Used primarily as a fuel source for internal combustion engines. |

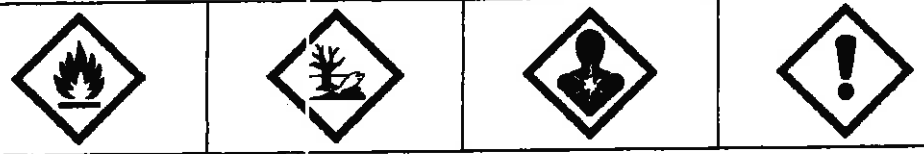
## SECTION 2 * HAZARDS IDENTIFICATION

### GHS CLASSIFICATIONS

| | | |
|---|---|---|
| Aspiration Hazard - Category 1 | Carcinogenicity - Category 2 | Flammable Liquid and Vapor- Category 3 |
| Germ Cell Mutagenicity - Category 2 | Eye Damage/Irritation - Category 2B | Skin Corrosion/Irritation - Category 2 |
| Hazardous to the Aquatic Environment - Acute Hazard - Category 3 | Hazardous to the Aquatic Environment - Chronic Hazard - Category 3 | |
| Specific Target Organ Toxicity (Repeat Exposure) - Category 2 | Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis) | |

### GHS LABEL ELEMENTS

Diesel Fuels, All Grades

| GHS PICTOGRAMS | SIGNAL WORD |
|---|---|
|  | DANGER |

### HAZARD STATEMENTS

| | | |
|---|---|---|
| May cause drowsiness or dizziness. | May be fatal if swallowed and enters airways. | |
| Causes skin irritation. | Harmful to aquatic life. | Flammable liquid and vapor. |
| May cause genetic defects. | May cause respiratory irritation. | Suspect of causing cancer. |

### PRECAUTIONARY STATEMENTS

*Prevention*

| | |
|---|---|
| Keep away from heat/sparks/open flames/hot surfaces. No smoking. Keep container tightly closed. | |
| Ground/bond container and receiving equipment. | Use only non-sparking tools. |
| Use explosion-proof electrical/ ventilating/ lighting/equipment. | |
| Take precautionary measures against static discharge. | Keep out of reach of children |
| Wear protective gloves/protective clothing/eye protection/face protection. | |
| Wash hands and forearms thoroughly after handling. | Obtain special instructions before use. |
| Do not breathe mist/vapors/spray. | Use only outdoors or in well-ventilated area. |
| Do not eat, drink or smoke when using this product. | Avoid release to the environment. |
| Do not handle until all safety precautions have been read and understood. | |

*Response*

| |
|---|
| In case of fire: Use water spray, fog, dry chemical fire extinguishers or hand held fire extinguisher. |
| IF exposed or concerned: Get medical advice/attention. |

IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash before reuse. If skin irritation occurs, get medical advice/attention.

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a poison control center or doctor/physician if you feel unwell.

Get medical advice/attention if you feel unwell.

IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting.

*Storage*

| | | | |
|---|---|---|---|
| Store in a well-ventilated place | Keep cool | Store locked up | Keep container tightly closed |

*Disposal*

Dispose of contents/container in accordance with local/regional/national/international regulations.

SUPPLIER INFORMATION

| | | |
|---|---|---|
| Explorer Pipeline Company | 6120 South Yale Ave., Suite 1100 | Tulsa, Oklahoma 74136 |

## SECTION 3 ▼ COMPOSITION/INFORMATION OF INGREDIENTS

| INGREDIENT | CAS NUMBER | PERCENTAGE (%) |
|---|---|---|
| Diesel fuel | 68476-34-6 | 85-95 |
| FAME (Fatty Acid Methyl Esters) | Various | 0-5%. |
| Naphthalene | 91-20-3 | 1-3 |
| n-Nonane | 111-84-2 | 1-3 |
| Hexane (All isomers) | 110-54-3 | 1-3 |
| Heptane | 142-82-5 | 1-2 |
| Octane (All isomers) | 111-65-9 | 1–2 |

## SECTION 4 ✚ FIRST AID MEASURES

**EYES:** Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids, Get Medical Aid.

**SKIN:** Quickly remove contaminated clothing and immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

**INGESTION:** Do not induce vomiting. Call a physician and/or transport to an emergency facility immediately.

**INHALATION:** Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give cardiopulmonary resuscitation. If breathing is difficult, give medical oxygen.

NOTE TO PHYSICIAN: TREAT SYMPTOMATICALLY AND SUPPORTIVELY

## SECTION 5 ✖ FIRE-FIGHTING MEASURES

**SEE SECTION 9 FOR FLAMMABILITY PROPERTIES**

**EXTREMELY FLAMMABLE!** This material releases vapors at or below ambient temperatures. When mixed with air in certain proportions and exposed to an ignition source, these vapors can burn in the open or explode in confined spaces. Being heavier than air, flammable vapors may travel long distances along the ground before reaching a point of ignition and flashing back.

**SUITABLE EXTINGUISHING MEDIA:** Water fog, dry chemical, foam, or Carbon Dioxide. Use water spray to cool nearby containers and structure exposed to fire. Water fog or spray are of value in cooling tanks and containers but may not achieve extinguishment.

**HAZARDOUS REACTIONS/DECOMPOSITION:** Burning or excessive heating may produce carbon monoxide and carbon dioxide, also other harmful gases/vapors including oxides and/or other compounds of chlorine, manganese, and bromine. Also, diesel Exhaust has been reported to be an occupational hazard due to NIOSH-reported potential carcinogenic properties.

**SPECIAL PROTECTIVE ACTIONS FOR FIREFIGHTERS:** For fires involving this material, do not enter any enclosed or confined space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of combustion products and oxygen deficiencies. If firefighters cannot work upwind of

| |
|---|
| the fire, respiratory protective equipment must be worn. Cool tanks and containers exposed to fire with water. Burning liquid will float on water. Notify appropriate authorities if liquid enters sewer/waterways. |

## 6SECTION 6 ❖ ACCIDENTAL RELEASE MEASURES

| | |
|---|---|
| **PERSONAL PRECAUTIONS** | ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Evacuate personnel to safe areas. Use personal protective equipment. All equipment used when handling the product must be grounded. Ensure adequate ventilation. Take precautionary measures against static discharges. Keep people away from and upwind of spill/leak. Stop leak if you can do so without risk. |
| **METHODS FOR CONTAINMENT** | A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Dike far ahead of liquid spill for later disposal. |
| **METHODS FOR CLEANING UP** | Use clean non-sparking tools to collect absorbed material. Dike far ahead of liquid spill for later disposal. |
| **OTHER INFORMATION** | Water spray may reduce vapor but may not prevent ignition in closed spaces. |

## SECTION 7 ✕ HANDLING AND STORAGE

Prior to working with this product workers should be trained on its proper handling and storage

| | |
|---|---|
| **PRECAUTIONS FOR SAFETY HANDLING** | ➢ Use only as a motor fuel.<br>➢ Do not siphon by mouth.<br>➢ Handle as a flammable liquid.<br>➢ Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.<br>➢ Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents." |
| **STORAGE PROCEDURES** | ➢ Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers.<br>➢ Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.<br>➢ Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code".<br>➢ Avoid storage near incompatible materials. |
| **INCOMPATIBILITIES** | ➢ Keep away from strong oxidizers. |

## SECTION 8 # EXPOSURE CONTROLS / PERSONAL PROTECTION

**EXPOSURE LIMITS**

| Chemical Name | ACGIH TLV (2013) | OSHA PEL | NIOSH IDLH |
|---|---|---|---|
| Diesel | TWA: 100 mg/M$^3$ (*Skin*) | Not Applicable | Not Applicable |
| Naphthalene | TWA: 10 ppm<br>STEL: 15 ppm<br>*Skin* | TWA: 10 ppm | 250 ppm |
| n-Nonane | TWA: 200 ppm | Not Applicable | Not Applicable |
| Hexane(All isomers) | TWA: 50 ppm<br>*Skin* | TWA: 500 ppm | 1,100 ppm |
| Heptane | TWA: 400 ppm | TWA: 500 ppm | 750 ppm |

| | | | |
|---|---|---|---|
| | STEL: 500 ppm | | |
| Octane (All isomers) | TWA: 300 ppm | TWA: 500 ppm | 1,000 ppm |

**ENGINEERING CONTROLS:** Use adequate ventilation to keep vapor concentrations of this product below occupational exposure limits and flammability limits, particularly in confined areas.

**PERSONAL PROTECTIVE EQUIPMENT**

- **EYES:** Eye protection (ANSI Z87.1 approved) should be worn whenever there is a likelihood of misting or splashing/spraying liquid. Suitable eyewash station should be available. Contact lenses must not be worn.
- **SKIN/BODY:** Chemical protective clothing is recommended based on a thorough PPE hazard assessment. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for specific information.
- **HAND PROTECTION:** Gloves constructed of nitrile, neoprene, or PVC are recommended. Consult manufacturer specifications for specific information.
- **RESPIRATORY PROTECTION:** A NIOSH approved air purifying respirator (APR) with properly selected cartridges may be permissible under certain circumstances where airborne concentrations may exceed exposure limits. Protection provided by APRs is limited, calculate the maximum use concentration for the exposure situation. Use a positive pressure air supplied (Grade D) respirator if there is any potential for an uncontrolled release, exposure levels are not known or any other circumstances where APRs may not provide adequate protection.
- **OTHER HYGIENIC AND WORK PRACTICES:** Use good personal hygiene practices. In case of skin contact, wash with mild soap and water or a waterless hand cleaner. Immediately remove soaked clothing and wash thoroughly before reuse.

## SECTION 9 ϟ PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **BOILING POINT (760 MM HG):** 325-700 °F/162-371 °C | **PERCENT VOLATILE BY VOLUME:** Slight |
| **SPECIFIC GRAVITY ($H_2O$ = 1):** 0.84-0.93 | **VISCOSITY UNITS, TEMP:** No data |
| **EVAPORATION RATE (BuAc = 1):** 0.02 | **VAPOR DENSITY (AIR =1):** 4 |
| **VAPOR PRESSURE AT 20°C:** <3.0 mm Hg | **SOLUBILITY IN WATER:** Negligible |

**APPEARANCE AND ODOR:** Clear to straw colored liquid; petroleum distillates/kerosene odor (may be dyed red).

| | | |
|---|---|---|
| **FLASH POINT:** (Method Used) 125-190 °F/51.6-87.7 °C | **FLAMMABLE LIMITS:** | LEL: 0.4%<br>UEL: 8.0% |
| **AUTOIGNITION TEMPERATURE:** 495 °F/ 257.2 °C | **VOC CONTENT:** 100% | |

## SECTION 10 ¤ STABILITY AND REACTIVITY

**CHEMICAL STABILITY:** Stable under normal temperatures and pressures

**HAZARDOUS REACTION POTENTIAL:** Will not occur

**CONDITIONS TO AVOID:** Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

**INCOMPATIBLE PRODUCTS:** Keep away from strong oxidizers.

**MATERIALS TO AVOID:** Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

**HAZARDOUS POLYMERIZATION:** Has not been reported

**OTHER PHYSICAL AND CHEMICAL PROPERTIES:** If uninhibited, diesel will cause rusting of copper and alloys containing copper.

## SECTION 11 ⊛ TOXICOLOGICAL INFORMATION

***DIESEL FUEL***

Diesel may be irritating to the eyes, respiratory system and skin. The main hazard associated with diesel is chemical pneumonitis that may arise following aspiration of liquid or inhalation of mist/vapor.

Toxicity

| Type Of Dose | Specie | Result | Type Of Dose | Specie | Result | Type Of Dose | Specie | Result |
|---|---|---|---|---|---|---|---|---|
| $LD_{50(oral)}$ | Rat | 5,001 mg/Kg | $LD_{50(dermal)}$ | Rabbit | 2,001 mg/Kg | $LC_{50(inh)}$ | Rat (4 hours) | 7.64 mg/l |

**CARCINOGENICITY**

| | | | |
|---|---|---|---|
| **IARC** | Inadequate evidence in animals | Inadequate evidence in humans | Group 3: not classifiable as a human carcinogen |
| **NTP** | Not Listed | | |
| **California (Prop 65):** Listed as carcinogen | **NIOSH:** Not Listed | **ACGIH:** Not Listed | **OSHA:** Not Listed |

RTECS #: LS9142500

***NAPHTHALENE***

Inhalation may cause respiratory tract irritation. Hemolytic anemia (destruction of red blood cells) is the primary health concern for humans exposed to naphthalene for either short or long periods of time. Other effects may include nausea, profuse perspiration, vomiting, kidney damage and liver damage. Chronic exposure may cause lung damage.

**TOXICITY**

| Type Of Dose | Specie | Result | Type Of Dose | Specie | Result | Type Of Dose | Specie | Result |
|---|---|---|---|---|---|---|---|---|
| $LD_{50(oral)}$ | Rat | 490 mg/kg | $LD_{50(dermal)}$ | Rabbit | >20 g/kg | $LC_{50(inh)}$ | Rat (1 hour) | No Data |

| | |
|---|---|
| Specific organ toxicity, single exposure: No data available | Specific organ toxicity, repeated exposure: No data available |

**CARCINOGENICITY**

| | | | |
|---|---|---|---|
| **IARC** | Sufficient evidence in animals | Inadequate evidence in humans | Group 2B: Possibly carcinogenic to humans |
| **NTP** | Listed as reasonably anticipated to be a human carcinogen | | |
| **California (Prop 65):** Listed as carcinogen | **NIOSH:** Not Listed | **ACGIH:** Not Listed | **OSHA:** Not Listed |

**MUTAGENICITY, TERATOGENICITY AND REPRODUCTIVE EFFECTS**

| | |
|---|---|
| Respiratory or Skin sensitization: No data available | Germ cell mutagenicity: No data available |
| Reproductive toxicity: No data available | Teratogenicity: No data available |
| Skin Corrosion/irritation: Testing showed no irritation | Serious eye damage, irritation-rabbit: mild eye irritation |
| Synergistic effects: No data available | Aspiration hazard: No data available |

RTECS #: QJ0525000

***NONANE***

Nonane may cause irritation eyes, skin, nose, and throat. Other symptoms may include: headache, drowsiness, dizziness, confusion, nausea, tremor, and incoordination. If liquid is aspirated it may cause chemical pneumonitis.

**TOXICITY**

| Type Of Dose | Specie | Result | Type Of Dose | Specie | Result | Type Of Dose | Specie | Result |
|---|---|---|---|---|---|---|---|---|
| $LD_{50(oral)}$ | Mouse | 218 mg/kg | $LD_{50(dermal)}$ | Rabbit | No Data | $LC_{50(inh)}$ | Rat (4 hours) | 3,200 ppm |

| | |
|---|---|
| Specific organ toxicity, single exposure: May cause drowsiness | Specific organ toxicity, repeated exposure: No data available |

**CARCINOGENICITY**

| | |
|---|---|
| **IARC** | Not Listed |
| **NTP** | Not Listed |

| California (Prop 65): Not Listed | NIOSH: Not Listed | ACGIH: Not Listed | OSHA: Not Listed |
|---|---|---|---|

**MUTAGENICITY, TERATOGENICITY AND REPRODUCTIVE EFFECTS**

| | |
|---|---|
| Respiratory or Skin sensitization: No data available | Germ cell mutagenicity: No data available |
| Reproductive toxicity: No data available | Teratogenicity: No data available |
| Skin Corrosion/irritation: Testing showed no irritation | Serious eye damage, irritation-rabbit: mild eye irritation |
| Synergistic effects: No data available | Aspiration hazard: No data available |

RTECS #: RA6115000

***HEXANE (ALL ISOMERS)***

May cause respiratory tract irritation. Exposure produces central nervous system depression. Inhalation of vapors may cause drowsiness and dizziness. Chronic exposure may cause liver damage. Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic effects.

**TOXICITY**

| Type Of Dose | Specie | Result | Type Of Dose | Specie | Result | Type Of Dose | Specie | Result |
|---|---|---|---|---|---|---|---|---|
| $LD_{50(oral)}$ | Rat | 15.8 g/kg | $LD_{50(dermal)}$ | Rabbit | No Data | $LC_{50(inh)}$ | Rat (4 hours) | 48,000 ppm |

| | |
|---|---|
| Specific organ toxicity, single exposure: May cause drowsiness or dizziness | Specific organ toxicity, repeated exposure: may cause damage to organs from repeated or prolonged exposure. May cause nervous system damage. |

**CARCINOGENICITY**

Testicular tumors shown in rats.

| | |
|---|---|
| IARC | Not Listed |
| NTP | Not Listed |

| California (Prop 65): Not listed as carcinogen | NIOSH: Not Listed | ACGIH: Not Listed | OSHA: Not Listed |
|---|---|---|---|

**MUTAGENICITY, TERATOGENICITY AND REPRODUCTIVE EFFECTS**

| | |
|---|---|
| Respiratory or Skin sensitization: No data available | Germ cell mutagenicity: No data available |
| Reproductive toxicity: overexposure may cause reproductive disorders based on lab animals. May damage fertility in humans. | Teratogenicity: No data available |
| Skin Corrosion/irritation: No data available | Serious eye damage, irritation -rabbit: mild eye irritation |
| Synergistic effects: No data ava lable | Aspiration hazard: May be fatal if swallowed and enters airway. |

RTECS #: MN9275000

***HEPTANE***

Heptane can affect the body if it is inhaled, comes in contact with the eyes or skin, or is swallowed. Hexane vapor is a narcotic and a mild upper respiratory irritant. Peripheral nerve damage has been reported to occur in workers exposed to hexane vapors, characterized by progressive weakness and numbness in the extremities.

**TOXICITY**

| Type Of Dose | Specie | Result | Type Of Dose | Specie | Result | Type Of Dose | Specie | Result |
|---|---|---|---|---|---|---|---|---|
| $LD_{50(oral)}$ | Mouse | 222 mg/kg | $LD_{50(dermal)}$ | Rabbit | No Data | $LC_{50(inh)}$ | Rat (4 hours) | 103 $g/M^3$ |

| | |
|---|---|
| Specific organ toxicity, single exposure: May cause drowsiness | Specific organ toxicity, repeated exposure: No data available |

**CARCINOGENICITY**

| | |
|---|---|
| IARC | Not Listed |

| | | | |
|---|---|---|---|
| **NTP** | Not Listed | | |
| **California (Prop 65):** Not Listed | **NIOSH:** Not Listed | **ACGIH:** Not Listed | **OSHA:** Not Listed |

**MUTAGENICITY, TERATOGENICITY AND REPRODUCTIVE EFFECTS**

| | |
|---|---|
| Respiratory or Skin sensitization: No data available | Germ cell mutagenicity: No data available |
| Reproductive toxicity: No data available | Teratogenicity: No data available |
| Skin Corrosion/irritation: Testing showed no irritation | Serious eye damage, irritation-rabbit: mild eye irritation |
| Synergistic effects: No data available | Aspiration hazard: No data available |

RTECS #: MI7700000

***OCTANE***

Octane can affect the body if it s inhaled, comes in contact with the skin or eyes or is swallowed. Octane vapor is a mild narcotic and mucous membrane irritant. No chronic systemic effects have been reported in humans.

**TOXICITY**

| Type Of Dose | Specie | Result | Type Of Dose | Specie | Result | Type Of Dose | Specie | Result |
|---|---|---|---|---|---|---|---|---|
| $LD_{50(oral)}$ | Mouse | No Data | $LD_{50(dermal)}$ | Rabbit | No Data | $LC_{50(inh)}$ | Rat (4 hours) | 118 g/M$^3$ |

| | |
|---|---|
| Specific organ toxicity, single exposure: May cause drowsiness | Specific organ toxicity, repeated exposure: No data available |

**CARCINOGENICITY**

| | |
|---|---|
| **IARC** | Not Listed |
| **NTP** | Not Listed |

| | | | |
|---|---|---|---|
| **California (Prop 65):** Not Listed | **NIOSH:** Not Listed | **ACGIH:** Not Listed | **OSHA:** Not Listed |

**MUTAGENICITY, TERATOGENICITY AND REPRODUCTIVE EFFECTS**

| | |
|---|---|
| Respiratory or Skin sensitization: No data available | Germ cell mutagenicity: No data available |
| Reproductive toxicity: No data available | Teratogenicity: No data available |
| Skin Corrosion/irritation: Testing showed no irritation | Serious eye damage, irritation-rabbit: mild eye irritation |
| Synergistic effects: No data available | Aspiration hazard: No data available |

RTECS #: RG8400000

## SECTION 12 ● ECOLOGICAL INFORMATION

***DIESEL***

**TOXICITY**

| Type Of Dose | Specie | Result | Type Of Dose | Specie | Result |
|---|---|---|---|---|---|
| $LC_{50}$ | Fathead Minnow | 35 mg/L 96 hours | $EC_{50}$ | ---------- | No Data |
| $EC_{50}$ | ---------- | No Data | $EC_{50}$ | ---------- | No Data |

**PERSISTENCE AND DEGRADABILITY**

Readily biodegradable in the environment. The presence of ethanol in this product may impede the biodegradation of benzene, toluene, ethyl benzene and xylene in groundwater, resulting in elongated plumes of these constituents.

**BIOACCUMULATIVE POTENTIAL**

| | | | |
|---|---|---|---|
| Log $P_{ow}$ | 3 - 6.0 | BCF | No Data |

**MOBILITY IN SOIL**

| | |
|---|---|
| $K_{oc}$ (Soil/water Partition Coefficient) | No Data |

***NAPHTHALENE***

**TOXICITY**

| Type Of Dose | Specie | Result | Type Of Dose | Specie | Result |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| $LC_{50}$ | Fathead Minnow | 1-6.5 mg/L 96 hours | $EC_{50}$ | Water Flea | 2.16 mg/L 48 Hours |
| $EC_{50}$ | Green algae | 0.4 mg/L 96 Hours | $EC_{50}$ | Microtox | 0.93 mg/L 30 Min |

**BIOACCUMULATIVE POTENTIAL**

| | | | |
|---|---|---|---|
| Log $P_{ow}$ | 3.3 | BCF | 85.1 |
| $K_{oc}$ (Soil/water Partition Coefficient) | | 1,191 | |

***NONANE***

**TOXICITY**

| Type Of Dose | Specie | Result | Type Of Dose | Specie | Result |
|---|---|---|---|---|---|
| $LC_{50}$ | ---------- | No Data | $EC_{50}$ | ---------- | No Data |
| $EC_{50}$ | ---------- | No Data | $EC_{50}$ | ---------- | No Data |

**BIOACCUMULATIVE POTENTIAL**

| | | | |
|---|---|---|---|
| Log $P_{ow}$ | 5.65 | BCF | No Data |
| $K_{oc}$ (Soil/water Partition Coefficient) | | No Data | |

***HEXANE***

**TOXICITY**

| Type Of Dose | Specie | Result | Type Of Dose | Specie | Result |
|---|---|---|---|---|---|
| $LC_{50}$ | Fathead Minnow | 2.5 mg/L 96 hours | $EC_{50}$ | Water Flea | 3.87 mg/L 48 Hours |
| $EC_{50}$ | Green algae | 12.8 g/L 3 hours | $EC_{50}$ | Microtox | No Data |

**BIOACCUMULATIVE POTENTIAL**

| | | | |
|---|---|---|---|
| Log $P_{ow}$ | 3.9 | BCF | No Data |

***HEPTANE***

**TOXICITY**

| Type Of Dose | Specie | Result | Type Of Dose | Specie | Result |
|---|---|---|---|---|---|
| $LC_{50}$ | Goldfish 24 hours | 4 mg/L | $EC_{50}$ | Water Flea | 1.5 mg/L 48 Hours |
| $EC_{50}$ | ---------- | No Data | $EC_{50}$ | ---------- | No Data |

**BIOACCUMULATIVE POTENTIAL**

| | | | |
|---|---|---|---|
| Log $P_{ow}$ | >3.0 | BCF | No Data |
| $K_{oc}$ (Soil/water Partition Coefficient) | | No Data | |

***OCTANE***

**TOXICITY**

| Type Of Dose | Specie | Result | Type Of Dose | Specie | Result |
|---|---|---|---|---|---|
| $LC_{50}$ | Rice Fish 96 hours | 0.42 mg/L | $EC_{50}$ | Water Flea | 0.38 mg/L 48 Hours |
| $EC_{50}$ | Green algae | 5.8 g/L 72 hours | $EC_{50}$ | ---------- | No Data |

**BIOACCUMULATIVE POTENTIAL**

| | | | |
|---|---|---|---|
| Log $P_{ow}$ | 5.15 | BCF | No Data |
| $K_{oc}$ (Soil/water Partition Coefficient) | | No Data | |

## SECTION 13 * DISPOSAL CONSIDERATIONS

Not Meant To Be All Inclusive - Check Local, State, And Federal Laws And Regulations

Maximize product recovery for reclaim and reuse. Implement waste minimization principles. EPA U.S. Waste Codes: "Ignitable hazardous waste" (D001), unless proven otherwise. Use approved treatment, transporters, and disposal sites in compliance with all laws.

Waste Disposal Method: Should not be released into the environment.

Contaminated Packaging: Dispose of in accordance with local regulations.

US EPA Waste Number: D001, Waste Flammable Material with a flashpoint <140 °F

## SECTION 14 ■ TRANSPORTATION INFORMATION

Not Meant To Be All Inclusive - Check Local, State, And Federal Laws And Regulations

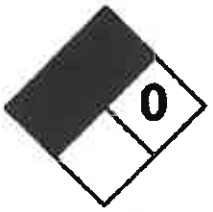
| Element | U.S. DOT | IMDG | IATA |
|---|---|---|---|
| UN Number | UN 1202 | UN 1202 | UN 1202 |
| UN Proper Shipping Name | Diesel Fuel | Diesel Fuel | Diesel Fuel |
| Hazard Class | 3 | 3 | 3 |
| Placard/Label |   | | |
| Environmental Hazard | Yes | Yes | Yes |
| Packing Group | III | III | III |

## SECTION 15 ❯ REGULATORY INFORMATION

| Agency | Listing<br>Guidance only, consult specific regulations | | |
|---|---|---|---|
| OSHA | All ingredients are listed as hazardous under 29 CFR 1910.1200 | | |
| CERCLA RQ's (40 CFR Part 102) | Naphthalene – 100 pounds | Hexane – 5,000 pounds | |
| TSCA 8(a) | Naphthalene | n-Heptane | n-Nonane |
| TSCA 8(b) | All components are listed | | |
| SARA (40 CFR Part 355) TPQ's | None of the ingredients are listed | | |
| SARA 302/304/311/312 extremely hazardous substances | None of the ingredients are listed | | |
| SARA 302/304 emergency planning and notification | None of the ingredients are listed | | |
| SARA 302/304/311/312 hazardous chemicals | n-Hexane | Naphthalene | Heptane |
| | Hexane (all isomers) | Nonane | Octane (all isomers) |
| RCRA | Naphthalene – U165 | Hexane - U056 | |
| State Regulations: Massachusetts, New Jersey, and Pennsylvania, and New York | All components are listed except diesel and gasoline | | |
| SARA 311/312 SDS distribution - chemical inventory - hazard identification | Hexane (Other Isomers): Fire hazard, Immediate (acute) health hazard; Naphthalene: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; n-Heptane: Fire hazard; n-Hexane: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; n-Nonane: Fire hazard, Immediate (acute) health hazard; Octane (All Isomers): Fire hazard | | |
| EPA Form R Toxic Chemical Release Inventory | n-Hexane | Naphthalene | |
| Clean Water Act (CWA) 307 | Naphthalene | | |

| | | |
|---|---|---|
| Clean Water Act (CWA) 311 | Naphthalene | |
| Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) | n-Hexane | Naphthalene |
| Clean Air Act Section 602 Class I Substances | Not Listed | |
| Clean Air Act Section 602 Class II Substances | Not Listed | |

## SECTION 16 ※ OTHER INFORMATION




NFPA LABEL


HMIS III LABEL

### Acronym List

| | | |
|---|---|---|
| °F=degrees Fahrenheit | °C=degrees Celsius | ACGIH= American Conference of Industrial Hygienists |
| APR=Air Purifying Respirator | BCF= Bioconcentration Factor | BuAc=Butyl Acetate |
| CANUTEC= Canadian Transport Emergency Centre | CAS=Chemical Abstract Service | CERCLA= Comprehensive Environmental Response, Compensation, and Liability Act |
| CHEMTREC= Chemical Transportation Emergency Center | CNS=Central Nervous System | CWA=Clean Water Act |
| DOT=Department of Transportation | EC50= Effective Concentration Fifty | EPA=Environmental Protection Agency |
| g/Kg=Grams per Kilogram | g/M$^3$=Grams per Cubic Meter | GHS=Global Harmonization System |
| $H_2O$=Water | HAP=Hazardous Air Pollutants | HMIS= Hazardous Materials Identification System |
| IARC= International Agency for Research on Cancer | IATA= International Air Transport Association | IMDG= International Maritime Dangerous Goods |
| $LC_{50}$=Lethal Concentration Fifty | $LD_{50}$=Lethal Dose Fifty | LEL=Lower Explosive Limit |
| Log $P_{ow}$ =Octanol/water partition coefficient | mg/Kg=Milligrams per Kilogram | mg/L=Milligrams per Liter |
| mL/Kg=Milliliters per Kilogram | mm HG=millimeters of mercury | NFPA=National Fire Protection Association |
| NIOSH= National Institute for Occupational Safety and Health | NTP=National Toxicology Program | OSHA=Occupational Safety and Health Administration |
| PEL=Permissible Exposure Limit | ppm=Parts per Million | RCRA=Resource Conservation and Recovery Act |
| RQ=Reportable Quantities | RTECS=Registry of Toxic Effects of Chemical Substances | SARA= Superfund Amendments and Reauthorization Act |
| SDS=Safety Data Sheet | SETIQ= Emergency Transportation System for the Chemical Industry; Mexico | STEL=Short Term Exposure Limit |
| TLV=Threshold Limit Value | TPQ=Threshold Planning Quantity | TSCA=Toxic Substance and Control Act |
| TWA=Time Weighted Average | UEL=Upper Explosive Limit | VOC=Volatile Organic Compounds |

**SDS REVISIONS:** Reformatted to meet GHS Requirements

| SDS CREATION DATE: 04/29/14 | REVISION #1: 03/02/15 |
|---|---|

**DISCLAIMER**

The information in this SDS was obtained from sources which we believe are reliable. **HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY WARRANTY, EXPRESSED OR IMPLIED, REGARDING ITS ACCURACY.** Some conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. **FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.** All product measurements such as flash point, *etc.* are considered approximate values. All data provided by Explorer Pipeline Company. This SDS was prepared and is to be used only for this product.

SDS DEVELOPER: Cass Willard

Cass Willard, CIH

DATE: 03/02/15

# Attachment O: Emissions Summary Sheets

# EMERGENCY GENERATOR ENGINE DATA SHEET

| Source Identification Number[1] | | EG-1 | | EG-2 | |
|---|---|---|---|---|---|
| Engine Manufacturer and Model | | Detroit Diesel Engine 8V-92TA | | Cummins Engine NTA855-G2 | |
| Manufacturer's Rated bhp/rpm | | 643 HP | | 465 HP | |
| Source Status[2] | | ES | | ES | |
| Date Installed/Modified/Removed[3] | | November 1992 | | September 2004 | |
| Engine Manufactured/Reconstruction Date[4] | | 1992 | | 2004 | |
| Is this a Certified Stationary Compression Ignition Engine according to 40CFR60 Subpart IIII? (Yes or No)[5] | | No | | No | |
| Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No)[6] | | No | | No | |
| Engine, Fuel and Combustion Data | Engine Type[7] | LB2S | | RB4S | |
| | APCD Type[8] | NA | | NA | |
| | Fuel Type[9] | 2FO | | 2FO | |
| | $H_2S$ (gr/100 scf) | NA | | NA | |
| | Operating bhp/rpm | 643 HP @ 1800 RPM | | 465 HP @ 1800 RPM | |
| | BSFC (Btu/bhp-hr) | 7,229 | | 7,075 | |
| | Fuel throughput ($ft^3$/hr) | 33.4 gals diesel/hr. | | 23.5 gals diesel/hr. | |
| | Fuel throughput ($MMft^3$/yr) | < 16,700 gals diesel/yr. | | < 11,750 gals diesel/yr. | |
| | Operation (hrs/yr) | < 500 | | < 500 | |
| Reference[10] | Potential Emissions[11] | lbs/hr | tons/yr | lbs/hr | tons/yr |
| Manufacturer Data Sheet (EG-1, EG-2) | $NO_X$ | 14.11 | 3.53 | 9.10 | 2.27 |
| Manufacturer Data Sheet (EG-1, EG-2) | CO | 7.61 | 1.90 | 1.23 | 0.31 |
| Manufacturer Data Sheet (EG-1, EG-2) | VOC | 0.16 | 0.04 | 0.07 | 0.02 |
| Manufacturer Data Sheet (EG-1, EG-2) | $SO_2$ | 2.40 | 0.60 | 0.65 | 0.16 |
| AP-42 (EG-1) Manufacturer Data Sheet (EG-2) | $PM_{10}$ | 1.42 | 0.35 | 0.31 | 0.08 |
| AP-42 (EG-1, EG-2) | Formaldehyde | 3.67E-04 | 9.17E-05 | 2.60E-04 | 6.49E-05 |

# STORAGE TANK DATA SHEET

| Source ID #[1] | Status[2] | Content[3] | Volume[4] | Dia[5] | Throughput[6] | Orientation[7] | Liquid Height[8] |
|---|---|---|---|---|---|---|---|
| T01 | EXIST | 2FO | 50 | Rectangular 18" deep x 24" wide x 30" high | < 16,700 | VERT | ~24" |
| T02 | EXIST | 2FO | 40 | Rectangular 9.5" deep x 45" wide x 15" high | < 11,750 | HORZ | ~12" |
| T03 | EXIST | 2FO | 5,000 | Cylindrical 80" diameter | < 28,450 | HORZ | ~36" |

## EMERGENCY GENERATOR EMISSION SUMMARY SHEET FOR CRITERIA POLLUTANTS

**Emergency Generator Location:** Greenbrier Valley Medical Center | **Registration Number (Agency Use)** G60-C

| | Potential Emissions (lbs/hr) | | | | | Potential Emissions (tons/yr) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Source ID No.** | **$NO_X$** | **CO** | **VOC** | **$SO_2$** | **$PM_{10}$** | **$NO_X$** | **CO** | **VOC** | **$SO_2$** | **$PM_{10}$** |
| **EG-1** | 14.11 | 7.61 | 0.16 | 2.40 | 1.42 | 4.98 | 1.07 | 0.40 | 0.33 | 0.35 |
| **EG-2** | 9.10 | 1.23 | 0.07 | 0.65 | 0.31 | 2.27 | 0.31 | 0.02 | 0.16 | 0.08 |
| **Total** | **23.21** | **8.84** | **0.23** | **3.05** | **1.73** | **7.26** | **1.38** | **0.42** | **0.49** | **0.43** |

## EMERGENCY GENERATOR EMISSION SUMMARY SHEET FOR HAZARDOUS/TOXIC POLLUTANTS

**Emergency Generator Location:** Greenbrier Valley Medical Center | **Registration Number (Agency Use)** G60-C

| | Potential Emissions (lbs/hr) | | | | | | Potential Emissions (tons/yr) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Source ID No.** | **Benzene** | **Ethyl-benzene** | **Toluene** | **Xylenes** | **n-Hexane** | **Formalde-hyde** | **Benzene** | **Ethyl-benzene** | **Toluene** | **Xylenes** | **n-Hexane** | **Formalde-hyde** |
| **EG-1** | 0.0036 | Not Available | 0.0013 | 0.0009 | Not Available | 0.0004 | 0.0009 | Not Available | 0.0003 | 0.0002 | Not Available | 0.00009 |
| **EG-2** | 0.0026 | Not Available | 0.0009 | 0.0006 | Not Available | 0.0003 | 0.0006 | Not Available | 0.0002 | 0.0002 | Not Available | 0.00006 |
| **Total** | **0.0062** | Not Available | **0.0022** | **0.0015** | Not Available | **0.0007** | **0.0015** | Not Available | **0.0005** | **0.0004** | Not Available | **0.00015** |

**Other Supporting Documentation Not Described Above (Equipment Drawings, Etc.)**

**Greenbrier Valley Medical Center**
**Generator Data**
**2014**
EC.02.05.07.4-6.c
(Revised 12/09)

| **Generator Number** | **Location Served** | |
|---|---|---|
| #1 | | |
| **Manufacturer** | **Model/Serial Number** | |
| Kohler | 400ROZD7 – S/N 324035 | |
| **KW** | **KVA** | |
| 400 | 500 | |
| **Nominal Voltage** | **Power factor** | |
| 480 | .8 | |
| **FLA** (provide nameplate FLA if available) | **Calculated FLA** (if not provided on data plate) | **FLA Calculation** {(KW x 1000) / (V x 1.732)} / PF |
| _____ FLA | 667 FLA | |
| **30% of FLA** | | |
| 200 | | |

| **Generator Number** | **Location Served** | |
|---|---|---|
| #2 | | |
| **Manufacturer** | **Model/Serial Number** | |
| Cummins | DFCB-5690591 – S/N H040687365 | |
| **KW** | **KVA** | |
| 300 | 375 | |
| **Nominal Voltage** | **Power factor** | |
| 480 | .8 | |
| **FLA** (provide nameplate FLA if available) | **Calculated FLA** (if not provided on data plate) | **FLA Calculation** {(KW x 1000) / (V x 1.732)} / PF |
| _____FLA | 500 FLA | |
| **30% of FLA** | | |
| 150 | | |

# Model: 400ROZD

# KOHLER.POWER SYSTEMS

**Diesel**

ISO 9001 U.S.A. Plant ISO Registered

## Ratings Range

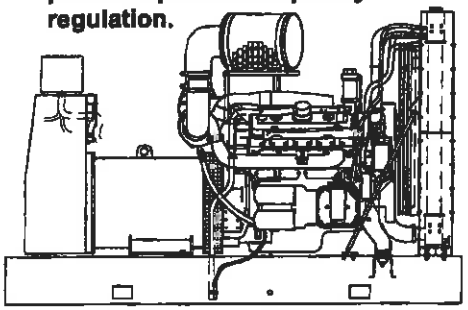
| | | 60 Hz | 50 Hz |
|---|---|---|---|
| Standby: | kW | 305-410 | 288-336 |
| | kVA | 381-513 | 360-420 |
| Prime: | kW | 275-370 | 260-304 |
| | kVA | 344-463 | 325-380 |

## Generator Ratings

| Generator | Voltage | PH | Hz | 130°C Rise Standby Rating kW/kVA | 105°C Rise Prime Rating kW/kVA | 150°C Rise Standby Rating kW/kVA | 125°C Rise Prime Rating kW/kVA |
|---|---|---|---|---|---|---|---|
| 4M4019 | 120/208 | 3 | 60 | 350/438 | 315/394 | 360/450 | 325/406 |
| | 127/220 | 3 | 60 | 360/450 | 325/406 | 375/469 | 340/425 |
| | 139/240 | 3 | 60 | 375/469 | 340/425 | 400/500 | 360/450 |
| | 220/380 | 3 | 60 | 305/381 | 275/344 | 305/381 | 275/344 |
| | 240/416 | 3 | 60 | 350/438 | 315/394 | 360/450 | 325/406 |
| | 277/480 | 3 | 60 | 375/469 | 340/425 | 400/500 | 360/450 |
| | 110/190 | 3 | 50 | 300/375 | 272/340 | 324/405 | 292/365 |
| | 115/200 | 3 | 50 | 296/370 | 268/335 | 324/405 | 292/365 |
| | 120/208 | 3 | 50 | 288/360 | 260/325 | 316/395 | 288/360 |
| | 220/380 | 3 | 50 | 300/375 | 272/340 | 324/405 | 292/365 |
| | 230/400 | 3 | 50 | 296/370 | 268/335 | 324/405 | 292/365 |
| | 240/416 | 3 | 50 | 288/360 | 260/325 | 316/395 | 288/360 |
| 4M4021 | 120/208 | 3 | 60 | 370/463 | 335/419 | 395/494 | 360/450 |
| | 127/220 | 3 | 60 | 390/488 | 355/444 | 405/506 | 365/456 |
| | 139/240 | 3 | 60 | 405/506 | 365/456 | 405/506 | 365/456 |
| | 220/380 | 3 | 60 | 315/394 | 285/356 | 315/394 | 285/356 |
| | 240/416 | 3 | 60 | 370/463 | 335/419 | 395/494 | 360/450 |
| | 277/480 | 3 | 60 | 405/506 | 365/456 | 405/506 | 365/456 |
| | 110/190 | 3 | 50 | 320/400 | 288/360 | 332/415 | 300/375 |
| | 115/200 | 3 | 50 | 324/405 | 292/365 | 332/415 | 300/375 |
| | 120/208 | 3 | 50 | 320/400 | 288/360 | 328/410 | 296/370 |
| | 220/380 | 3 | 50 | 320/400 | 288/360 | 332/415 | 300/375 |
| | 230/400 | 3 | 50 | 324/405 | 292/365 | 332/415 | 300/375 |
| | 240/416 | 3 | 50 | 320/400 | 288/360 | 328/410 | 296/370 |
| 5M4024 | 120/208 | 3 | 60 | 405/506 | 365/456 | 405/506 | 365/456 |
| | 127/220 | 3 | 60 | 405/506 | 365/456 | 405/506 | 365/456 |
| | 139/240 | 3 | 60 | 405/506 | 365/456 | 405/506 | 365/456 |
| | 220/380 | 3 | 60 | 400/500 | 360/450 | 400/500 | 360/450 |
| | 240/416 | 3 | 60 | 405/506 | 365/456 | 405/506 | 365/456 |
| | 277/480 | 3 | 60 | 405/506 | 365/456 | 405/506 | 365/456 |
| | 110/190 | 3 | 50 | 336/420 | 304/380 | 336/420 | 304/380 |
| | 115/200 | 3 | 50 | 336/420 | 304/380 | 336/420 | 304/380 |
| | 120/208 | 3 | 50 | 336/420 | 304/380 | 336/420 | 304/380 |
| | 220/380 | 3 | 50 | 336/420 | 304/380 | 336/420 | 304/380 |
| | 230/400 | 3 | 50 | 336/420 | 304/380 | 336/420 | 304/380 |
| | 240/416 | 3 | 50 | 336/420 | 304/380 | 336/420 | 304/380 |
| 5M4027 | 120/208 | 3 | 60 | 405/506 | 365/456 | 405/506 | 365/456 |
| | 127/220 | 3 | 60 | 405/506 | 365/456 | 405/506 | 365/456 |
| | 139/240 | 3 | 60 | 410/513 | 370/463 | 410/513 | 370/463 |
| | 220/380 | 3 | 60 | 405/506 | 365/456 | 405/506 | 365/456 |
| | 240/416 | 3 | 60 | 405/506 | 365/456 | 405/506 | 365/456 |
| | 277/480 | 3 | 60 | 410/513 | 370/463 | 410/513 | 370/463 |
| | 110/190 | 3 | 50 | 336/420 | 304/380 | 336/420 | 304/380 |
| | 115/200 | 3 | 50 | 336/420 | 304/380 | 336/420 | 304/380 |
| | 120/208 | 3 | 50 | 336/420 | 304/380 | 336/420 | 304/380 |
| | 220/380 | 3 | 50 | 336/420 | 304/380 | 336/420 | 304/380 |
| | 230/400 | 3 | 50 | 336/420 | 304/380 | 336/420 | 304/380 |
| | 240/416 | 3 | 50 | 336/420 | 304/380 | 336/420 | 304/380 |
| 5M4160 | 220/380 | 3 | 60 | 405/506 | 365/456 | 405/506 | 365/456 |
| 5M4162 | 220/380 | 3 | 60 | 410/513 | 370/463 | 410/513 | 370/463 |
| 4M4266 | 347/600 | 3 | 60 | 400/500 | 360/450 | 405/506 | 365/456 |
| 5M4272 | 347/600 | 3 | 60 | 410/513 | 370/463 | 410/513 | 370/463 |

## Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- All generator sets and components are prototype tested, factory built, and production tested.
- Generator set provides one-step load acceptance per NFPA 110.
- 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, pilot-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.
  - Electronic, isochronous governor provides precise frequency regulation.



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 alternators may be used to meet special application requirements. Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler Co. generator distributor for availability. GENERAL GUIDELINES FOR DERATION: *ALTITUDE:* Derate 1.5% per 1000 ft. (305 m) elevation above 3300 ft. (1006 m). *TEMPERATURE:* Derate 2.75% per 10°F (5.5°C) temperature increase above 105°F (40°C).

# Alternator Specifications

| Specifications | | TR II -Series™ Generator |
|---|---|---|
| Type | | 4-Pole, Rotating Field |
| Exciter type | | Brushless Permanent Magnet Pilot Exciter |
| Voltage regulator | | Solid State, Volts/Hz |
| Insulation: NEMA MG1-1.66, | | |
| Material | | Class H, Synthetic, Nonhygroscopic |
| Temperature rise | | 130°C, 150°C Standby |
| Bearing, number, type | | 1, Sealed |
| Coupling | | Flexible Disc |
| Amortisseur windings | | Full |
| Rotor balancing | | 125% (60Hz) 150% (50Hz) |
| Voltage regulation, no load to full load (with <0.5% drift due to temp. variation) | | ±0.25% |
| One-step load acceptance per NFPA 110 | | 100% of Rating |
| Peak motor starting kVA: | | (35% dip for voltages listed) |
| 480/416V | 4M4019 (12 lead) | 1350 (60Hz), 1000 (50Hz) |
| 480/416V | 4M4021 (12 lead) | 1350 (60Hz), 1000 (50Hz) |
| 480/416V | 5M4024 (10 lead) | 1350 (60Hz), 1000 (50Hz) |
| 480/416V | 5M4027 (12 lead) | 1550 (60Hz), 1250 (50Hz) |
| 380V | 5M4160 (4 lead) | 1175 (60Hz) |
| 380V | 5M4162 (4 lead) | 2100 (60Hz) |
| 600V | 4M4266 (4 lead) | 1300 (60Hz) |
| 600V | 5M4272 (4 lead) | 1750 (60Hz) |

- 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.
- Superior voltage waveform from two-thirds pitch windings and skewed stator.
- A digital solid-state, volts-per-hertz voltage regulator with ±0.25% no-load to full-load regulation.
- A brushless alternator with brushless pilot exciter for excellent load response.

# Application Data

## Engine

| Engine Specifications | 60 Hz | 50 Hz |
|---|---|---|
| Manufacturer | Detroit Diesel | |
| Engine, model, type | 8V-92TA, (8083-7416) 2-Cycle, Turbocharged, Aftercooled | |
| Cylinder arrangement | 8-V | |
| Displacement, cu. in. (L) | 736 (12.1) | |
| Bore and stroke, in. (mm) | 4.84 (123) x 5.00 (127) | |
| Compression ratio | 15.0:1 | |
| Piston speed, ft/min. (m/sec.) | 1500 (7.6) | 1250 (6.3) |
| Main bearings: number, type | 5, Replaceable Insert | |
| Rated rpm | 1800 | 1500 |
| Max. power at rated rpm, hp (kW) | 643 (480) | 526 (392) |
| Cylinder head material | Cast Iron | |
| Crankshaft material | Forged Steel | |
| Valve (exhaust) material | Pyromet 31 | |
| Governor, type, make/model | Electronic, Barber-Colman, Dyna 8000 | |
| Frequency regulation, no load to full load | Isochronous | |
| Frequency regulation, steady state | ±0.25% | |
| Air cleaner type, all models | Dry | |

## Exhaust

| Exhaust System | 60 Hz | 50 Hz |
|---|---|---|
| Exhaust flow at rated kW, cfm ($m^3$/min.) | 4460 (126) | 3800 (108) |
| Exhaust temperature at rated kW, dry exhaust, °F (°C) | 865 (462) | 890 (477) |
| Maximum allowable back pressure, in. Hg (kPa) | 2.0 (6.8) | 1.4 (4.7) |
| Engine exhaust outlet size, in. (mm) | see ADV drawing | |

## Engine Electrical

| Engine Electrical System | 60 Hz | 50 Hz |
|---|---|---|
| Battery charging alternator: | | |
| Ground (negative/positive) | Negative | |
| Volts (DC) | 24 | |
| Ampere rating | 65 | |
| Starter motor rated voltage (DC) | 24 | |
| Recommended battery cold cranking amps (CCA) rating | 950 above 32°F (0°C) 1250 below 32°F (0°C) | |
| Quantity of batteries | 2 above 32°F (0°C), 4 below 32°F (0°C) | |
| Battery voltage (DC) | 12 | |
| Rolling current at 32°F (0°C) | - | |

## Fuel

| Fuel System | 60 Hz | 50 Hz |
|---|---|---|
| Fuel supply line, min. ID, in. (mm) | 0.5 (13) | |
| Fuel return line, min. ID, in. (mm) | 0.31 (8) | |
| Max. lift, engine-driven fuel pump, ft. (m) | 6.8 (2.1) | |
| Max. fuel flow, gph (Lph) | 96 (363) | 91 (344) |
| Fuel prime pump | N/A | |
| Fuel filter | 2, Primary/Secondary | |
| Recommended fuel | #2 Diesel | |

## Lubrication

| Lubricating System | 60 Hz | 50 Hz |
|---|---|---|
| Type | Full Pressure | |
| Oil pan capacity, qts. (L) | 25.0 (24) | |
| Oil pan capacity with filter, qts. (L) | 27.0 (26) | |
| Oil filter, quantity, type | 2, Cartridge | |
| Oil cooler | Water-Cooled | |

# Application Data

## Cooling (Standard Radiator)

| Cooling System | 60 Hz | 50 Hz |
|---|---|---|
| Ambient temperature °F (°C) | 105 (40) | |
| Engine jacket water capacity, gal. (L) | 7.3 (27.0) | |
| Radiator system capacity, including engine, gal. (L) | 23.3 (87.6) | |
| Engine jacket water flow, gpm (Lpm) | 160 (606) | 133 (505) |
| Heat rejected to cooling water at rated kW, dry exhaust Btu/min. | 19933 | 16306 |
| Water pump type | Centrifugal | |
| Fan diameter, including blades, in. (mm) | 40 (1016) | |
| Fan hp (kW) | 30 (22.4) | 17 (12.7) |
| Max. restriction of cooling air, intake and discharge side of rad., in. Hg (KPa) | 0.037 (0.125) | |

## Cooling (Optional Systems)

| High Ambient Radiator System | 60 Hz | 50 Hz |
|---|---|---|
| Ambient temperature °F (°C) | 122 (50) | |
| Engine jacket water capacity, gal. (L) | 7.3 (27.0) | |
| Radiator system capacity, including engine, gal. (L) | - | |
| Engine jacket water flow, gpm (Lpm) | 160 (606) | 133 (505) |
| Heat rejected to cooling water at rated kW, dry exhaust Btu/min. | 19933 | 16306 |
| Water pump type | Centrifugal | |
| Fan diameter, including blades, in. (mm) | 43 (1092) | |
| Fan hp (kW) | 29 (21.6) | 17 (12.7) |
| Max. restriction of cooling air, intake and discharge side of rad., in. Hg (kPA) | 0.037 (0.125) | |

| Remote Radiator System† | 60 Hz | 50 Hz |
|---|---|---|
| Exhaust manifold type | Dry | |
| Connection sizes: | | |
| Water inlet, in. (mm) | 3.5 (89) ID Hose | |
| Water outlet, in. (mm) | (2) 2.5 (63) ID Hose | |
| Static head allowable above engine, ft. (m) | 50 (15.25) | |

| City Water Cooling System | 60 Hz | 50 Hz |
|---|---|---|
| Exhaust manifold type | Dry | |
| System capacity, gal. (L) | 12.3 (46.5) | |
| City water consumption,* gpm (Lpm) at 50°F (10°C) | 28.4 (108) | 23 (87) |
| Connection sizes:* | | |
| Water inlet, in. | 1.5 NPT | |
| Water outlet, in. | 1.0 NPT | |

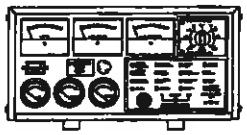
* Data based on Modine C-820-438 heat exchanger with thermostatically controlled water-saver valve, electric solenoid valve, and surge tank.

† Contact your local distributor for cooling system options and specifications based on your specific application.

## Operation Requirements

| Air Requirements | 60 Hz | 50 Hz |
|---|---|---|
| Radiator-cooled cooling air, cfm ($m^3$/min.) | 22600 (640) | 18800 (532) |
| 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.) | 10100 (286) | 9100 (258) |
| Combustion air, cfm ($m^3$/min.) | 1770 (50) | 1480 (42) |
| Heat rejected to ambient air: | | |
| Engine BTU/min. | 2640 | 2520 |
| Generator BTU/min. | 1770 | 1460 |
| **Fuel Consumption** | **60 Hz** | **50 Hz** |
| **Diesel, gph (Lph) at % load** | | |
| 100% | 33.2 (125.6) | 27.3 (103.3) |
| 75% | 25.1 (95.0) | 19.9 (75.3) |
| 50% | 16.7 (63.2) | 14.0 (53.0) |
| 25% | 10.2 (38.6) | 8.3 (31.4) |

# Controllers



## Standard Controller

**Decision-Maker™ 3+, 16-Light Controller**
Audio/visual annunciation with NFPA-110, Level 1 capability
Microprocessor logic with AC meters and engine gauges
Compatible with 12-volt and 24-volt engine electrical systems
Remote start, prime power, and remote annunciation capability

## Optional Controllers

**Decision-Maker™ 340 Controller**
Audio/visual annunciation with NFPA-110, Level 1 capability
Programmable microprocessor logic with digital display
Compatible with 12-volt and 24-volt engine electrical systems
Remote start, prime power, remote annunciation, and remote communication capability

**Decision-Maker™ 3+, 7-Light Controller**
Audio/visual annunciation with NFPA-110, Level 2 capability
Microprocessor logic with AC meters and engine gauges
Compatible with 12-volt and 24-volt engine electrical systems
Remote start, prime power, and remote annunciation capability

**Oversized Meterbox Controllers**
Provides additional space for optional engine oil temperature gauge, tachometer, and wattmeter
Available with 16-light or 7-light annunciation and microprocessor logic
Same features as Decision-Maker™ 3+ controller
Compatible with 12-volt and 24-volt engine electrical systems

**Engine Gauge Box Controller for Paralleling Switchgear**
Interfaces between generator set and switchgear for paralleling switchgear applications
Engine gauges with emergency stop switch
Compatible with 24-volt engine electrical systems only

**Manual Paralleling Controller**
Provides capability to parallel two or more generator sets without large switchgear-style cubicles
Uses 16-light annunciation and microprocessor logic
Same features as Decision-Maker™ 3+ controller
Compatible with 12-volt and 24-volt engine electrical systems

NOTE: See the respective controller spec sheet for additional controller features and accessories.

KOHLER CO., Kohler, Wisconsin 53044 U.S.A.
Phone 920-565-3381, Web site www.kohlergenerators.com
Fax 920-459-1646 (U.S.A. Sales), Fax 920-459-1614 (International)
For the nearest sales and service outlet in U.S.A. and Canada
Phone 1-800-544-2444

Kohler® Power Systems
Asia Pacific Headquarters
7 Jurong Pier Road
Singapore 619159
Phone (65)264-6422, Fax (65)264-6455

# Accessories

**Open Unit**
- ☐ Exhaust Silencer, Critical or Residential
- ☐ Flexible Exhaust Connector, Stainless Steel

**Cooling System**
- ☐ Block Heater
- ☐ City Water Cooling
- ☐ High Ambient Radiator
- ☐ Radiator Duct Flange
- ☐ Remote Radiator Cooling

**Fuel System**
- ☐ 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 (standard)

**Engine and Generator**
- ☐ Air Cleaner, Heavy Duty
- ☐ Air Cleaner Restriction Indicator
- ☐ Bus Bar Kits
- ☐ 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

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

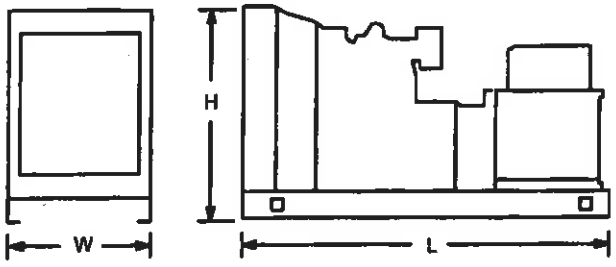
**Maintenance**
- ☐ General Maintenance Literature Kit
- ☐ Maintenance Kit (includes air, oil, and fuel filters)
- ☐ Overhaul Literature Kit

**Controller (Standard Controller)**
- ☐ Common Failure Relay Kit
- ☐ Customer Connection Kit
- ☐ Decision Monitor™ Remote Annunciator Panel
- ☐ Dry Contact Kit (Isolated Alarm)
- ☐ Extension Wiring Harness for Remote Mounting of Controller
- ☐ FASTCHECK® Diagnostic Fault Detector
- ☐ Prealarm Sender Kit
- ☐ 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): | 114.0 x 52.1 x 74.3 (2896 x 1322 x 1887) |
| Weight (Radiator Model), wet lb. (kg): | 7040 (3193) |




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:

KOHLER. Warranty Processing System

# Unit History

## Unit

| Serial Number | In-Service Date | Warranty Expiration | Sales Order Number |
|---|---|---|---|
| 324035 | 08/19/1993 | 08/19/1994 | 867299 |
| **Parts Coverage** | **Labor Coverage** | **Travel Coverage** | |
| 12 Months / 2000 Hours | 12 Months / 2000 Hours | 12 Months / 2000 Hours | |
| **Model** | **Specification Number** | **Product ID** | **Material** |
| 400ROZD | PA-132361 | Generator Set | 400ROZD71 |
| **Test Date** | **Engine Serial Number** | **Engine Manufacturer Name** | **Engine Model** |
| 01/29/1993 | 156399 | DETROIT DIESEL | |
| **Engine RPM** | **Fuel Type** | **KW** | **KVA** |
| 0 | Diesel | 400 | 500.00 |
| **Amps** | **Power Factor** | **Hertz** | **Phase** |
| 601.00 | 0.80 | 60 | |
| **Low Volt** | **High Volt** | **Battery Volt** | **Market** |
| 277 | 480 | 24 | Industrial |
| **Brand** | **Usage** | **Standard Warranty Desc.** | **Extended Warranty Desc.** |
| Kohler Generator Brand | Standby | 1 Year Industrial Standby Standard Warranty | |
| **Standard Warranty Part #** | **Extended Warranty Part #** | | |
| GM50088 | | | |

## Kits

| Kit Type | Kit Material Number | Kit Description |
|---|---|---|
| Unknown | 279926 | KIT, BLOCK HTR 110-240 |
| Unknown | 274302 | KIT, ANTICIPATORY ALARM |
| Unknown | 274283 | KIT, BATTERY RACK&CABLES |
| Unknown | 279991 | KIT, NAMEPLATE 150C STDBY |
| Unknown | 292858 | KIT, SAFEGUARD BREAKER |
| Unknown | 293734 | KIT, CIRCUIT BREAKER |
| Unknown | 274740 | KIT, FLEXIBLE FUEL LINE |
| Unknown | 293799 | KIT, CIRCUIT BREAKER |
| Unknown | 291746 | KIT, OVERVOLTAGE |

## Unit Registrations

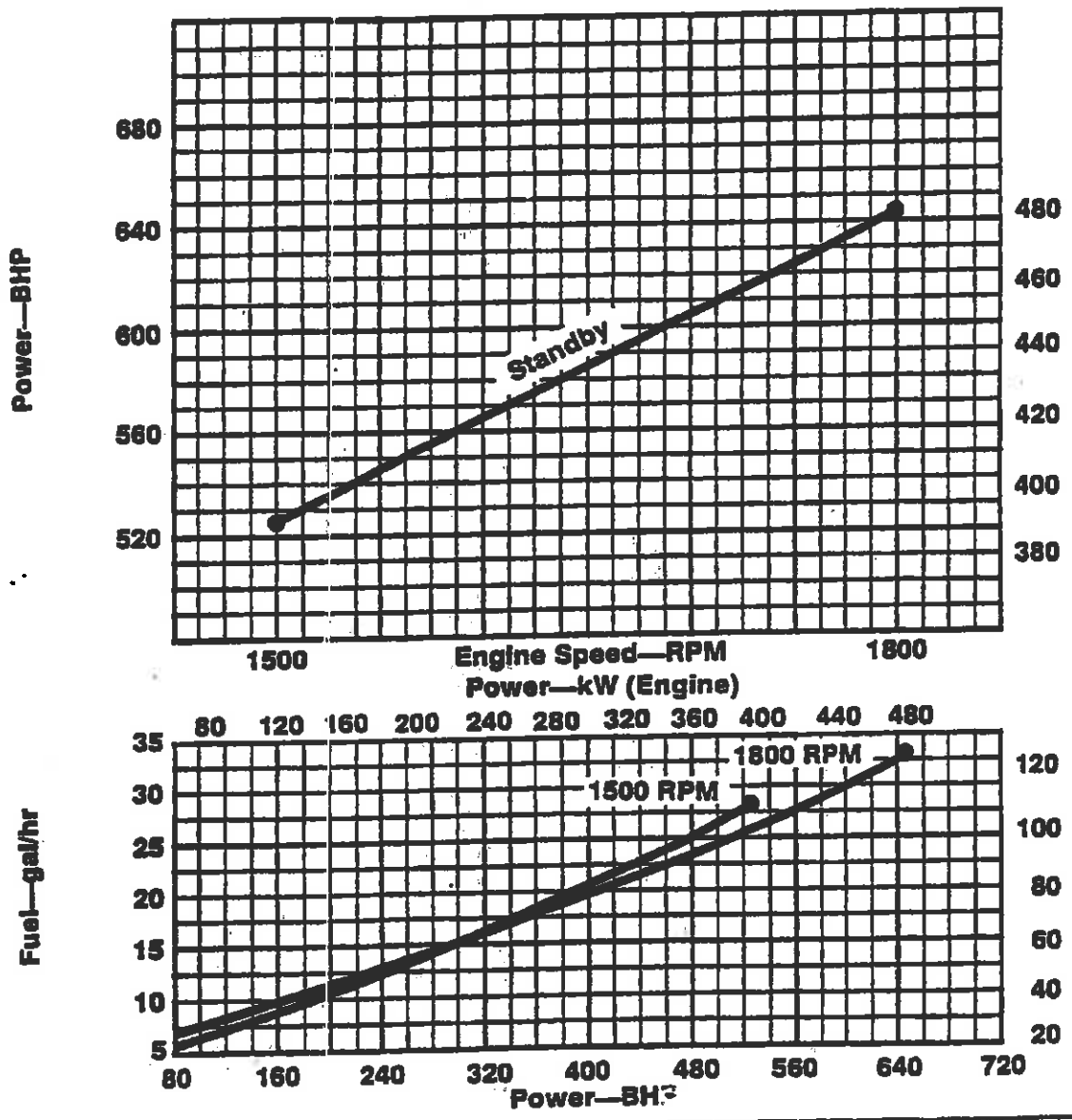
| Serial # | Type | Submission ID | Service ID | Service Name | Owner Last Name | Owner Company | Registration Date |
|---|---|---|---|---|---|---|---|
| 324035 | Original | 0 | 12008 | NIXON POWER SERVICES, LLC | | HUMANA HOSPITAL | 03/26/2010 |

DETROIT DIESEL
CORPORATION

8V-92TA
Generator Set
Rated BHP
643 BHP @ 1800 RPM
526 BHP @ 1500 RPM
Injector: 145
Turbocharger: TV7512 (1.23 A/R)

ABC REED

## ENGINE PERFORMANCE CURVE




- Power output guaranteed within 5% of SAE J1349 conditions: 77°F (25°C) air inlet temperature; 29.31 in. Hg (99kPa) dry barometer.
- Fuel consumption data is based on diesel fuel no. 2 with a fuel weight of 7.11 lb.U.S. gal. (.85kg Litre).
- Performance is based on minimum intake and exhaust restrictions.
- Conversion factors: Power: kW = bhp x 0.743
  Fuel: L/hr = gal/hr x 3.785
- Values are derived from currently available data and subject to change without notice.

Certified by:

Mark S. Kuhn

Curve No.
E4-8085-32-10
Date: 3-20-89
Rev./Date: 2/3-28-90
Sht. 1 of 3

# Engine Specification Data
## Standby Power

**General Data**

| | |
|---|---|
| Model | 6063-7416 |
| Number of Cylinders | 6 |
| Bore and Stroke-in (mm) | 4.84x5.00 (123x127) |
| Displacement-in³ (L) | 738 (12.1) |
| Compression Ratio | 15.0:1 |
| Combustion System | Direct Injection |
| Engine Type | 83.5° Vee-2 Cycle |
| Aspiration | Turbocharged |

**Configuration**

| | |
|---|---|
| Turbocharger | TV7512 (1.23 A/R) |
| Charge Air Cooling System | JWAC |
| Blower Type | By-pass |
| Blower Drive Ratio | 2.05:1 |
| Thrust Bearing Load Limit | |
| Continuous-lbf (N) | 600 (2670) |
| Intermittent-lbf (N) | 1800 (8000) |
| Engine Crankcase Vent System | Open |
| Maximum Pressure-in $H_2O$ (kPa) | 2.5 (0.65) |

**Physical Data**

| | |
|---|---|
| Size | |
| Length-in (mm) | 50.7 (1287) |
| Width-in (mm) | 40 (1016) |
| Height-in (mm) | 53 (1346) |
| Weight, dry-lb (kg) | 2465 (1118) |
| Weight, wet-lb (kg) | 2660 (1207) |
| Center of Gravity Distance | |
| From R.F.O.B. (x axis)-in (mm) | 11.8 (300) |
| Above Crankshaft (y axis)-in (mm) | 8.5 (216) |
| Right of Crankshaft (z axis)-in (mm) | 0.4 (10.2) |
| Installation Drawing | 2350463B |
| Maximum Allowable Static Bending Moment at Rear Face of FW Hsg-lbf ft (N-m) | 0 |
| Maximum Allowable Vertical Load at Rear Face of Flywheel-lb (kg) | 800 (363) |

**Fuel System**

| | 1800 | 1500 |
|---|---|---|
| Fuel Injector/Timing | 145/1.508 | 145/1.508 |
| Fuel Injection Pump/Timing | Not Applicable | Not Applicable |
| Fuel Consumption-lb/hr (kg/hr) | 237.3 (107.6) | 200.9 (91.1) |
| Fuel Consumption-gal/hr (L/hr) | 33.4 (126.4) | 28.3 (107.1) |
| Fuel Self Rate-lb/hr (kg/hr) | 445 (202) | 444 (201) |
| Fuel Spill Rate-gal/hr (L/hr) | 63.8 (241) | 63.5 (240) |
| Total Fuel Flow-lb/hr (kg/hr) | 682 (309) | 645 (293) |
| Total Fuel Flow-gal/hr (L/hr) | 97.0 (367) | 91.8 (347) |
| Maximum Allowable Fuel Pump Suction | | |
| Clean System-in Hg (kPa) | 6.0 (20) | 6.0 (20) |
| Dirty System-in Hg (kPa) | 12.0 (41) | 12.0 (41) |
| Fuel Filter Micron Size | | |
| Primary-Micron | 30 | 30 |
| Secondary-Micron | 12 | 12 |

**Lubrication System**

| | | |
|---|---|---|
| Oil Pressure | | |
| Rated Speed-lbf/in² (kPa) | 49-70 (338-483) | 41-62 (283-427) |
| Low Idle-lbf/in² (kPa) | 5 (34) | 5 (34) |
| In Pan Oil Temperature-°F (°C) | 200-250 (93-121) | 200-250 (93-121) |
| Oil Flow-gal/min (L/min) | 34 (129) | 31 (117) |
| Oil Pan Capacity | | |
| High-qt (L) | 23 (22) | 23 (22) |
| Low-qt (L) | 17 (16) | 17 (16) |
| Total Engine Oil Capacity with filters-qt (L) | 25 (24) | 25 (24) |
| Bypass Oil Filter Orifice-in (mm) | 0.101 (2.57) | 0.101 (2.57) |
| Engine Angularity Limits | | |
| Front up-degrees | 17 | 17 |
| Front down-degrees | 17 | 17 |
| Side tilt-degrees | Not Available | Not Available |

**Electrical System**

| | |
|---|---|
| Recommended Battery Capacity (CCA @ 0°F) | |
| 12 Volt System | |
| Above 32°F (0°C)-A | 1000 |
| Below 32°F (0°C)-A | 2000 |
| 24 Volt System | |
| Above 32°F (0°C)-A | 950 |
| Below 32°F (0°C)-A | 1250 |
| Maximum Allowable Resistance of Starting Circuit | |
| 12 volt system-ohm | 0.0012 |
| 24 volt system-ohm | 0.002 |

**Part Load Fuel Consumption**

| | 1800 | 1500 |
|---|---|---|
| Fuel-gal/hr (L/hr) - 0% Power | 3.0 (11.4) | 2.1 (7.9) |
| 25% Power | 10.1 (38.2) | 8.1 (30.7) |
| 50% Power | 17.5 (65.5) | 14.3 (54.1) |
| 75% Power | 25.0 (94.6) | 21.1 (79.9) |
| 100% Power | 33.4 (126.4) | 28.3 (107.1) |

All values at rated speed and power and with standard engine hardware unless otherwise noted.

A block heater is required.

**Cooling System**

| | 1800 | 1500 |
|---|---|---|
| Engine Heat Rejection-Btu/min (kW) | 19933 (350) | 16306 (287) |
| Engine Radiated Heat-Btu/min (kW) | 3280 (57.7) | 3080 (54.1) |
| Generator Heat Radiated to Room Btu/min (kW) | 1530 (26.8) | 1294 (22.7) |
| Coolant Flow-gal/min (L/min) | 160 (606) | 133 (503) |
| Thermostat | | |
| Start to Open-°F (°C) | 177 (81) | 177 (81) |
| Fully Open-°F (°C) | 197 (92) | 197 (92) |
| Maximum Water Pump Inlet Restriction-in Hg (kPa) | 3.0 (10.2) | 2.0 (6.7) |
| Engine Coolant Capacity-qt (L) | 29 (27) | 29 (27) |
| Minimum Pressure Cap-lbf/in² (kPa) | 9 (62) | 9 (62) |
| Maximum Coolant Pressure (Exclusive of Pressure Cap and/or Head)-lbf/in² (kPa) | 11.4 (78.6) | 8.2 (56.5) |
| Maximum Allowable Cooling System Static Head W/Vented Cap-ft $H_2O$ (kPa) | 50 (149) | 50 (149) |
| Maximum Top Tank Temperature-°F (°C) | 210 (99) | 210 (99) |
| Minimum Top Tank Temperature-°F (°C) | 160 (71) | 160 (71) |
| Minimum Coolant Fill Rate-gal/min (L/min) | 3.0 (11.4) | 3.0 (11.4) |
| Cooling Index | | |
| Minimum Air to Boil-°F (°C) | 117 (47) | 117 (47) |
| Maximum Air to Water Diff.-°F (°C) | 95 (53) | 95 (53) |
| Deaeration-Air Injection Capacity-ft³/min (m³/min) | 0.8 (0.023) | 0.8 (0.023) |
| Drawdown-Minimum Requirement (or 10% of Cooling System Capacity-Whichever is Larger)-qt (L) | 4.0 (3.8) | 4.0 (3.8) |
| Heat Exchanger Raw Water Flow-gal/min (L) | 58 (220) | 50 (189) |
| Maximum Suction Pressure (Raw Water) in Hg (kPa) | 5 (17) | 5 (17) |
| Maximum Discharge Pressure (Raw Water)-lb/in² (kPa) | 10 (69) | 10 (69) |

**Air System**

| | | |
|---|---|---|
| Maximum Allowable Temperature Rise (Ambient Air to Engine Inlet)-°F (°C) | 30 (17) | 30 (17) |
| Air Intake Restriction Maximum Limit | | |
| Dirty Air Cleaner-in $H_2O$ (kPa) | 14.4 (3.6) | 10.3 (2.6) |
| Clean Air Cleaner-in $H_2O$ (kPa) | 6.7 (2.2) | 6.2 (1.5) |
| Engine Air Flow-ft³/min (m³/min) | 1770 (50.1) | 1480 (41.9) |
| Fan Air Flow-ft³/min (m³/min) | Not Available | Not Available |
| Engine Air Box/Manifold Pressure-in Hg (kPa) | 43.0 (145) | 34.2 (115) |
| Recommended Intake Pipe Dia.-in (mm) | 6.0 (152) | 6.0 (152) |

**Exhaust System**

| | | |
|---|---|---|
| Exhaust Flow-ft³/min (m³/min) | 4370 (124) | 3720 (105) |
| Exhaust Temperature-°F (°C) | 865 (463) | 890 (477) |
| Maximum Allowable Back Pressure-in Hg (kPa) | 2.0 (6.8) | 1.4 (4.7) |
| Recommended Exhaust Pipe Dia. | | |
| Single-in (mm) | 6.0 (152) | 6.0 (152) |
| Dual-in (mm) | Not Applicable | Not Applicable |

**Performance Data**

| | | |
|---|---|---|
| Power Output-bhp (kW) | 643 (480) | 526 (392) |
| Rated Speed-r/min | 1800 | 1500 |
| BMEP-lbf/in² (kPa) | 182 (1325) | 189 (1301) |
| Piston Speed-ft/min (m/min) | 1500 (457) | 1250 (381) |
| Friction Power-bhp (kW) | 78 (58) | 56 (42) |
| Altitude Capability-ft (m) | 10000 (3050) | 10000 (3050) |
| Noise-dB(A) @ 1m | 102 (Est.) | 100 (Est.) |
| Smoke-Bosch Number | 1.1 | 1.8 |

**Emission Data-g/hr (at percentload) - 1800 r/min**

| | 0% | 25% | 50% | 75% | 100% |
|---|---|---|---|---|---|
| $NO_x$ | XXX | 1280 | 3030 | 5480 | 6400 |
| CO | XXX | 140 | 230 | 700 | 3450 |
| HC | XXX | 130 | 143 | 131 | 74 |
| $SO_2$ | XXX | 330 | 560 | 810 | 1090 |
| $CO_2$ | XXX | 113000 | 188000 | 263000 | 346000 |

**Emission Data-g/hr (at percent load) - 1500 r/min**

| | 0% | 25% | 50% | 75% | 100% |
|---|---|---|---|---|---|
| $NO_x$ | XXX | 1180 | 2910 | 4910 | 4940 |
| CO | XXX | 100 | 250 | 1190 | 5930 |
| HC | XXX | 92 | 114 | 107 | 52 |
| $SO_2$ | XXX | 280 | 480 | 690 | 920 |
| $CO_2$ | XXX | 91500 | 161000 | 231000 | 287000 |

CURVE NO. E4-6065-32-10
DATE: 3-29-89
REV.DATE: 3/3-28-90
SHT. 2 OF 3

# Diesel Generator Set
# Model DFCB 60 Hz

**300 kW, 375 kVA Standby**
**270 kW, 338 kVA Prime**

## Description

The Cummins Power Generation DF-series commercial generator set is a fully integrated power generation system providing optimum performance, reliability, and versatility for stationary standby or prime power applications.

A primary feature of the DF GenSet is strong motor-starting capability and fast recovery from transient load changes. The torque-matched system includes a heavy-duty Cummins 4-cycle diesel engine, an AC alternator with high motor-starting kVA capacity, and an electronic voltage regulator with three-phase sensing for precise regulation under steady-state or transient loads. The DF GenSet accepts 100% of the nameplate standby rating in one step, in compliance with NFPA 110 requirements.

The standard PowerCommand® digital electronic control is an integrated system that combines engine and alternator controls for high reliability and optimum GenSet performance.

Optional weather-protective enclosures and coolant heaters shield the generator set from extreme operating conditions. Environmental concerns are addressed by low exhaust emission engines, sound-attenuated enclosures, exhaust silencers, and dual-wall fuel tanks. A wide range of options, accessories, and services are available, allowing configuration to your specific power generation needs.

Every production unit is factory tested at rated load and power factor. This testing includes demonstration of rated power and single-step rated load pickup. Cummins Power Generation manufacturing facilities are registered to ISO9001 quality standards, emphasizing our commitment to high quality in the design, manufacture, and support of our products. The generator set is CSA certified and is available as UL2200 Listed. The PowerCommand control is UL508 Listed.

All Cummins Power Generation systems are backed by a comprehensive warranty program and supported by a worldwide network of 170 distributors and service branches to assist with warranty, service, parts, and planned maintenance support.

## Features

**UL Listed Generator Set** - The complete generator set assembly is available Listed to UL 2200.

**Cummins Heavy-Duty Engine** - Rugged 4-cycle industrial diesel engine delivers reliable power, low emissions, and fast response to load changes.

**Alternator** - Several alternator sizes offer selectable motor-starting capability with low reactance 2/3 pitch windings, low waveform distortion with non-linear loads, fault-clearing short-circuit capability, and class H insulation. The alternator electrical insulation system is UL1446 Recognized.

**Permanent Magnet Generator (PMG)** - Offers enhanced motor starting and fault-clearing short circuit capability.

**Control System** - The PowerCommand electronic control is standard equipment and provides total genset system integration, including automatic remote starting/stopping, precise frequency and voltage regulation, alarm and status message display, AmpSentry™ protection, output metering, auto-shutdown at fault detection, and NFPA 110 compliance. PowerCommand control is Listed to UL508.

**Cooling System** - Provides reliable running at the rated power level, at up to 50°C ambient temperature.

**Structural Steel Skid Base** - Robust skid base supports the engine, alternator, and radiator.

**E-Coat Finish** - Dual electro-deposition paint system provides high resistance to scratching, corrosion, and fading.

**Enclosures** - Optional weather-protective and sound-attenuated enclosures are available.

**Fuel Tanks** - Dual wall sub-base fuel tanks are also offered.

**Certifications** - Generator sets are designed, manufactured, tested, and certified to relevant UL, NFPA, ISO, IEC, and CSA standards.

**Warranty and Service** - Backed by a comprehensive warranty and worldwide distributor network.

# Generator Set

The general specifications provide representative configuration details. Consult the outline drawing for installation design.

## Specifications – General

See outline drawing 500-3014 for installation design specifications.

| | |
|---|---|
| **Unit Width, in (mm)** | 50.0 (1270) |
| **Unit Height, in (mm)** | 63.6 (1615) |
| **Unit Length, in (mm)** | 142.0 (3607) |
| **Unit Dry Weight, lb (kg)** | 7250 (3289) |
| **Unit Wet Weight, lb (kg)** | 7480 (3393) |
| **Rated Speed, rpm** | 1800 |
| **Voltage Regulation, No Load to Full Load** | ±0.5% |
| **Random Voltage Variation** | ±0.5% |
| **Frequency Regulation** | Isochronous |
| **Random Frequency Variation** | ±0.25% |
| **Radio Frequency Interference** | IEC 801.2, Level 4 Electrostatic Discharge<br>IEC 801.3, Level 3 Radiated Susceptibility<br>IEC 801.4, Level 4 Electrical Fast Transients<br>IEC 801.5, Level 5 Voltage Surge Immunity<br>MIL STD 461C, Part 9 Radiated Emissions (EMI) |

| **Cooling** | **Standby** | **Prime** |
|---|---|---|
| Fan Load, HP (kW) | 17.0 (12.7) | 17.0 (12.7) |
| Coolant Capacity with radiator, US Gal (L) | 13.5 (51.1) | 13.5 (51.1) |
| Coolant Flow Rate, Gal/min (L/min) | 130.0 (492.0) | 130.0 (492.0) |
| Heat Rejection To Coolant, Btu/min (MJ/min) | 11625.0 (12.3) | 10500.0 (11.1) |
| Heat Radiated To Room, Btu/min (MJ/min) | 4320.0 (4.6) | 3850.0 (4.1) |
| Maximum Coolant Friction Head, psi (kPa) | 7.0 (48.3) | 7.0 (48.3) |
| Maximum Coolant Static Head, ft (m) | 60.0 (18.3) | 60.0 (18.3) |

| **Air** | | |
|---|---|---|
| Combustion Air, scfm ($m^3$/min) | 980.0 (27.7) | 950.0 (26.9) |
| Alternator Cooling Air, scfm ($m^3$/min) | 2780.0 (78.7) | 2780.0 (78.7) |
| Radiator Cooling Air, scfm ($m^3$/min) | 15500.0 (438.6) | 15500.0 (438.6) |
| Max. Static Restriction, in $H_2O$ (Pa) | 0.5 (124.5) | 0.2 (62.2) |

## Rating Definitions

**Standby Rating based on:** Applicable for supplying emergency power for the duration of normal power interruption. No sustained overload capability is available for this rating. (Equivalent to Fuel Stop Power in accordance with ISO3046, AS2789, DIN6271 and BS5514). Nominally rated.

**Prime (Unlimited Running Time) Rating based on:** Applicable for supplying power in lieu of commercially purchased power. Prime power is the maximum power available at a variable load for an unlimited number of hours. A 10% overload capability is available for limited time. (Equivalent to Prime Power in accordance with ISO8528 and Overload Power in accordance with ISO3046, AS2789, DIN6271, and BS5514). This rating is not applicable to all generator set models.

**Base Load (Continuous) Rating based on:** Applicable for supplying power continuously to a constant load up to the full output rating for unlimited hours. No sustained overload capability is available for this rating. Consult authorized distributor for rating. (Equivalent to Continuous Power in accordance with ISO8528, ISO3046, AS2789, DIN6271, and BS5514). This rating is not applicable to all generator set models.

## Site Derating Factors

Rated power available up to 5800 ft (1769 m) at ambient temperatures up to 104°F (40°C). Above 5800 ft (1769 m), derate at 4% per 1000 ft (305 m) and 1% per 10°F (2% per 11°C) above 104°F (40°C).

# Engine

Cummins heavy duty diesel engines use advanced combustion technology for reliable and stable power, low emissions, and fast response to sudden load changes.

Electronic governing provides precise speed regulation, especially useful for applications requiring constant (isochronous) frequency regulation such as Uninterruptible Power Supply (UPS) systems, non-linear loads, or sensitive electronic loads. Optional coolant heaters are recommended for all emergency standby installations or for any application requiring fast load acceptance after start-up.

## Specifications – Engine

| | |
|---|---|
| **Base Engine** | Cummins Model NTA855-G2, Turbocharged and Aftercooled, diesel-fueled |
| **Displacement in$^3$ (L)** | 855.0 (14.0) |
| **Overspeed Limit, rpm** | 2100 ±50 |
| **Regenerative Power, kW** | 44.00 |
| **Cylinder Block Configuration** | Cast iron with replaceable wet cylinder liners, In-line 6 cylinder |
| **Battery Capacity** | 565 amps minimum at ambient temperature of 32°F (0°C) |
| **Battery Charging Alternator** | 55 amps |
| **Starting Voltage** | 24-volt, negative ground |
| **Lube Oil Filter Types** | Single spin-on, combination full flow/bypass |
| **Standard Cooling System** | 122°F (50°C) ambient radiator |

| **Power Output** | **Standby** | **Prime** |
|---|---|---|
| Gross Engine Power Output, bhp (kWm) | 465.0 (346.9) | 420.0 (313.3) |
| BMEP at Rated Load, psi (kPa) | 232.0 (1599.6) | 210.0 (1447.9) |
| Bore, in. (mm) | 5.50 (139.7) | 5.50 (139.7) |
| Stroke, in. (mm) | 6.00 (152.4) | 6.00 (152.4) |
| Piston Speed, ft/min (m/s) | 1800.0 (9.1) | 1800.0 (9.1) |
| Compression Ratio | 15.3:1 | 15.3:1 |
| Lube Oil Capacity, qt. (L) | 40.0 (37.9) | 40.0 (37.9) |
| **Fuel Flow** | | |
| Fuel Flow at Rated Load, US Gal/hr (L/hr) | 101.0 (382.3) | 101.0 (382.3) |
| Maximum Inlet Restriction, in. Hg (mm Hg) | 4.0 (101.6) | 4.0 (101.6) |
| Maximum Return Restriction, in. Hg (mm Hg) | 6.0 (152.4) | 6.0 (152.4) |
| **Air Cleaner** | | |
| Maximum Air Cleaner Restriction, in. $H_2O$ (kPa) | 25.0 (6.2) | 25.0 (6.2) |
| **Exhaust** | | |
| Exhaust Flow at Rated Load, cfm (m$^3$/min) | 2570.0 (72.7) | 2435.0 (68.9) |
| Exhaust Temperature,°F (°C) | 900.0 (482.2) | 870.0 (465.6) |
| Max Back Pressure, in. $H_2O$ (kPa) | 41.0 (10.2) | 41.0 (10.2) |

| **Fuel System** | Direct injection, number 2 diesel fuel; fuel filter; automatic electric fuel shutoff. |
|---|---|

| **Fuel Consumption** | | **Standby** | | | | **Prime** | | | |
|---|---|---|---|---|---|---|---|---|---|
| **60 Hz Ratings, kW (kVA)** | | **300 (375)** | | | | **270 (338)** | | | |
| | Load | 1/4 | 1/2 | 3/4 | Full | 1/4 | 1/2 | 3/4 | Full |
| | US Gal/hr | 7.6 | 12.5 | 17.4 | 22.5 | 7.2 | 11.5 | 15.9 | 20.3 |
| | L/hr | 29 | 47 | 66 | 85 | 27 | 44 | 60 | 77 |
| | | | | | | | | | |

# Alternator

Several alternators are available for application flexibility based on the required motor-starting kVA and other requirements. Larger alternator sizes have lower temperature rise for longer life of the alternator insulation system. In addition, larger alternator sizes can provide a cost-effective use of engine power in across-the-line motor-starting applications and can be used to minimize voltage waveform distortion caused by non-linear loads.

Single-bearing alternators couple directly to the engine flywheel with flexible discs for drivetrain reliability and durability. No gear reducers or speed changers are used. Two-thirds pitch windings eliminate third-order harmonic content of the AC voltage waveform and provide the standardization desired for paralleling of generator sets. The standard excitation system is a PMG excited system.

## Alternator Application Notes

**Separately Excited Permanent Magnet Generator (PMG) System** - This standard system uses an integral PMG to supply power to the voltage regulator. A PMG system generally has better motor-starting performance, lower voltage dip upon load application, and better immunity from problems with harmonics in the main alternator output induced by non-linear loads. This system provides improved performance over self-excited regulators in applications that have large transient loads, sensitive electronic loads (especially UPS applications), harmonic content, or that require sustained short-circuit current (sustained 3-phase short circuit current at approximately 3 times rated for 10 seconds).

**Alternator Sizes** - On any given model, various alternator sizes are available to meet individual application needs. Alternator sizes are differentiated by maximum winding temperature rise, at the generator set standby or prime rating, when operated in a 40°C ambient environment. Available temperature rises range from 80°C to 150°C. Not all temperature rise selections are available on all models. Lower temperature rise is accomplished using larger alternators at lower current density. Lower temperature rise alternators have higher motor-starting kVA, lower voltage dip upon load application, and they are generally recommended to limit voltage distortion and heating due to harmonics induced by non-linear loads.

**Alternator Space Heater** - is recommended to inhibit condensation.

## Available Output Voltages

Three Phase Reconnectable

[ ] 110/190
[ ] 115/200
[ ] 120/208
[ ] 127/220
[ ] 139/240
[ ] 120/240
[ ] 220/380
[ ] 240/415
[ ] 254/440
[ ] 277/480

Three Phase Non-Reconnectable

[ ] 277/480
[ ] 347/600

# Specifications – Alternator

| | |
|---|---|
| **Design** | Brushless, 4 pole, drip proof revolving field |
| **Stator** | 2/3 pitch |
| **Rotor** | Direct coupled by flexible disc |
| **Insulation System** | Class H per NEMA MG1-1.65 |
| **Standard Temperature Rise** | 125°C @ Standby, 105°C @ Prime |
| **Exciter Type** | Permanent Magnet Generator (PMG) |
| **Phase Rotation** | A (U), B (V), C (W) |
| **Alternator Cooling** | Direct drive centrifugal blower |
| **AC Waveform Total Harmonic Distortion** | <5% total no load to full linear load<br><3% for any single harmonic |
| **Telephone Influence Factor (TIF)** | <50 per NEMA MG1-22.43 |
| **Telephone Harmonic Factor (THF)** | <3 |

| **Three Phase Table**[1] | | **80° C** | **80° C** | **105° C** | **105° C** | **125° C** | **125° C** | **125° C** | **125° C** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Feature Code | | B260 | B302 | B259 | B301 | B258 | B252 | B246 | B300 | | | | |
| Alternator Data Sheet Number | | 305 | 304 | 304 | 304 | 304 | 303 | 303 | 303 | | | | |
| Voltage Ranges | | 110/190 Thru 139/240 220/380 Thru 277/480 | 347/600 | 110/190 Thru 139/240 220/380 Thru 277/480 | 347/600 | 110/190 Thru 139/240 220/380 Thru 277/480 | 120/208 Thru 139/240 240/416 Thru 277/480 | 277/480 | 347/600 | | | | |
| Surge kW | | 314 | 314 | 309 | 314 | 309 | 311 | 313 | 313 | | | | |
| Motor Starting kVA (at 90% sustained voltage) | PMG | 1749 | 1372 | 1372 | 1372 | 1372 | 1210 | 1210 | 1210 | | | | |

| Full Load Current - Amps at Standby Rating | 120/208 | 127/220 | 139/240 | 220/380 | 240/416 | 254/440 | 277/480 | 347/600 |
|---|---|---|---|---|---|---|---|---|
| | 1041 | 984 | 902 | 570 | 520 | 492 | 451 | 361 |

**Notes:**

**1. Single Phase Capability:** Single phase power can be taken from a three phase generator set at up to 40% of the generator set nameplate kW rating at unity power factor.

# Control System

**PowerCommand Control with AmpSentry™ Protection**

- The PowerCommand Control is an integrated generator set control system providing governing, voltage regulation, engine protection, and operator interface functions.
- PowerCommand Controls include integral AmpSentry protection. AmpSentry provides a full range of alternator protection functions that are matched to the alternator provided.
- Controls provided include Battery monitoring and testing features, and Smart-Starting control system.
- InPower PC-based service tool available for detailed diagnostics.
- Standard PCCNet interface. Available with Echelon LonWorks™ network interface.
- NEMA 3R enclosure.
- Suitable for operation in ambient temperatures from -40C to +70C, and altitudes to 13,000 feet (5000 meters).
- Prototype tested; UL, CSA, and CE compliant.

| AmpSentry AC Protection | Engine Protection | Operator Interface |
|---|---|---|
| • Overcurrent and short circuit shutdown<br>• Overcurrent warning<br>• Single & 3-phase fault regulation<br>• Over and under voltage shutdown<br>• Over and under frequency shutdown<br>• Overload warning with alarm contact<br>• Reverse power and reverse Var shutdown<br>• Excitation fault | • Overspeed shutdown<br>• Low oil pressure warning and shutdown<br>• High coolant temperature warning and shutdown<br>• High oil temperature warning (optional)<br>• Low coolant level warning or shutdown<br>• Low coolant temperature warning<br>• High and low battery voltage warning<br>• Weak battery warning<br>• Dead battery shutdown<br>• Fail to start (overcrank) shutdown<br>• Fail to crank shutdown<br>• Redundant start disconnect<br>• Cranking lockout<br>• Sensor failure indication | • OFF/MANUAL/AUTO mode switch<br>• MANUAL RUN/STOP switch<br>• Panel lamp test switch<br>• Emergency Stop switch<br>• Alpha-numeric display with pushbutton access, for viewing engine and alternator data and providing setup, controls, and adjustments<br>• LED lamps indicating genset running, not in auto, common warning, common shutdown<br>• (5) configurable LED lamps<br>• LED Bargraph AC data display (optional) |
| **Alternator Data** | **Engine Data** | **Other Data** |
| • Line-to-line and line-to-neutral AC volts<br>• 3-phase AC current<br>• Frequency<br>• Total and individual phase kW and kVA | • DC voltage<br>• Lube oil pressure<br>• Coolant temperature<br>• Lube oil temperature (optional) | • Genset model data<br>• Start attempts, starts, running hours<br>• KW hours (total and since reset)<br>• Fault history<br>• Load profile (hours less than 30% and hours more than 90% load)<br>• System data display (optional with network and other PowerCommand gensets or transfer switches |
| **Governing** | **Voltage Regulation** | **Control Functions** |
| • Integrated digital electronic isochronous governor<br>• Temperature dynamic governing<br>• Smart idle speed mode<br>• Glow plug control (some models) | • Integrated digital electronic voltage regulator<br>• 3-phase line to neutral sensing<br>• PMG (Optional)<br>• Single and three phase fault regulation<br>• Configurable torque matching | • Data logging on faults<br>• Fault simulation (requires InPower)<br>• Time delay start and cooldown<br>• Cycle cranking<br>• PCCNet interface<br>• (4) Configurable customer inputs<br>• (4) Configurable customer outputs<br>• (8) Configurable network inputs and (16) outputs (with optional network) |

| Options | | |
|---|---|---|
| [ ] Analog AC Meter Display<br>[ ] Thermostatically Controlled Space Heater<br>[ ] Key-type mode switch | [ ] Ground fault module<br>[ ] Engine oil temperature<br>[ ] Auxiliary Relays (3) | [ ] Echelon LonWorks interface<br>[ ] Digital input and output module(s) (loose)<br>[ ] Remote annunciator (loose) |

## Generator Set Options

**Engine**

[ ] 208/240/480 V thermostatically controlled coolant heater for ambient above 40°F (4.5°C)
[ ] 208/240/480 V thermostatically controlled coolant heater for ambient below 40°F (4.5°C)
[ ] Fuel/water separator
[ ] Heavy duty air cleaner with safety element

**Cooling System**

[ ] Heat exchanger cooling
[ ] Remote radiator cooling

**Fuel System**

[ ] 300 Gal (1136 L) Sub-base tank
[ ] 400 Gal (1514 L) Sub-base tank
[ ] 500 Gal (1893 L) Sub-base tank
[ ] 600 Gal (2271 L) Sub-base tank
[ ] 660 Gal (2498 L) Sub-base tank
[ ] 720 Gal (2725 L) Sub-base tank
[ ] 1470 Gal (5565 L) Sub-base tank

**Alternator**

[ ] 80°C rise alternator
[ ] 105°C rise alternator
[ ] 120/240 V, 300 W anti-condensation heater

**Exhaust System**

[ ] Critical grade exhaust silencer
[ ] Exhaust packages
[ ] Industrial grade exhaust silencer
[ ] Residential grade exhaust silencer

**Generator Set**

[ ] AC entrance
[ ] Batteries
[ ] Battery charger
[ ] Export box packaging
[ ] Isolation pads
[ ] UL2200 Listed
[ ] Main line circuit breaker
[ ] PowerCommand (3100) Digital Parallel Control
[ ] PowerCommand Network
[ ] Remote annunciator panel
[ ] Sound-attenuated enclosure (2 levels) with internal silencers
[ ] Spring isolators
[ ] Weather-protective enclosure with internal silencer
[ ] 2 year prime power warranty
[ ] 2 year standby warranty
[ ] 5 year basic power warranty
[ ] 10 year major components warranty

## Available Products and Services

A wide range of products and services is available to match your power generation system requirements. Cummins Onan products and services include:

Diesel and Spark-Ignited Generator Sets

Transfer Switches

Bypass Switches

Parallel Load Transfer Equipment

Digital Paralleling Switchgear

PowerCommand Network and Software

Distributor Application Support

Planned Maintenance Agreements

## Warranty

All components and subsystems are covered by an express limited one-year warranty. Other optional and extended factory warranties and local distributor maintenance agreements are available. Contact your distributor/dealer for more information.

## Certifications

**ISO9001** - This generator set was designed and manufactured in facilities certified to ISO9001.

**CSA** - This generator set is CSA certified to product class 4215-01.

**PTS** - The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Products bearing the PTS symbol have been subjected to demanding tests in accordance to NFPA 110 Level 1 to verify the design integrity and performance under both normal and abnormal operating conditions including short circuit, endurance, temperature rise, torsional vibration, and transient response, including full load pickup.

**UL** - The generator set is available Listed to UL 2200, Stationary Engine Generator Assemblies. The PowerCommand control is Listed to UL 508 - Category NITW7 for U.S. and Canadian usage.

## See your distributor for more information

**Cummins Power Generation**
**1400 73rd Avenue N.E.**
**Minneapolis, MN 55432**
**763.574.5000**
**Fax: 763.574.5298**
**www.cumminspower.com**



**Important: Backfeed to a utility system can cause electrocution and/or property damage. Do not connect generator sets to any building electrical system except through an approved device or after building main switch is open.**

 Specifications subject to change without notice S-1144h (6/06)

Power Generation

# Exhaust Emission Data Sheet

## 300DFCB

### 60 Hz Diesel Generator Set

## ENGINE

Model: Cummins NTA855-G2
Type: 4 Cycle, In-line 6 Cylinder Diesel
Aspiration: Turbocharged and Aftercooled
Compression Ratio: 15.3:1
Emission Control Device: Turbocharger and Aftercooler, with Variable Timing

Bore: 5.5 in. ( 140 mm )
Stroke 6 in. ( 152 mm )
Displacement: 855 cu. in. ( 14.0 liters )

| PERFORMANCE DATA | STANDBY | PRIME |
|---|---|---|
| BHP @ 1800 RPM ( 60 Hz) | 465 | 420 |
| Fuel Consumption (gal/Hr) | 23.5 | 20.9 |
| Exhaust Gas Flow (CFM) | 2570 | 2435 |
| Exhaust Gas Temperature ( °F) | 900 | 870 |

## EXHAUST EMISSION DATA

(All Values are Grams per HP-Hour)

| COMPONENT | STANDBY | PRIME |
|---|---|---|
| HC ( Total Unburned Hydrocarbons ) | 0.07 | 0.09 |
| NOx ( Oxides of Nitrogen as NO2 ) | 8.87 | 7.53 |
| CO ( Carbon Monoxide ) | 1.20 | 1.10 |
| PM ( Particulate Matter ) | 0.30 | 0.33 |
| $SO_2$ ( Sulfur Dioxide ) | 0.63 | 0.62 |

## TEST CONDITIONS

Data was recorded during steady-state rated engine speed ( ± 25 RPM) with full load ( ± 2% ).
Pressures, temperatures, and emission rates were stablized.

| | |
|---|---|
| Fuel Specification: | ASTM D975 No. 2-D diesel fuel with 0.03-0.05% sulfur content (by weight), and 40-48 cetane number. |
| Fuel Temperature: | 99 ± 9 ° F ( at fuel pump inlet) |
| Intake Air Temperature: | 77 ± 9 ° F |
| Barometric Pressure: | 29.6 ± 1 in. Hg |
| Humidity: | NOx measurement corrected to 75 grains H2O/lb dry air |
| Reference Standard: | ISO 8178 |

The NOx, HC, CO and PM emission data tabulated here were taken from a single engine under the test conditions shown above. Data for the other components are estimated. These data are subject to instrumentation and engine-to-engine variability. Field emissions test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation,fuel specification, test procedures and instrumentation. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.