225 Schilling Circle, Suite 400
Hunt Valley, MD 21031
Telephone: 410-584-7000
Fax: 410-771-1625
www.eaest.com

EA Engineering, Science, and Technology, Inc., PBC

RECEIVED
OCT 20 2016
WV DEP / DIV OF AIR QUALITY

18 October 2016

William F. Durham
Director, Division of Air Quality
West Virginia Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

RE: Air Quality Permit for Four Emergency Generators at the Needy Road Facility in Martinsburg, West Virginia

Dear Mr. Durham:

EA Engineering, Science, and Technology, Inc., PBC, (EA) on behalf of the General Service Administration (GSA) is requesting a General Permit Registration for four existing Class II emergency generators located at the Needy Road Facility, 244 Needy Road, Martinsburg, West Virginia.

Pursuant to the requirements of West Virginia Code 45 CSR 13, EA is submitting an *Application for General Permit Registration to Construct, Modify, Relocate or Administratively Update a Stationary source of Air Pollution (G-60C)* for four (4) emergency generators. Permit application forms, emission calculations and supporting documents are included as part of this submission. The four emergency generators are classified as "existing" under 40 CFR Part 63 Subpart ZZZZ and are not subject to 40 CFR Part 60, Subpart IIII, New Source Performance Standards (NSPS). This application is being submitted per the requirements in WV 45 CSR 13.

The permit registration application fee has been included with this submittal, as follows: check payable to State of West Virginia, WVDEP for $500.00.

If you have any questions or comments, or need further information, please contact me at 410-584-7000, extension 5913.

Sincerely,

Marcia W Thiess
Senior Engineer
mthiess@eaest.com

cc: Jeffrey Smith - GSA
Christi Davis – GSA
Scott Wooten – GSA

Attachments

RECEIVED
OCT 20 2016
WV DEP / DIV OF AIR QUALITY

APPLICATION FOR GENERAL PERMIT REGISTRATION (G60-C)
CLASS II EMERGENCY GENERATORS

GENERAL SERVICES ADMINSITRATION
NEEDY ROAD FACILITY

October 2016

Prepared for:

General Services Administration
244 Needy Road
Martinsburg, West Virginia 25405-9431

Prepared by:

EA Engineering, Science, and Technology, Inc., PBC
225 Schilling Circle
Hunt Valley, MD 21031
(410) 584-7000

APPLICATION FOR GENERAL PERMIT REGISTRATION (G60-C)
CLASS II EMERGENCY GENERATORS

GENERAL SERVICES ADMINSITRATION
NEEDY ROAD FACILITY

TABLE OF CONTENTS

Application for General Permit Registration to Construct, Modify, Relocate, or Administratively Update a Stationary Source of Air Pollutants

ATTACHMENTS

Attachment B.	Process Description
Attachment D.	Process Flow Diagram
Attachment E.	Plot Plan
Attachment F.	Area Map
Attachment G.	Affected Source Sheets
Attachment I.	Emissions Calculations
Attachment J.	Class I Legal Advertisement
Attachment L.	General Permit Registration Application Fee.
Attachment O.	Emissions Summary Sheets

**** Note — There are no Attachments A, C, H, K, M, and N for this permit application. This facility is a General Services Administration, an agency of the federal government, and does not have a business certificate.**
All four emission units (EG-1 through EG-4) are existing emergency generators with respect to 40 CFR 63 Subpart ZZZZ. This application is being submitted per the requirements in WV 45 CSR 13.

WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY
601 57th Street, SE
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

X 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): General Services Administration

2. Federal Employer ID No. **(FEIN):** 44-0553234F

3. Applicant's mailing address: 300 Virginia St E, Room 1620
Charleston, WV 25301-2503

4. Applicant's physical address: 244 Needy Road
Martinsburg, WV 25405-9431

5. If applicant is a subsidiary corporation, please provide the name of parent corporation: United States of America - General Services Administration

6. **WV BUSINESS REGISTRATION.** Is the applicant a resident of the State of West Virginia? **YES** ☐ **NO** Not Applicable

➪ IF **YES,** provide a copy of the Certificate of **Incorporation/ Organization / Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A**.

➪ IF **NO,** provide a copy of the **Certificate of Authority / Authority of LLC / 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.): Office facility

8a. Standard Industrial Classification Classification (SIC) code: 9229 - Public Order and Safety

AND

8b. North American Industry System (NAICS) code:

9. DAQ Plant ID No. (for existing facilities only): ___ ___ ___ - ___ ___ ___ ___ ___

10. List all current 45CSR13 and other General Permit numbers associated with this process (for existing facilities only):

RECEIVED
OCT 20 2016
WV DEP / DIV OF AIR QUALITY

Date of Last Application Revision 10/18/2013

A: PRIMARY OPERATING SITE INFORMATION

11A. Facility name of primary operating site:	12A. Address of primary operating site:
Needy Road Federal Building	Mailing: 244 Needy Road Martinsburg, WV 25405-9431 Physical: (Same)

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: Owns site

➪ 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. Include a **MAP** as **Attachment F**.

From WV Route 9 (Veterans Memorial HIghway) exit onto Opequon Connector, heading northeast. At interesction of Opequon Connector, turn right onto Rt. 115 (Charles Town Rd.), and head southeast to Irs Access Rd. Turn left onto Irs Access Rd, then turn left onto Needy Rd. The Needy Road facility will be on the right.

15A. Nearest city or town:	16A. County:	17A. UTM Coordinates:
Baker Heights, WV	Berkeley County	Northing (KM): 4347693.4 Easting (KM): 279214.8 Zone: 18

18A. Briefly describe the proposed new operation or change (s) to the facility:	19A. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):
Four existing emergency generators	Latitude: 39.417922 Longitude: -77.916236

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:
	Mailing: Physical:

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: Northing (KM): _____ Easting (KM): _____ Zone: _____
18B. Briefly describe the proposed new operation or change (s) to the facility:		19B. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: _____ Longitude: _____

C: 2ND ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits):

11C. Name of 2nd alternate operating site:	12C. Address of 2nd alternate operating site: Mailing:_____ Physical:_____

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: Northing (KM): _____ Easting (KM): _____ Zone: _____
18C. Briefly describe the proposed new operation or change (s) to the facility:		19C. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: _____ Longitude: _____

20. Provide the date of anticipated installation or change:	21. Date of anticipated Start-up if registration is granted:
____/____/____ ☒ this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: : ____/____/____ See Attachment B Process Description	____/____/____

22. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application if other than 8760 hours/year. (Note: anything other than 24/7/52 may result in a restriction to the facility's operation).

Hours per day 2 Days per week 5 Weeks per year 50 Percentage of operation _____

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.

25. 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) _____
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 _____ 10/6/16
(please use blue ink) Responsible Official Date

Name & Title Jeffrey Smith, Charleston Field Office Manager (Acting)
(please print or type)

Signature _____
(please use blue ink) Authorized Representative (if applicable) Date

Applicant's Name General Services Administration - Needy Road Federal Building

Phone & Fax (681) 313-4193 (215) 446-6167
Phone Fax

Email Scott.Wooten@GSA.gov

ATTACHMENT B

Process Description

ATTACHMENT B
PROCESS DESCRIPTION

APPLICATION FOR GENERAL PERMIT (G60-C)
CLASS II EMERGENCY GENERATOR
NEEDY ROAD FACILITY, MARTINSBURG, WV

The General Services Administration (GSA) operates a federal office building on 244 Needy Road, Martinsburg, West Virginia. To ensure uninterruptible electrical power, the site is equipped with four emergency generators. These generators are diesel powered and are used for onsite electrical demands only during times of disrupted utility-supplied power.

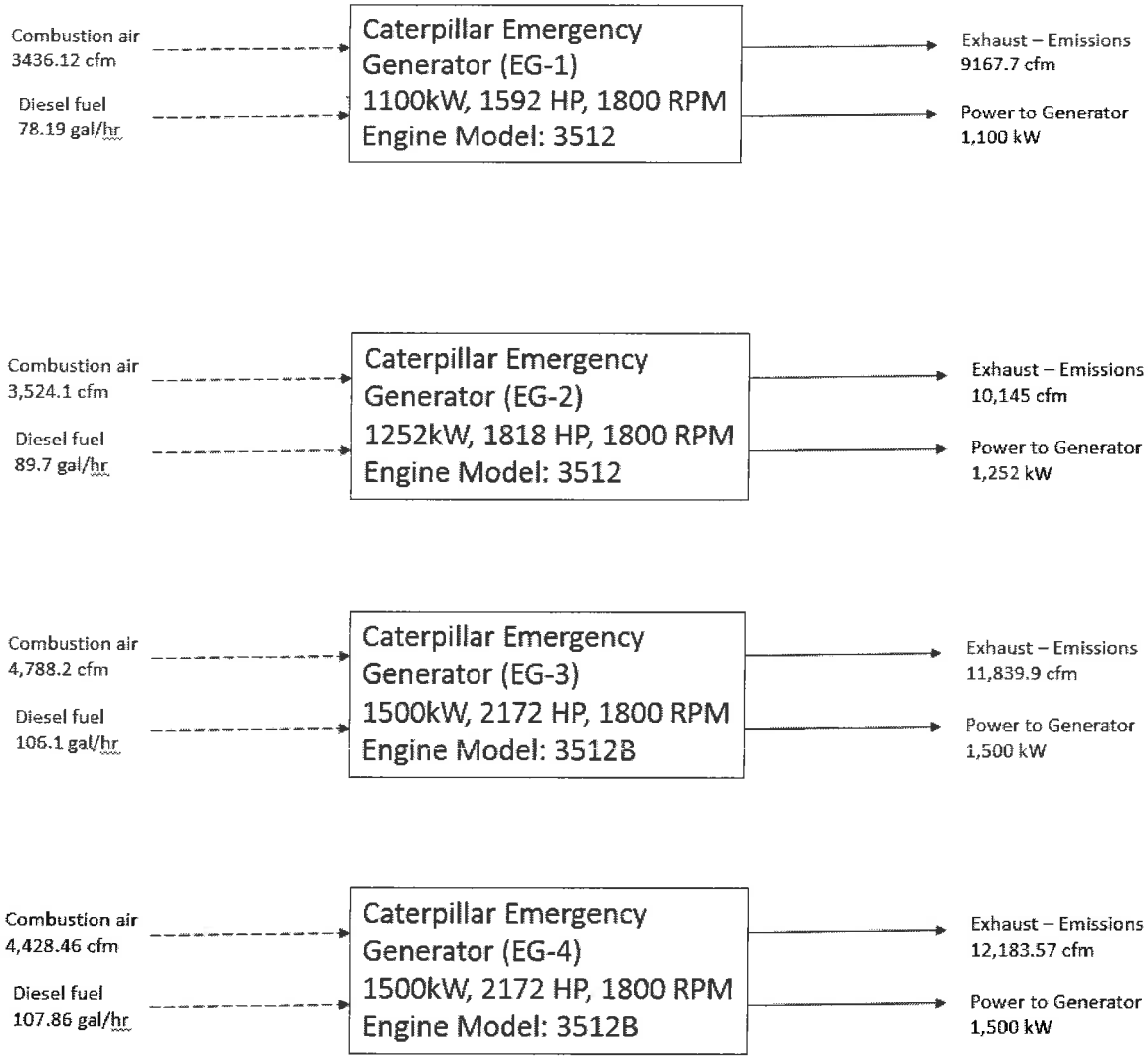
The first Caterpillar diesel-fired, standby emergency generator (EG-1) was installed in 1989 with an engine power of 1,592 HP and maximum power output of 1,100 kW. The second Caterpillar diesel-fired, standby emergency generator (EG-2) was installed in 1993, and has an engine power of 1,818 HP and a maximum power output of 1,250 kW. The third and fourth Caterpillar diesel-fired, standby emergency generators (EG-3 and EG-4) were installed in 2000 and 2006, respectively, and each have an engine power of 2,172 HP and a maximum power output of 1,500kW.

ATTACHMENT D

Process Flow Diagram

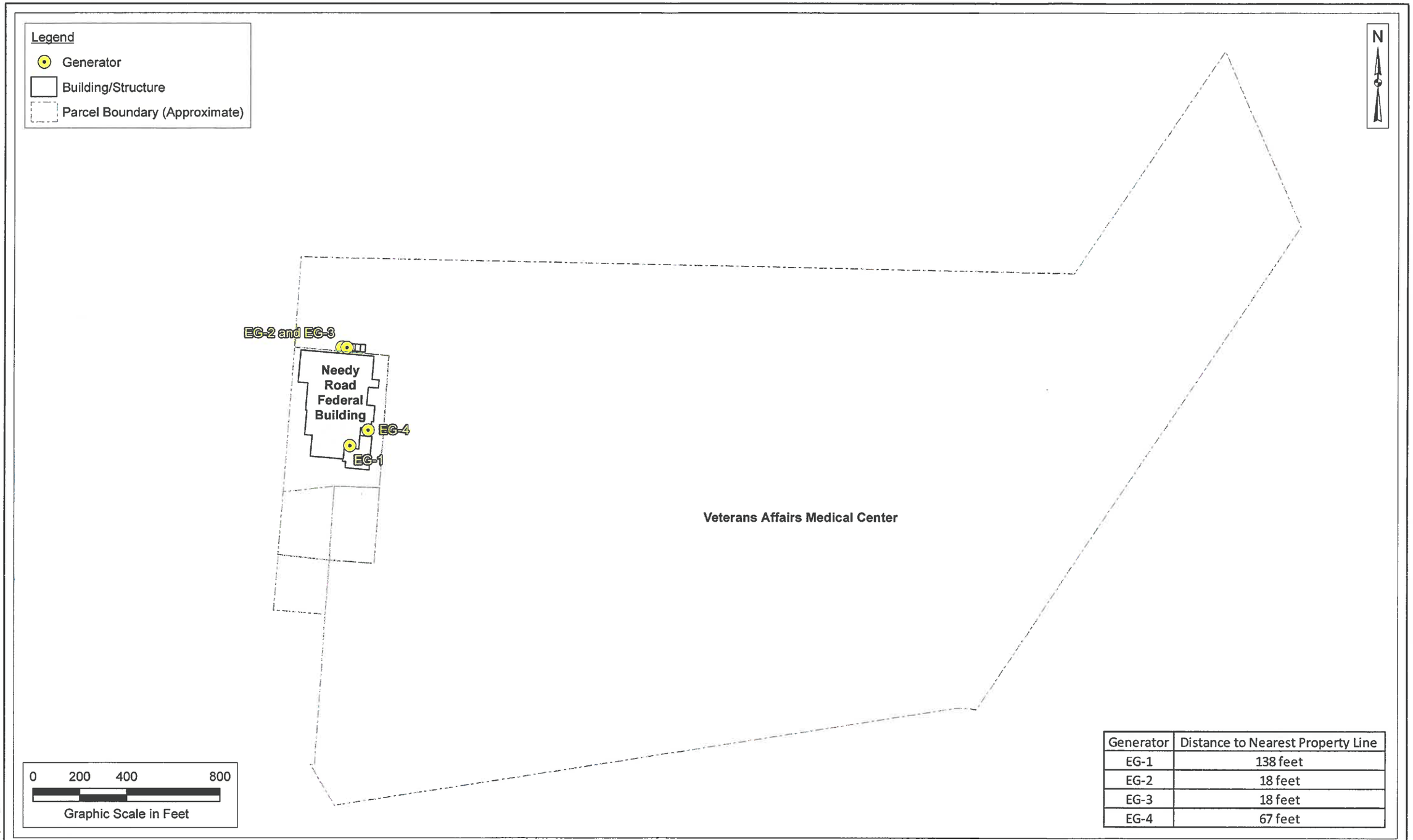
ATTACHMENT D
PROCESS FLOW DIAGRAM

APPLICATION FOR GENERAL PERMIT (G60-C)
CLASS II EMERGENCY GENERATOR
FEDERAL BUILDING, MARTINSBURG, WV



ATTACHMENT E

Plot Plan



Generator	Distance to Nearest Property Line
EG-1	138 feet
EG-2	18 feet
EG-3	18 feet
EG-4	67 feet

EA Engineering, Science, and Technology, Inc., PBC

NEEDY ROAD FEDERAL BUILDING
MARTINSBURG, WEST VIRGINIA

SITE PLOT PLAN

DESIGNED BY	DRAWN BY	DATE	PROJECT NO.
JK	JK	MAY 2016	6292209
CHECKED BY	PROJECT MGR.	DRAWING NO.	FIGURE
MWT	MWT	—	1

G:\E\Projects\WVGS\MXD\NeedyRoad_v2.mxd

ATTACHMENT F

Area Map

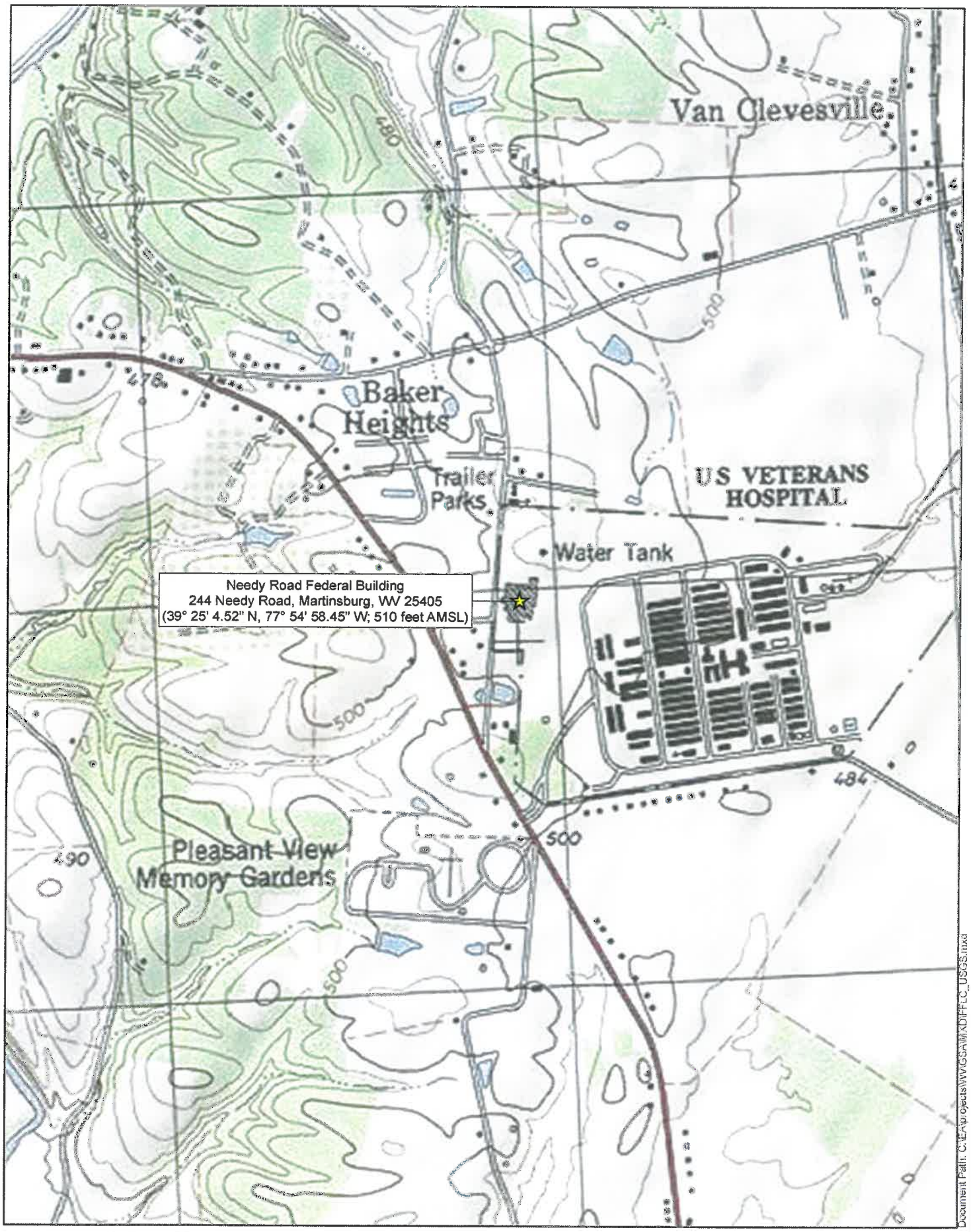


Figure 2
Needy Road Federal Building
244 Needy Road, Martinsburg, WV 25405

Feet 0 250 500 1,000

ATTACHMENT G

Affected Source Sheets

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.**

NOTE: All four emission units (EG-1 through EG-4) are existing emergency generators with respect to 40 CFR 63 Subpart ZZZZ. This application is being submitted per the requirements in WV 45 CSR 13.

EMERGENCY GENERATOR ENGINE DATA SHEET

Source Identification Number[1]		EG-1		EG-2		EG-3	
Engine Manufacturer and Model		Caterpillar/3512		Caterpillar/3512		Caterpillar/3512B	
Manufacturer's Rated bhp/rpm		1,592 bhp (1,100 kW)		1,818 bhp (1,252 kW)		2,172 bhp (1,500 kW)	
Source Status2		ES		ES		ES	
Date Installed/Modified/Removed[3]		Installed 1989		Installed 1993		Installed 2000	
Engine Manufactured/Reconstruction Date[4]		August 1989		August 1993		September 2000	
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart IIII? (Yes or No)[5]		No		No		No	
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No)[6]		No		No		No	
Engine, Fuel and Combustion Data	Engine Type[7]	CI		CI		CI	
	APCD Type[8]	NA		NA		NA	
	Fuel Type[9]	2FO		2FO		2FO	
	H_2S (gr/100 scf)	NA		NA		NA	
	Operating bhp/rpm	1592/1800		1818/1800		2172/1800	
	BSFC (Btu/bhp-hr)						
	Fuel throughput (gal/hr)	78.19		89.7		106.1	
	Fuel throughput (gal/yr)	39,095		44,850		53,050	
	Operation (hrs/yr)	500		500		500	
Reference[10]	Potential Emissions[11]	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
AP-42	NO_X	35.66	8.92	40.72	10.18	48.65	12.16
AP-42	CO	9.47	2.37	10.82	2.70	12.92	3.23
AP-42	VOC	0.91	0.23	1.04	0.26	1.25	0.31
AP-42	SO_2	0.017	0.0042	0.019	0.0048	0.023	0.0058
AP-42	PM_{10}	0.64	0.16	0.73	0.18	0.87	0.22

EMERGENCY GENERATOR ENGINE DATA SHEET

Source Identification Number[1]		EG-4					
Engine Manufacturer and Model		Caterpillar/3512B					
Manufacturer's Rated bhp/rpm		2,172 bhp (1,500 kW)					
Source Status[2]		ES					
Date Installed/Modified/Removed[3]		Installed 2006					
Engine Manufactured/Reconstruction Date[4]		March 2006					
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart IIII? (Yes or No)[5]		No					
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No)[6]		No					
Engine, Fuel and Combustion Data	Engine Type[7]	CI					
	APCD Type[8]	NA					
	Fuel Type[9]	2FO					
	H_2S (gr/100 scf)	NA					
	Operating bhp/rpm	2172/1800					
	BSFC (Btu/bhp-hr)						
	Fuel throughput (gal/hr)	107.86					
	Fuel throughput (gal/yr)	53,930					
	Operation (hrs/yr)	500					
Reference[10]	Potential Emissions[11]	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
AP-42	NO_X	48.65	12.16				
AP-42	CO	12.92	3.23				
AP-42	VOC	1.25	0.31				
AP-42	SO_2	0.023	0.0058				
AP-42	PM_{10}	0.87	0.22				

1. Enter the appropriate Source Identification Number for each emergency generator. Generator engines should be designated EG-1, EG-2, EG-3 etc. If more than three (3) engines exist, please use additional sheets.

2. Enter the Source Status using the following codes:

NS	Construction of New Source (installation)	ES	Existing Source
MS	Modification of Existing Source	RS	Removal of Source

3. Enter the date (or anticipated date) of the engine's installation (construction of source), modification or removal.

4. Enter the date that the engine was manufactured, modified or reconstructed.

5. Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart IIII. If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance according to 40CFR§60.4210 as appropriate.

   Provide a manufacturer's data sheet for all engines being registered.

6. Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart JJJJ. If so, the engine and control device must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance according to 40CFR§60.4243a(2)(i) through (iii), as appropriate.

   Provide a manufacturer's data sheet for all engines being registered.

7. Enter the Engine Type designation(s) using the following codes:

LB2S	Lean Burn Two Stroke	RB4S	Rich Burn Four Stroke
LB4S	Lean Burn Four Stroke		

8. Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes:

A/F	Air/Fuel Ratio	IR	Ignition Retard
HEIS	High Energy Ignition System	SIPC	Screw-in Precombustion Chambers
PSC	Prestratified Charge	LEC	Low Emission Combustion
NSCR	Rich Burn & Non-Selective Catalytic Reduction	SCR	Lean Burn & Selective Catalytic Reduction

9. Enter the Fuel Type using the following codes:

PQ	Pipeline Quality Natural Gas	RG	Raw Natural Gas
2FO	#2 Fuel Oil	LPG	Liquid Propane Gas

10. Enter the Potential Emissions Data Reference designation using the following codes. Attach all referenced data to this *Compressor/Generator Data Sheet(s)*.

MD	Manufacturer's Data	AP	AP-42	
GR	GRI-HAPCalc™	OT	Other _____	(please list)

11. Enter each engine's Potential to Emit (PTE) for the listed regulated pollutants in pounds per hour and tons per year. PTE shall be calculated at manufacturer's rated brake horsepower and may reflect reduction efficiencies of listed Air Pollution Control Devices. Emergency generator engines may use 500 hours of operation when calculating PTE. PTE data from this data sheet shall be incorporated in the *Emissions Summary Sheet.*

GEN SET PERFORMANCE DATA [24Z02890]

OCTOBER 28, 2015

For Help Desk Phone Numbers Click here

Performance Number: TM3399

Change Level: 09

Sales Model: 3512 DITA **Combustion:** DI **Aspr:** TA

Engine Power:
1100 W/O F EKW
1,592 HP

Speed: 1,800 RPM **After Cooler:** JWAC

Manifold Type: DRY **Governor Type:** WDWRD **After Cooler Temp(F):** 180

Turbo Quantity: **Engine App:** GS **Turbo Arrangement:**

Hertz: 60 **Application Type:** GEN SET-DIE **Engine Rating:** GS **Strategy:**

Rating Type: STANDBY **Certification:**

General Performance Data

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL BSFC LB/BHP-HR	FUEL RATE GPH	INTAKE MFLD TEMP DEG F	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH MFLD TEMP DEG F	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
1,100	100	1559	217.27	0.35	78.19	193.82	55.05	3,436.12	1,150.16	901.76	9,167.7
990	90	1401	195.22	0.35	69.74	190.58	48.8	3,160.67	1,089.32	865.4	8,203.61
880	80	1244	173.32	0.35	62.58	187.52	41.46	2,892.27	1,040.72	855.5	7,444.34
825	75	1166	162.44	0.35	59.1	186.26	37.85	2,761.61	1,021.28	850.28	7,080.6
770	70	1088	151.57	0.36	55.61	185	34.29	2,634.48	1,004.36	844.16	6,720.39
660	60	933	129.96	0.37	48.66	182.84	27.42	2,383.74	970.7	828.86	6,003.5
550	50	779	108.49	0.38	41.77	180.68	20.94	2,136.54	933.26	809.96	5,293.67
440	40	629	87.6	0.39	35.03	178.52	15.31	1,896.4	879.44	784.22	4,597.97
330	30	476	66.28	0.41	28.19	176.36	10.31	1,656.26	809.42	747.32	3,895.21
275	25	399	55.55	0.43	24.7	175.46	8.11	1,543.25	766.76	721.58	3,542.06
220	20	321	44.67	0.46	21.24	174.74	6.4	1,454.97	714.2	679.46	3,224.23
110	10	162	22.48	0.61	14.21	173.84	3.85	1,310.18	588.92	570.74	2,609.76

Engine Heat Rejection Data

GEN PWR EKW	PERCENT LOAD	REJ TO JW BTU/MN	REJ TO ATMOS BTU/MN	REJ TO EXHAUST BTU/MN	EXH RCOV TO 350F BTU/MN	FROM OIL CLR BTU/MN	FROM AFT CLR BTU/MN	WORK ENERGY BTU/MN	LHV ENERGY BTU/MN	HHV ENERGY BTU/MN
1,100	100	39,979.5	6,767.5	65,969.1	35,714.3	8,928.6	9,326.7	66,139.7	167,823.0	178,742.0
990	90	35,828.0	6,540.0	58,746.6	30,539.1	8,018.6	7,336.2	59,429.0	149,681.5	159,406.3
880	80	32,131.5	6,369.4	52,661.5	27,354.4	7,222.5	5,459.5	52,718.4	134,326.7	143,084.6
825	75	30,311.7	6,255.7	49,704.3	25,818.9	6,767.5	4,606.5	49,419.9	126,819.8	135,066.0
770	70	28,434.9	6,142.0	46,747.0	24,283.4	6,369.4	3,810.3	46,121.5	119,313.0	127,104.2
660	60	24,738.4	5,914.5	40,946.3	21,212.5	5,573.2	2,331.7	39,581.4	104,413.1	111,237.5
550	50	21,098.7	5,687.0	35,316.2	18,198.4	4,777.1	1,080.5	33,041.4	89,626.9	95,484.5
440	40	17,629.7	5,459.5	29,970.4	15,184.3	3,980.9	113.7	26,672.0	75,182.0	80,072.8
330	30	14,160.6	5,232.0	24,624.7	12,056.4	3,184.7	-625.6	20,188.8	60,452.7	64,433.6
275	25	12,397.6	5,118.3	21,894.9	10,464.1	2,843.5	-909.9	16,890.4	53,002.7	56,471.8
220	20	10,634.7	5,004.5	19,222.0	8,644.2	2,445.4	-1,137.4	13,591.9	45,552.8	48,566.9
110	10	7,051.9	4,720.2	13,762.5	5,118.3	1,649.2	-1,364.9	6,881.3	30,482.3	32,472.7

EXHAUST Sound Data: 4.92 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,100	100	114	104	119	115	107	105	106	106	104
990	90	113	103	118	114	106	104	105	105	103
880	80	112	102	117	113	105	103	105	104	102
825	75	111	102	116	112	104	103	104	104	102
770	70	111	101	116	112	104	102	104	103	102
660	60	110	100	115	111	103	101	103	102	101
550	50	109	99	114	110	102	100	102	101	99
440	40	108	98	113	109	101	99	100	100	98
330	30	106	97	111	107	99	98	99	99	97
275	25	105	96	110	106	98	97	98	98	96
220	20	105	95	110	106	98	96	97	97	95
110	10	103	93	108	104	96	94	95	95	93

EXHAUST Sound Data: 22.97 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,100	100	100	92	108	102	94	92	93	93	90
990	90	99	91	107	102	93	91	92	92	89
880	80	98	90	106	101	92	90	91	91	88
825	75	98	89	106	100	92	90	91	90	88
770	70	97	89	105	100	91	89	90	90	87
660	60	96	88	104	99	90	88	89	89	86
550	50	95	87	103	98	89	87	88	88	85
440	40	94	86	102	96	88	86	87	87	84
330	30	93	84	101	95	86	85	86	85	83
275	25	92	83	100	94	86	84	85	85	82
220	20	91	83	99	93	85	83	84	84	81
110	10	89	81	97	91	83	81	82	82	79

EXHAUST Sound Data: 49.21 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,100	100	94	85	102	96	87	86	86	86	83
990	90	93	84	101	95	86	85	85	85	82
880	80	92	83	100	94	85	84	84	84	82
825	75	91	83	99	94	85	83	84	84	81
770	70	91	82	99	93	84	83	84	83	81
660	60	90	81	98	92	83	82	83	82	80
550	50	89	80	97	91	82	81	81	81	79
440	40	88	79	96	90	81	80	80	80	77
330	30	86	78	94	88	80	78	79	79	76
275	25	85	77	93	88	79	77	78	78	75
220	20	85	76	93	87	78	77	77	77	74
110	10	83	74	91	85	76	75	75	75	72

MECHANICAL Sound Data: 3.28 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,100	100	104	91	99	100	98	99	100	98	102
990	90	104	91	99	100	98	99	100	98	102
880	80	104	91	99	100	98	99	100	98	102
825	75	104	91	99	100	98	99	100	98	102
770	70	104	91	99	100	98	99	100	98	102
660	60	104	91	99	100	98	99	100	98	102
550	50	104	91	99	100	98	99	100	98	102
440	40	104	91	99	100	98	99	100	98	102
330	30	104	91	99	100	98	99	100	98	102
275	25	104	91	99	100	98	99	100	98	102
220	20	104	91	99	100	98	99	100	98	102
110	10	102	89	97	98	96	97	98	96	100

MECHANICAL Sound Data: 22.97 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCJ 8000HZ DB
1,100	100	92	80	87	88	86	87	88	86	90
990	90	92	80	87	88	86	87	88	86	90
880	80	92	80	87	88	86	87	88	86	90
825	75	92	80	87	88	86	87	88	86	90
770	70	92	80	87	88	86	87	88	86	90
660	60	92	80	87	88	86	87	88	86	90
550	50	92	80	87	88	86	87	88	86	90
440	40	92	80	87	88	86	87	88	86	90
330	30	92	80	87	88	86	87	88	86	90
275	25	92	80	87	88	86	87	88	86	90
220	20	92	80	87	88	86	87	88	86	90
110	10	90	78	85	86	84	85	86	84	88

MECHANICAL Sound Data: 49.21 FEET

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,100	100	87	74	81	82	80	81	83	80	84
990	90	87	74	81	82	80	81	83	80	84
880	80	87	74	81	82	80	81	83	80	84
825	75	87	74	81	82	80	81	83	80	84
770	70	87	74	81	82	80	81	83	80	84
660	60	87	74	81	82	80	81	83	80	84
550	50	87	74	81	82	80	81	83	80	84
440	40	87	74	81	82	80	81	83	80	84
330	30	87	74	81	82	80	81	83	80	84
275	25	87	74	81	82	80	81	83	80	84
220	20	87	74	81	82	80	81	83	80	84
110	10	85	72	79	80	78	79	81	78	82

EMISSIONS DATA

Certification:

To properly apply this data you must refer to performance parameter DM1176 for additional information...

REFERENCE EXHAUST STACK DIAMETER	10 IN
WET EXHAUST MASS	--
WET EXHAUST FLOW (-- STACK TEMP)	--
WET EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	--
DRY EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	--
FUEL FLOW RATE	--

Altitude Capability Data(Corrected Power Altitude Capability)

Ambient Operating Temp. / Altitude	50 F	68 F	86 F	104 F	122 F	NORMAL
0 FT	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp
984.25 FT	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp
1,640.42 FT	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp
3,280.84 FT	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp
4,921.26 FT	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp
6,561.68 FT	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,591.79 hp	1,567.65 hp	1,591.79 hp
8,202.1 FT	1,591.79 hp	1,591.79 hp	1,568.99 hp	1,519.38 hp	1,472.44 hp	1,591.79 hp
9,842.52 FT	1,577.04 hp	1,523.4 hp	1,473.78 hp	1,426.85 hp	1,382.59 hp	1,573.02 hp
10,498.69 FT	1,538.15 hp	1,485.85 hp	1,436.23 hp	1,390.64 hp	1,347.73 hp	1,539.49 hp

The powers listed above and all the Powers displayed are Corrected Powers

Identification Reference and Notes

Engine Arrangement:	7C1300	**Lube Oil Press @ Rated Spd(PSI):**	55.8
Effective Serial No:	24Z08548	**Piston Speed @ Rated Eng SPD(FT/Min):**	2,244.1
Primary Engine Test Spec:	0T6273	**Max Operating Altitude(FT):**	9,455.4
Performance Parm Ref:	TM5738	**PEEC Elect Control Module Ref**	
Performance Data Ref:	TM3399	**PEEC Personality Cont Mod Ref**	
Aux Coolant Pump Perf Ref:			
Cooling System Perf Ref:	TD3097	**Turbocharger Model**	TV9211-1.70VTF
Certification Ref:		**Fuel Injector**	9Y0136
Certification Year:		**Timing-Static (DEG):**	--
Compression Ratio:	13.0	**Timing-Static Advance (DEG):**	--
Combustion System:	DI	**Timing-Static (MM):**	--
Aftercooler Temperature (F):	180	**Unit Injector Timing (MM):**	86.8
Crankcase Blowby Rate(CFH):	794.6	**Torque Rise (percent)**	--
Fuel Rate (Rated RPM) No Load(Gal/HR):	8.1	**Peak Torque Speed RPM**	--
Lube Oil Press @ Low Idle Spd(PSI):	20.0	**Peak Torque (LB.FT):**	--

Reference Number: TM3399

NOTE: ALSO USES ENGINE ARRANGEMENT 8N5806

Parameters Reference: TM5738

GEN SET - DIESEL

TOLERANCES:
AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES. EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING TOLERANCES.

Power	+/- 3%
Exhaust Stack Temperature	+/- 8%
Generator Power	+/- 5%
Inlet Airflow	+/- 5%
Intake Manifold Pressure-gage	+/- 10%
Exhaust Flow	+/- 6%
Specific Fuel Consumption	+/- 3%
Fuel Rate	+/- 5%
Heat Rejection	+/- 5%
Heat Rejection - Exhaust Only	+/- 10%

T4i Tolerance Exceptions
C15: Power Tolerance +4% , -0%
C27: Power Tolerance +0% , -4%

CONDITIONS:
ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS OF 99 KPA (29.31 IN HG) AND 25 DEG C (77 DEG F).

THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND TEMPERATURE IN ACCORDANCE WITH SAE J1995. ALSO INCLUDED IS A CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A LOWER HEATING VALUE OF 42,780 KJ/KG (18,390 BTU/LB) WHEN USED AT 29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.002 LB/GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL
APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE DATA IS CORRECTED TO SAE J1995, ISO 3046-2 & 8665 & 2288 & 9249 & 1585, EEC 80/1269 AND DIN70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS, AND CHARGING ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT

TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON THE PERFORMANCE DATA SET.

ALTITUDE:
ALTITUDE CAPABILITY - THE RECOMMENDED REDUCED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT TEMPERATURES.

COLUMN "N" DATA - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR INLET DURING NORMAL ENGINE OPERATION.

NORMAL TEMPERATURE - THE NORMAL TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS IS FOUND ON TM2001.

THE GENERATOR POWER CURVE TABULAR DATA REPRESENTS THE NET ELECTRICAL POWER OUTPUT OF THE GENERATOR.

GENERATOR SET RATINGS

EMERGENCY STANDBY POWER (ESP)

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY
OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE ESP RATING. TYPICAL OPERATION IS 50 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 200 HOURS PER YEAR.

STANDBY POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY
OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE STANDBY POWER RATING. TYPICAL OPERATION IS 200 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 500 HOURS PER YEAR.

PRIME POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70% OF THE PRIME POWER RATING. TYPICAL PEAK DEMAND IS 100% OF PRIME RATED EKW WITH 10% OVERLOAD CAPABILITY FOR EMERGENCY USE FOR A MAXIMUM OF 1 HOUR IN 12. OVERLOAD OPERATION CANNOT EXCEED 25 HOURS PER YEAR.

CONTINUOUS POWER RATING

OUTPUT AVAILABLE WITH NON-VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70-100% OF THE CONTINUOUS POWER RATING. TYPICAL PEAK DEMAND IS 100% OF CONTINUOUS RATED EKW FOR 100% OF OPERATING HOURS.

SOUND DEFINITIONS:

Sound Power : DM8702
Sound Pressure : TM7080

Date Released : 03/14/12

Caterpillar Confidential: **Green**
Content Owner: Commercial Processes Division
Web Master(s): PSG Web Based Systems Support
Current Date: Wednesday, October 28, 2015 8:16:00 PM
© Caterpillar Inc. 2015 All Rights Reserved.
Data Privacy Statement.

PERFORMANCE DATA[TM3401]

October 28, 2015

Performance Number: TM3401 **Change Level: 11**

SALES MODEL:	3512	**COMBUSTION:**	DI
ENGINE POWER (BHP):	1,818	**ENGINE SPEED (RPM):**	1,800
GEN POWER W/O FAN (EKW):	1,252.0	**HERTZ:**	60
COMPRESSION RATIO:	13	**ASPIRATION:**	TA
RATING LEVEL:	STANDBY	**AFTERCOOLER TYPE:**	JWAC
PUMP QUANTITY:	1	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC+AC
FUEL TYPE:	DIESEL	**AFTERCOOLER TEMP (F):**	180
MANIFOLD TYPE:	DRY	**JACKET WATER TEMP (F):**	210.2
GOVERNOR TYPE:	WOODWARD	**TURBO CONFIGURATION:**	PARALLEL
CAMSHAFT TYPE:	STANDARD	**TURBO QUANTITY:**	2
IGNITION TYPE:	CI	**TURBOCHARGER MODEL:**	TV9215-48T-2.00
INJECTOR TYPE:	MUI	**COMBUSTION STRATEGY:**	LOW BSFC
FUEL INJECTOR:	1113718	**CRANKCASE BLOWBY RATE (FT3/HR):**	907.5
UNIT INJECTOR TIMING (IN):	86.90	**FUEL RATE (RATED RPM) NO LOAD (GAL/HR):**	8.1
REF EXH STACK DIAMETER (IN):	10	**PISTON SPD @ RATED ENG SPD (FT/MIN):**	2,244.1
MAX OPERATING ALTITUDE (FT):	3,274		

INDUSTRY	SUBINDUSTRY	APPLICATION
ELECTRIC POWER	STANDARD	GENERATOR SET

General Performance Data

GENSET POWER WITHOUT FAN	PERCENT LOAD	ENGINE POWER	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	ENGINE OUTLET TEMP
EKW	%	BHP	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	DEG F
1,252.0	100	1,764	246	0.356	89.7	54.1	194.4	1,271.5	1,011.7
1,126.8	90	1,583	221	0.353	79.9	47.7	190.9	1,207.0	972.3
1,001.6	80	1,405	196	0.353	70.9	40.5	187.9	1,162.1	942.3
939.0	75	1,316	183	0.355	66.6	36.8	186.5	1,142.8	932.0
876.4	70	1,227	171	0.356	62.5	33.3	185.2	1,123.5	923.5
751.2	60	1,051	146	0.363	54.5	26.3	183.0	1,084.8	910.6
626.0	50	875	122	0.373	46.6	19.6	180.9	1,044.7	898.2
500.8	40	703	98	0.387	38.8	13.5	177.8	978.0	872.6
375.6	30	530	74	0.411	31.1	8.0	174.5	885.7	828.1
313.0	25	443	62	0.430	27.3	5.6	173.1	830.1	795.6
250.4	20	356	50	0.460	23.4	3.4	171.7	768.0	755.0
125.2	10	179	25	0.607	15.6	0.2	170.1	624.9	638.0

GENSET POWER WITHOUT FAN	PERCENT LOAD	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
EKW	%	BHP	IN-HG	DEG F	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
1,252.0	100	1,764	57	347.5	3,524.1	10,145.0	15,552.0	16,180.0	3,389.9	3,060.5
1,126.8	90	1,583	50	320.2	3,238.0	9,057.1	13,498.5	14,057.8	3,109.7	2,807.6
1,001.6	80	1,405	43	291.2	2,959.1	8,100.5	11,812.8	12,309.3	2,840.9	2,564.9
939.0	75	1,316	39	276.4	2,814.7	7,647.1	11,068.0	11,534.5	2,701.8	2,439.2
876.4	70	1,227	35	261.7	2,669.5	7,207.0	10,367.9	10,805.3	2,561.8	2,312.9
751.2	60	1,051	28	232.3	2,387.0	6,366.4	9,074.3	9,455.5	2,284.4	2,062.4
626.0	50	875	21	203.2	2,108.0	5,571.8	7,874.2	8,200.3	2,017.6	1,821.5
500.8	40	703	15	174.8	1,855.6	4,809.8	6,672.8	6,944.7	1,775.1	1,602.6
375.6	30	530	9	147.5	1,630.6	4,075.9	5,471.5	5,689.3	1,556.2	1,404.9
313.0	25	443	7	135.1	1,530.2	3,721.4	4,874.7	5,065.5	1,457.6	1,316.0
250.4	20	356	4	123.7	1,437.7	3,374.2	4,278.6	4,442.2	1,365.8	1,233.1
125.2	10	179	1	108.7	1,278.9	2,704.3	3,108.6	3,217.5	1,211.3	1,093.6

Heat Rejection Data

GENSET POWER WITHOUT FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHUAST RECOVERY TO 350F	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
EKW	%	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
1,252.0	100	1,764	46,236	7,166	77,287	44,644	10,294	9,611	74,790	192,513	205,075
1,126.8	90	1,583	41,059	6,881	67,617	38,329	9,156	7,450	67,145	171,419	182,605
1,001.6	80	1,405	36,341	6,597	59,658	33,213	8,133	5,460	59,567	152,208	162,139
939.0	75	1,316	34,125	6,483	56,129	31,003	7,643	4,524	55,799	143,014	152,346
876.4	70	1,227	31,961	6,369	52,719	28,947	7,166	3,640	52,036	134,054	142,801
751.2	60	1,051	27,752	6,085	46,120	25,193	6,256	2,104	44,556	116,860	124,485
626.0	50	875	23,599	5,801	39,693	21,723	5,345	853	37,122	99,933	106,453
500.8	40	703	19,624	5,535	33,518	18,180	4,425	-103	29,795	83,322	88,759
375.6	30	530	15,682	5,288	27,447	14,431	3,523	-798	22,472	66,781	71,138
313.0	25	443	13,707	5,178	24,424	12,518	3,102	-1,053	18,796	58,498	62,315
250.4	20	356	11,727	5,062	21,400	10,645	2,675	-1,250	15,098	50,178	53,452
125.2	10	179	7,752	4,778	15,326	6,559	1,767	-1,478	7,610	33,390	35,569

Emissions Data

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITHOUT FAN		EKW	1,252.0	939.0	626.0	313.0	125.2
PERCENT LOAD		%	100	75	50	25	10
ENGINE POWER		BHP	1,764	1,316	875	443	179
TOTAL NOX (AS NO2)		G/HR	17,887	15,846	12,037	5,958	2,210
TOTAL CO		G/HR	4,918	2,675	1,845	1,193	797
TOTAL HC		G/HR	269	469	499	420	355
PART MATTER		G/HR	725.1	372.4	325.4	239.0	137.4
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	4,752.4	5,687.3	6,477.9	4,482.8	1,755.8
TOTAL CO	(CORR 5% O2)	MG/NM3	1,306.8	960.1	992.9	897.5	632.5
TOTAL HC	(CORR 5% O2)	MG/NM3	71.1	168.4	268.3	316.1	282.7
PART MATTER	(CORR 5% O2)	MG/NM3	192.6	133.7	175.1	179.8	109.1
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	2,233	2,705	2,914	2,035	977
TOTAL CO	(CORR 5% O2)	PPM	990	731	736	677	498
TOTAL HC	(CORR 5% O2)	PPM	113	263	402	481	433
TOTAL NOX (AS NO2)		G/HP-HR	10.14	12.04	13.75	13.44	12.32
TOTAL CO		G/HP-HR	2.79	2.03	2.11	2.69	4.44
TOTAL HC		G/HP-HR	0.15	0.36	0.57	0.95	1.98
PART MATTER		G/HP-HR	0.41	0.28	0.37	0.54	0.77
TOTAL NOX (AS NO2)		LB/HR	39.43	34.93	26.54	13.14	4.87
TOTAL CO		LB/HR	10.84	5.90	4.07	2.63	1.76
TOTAL HC		LB/HR	0.59	1.04	1.10	0.93	0.78
PART MATTER		LB/HR	1.60	0.82	0.72	0.53	0.30

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITHOUT FAN		EKW	1,252.0	939.0	626.0	313.0	125.2
PERCENT LOAD		%	100	75	50	25	10
ENGINE POWER		BHP	1,764	1,316	875	443	179
TOTAL NOX (AS NO2)		G/HR	14,906	13,205	10,030	4,965	1,842
TOTAL CO		G/HR	2,732	1,486	1,025	663	443
TOTAL HC		G/HR	202	353	375	316	267
TOTAL CO2		KG/HR	875	634	466	253	121
PART MATTER		G/HR	517.9	266.0	232.4	170.7	98.2
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	3,960.3	4,739.4	5,398.2	3,735.7	1,463.2
TOTAL CO	(CORR 5% O2)	MG/NM3	726.0	533.4	551.6	498.6	351.4
TOTAL HC	(CORR 5% O2)	MG/NM3	53.5	126.6	201.7	237.7	212.5
PART MATTER	(CORR 5% O2)	MG/NM3	137.6	95.5	125.1	128.4	77.9
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,861	2,254	2,428	1,696	814
TOTAL CO	(CORR 5% O2)	PPM	550	406	409	376	276
TOTAL HC	(CORR 5% O2)	PPM	85	198	302	362	325
TOTAL NOX (AS NO2)		G/HP-HR	8.45	10.04	11.46	11.20	10.26
TOTAL CO		G/HP-HR	1.55	1.13	1.17	1.50	2.47
TOTAL HC		G/HP-HR	0.11	0.27	0.43	0.71	1.49

PART MATTER	G/HP-HR	0.29	0.20	0.27	0.39	0.55
TOTAL NOX (AS NO2)	LB/HR	32.86	29.11	22.11	10.95	4.06
TOTAL CO	LB/HR	6.02	3.28	2.26	1.46	0.98
TOTAL HC	LB/HR	0.45	0.78	0.83	0.70	0.59
TOTAL CO2	LB/HR	1,928	1,398	1,028	558	266
PART MATTER	LB/HR	1.14	0.59	0.51	0.38	0.22
OXYGEN IN EXH	%	9.4	10.3	11.5	11.7	10.5
DRY SMOKE OPACITY	%	4.2	2.9	4.6	2.5	1.0
BOSCH SMOKE NUMBER		1.49	1.07	1.55	0.90	0.37

Altitude Derate Data

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	30	40	50	60	70	80	90	100	110	120	130	NORMAL
ALTITUDE (FT)												
0	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,818		1,818
1,000	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,818		1,818
2,000	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,818	1,789	1,758		1,818
3,000	1,818	1,818	1,818	1,818	1,818	1,818	1,787	1,755	1,724	1,694		1,818
4,000	1,818	1,818	1,818	1,818	1,787	1,754	1,722	1,691	1,661	1,633		1,778
5,000	1,818	1,818	1,789	1,755	1,721	1,689	1,659	1,629	1,601	1,573		1,725
6,000	1,793	1,757	1,723	1,690	1,658	1,627	1,598	1,569	1,541	1,515		1,672
7,000	1,727	1,692	1,659	1,627	1,596	1,567	1,538	1,511	1,484	1,459		1,621
8,000	1,662	1,629	1,597	1,566	1,537	1,508	1,481	1,454	1,429	1,404		1,571
9,000	1,599	1,567	1,537	1,507	1,479	1,451	1,425	1,399	1,375	1,351		1,523
10,000	1,539	1,508	1,478	1,450	1,423	1,396	1,371	1,346	1,323	1,300		1,475
11,000												
12,000												
13,000												
14,000												
15,000												

Cross Reference

Engine Arrangement			
Arrangement Number	Effective Serial Number	Engineering Model	Engineering Model Version
7C5185	24Z00001	E274	-

Supplementary Data

Type	Classification	Performance Number
SOUND	SOUND PRESSURE	DM8779

General Notes

General Notes TM3401 - 11
SOUND PRESSURE DATA FOR THIS RATING CAN BE FOUND IN PERFORMANCE NUMBER - DM8779

Performance Parameter Reference

Parameters Reference:DM9600-08
PERFORMANCE DEFINITIONS

PERFORMANCE DEFINITIONS DM9600

PERFORMANCE DATA[TM3401]

APPLICATION:
Engine performance tolerance values below are representative of a typical production engine tested in a calibrated dynamometer test cell at SAE J1995 standard reference conditions. Caterpillar maintains ISO9001:2000 certified quality management systems for engine test Facilities to assure accurate calibration of test equipment. Engine test data is corrected in accordance with SAE J1995. Additional reference material SAE J1228, J1349, ISO 8665, 3046-1:2002E, 3046-3:1989, 1585, 2534, 2288, and 9249 may apply in part or are similar to SAE J1995. Special engine rating request (SERR) test data shall be noted.

PERFORMANCE PARAMETER TOLERANCE FACTORS:

Power	+/- 3%
Torque	+/- 3%
Exhaust stack temperature	+/- 8%
Inlet airflow	+/- 5%
Intake manifold pressure-gage	+/- 10%
Exhaust flow	+/- 6%
Specific fuel consumption	+/- 3%
Fuel rate	+/- 5%
Specific DEF consumption	+/- 3%
DEF rate	+/- 5%
Heat rejection	+/- 5%
Heat rejection exhaust only	+/- 10%
Heat rejection CEM only	+/- 10%

Heat Rejection values based on using treated water.

Torque is included for truck and industrial applications, do not use for Gen Set or steady state applications.

On C7 - C18 engines, at speeds of 1100 RPM and under these values are provided for reference only, and may not meet the tolerance listed.

These values do not apply to C280/3600. For these models, see the tolerances listed below.

C280/3600 HEAT REJECTION TOLERANCE FACTORS:

Heat rejection	+/- 10%
Heat rejection to Atmosphere	+/- 50%
Heat rejection to Lube Oil	+/- 20%
Heat rejection to Aftercooler	+/- 5%

TEST CELL TRANSDUCER TOLERANCE FACTORS:

Torque	+/- 0.5%
Speed	+/- 0.2%
Fuel flow	+/- 1.0%
Temperature	+/- 2.0 C degrees
Intake manifold pressure	+/- 0.1 kPa

OBSERVED ENGINE PERFORMANCE IS CORRECTED TO SAE J1995 REFERENCE AIR AND FUEL CONDITIONS.

REFERENCE ATMOSPHERIC INLET AIR
FOR 3500 ENGINES AND SMALLER
SAE J1228 AUG2002 for marine engines, and J1995 JAN2014 for other engines, reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity at the stated aftercooler water temp, or inlet manifold temp.

FOR 3600 ENGINES
Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JANJAN2014 reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity and 150M altitude at the stated aftercooler water temperature.

MEASUREMENT LOCATION FOR INLET AIR TEMPERATURE
Location for air temperature measurement air cleaner inlet at

stabilized operating conditions.

REFERENCE EXHAUST STACK DIAMETER
The Reference Exhaust Stack Diameter published with this dataset is only used for the calculation of Smoke Opacity values displayed in this dataset. This value does not necessarily represent the actual stack diameter of the engine due to the variety of exhaust stack adapter options available. Consult the price list, engine order or general dimension drawings for the actual stack diameter size ordered or options available.

REFERENCE FUEL
DIESEL
Reference fuel is #2 distillate diesel with a 35API gravity;
A lower heating value is 42,780 KJ/KG (18,390 BTU/LB) when used at 29 (84.2), where the density is 838.9 G/Liter (7.001 Lbs/Gal).

GAS
Reference natural gas fuel has a lower heating value of 33.74 KJ/L (905 BTU/CU Ft). Low BTU ratings are based on 18.64 KJ/L (500 BTU/CU FT) lower heating value gas. Propane ratings are based on 87.56 KJ/L (2350 BTU/CU Ft) lower heating value gas.

ENGINE POWER (NET) IS THE CORRECTED FLYWHEEL POWER (GROSS) LESS EXTERNAL AUXILIARY LOAD
Engine corrected gross output includes the power required to drive standard equipment; lube oil, scavenge lube oil, fuel transfer, common rail fuel, separate circuit aftercooler and jacket water pumps. Engine net power available for the external (flywheel) load is calculated by subtracting the sum of auxiliary load from the corrected gross flywheel out put power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators. For Tier 4 ratings additional Parasitic losses would also include Intake, and Exhaust Restrictions.

ALTITUDE CAPABILITY
Altitude capability is the maximum altitude above sea level at standard temperature and standard pressure at which the engine could develop full rated output power on the current performance data set.

Standard temperature values versus altitude could be seen on TM2001.

When viewing the altitude capability chart the ambient temperature is the inlet air temp at the compressor inlet.

Engines with ADEM MEUI and HEUI fuel systems operating at conditions above the defined altitude capability derate for atmospheric pressure and temperature conditions outside the values defined, see TM2001.

Mechanical governor controlled unit injector engines require a setting change for operation at conditions above the altitude defined on the engine performance sheet. See your Caterpillar technical representative for non standard ratings.

REGULATIONS AND PRODUCT COMPLIANCE
TMI Emissions information is presented at 'nominal' and 'Potential Site Variation' values for standard ratings. No tolerances are applied to the emissions data. These values are subject to change at any time. The controlling federal and local emission requirements need to be verified by your Caterpillar technical representative.

Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.

EMISSIONS DEFINITIONS:
Emissions : DM1176

PERFORMANCE DATA[TM3401]

HEAT REJECTION DEFINITIONS:
Diesel Circuit Type and HHV Balance : DM9500

HIGH DISPLACEMENT (HD) DEFINITIONS:
3500: EM1500

RATING DEFINITIONS:
Agriculture : TM6008

Fire Pump : TM6009

Generator Set : TM6035

Generator (Gas) : TM6041

Industrial Diesel : TM6010

Industrial (Gas) : TM6040

Irrigation : TM5749

Locomotive : TM6037

Marine Auxiliary : TM6036

Marine Prop (Except 3600) : TM5747

Marine Prop (3600 only) : TM5748

MSHA : TM6042

Oil Field (Petroleum) : TM6011

Off-Highway Truck : TM6039

On-Highway Truck : TM6038

SOUND DEFINITIONS:
Sound Power : DM8702

Sound Pressure : TM7080

Date Released : 7/7/15

GEN SET PACKAGE PERFORMANCE DATA [6WN00688]

OCTOBER 29, 2015

For Help Desk Phone Numbers Click here

Performance Number: DM2053

Change Level: 09

Sales Model: 3512BDITA **Combustion:** DI **Aspr:** TA

Engine Power:
1500 W/F EKW 1545 W/O F EKW
2,172 HP

Speed: 1,800 RPM **After Cooler:** JWAC

Manifold Type: DRY **Governor Type:** ADEM **After Cooler Temp(F):** 194

Turbo Quantity: 4 **Engine App:** GP **Turbo Arrangement:** Parallel

Hertz: 60 **Application Type:** PACKAGE-DIE **Engine Rating:** PGS **Strategy:** Low BSFC Strategy

Rating Type: STANDBY **Certification:** N-C 1970 - 2100

General Performance Data

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL BSFC LB/BHP-HR	FUEL RATE GPH	INTAKE MFLD TEMP DEG F	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH MFLD TEMP DEG F	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
1,500	100	2153	299.94	0.35	107.86	224.24	79.54	4,428.46	1,293.98	943.52	12,183.57
1,350	90	1940	270.21	0.35	96.85	221.72	73.62	4,230.7	1,231.34	887.72	11,152.38
1,200	80	1728	240.77	0.35	85.27	218.3	66.13	3,955.25	1,166.9	826.52	9,930.49
1,125	75	1623	226.12	0.34	79.57	217.04	61.95	3,789.27	1,143.14	796.28	9,287.77
1,050	70	1517	211.32	0.34	73.41	214.52	55.14	3,559.72	1,109.48	765.32	8,503.78
900	60	1307	182.17	0.34	63.8	211.1	43.95	3,107.69	1,056.02	740.66	7,257.17
750	50	1099	153.02	0.35	54.71	208.04	34.35	2,705.11	1,004.72	721.4	6,190.67
600	40	895	124.59	0.36	46.02	205.16	26.24	2,351.96	954.68	702.5	5,283.08
450	30	688	95.87	0.38	37.35	202.1	19.31	2,034.13	903.74	683.42	4,495.56
375	25	584	81.37	0.4	33.05	200.66	16.29	1,892.87	878.18	673.7	4,149.48
300	20	479	66.72	0.42	28.72	199.04	13.5	1,762.2	846.14	659.84	3,824.58
150	10	266	37.13	0.52	19.94	195.62	8.05	1,567.97	715.1	586.04	3,178.32

Engine Heat Rejection Data

GEN W/F EKW	PERCENT LOAD	REJ TO JW BTU/MN	REJ TO ATMOS BTU/MN	REJ TO EXHAUST BTU/MN	EXH RCOV TO 350F BTU/MN	FROM OIL CLR BTU/MN	FROM AFT CLR BTU/MN	WORK ENERGY BTU/MN	LHV ENERGY BTU/MN	HHV ENERGY BTU/MN
1,500	100	56,699.3	8,871.7	90,764.3	49,874.9	11,601.5	19,733.8	91,276.2	232,484.1	247,668.3
1,350	90	51,126.0	8,018.6	79,447.2	42,823.0	10,407.2	16,606.0	82,233.8	207,347.6	220,882.6
1,200	80	45,666.5	7,336.2	68,471.3	35,202.5	9,156.0	13,535.0	73,248.4	182,836.7	194,722.5
1,125	75	42,936.8	7,051.9	63,068.7	31,449.0	8,530.5	11,942.7	68,812.5	170,723.4	181,869.9
1,050	70	40,263.9	6,824.4	57,779.8	27,411.3	7,904.9	10,407.2	64,319.8	158,780.7	169,131.0
900	60	35,031.9	6,312.6	47,941.3	22,463.6	6,824.4	7,563.7	55,448.1	135,862.1	144,733.8
750	50	30,027.3	5,857.6	39,297.1	18,539.6	5,857.6	5,232.0	46,576.4	114,308.5	121,758.4
600	40	25,250.2	5,402.6	31,904.0	15,241.1	4,947.7	3,298.4	37,932.2	94,347.1	100,489.1

450	30	20,643.8	4,947.7	25,420.8	12,397.6	3,980.9	1,819.8	29,174.2	75,295.7	80,243.4
375	25	18,369.0	4,777.1	22,577.3	11,146.5	3,525.9	1,251.1	24,738.4	66,139.7	70,461.8
300	20	16,094.2	4,549.6	19,961.3	9,895.4	3,071.0	796.2	20,302.6	57,211.1	60,907.6
150	10	11,658.3	4,094.6	15,582.3	6,596.9	2,161.1	284.4	11,317.1	40,036.4	42,652.4

EXHAUST Sound Data: 4.92 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,500	100	116	107	121	117	109	108	109	109	107
1,350	90	115	106	120	116	108	107	108	108	106
1,200	80	114	105	119	115	107	106	107	107	105
1,125	75	114	104	119	115	107	105	107	107	105
1,050	70	113	104	118	114	106	105	106	106	104
900	60	112	102	117	113	105	104	105	105	103
750	50	111	101	116	112	104	102	104	104	102
600	40	110	100	115	111	103	101	102	102	100
450	30	108	98	113	109	101	100	101	101	99
375	25	107	97	112	108	100	99	100	100	98
300	20	106	97	111	107	99	98	99	99	97
150	10	104	94	109	105	97	95	97	97	95

EXHAUST Sound Data: 22.97 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,500	100	103	94	111	105	97	95	96	96	93
1,350	90	102	93	110	104	96	94	95	95	92
1,200	80	101	92	109	103	95	93	94	94	91
1,125	75	101	92	109	103	94	93	93	93	90
1,050	70	100	91	108	102	94	92	93	92	90
900	60	99	90	107	101	92	91	91	91	89
750	50	98	89	106	100	91	90	90	90	87
600	40	96	88	104	98	90	88	89	89	86
450	30	95	86	103	97	88	87	87	87	84
375	25	94	85	102	96	87	86	86	86	84
300	20	93	84	101	95	86	85	86	85	83
150	10	91	82	99	93	84	83	83	83	80

EXHAUST Sound Data: 49.21 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,500	100	96	88	104	99	90	88	89	89	86
1,350	90	95	87	103	98	89	87	88	88	85
1,200	80	94	86	102	97	88	86	87	87	84
1,125	75	94	85	102	96	87	86	87	86	84
1,050	70	93	85	101	96	87	85	86	86	83
900	60	92	84	100	94	86	84	85	85	82
750	50	91	82	99	93	85	83	84	83	81
600	40	90	81	98	92	83	82	82	82	79
450	30	88	79	96	90	82	80	81	81	78
375	25	87	79	95	89	81	79	80	80	77
300	20	86	78	94	88	80	78	79	79	76
150	10	84	75	92	86	78	76	77	77	74

MECHANICAL Sound Data: 3.28 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,500	100	111	113	123	113	105	100	100	98	102
1,350	90	111	113	123	113	105	100	100	98	102
1,200	80	111	113	123	113	105	100	100	98	102
1,125	75	111	113	123	113	105	100	100	98	102
1,050	70	111	113	123	113	105	100	100	98	102
900	60	111	113	123	113	105	100	100	98	102
750	50	111	113	123	113	105	100	100	98	102
600	40	111	113	123	113	105	100	100	98	102
450	30	111	113	123	113	105	100	100	98	102
375	25	111	113	123	113	105	100	100	98	102
300	20	111	113	123	113	105	100	100	98	102
150	10	111	113	123	113	105	100	100	98	102

MECHANICAL Sound Data: 22.97 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCJ 8000HZ DB
1,500	100	98	100	109	100	92	88	88	86	90
1,350	90	98	100	109	100	92	88	88	86	90
1,200	80	98	100	109	100	92	88	88	86	90
1,125	75	98	100	109	100	92	88	88	86	90
1,050	70	98	100	109	100	92	88	88	86	90
900	60	98	100	109	100	92	88	88	86	90
750	50	98	100	109	100	92	88	88	86	90
600	40	98	100	109	100	92	88	88	86	90
450	30	98	100	109	100	92	88	88	86	90
375	25	98	100	109	100	92	88	88	86	90
300	20	98	100	109	100	92	88	88	86	90
150	10	98	100	109	100	92	88	88	86	90

MECHANICAL Sound Data: 49.21 FEET

GEN W/F EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
1,500	100	92	94	103	94	86	82	83	80	84
1,350	90	92	94	103	94	86	82	83	80	84
1,200	80	92	94	103	94	86	82	83	80	84
1,125	75	92	94	103	94	86	82	83	80	84
1,050	70	92	94	103	94	86	82	83	80	84
900	60	92	94	103	94	86	82	83	80	84
750	50	92	94	103	94	86	82	83	80	84
600	40	92	94	103	94	86	82	83	80	84
450	30	92	94	103	94	86	82	83	80	84
375	25	92	94	103	94	86	82	83	80	84
300	20	92	94	103	94	86	82	83	80	84
150	10	92	94	103	94	86	82	83	80	84

EMISSIONS DATA

N-C 1970 - 2100 ********** N1

Non-Certified: This engine rating is not emission certified by any domestic or foreign agency.

REFERENCE EXHAUST STACK DIAMETER	10 IN
WET EXHAUST MASS	20,339.8 LB/HR
WET EXHAUST FLOW (942.80 F STACK TEMP)	12,190.63 CFM
WET EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	4,198.00 STD CFM
DRY EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	3,845.77 STD CFM
FUEL FLOW RATE	107 GAL/HR

RATED SPEED "Potential site variation"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,500	100	2153	54.9400	13.8200	1.8200	.5800	9.5000	2.0000	1.2800
1,125	75	1623	41.9800	9.0000	1.5700	.4000	11.1000	1.3000	1.2800
750	50	1099	22.0100	8.9300	.8700	.3800	12.0000	2.1000	1.3100
375	25	584	12.0400	7.5000	.6500	.4400	13.0000	3.7000	1.3500
150	10	266	8.2500	5.0600	.5900	.3700	15.1000	3.6000	1.3300

RATED SPEED "Nominal Data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	TOTAL CO2 LB/HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT	DRY SMOKE OPACITY PERCENT	BOSCH SMOKE NUMBER
1,500	100	2153	45.7800	7.6800	1.3700	2,179.7	.4100	9.5000	2.0000	1.2800
1,125	75	1623	34.9800	5.0000	1.1800	1,586	.2900	11.1000	1.3000	1.2800
750	50	1099	18.3400	4.9600	.6500	1,085.7	.2700	12.0000	2.1000	1.3100
375	25	584	10.0300	4.1700	.4900	649.6	.3200	13.0000	3.7000	1.3500
150	10	266	6.8700	2.8100	.4500	386.9	.2600	15.1000	3.6000	1.3300

Altitude Capability Data(Corrected Power Altitude Capability)

Ambient Operating Temp. / Altitude	50 F	68 F	86 F	104 F	122 F	NORMAL
0 FT	2,172.45 hp	2,172.45 hp	2,172.45 hp	2,172.45 hp	2,172.45 hp	2,172.45 hp
984.25 FT	2,172.45 hp	2,172.45 hp	2,172.45 hp	2,172.45 hp	2,109.42 hp	2,172.45 hp
1,640.42 FT	2,172.45 hp	2,172.45 hp	2,172.45 hp	2,125.52 hp	2,059.81 hp	2,172.45 hp
3,280.84 FT	2,172.45 hp	2,137.59 hp	2,066.51 hp	2,000.8 hp	1,939.11 hp	2,109.42 hp
4,921.26 FT	2,081.26 hp	2,010.19 hp	1,944.48 hp	1,882.79 hp	1,823.79 hp	2,006.17 hp
6,561.68 FT	1,956.55 hp	1,890.84 hp	1,827.81 hp	1,770.15 hp	1,715.16 hp	1,906.93 hp
8,202.1 FT	1,838.54 hp	1,775.51 hp	1,717.85 hp	1,662.86 hp	1,610.57 hp	1,811.72 hp
9,842.52 FT	1,725.89 hp	1,666.89 hp	1,611.91 hp	1,560.95 hp	1,512.67 hp	1,720.53 hp
10,498.69 FT	1,682.98 hp	1,625.32 hp	1,571.68 hp	1,522.06 hp	1,475.12 hp	1,685.66 hp

The powers listed above and all the Powers displayed are Corrected Powers

Identification Reference and Notes

Engine Arrangement:	1282846	**Lube Oil Press @ Rated Spd(PSI):**	55.8
Effective Serial No:	6WN00803	**Piston Speed @ Rated Eng SPD(FT/Min):**	2,173.2
Primary Engine Test Spec:	2T8373	**Max Operating Altitude(FT):**	2,296.6
Performance Parm Ref:	TM5739	**PEEC Elect Control Module Ref**	
Performance Data Ref:	DM2053	**PEEC Personality Cont Mod Ref**	
Aux Coolant Pump Perf Ref:			
Cooling System Perf Ref:		**Turbocharger Model**	BTV7510-0.96
Certification Ref:		**Fuel Injector**	2563663
Certification Year:		**Timing-Static (DEG):**	--
Compression Ratio:	14.0	**Timing-Static Advance (DEG):**	--
Combustion System:	DI	**Timing-Static (MM):**	--
Aftercooler Temperature (F):	194	**Unit Injector Timing (MM):**	64.3
Crankcase Blowby Rate(CFH):	2,171.9	**Torque Rise (percent)**	--
Fuel Rate (Rated RPM) No Load(Gal/HR):	11.8	**Peak Torque Speed RPM**	--
Lube Oil Press @ Low Idle Spd(PSI):	20.0	**Peak Torque (LB.FT):**	--

Reference Number: DM2053 N-C 19702100N1

Parameters Reference: TM5739

GEN SET - PACKAGED - DIESEL

TOLERANCES:
AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES. EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING TOLERANCES.

Power	+/- 3%
Exhaust Stack Temperature	+/- 8%
Generator Power	+/- 5%
Inlet Airflow	+/- 5%
Intake Manifold Pressure-gage	+/- 10%
Exhaust Flow	+/- 6%
Specific Fuel Consumption	+/- 3%
Fuel Rate	+/- 5%
Heat Rejection	+/- 5%
Heat Rejection - Exhaust Only	+/- 10%

T4i Tolerance Exceptions
C15: Power Tolerance +4% , -0%
C27: Power Tolerance +0% , -4%

CONDITIONS:
ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS OF 99 KPA (29.31 IN HG) AND 25 DEG C (77 DEG F).

THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND TEMPERATURE IN ACCORDANCE WITH SAE J1349. ALSO INCLUDED IS A CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A LOWER HEATING VALUE OF 42,780 KJ/KG (18,390 BTU/LB) WHEN USED AT 29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.002 LB/GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL
APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE DATA IS CORRECTED TO SAE J1349, ISO 3046-2 & 8665 & 2288 & 9249 & 1585, EEC 80/1269 AND DIN70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS, AND CHARGING ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT

TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON THE PERFORMANCE DATA SET.

ALTITUDE:
ALTITUDE CAPABILITY - THE RECOMMENDED REDUCED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT TEMPERATURES.

COLUMN "N" DATA - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR INLET DURING NORMAL ENGINE OPERATION.

NORMAL TEMPERATURE - THE NORMAL TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS IS FOUND ON TM2001.

THE GENERATOR POWER CURVE TABULAR DATA REPRESENTS THE NET ELECTRICAL POWER OUTPUT OF THE GENERATOR.

GENERATOR SET RATINGS

EMERGENCY STANDBY POWER (ESP)

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY
OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE ESP RATING. TYPICAL OPERATION IS 50 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 200 HOURS PER YEAR.

STANDBY POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY
OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE STANDBY POWER RATING. TYPICAL OPERATION IS 200 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 500 HOURS PER YEAR.

PRIME POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70% OF THE PRIME POWER RATING. TYPICAL PEAK DEMAND IS 100% OF PRIME RATED EKW WITH 10% OVERLOAD CAPABILITY FOR EMERGENCY USE FOR A MAXIMUM OF 1 HOUR IN 12. OVERLOAD OPERATION CANNOT EXCEED 25 HOURS PER YEAR.

CONTINUOUS POWER RATING

OUTPUT AVAILABLE WITH NON-VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70-100% OF THE CONTINUOUS POWER RATING. TYPICAL PEAK DEMAND IS 100% OF CONTINUOUS RATED EKW FOR 100% OF OPERATING HOURS.

SOUND DEFINITIONS:

Sound Power : DM8702
Sound Pressure : TM7080

Caterpillar Confidential: **Green**
Content Owner: Commercial Processes Division
Web Master(s): PSG Web Based Systems Support
Current Date: Thursday, October 29, 2015 9:00:56 AM
© Caterpillar Inc. 2015 All Rights Reserved.
Data Privacy Statement.

Performance Number: DM8200 **Change Level: 02**

SALES MODEL:	3512B	**COMBUSTION:**	DI
ENGINE POWER (BHP):	2,172	**ENGINE SPEED (RPM):**	1,800
GEN POWER WITH FAN (EKW):	1,500.0	**HERTZ:**	60
COMPRESSION RATIO:	14	**FAN POWER (HP):**	59.5
RATING LEVEL:	STANDBY	**ASPIRATION:**	TA
PUMP QUANTITY:	2	**AFTERCOOLER TYPE:**	SCAC
FUEL TYPE:	DIESEL	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC, AC
MANIFOLD TYPE:	DRY	**AFTERCOOLER TEMP (F):**	86
GOVERNOR TYPE:	ADEM3	**JACKET WATER TEMP (F):**	210.2
ELECTRONICS TYPE:	ADEM3	**TURBO CONFIGURATION:**	PARALLEL
CAMSHAFT TYPE:	STANDARD	**TURBO QUANTITY:**	4
IGNITION TYPE:	CI	**TURBOCHARGER MODEL:**	BTVA7510-53T-0.96
INJECTOR TYPE:	EUI	**COMBUSTION STRATEGY:**	LOW BSFC
UNIT INJECTOR TIMING (IN):	64.34	**CRANKCASE BLOWBY RATE (FT3/HR):**	2,171.6
REF EXH STACK DIAMETER (IN):	10	**FUEL RATE (RATED RPM) NO LOAD (GAL/HR):**	11.8
MAX OPERATING ALTITUDE (FT):	5,906	**PISTON SPD @ RATED ENG SPD (FT/MIN):**	2,244.1

INDUSTRY	SUBINDUSTRY	APPLICATION
OIL AND GAS	LAND PRODUCTION	PACKAGED GENSET
ELECTRIC POWER	STANDARD	PACKAGED GENSET

General Performance Data

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	ENGINE OUTLET TEMP
EKW	%	BHP	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	DEG F
1,500.0	100	2,168	302	0.343	106.1	74.1	124.5	1,175.9	805.6
1,350.0	90	1,952	272	0.343	95.5	69.1	122.4	1,125.0	798.6
1,200.0	80	1,739	242	0.341	84.7	61.5	119.1	1,051.7	763.5
1,125.0	75	1,633	227	0.340	79.2	56.9	117.4	1,017.5	747.0
1,050.0	70	1,527	213	0.338	73.8	52.4	115.5	984.6	730.9
900.0	60	1,316	183	0.338	63.5	43.4	111.0	922.1	700.3
750.0	50	1,107	154	0.340	53.8	34.9	106.5	866.5	673.5
600.0	40	901	125	0.351	45.2	27.1	103.4	829.6	660.7
450.0	30	694	97	0.371	36.8	20.0	100.8	792.9	647.7
375.0	25	590	82	0.388	32.7	16.7	99.6	774.5	641.2
300.0	20	486	68	0.410	28.5	13.7	98.4	756.1	634.5
150.0	10	274	38	0.495	19.4	8.3	95.9	618.6	530.2

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
EKW	%	BHP	IN-HG	DEG F	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
1,500.0	100	2,168	78	446.9	4,788.2	11,839.9	21,182.3	21,925.1	4,600.7	4,173.5
1,350.0	90	1,952	73	419.7	4,385.6	10,784.1	19,190.3	19,859.2	4,213.8	3,822.5
1,200.0	80	1,739	64	388.9	4,071.3	9,724.5	16,815.3	17,408.4	3,908.8	3,545.9
1,125.0	75	1,633	60	372.3	3,889.0	9,157.0	15,633.9	16,189.0	3,731.2	3,384.7
1,050.0	70	1,527	55	354.9	3,700.6	8,591.1	14,453.1	14,969.9	3,547.8	3,218.3
900.0	60	1,316	46	318.9	3,340.3	7,552.8	12,377.8	12,822.3	3,201.3	2,904.0
750.0	50	1,107	37	283.1	2,987.2	6,585.1	10,544.1	10,921.0	2,857.2	2,591.9
600.0	40	901	29	253.5	2,614.1	5,662.8	8,952.9	9,269.3	2,485.1	2,254.3
450.0	30	694	22	226.7	2,233.9	4,774.5	7,480.7	7,738.4	2,119.8	1,923.0
375.0	25	590	18	213.9	2,041.9	4,340.7	6,795.3	7,024.1	1,938.7	1,758.7
300.0	20	486	15	201.1	1,847.7	3,914.5	6,069.6	6,268.8	1,759.0	1,595.7
150.0	10	274	10	174.5	1,607.4	3,093.2	4,345.9	4,481.5	1,536.4	1,393.7

Heat Rejection Data

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHUAST RECOVERY TO 350F	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
EKW	%	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
1,500.0	100	2,168	34,122	7,450	82,291	40,776	11,374	27,525	91,942	228,441	243,347
1,350.0	90	1,952	31,506	6,881	73,363	36,681	10,237	23,260	82,792	204,471	217,813
1,200.0	80	1,739	28,946	6,312	64,944	31,221	9,099	19,449	73,736	181,509	193,353
1,125.0	75	1,633	27,670	6,076	60,894	28,480	8,499	17,626	69,238	170,326	181,440
1,050.0	70	1,527	26,387	5,858	56,926	25,989	7,905	15,866	64,745	159,302	169,697
900.0	60	1,316	23,714	5,459	49,247	21,496	6,824	12,624	55,821	137,837	146,831
750.0	50	1,107	21,041	5,118	41,910	17,685	5,800	9,667	46,954	117,015	124,650
600.0	40	901	18,342	4,776	35,019	14,768	4,881	7,184	38,189	97,111	103,448
450.0	30	694	15,572	4,435	28,355	12,048	3,978	5,112	29,422	77,771	82,845
375.0	25	590	14,150	4,265	25,068	10,800	3,526	4,210	25,021	68,252	72,706
300.0	20	486	12,689	4,095	21,797	9,504	3,073	3,416	20,592	58,771	62,606
150.0	10	274	9,568	3,755	15,270	5,137	2,052	2,222	11,630	39,802	42,400

Emissions Data

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN		EKW	1,500.0	1,125.0	750.0	375.0	150.0
PERCENT LOAD		%	100	75	50	25	10
ENGINE POWER		BHP	2,168	1,633	1,107	590	274
TOTAL NOX (AS NO2)		G/HR	17,726	13,424	10,825	6,180	3,464
TOTAL CO		G/HR	5,877	4,518	3,821	3,488	3,300
TOTAL HC		G/HR	1,169	751	469	442	565
PART MATTER		G/HR	514.0	236.2	165.1	203.6	195.2
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	3,835.8	3,896.6	4,620.6	4,367.3	4,137.4
TOTAL CO	(CORR 5% O2)	MG/NM3	1,271.7	1,311.5	1,631.0	2,464.7	3,944.8
TOTAL HC	(CORR 5% O2)	MG/NM3	253.0	218.1	200.6	311.9	675.2
PART MATTER	(CORR 5% O2)	MG/NM3	111.2	68.6	70.4	143.8	233.2
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,867	1,912	2,257	2,125	2,008
TOTAL CO	(CORR 5% O2)	PPM	1,017	1,049	1,310	2,014	3,108
TOTAL HC	(CORR 5% O2)	PPM	408	347	318	511	1,099
TOTAL NOX (AS NO2)		G/HP-HR	8.18	8.22	9.78	10.47	12.63
TOTAL CO		G/HP-HR	2.71	2.77	3.45	5.91	12.03
TOTAL HC		G/HP-HR	0.54	0.46	0.42	0.75	2.06
PART MATTER		G/HP-HR	0.24	0.14	0.15	0.35	0.71
TOTAL NOX (AS NO2)		LB/HR	39.08	29.60	23.86	13.62	7.64
TOTAL CO		LB/HR	12.96	9.96	8.42	7.69	7.28
TOTAL HC		LB/HR	2.58	1.66	1.03	0.97	1.25
PART MATTER		LB/HR	1.13	0.52	0.36	0.45	0.43

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN		EKW	1,500.0	1,125.0	750.0	375.0	150.0
PERCENT LOAD		%	100	75	50	25	10
ENGINE POWER		BHP	2,168	1,633	1,107	590	274
TOTAL NOX (AS NO2)		G/HR	14,771	11,187	9,021	5,150	2,887
TOTAL CO		G/HR	3,265	2,510	2,123	1,938	1,833
TOTAL HC		G/HR	879	565	353	332	425
TOTAL CO2		KG/HR	963	714	480	290	170
PART MATTER		G/HR	367.1	168.7	117.9	145.4	139.4
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	3,196.5	3,247.2	3,850.5	3,639.4	3,447.8
TOTAL CO	(CORR 5% O2)	MG/NM3	706.5	728.6	906.1	1,369.3	2,191.6
TOTAL HC	(CORR 5% O2)	MG/NM3	190.2	164.0	150.8	234.5	507.6
PART MATTER	(CORR 5% O2)	MG/NM3	79.4	49.0	50.3	102.7	166.6
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,556	1,593	1,881	1,771	1,673
TOTAL CO	(CORR 5% O2)	PPM	565	583	728	1,119	1,727
TOTAL HC	(CORR 5% O2)	PPM	307	261	239	384	826
TOTAL NOX (AS NO2)		G/HP-HR	6.81	6.85	8.15	8.73	10.53
TOTAL CO		G/HP-HR	1.51	1.54	1.92	3.28	6.69
TOTAL HC		G/HP-HR	0.41	0.35	0.32	0.56	1.55

PART MATTER	G/HP-HR	0.17	0.10	0.11	0.25	0.51
TOTAL NOX (AS NO2)	LB/HR	32.56	24.66	19.89	11.35	6.36
TOTAL CO	LB/HR	7.20	5.53	4.68	4.27	4.04
TOTAL HC	LB/HR	1.94	1.25	0.78	0.73	0.94
TOTAL CO2	LB/HR	2,124	1,575	1,059	639	375
PART MATTER	LB/HR	0.81	0.37	0.26	0.32	0.31
OXYGEN IN EXH	%	10.6	11.4	12.6	13.6	15.5
DRY SMOKE OPACITY	%	3.7	2.1	1.9	3.6	4.0
BOSCH SMOKE NUMBER		1.36	0.71	0.63	1.33	1.46

Altitude Derate Data

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	30	40	50	60	70	80	90	100	110	120	130	140	NORMAL
ALTITUDE (FT)													
0	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,129	2,063	2,172
1,000	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,129	2,042	2,172
2,000	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,129	2,063	1,977	2,172
3,000	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,107	2,020	1,933	2,172
4,000	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,172	2,129	2,042	1,955	1,890	2,172
5,000	2,172	2,172	2,172	2,172	2,172	2,172	2,148	2,110	2,063	1,977	1,911	1,824	2,172
6,000	2,166	2,166	2,166	2,166	2,147	2,107	2,069	2,032	1,996	1,911	1,846	1,759	2,166
7,000	2,099	2,099	2,099	2,099	2,067	2,029	1,992	1,956	1,922	1,846	1,781	1,716	2,099
8,000	2,036	2,036	2,036	2,028	1,990	1,953	1,917	1,883	1,850	1,781	1,716	1,651	2,035
9,000	1,975	1,975	1,975	1,952	1,915	1,879	1,845	1,812	1,780	1,716	1,651	1,586	1,972
10,000	1,916	1,916	1,914	1,878	1,842	1,808	1,775	1,743	1,713	1,651	1,586	1,520	1,910
11,000	1,759	1,759	1,759	1,759	1,759	1,739	1,707	1,672	1,629	1,564	1,499	1,455	1,759
12,000	1,716	1,716	1,716	1,716	1,703	1,672	1,641	1,607	1,542	1,477	1,412	1,368	1,716
13,000	1,672	1,672	1,672	1,669	1,637	1,607	1,564	1,520	1,455	1,390	1,325	1,260	1,672
14,000	1,629	1,629	1,629	1,604	1,573	1,542	1,477	1,434	1,368	1,303	1,238	1,173	1,629
15,000	1,586	1,586	1,571	1,541	1,511	1,455	1,390	1,347	1,281	1,195	1,129	1,064	1,586

Cross Reference

Engine Arrangement			
Arrangement Number	Effective Serial Number	Engineering Model	Engineering Model Version
2741995	1GZ00001	GS219	-
3869554	BS500001	GS654	LS
3869554	DB800001	GS654	XJ

Supplementary Data

Type	Classification	Performance Number
AFTERCOOLER TEMP	60C	DM8201
AFTERCOOLER TEMP	90C	DM8202
SOUND	SOUND PRESSURE	DM8779

General Notes

General Notes DM8200 - 02
SOUND PRESSURE DATA FOR THIS RATING CAN BE FOUND IN PERFORMANCE NUMBER - DM8779

Performance Parameter Reference

Parameters Reference:DM9600-08

PERFORMANCE DEFINITIONS

PERFORMANCE DEFINITIONS DM9600

APPLICATION:
Engine performance tolerance values below are representative of a typical production engine tested in a calibrated dynamometer test cell at SAE J1995 standard reference conditions. Caterpillar maintains ISO9001:2000 certified quality management systems for engine test Facilities to assure accurate calibration of test equipment. Engine test data is corrected in accordance with SAE J1995. Additional reference material SAE J1228, J1349, ISO 8665, 3046-1:2002E, 3046-3:1989, 1585, 2534, 2288, and 9249 may apply in part or are similar to SAE J1995. Special engine rating request (SERR) test data shall be noted.

PERFORMANCE PARAMETER TOLERANCE FACTORS:

Power	+/- 3%
Torque	+/- 3%
Exhaust stack temperature	+/- 8%
Inlet airflow	+/- 5%
Intake manifold pressure-gage	+/- 10%
Exhaust flow	+/- 6%
Specific fuel consumption	+/- 3%
Fuel rate	+/- 5%
Specific DEF consumption	+/- 3%
DEF rate	+/- 5%
Heat rejection	+/- 5%
Heat rejection exhaust only	+/- 10%
Heat rejection CEM only	+/- 10%

Heat Rejection values based on using treated water.

Torque is included for truck and industrial applications, do not use for Gen Set or steady state applications.

On C7 - C18 engines, at speeds of 1100 RPM and under these values are provided for reference only, and may not meet the tolerance listed.

These values do not apply to C280/3600. For these models, see the tolerances listed below.

C280/3600 HEAT REJECTION TOLERANCE FACTORS:

Heat rejection	+/- 10%
Heat rejection to Atmosphere	+/- 50%
Heat rejection to Lube Oil	+/- 20%
Heat rejection to Aftercooler	+/- 5%

TEST CELL TRANSDUCER TOLERANCE FACTORS:

Torque	+/- 0.5%
Speed	+/- 0.2%
Fuel flow	+/- 1.0%
Temperature	+/- 2.0 C degrees
Intake manifold pressure	+/- 0.1 kPa

OBSERVED ENGINE PERFORMANCE IS CORRECTED TO SAE J1995 REFERENCE AIR AND FUEL CONDITIONS.

REFERENCE ATMOSPHERIC INLET AIR
FOR 3500 ENGINES AND SMALLER
SAE J1228 AUG2002 for marine engines, and J1995 JAN2014 for other engines, reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity at the stated aftercooler water temp, or inlet manifold temp.

FOR 3600 ENGINES
Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JANJAN2014 reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity and 150M altitude at the stated aftercooler water temperature.

MEASUREMENT LOCATION FOR INLET AIR TEMPERATURE
Location for air temperature measurement air cleaner inlet at stabilized operating conditions.

REFERENCE EXHAUST STACK DIAMETER
The Reference Exhaust Stack Diameter published with this dataset is only used for the calculation of Smoke Opacity values displayed in this dataset. This value does not necessarily represent the actual stack diameter of the engine due to the variety of exhaust stack adapter options available. Consult the price list, engine order or general dimension drawings for the actual stack diameter size ordered or options available.

REFERENCE FUEL
DIESEL
Reference fuel is #2 distillate diesel with a 35API gravity;
A lower heating value is 42,780 KJ/KG (18,390 BTU/LB) when used at 29 (84.2), where the density is 838.9 G/Liter (7.001 Lbs/Gal).

GAS
Reference natural gas fuel has a lower heating value of 33.74 KJ/L (905 BTU/CU Ft). Low BTU ratings are based on 18.64 KJ/L (500 BTU/CU FT) lower heating value gas. Propane ratings are based on 87.56 KJ/L (2350 BTU/CU Ft) lower heating value gas.

ENGINE POWER (NET) IS THE CORRECTED FLYWHEEL POWER (GROSS) LESS EXTERNAL AUXILIARY LOAD
Engine corrected gross output includes the power required to drive standard equipment; lube oil, scavenge lube oil, fuel transfer, common rail fuel, separate circuit aftercooler and jacket water pumps. Engine net power available for the external (flywheel) load is calculated by subtracting the sum of auxiliary load from the corrected gross flywheel out put power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators. For Tier 4 ratings additional Parasitic losses would also include Intake, and Exhaust Restrictions.

ALTITUDE CAPABILITY
Altitude capability is the maximum altitude above sea level at standard temperature and standard pressure at which the engine could develop full rated output power on the current performance data set.

Standard temperature values versus altitude could be seen on TM2001.

When viewing the altitude capability chart the ambient temperature is the inlet air temp at the compressor inlet.

Engines with ADEM MEUI and HEUI fuel systems operating at conditions above the defined altitude capability derate for atmospheric pressure and temperature conditions outside the values defined, see TM2001.

Mechanical governor controlled unit injector engines require a setting change for operation at conditions above the altitude defined on the engine performance sheet. See your Caterpillar technical representative for non standard ratings.

REGULATIONS AND PRODUCT COMPLIANCE
TMI Emissions information is presented at 'nominal' and 'Potential Site Variation' values for standard ratings. No tolerances are applied to the emissions data. These values are subject to change at any time. The controlling federal and local emission requirements need to be verified by your Caterpillar technical representative.

Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.

PERFORMANCE DATA[DM8200]

EMISSIONS DEFINITIONS:
Emissions : DM1176

HEAT REJECTION DEFINITIONS:
Diesel Circuit Type and HHV Balance : DM9500

HIGH DISPLACEMENT (HD) DEFINITIONS:
3500: EM1500

RATING DEFINITIONS:
Agriculture : TM6008

Fire Pump : TM6009

Generator Set : TM6035

Generator (Gas) : TM6041

Industrial Diesel : TM6010

Industrial (Gas) : TM6040

Irrigation : TM5749

Locomotive : TM6037

Marine Auxiliary : TM6036

Marine Prop (Except 3600) : TM5747

Marine Prop (3600 only) : TM5748

MSHA : TM6042

Oil Field (Petroleum) : TM6011

Off-Highway Truck : TM6039

On-Highway Truck : TM6038

SOUND DEFINITIONS:
Sound Power : DM8702

Sound Pressure : TM7080

Date Released : 7/7/15

ATTACHMENT I

Emission Calculations

Needy Road Facility
Potential to Emit Calculations
Emergency Generator 1

Maximum Power Output - bhp	1592 bhp

Source Description and location	Source Fuel Type		Fuel Input Rate		Annual Operation		Pollutants	Emission Factors				Potential emission estimates	
			rate	unit	rate	unit		rate	unit	source	GWP[8]	lb/hr	tons/yr
One (1) Catterpillar Emergency Generator, 1,100 kW	Diesel	CP[7]	5572	MMBtu / yr	500	hr	NOx	3.2000	lb/MMBtu	1	-	35.66	8.92
			5572	MMBtu / yr	500	hr	CO	0.8500	lb/MMBtu	1	-	9.47	2.37
			5572	MMBtu / yr	500	hr	VOC	0.0819	lb/MMBtu	1	-	0.91	0.23
			5572	MMBtu / yr	500	hr	SO_2	0.0015	lb/MMBtu	1	-	0.017	0.0042
			5572	MMBtu / yr	500	hr	PM_{10}	0.0573	lb/MMBtu	1	-	0.64	0.16
			5572	MMBtu / yr	500	hr	$PM_{2.5}$	0.0443	lb/MMBtu	1	-	0.49	0.12
		GHG	5572	MMBtu / yr	500	hr	CO_2	1.65E+02	lb/MMBtu	8	1	1838.76	459.7
			5572	MMBtu / yr	500	hr	N_2O	--	--	--	--	--	--
			5572	MMBtu / yr	500	hr	CH_4	8.10E-03	lb/MMBtu	8	25	2.26	0.56
		HAPS	5572	MMBtu / yr	500	hr	Acetaldehyde	2.52E-05	lb/MMBtu	1	-	2.81E-04	7.0E-05
			5572	MMBtu / yr	500	hr	Acrolein	7.88E-06	lb/MMBtu	1	-	8.78E-05	2.2E-05
			5572	MMBtu / yr	500	hr	Benzene	7.76E-04	lb/MMBtu	1	-	8.65E-03	2.2E-03
			5572	MMBtu / yr	500	hr	Formaldehyde	7.89E-05	lb/MMBtu	1	-	8.79E-04	2.2E-04
			5572	MMBtu / yr	500	hr	Propylene	2.79E-03	lb/MMBtu	1	-	3.11E-02	7.8E-03
			5572	MMBtu / yr	500	hr	Toluene	2.81E-04	lb/MMBtu	1	-	3.13E-03	7.8E-04
			5572	MMBtu / yr	500	hr	Xylene	1.93E-04	lb/MMBtu	1	-	2.15E-03	5.4E-04
			5572	MMBtu / yr	500	hr	Total PAH[12]	2.12E-04	lb/MMBtu	1	-	2.36E-03	5.9E-04

Notes:

1	**Emission Factor source**: AP-42 Chapter 3.4 Large stationary diesel and all stationary dual-fuel engines (Tables 3.4-1, 3.4-2, 3.4-3)
2	Uncontrolled diesel engine; PM2.5 is assumed to equal 77.25% of PM10 value (consistent with filterable particulate ratios per Table 3.4-2)
3	TOC is by weight 9% methane and 91% nonmethane (0.09 TOC lb/mmBTU); VOC = TOC - Methane
4	Fuel consumption of the boilers is based on natural gas higher heating value of 1,020 Btu/scf (AP-42, Table 1.4-1)
5	Generators energy throughput (MMBtu/hr) is based on diesel average heating value of 140,000 Btu/gal (AP-42)
6	**Conversion factors**: Average 7000 Btu/hp-hr
	Sulfur content of diesel: 0.0015%
7	**CP** = Criteria Pollutant
8	**GWP** = Global Warming Potential--**Emission Factor Source**: 40 CFR Part 98
9	**HAPS** = Hazardous Air Pollutants
10	CO_2, CH_4 emission estimates are in CO_2 equivalent
11	No Emission Factor listed for N_2O in AP 42
12	Total PAH as listed on Table 3.4-4 of AP-42 Chapter 3.4 Large stationary diesel and all stationary dual-fuel engines. PAH's include: Napthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Benzo(k)flouranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, and Benzo(g,h,I)perylene

Needy Road Facility
Potential to Emit Calculations
Emergency Generator 2

Maximum Power Output - bhp	1818 bhp

Source Description and location	Source Fuel Type		Fuel Input Rate		Annual Operation		Pollutants	Emission Factors				Potential emission estimates	
			rate	unit	rate	unit		rate	unit	source	GWP[8]	lb/hr	tons/yr
One (1) Catterpillar Emergency Generator, 1,250 kW	Diesel	CP[7]	6363	MMBtu / yr	500	hr	NOx	3.2000	lb/MMBtu	1	-	40.72	10.18
			6363	MMBtu / yr	500	hr	CO	0.8500	lb/MMBtu	1	-	10.82	2.70
			6363	MMBtu / yr	500	hr	VOC	0.0819	lb/MMBtu	1	-	1.04	0.26
			6363	MMBtu / yr	500	hr	SO_2	0.0015	lb/MMBtu	1	-	0.019	0.0048
			6363	MMBtu / yr	500	hr	PM_{10}	0.0573	lb/MMBtu	1	-	0.73	0.18
			6363	MMBtu / yr	500	hr	$PM_{2.5}$	0.0443	lb/MMBtu	1	-	0.56	0.14
		GHG	6363	MMBtu / yr	500	hr	CO_2	1.65E+02	lb/MMBtu	8	1	2099.79	524.9
			6363	MMBtu / yr	500	hr	N_2O	--	--	--	--	--	--
			6363	MMBtu / yr	500	hr	CH_4	8.10E-03	lb/MMBtu	8	25	2.58	0.64
		HAPS	6363	MMBtu / yr	500	hr	Acetaldehyde	2.52E-05	lb/MMBtu	1	-	3.21E-04	8.0E-05
			6363	MMBtu / yr	500	hr	Acrolein	7.88E-06	lb/MMBtu	1	-	1.00E-04	2.5E-05
			6363	MMBtu / yr	500	hr	Benzene	7.76E-04	lb/MMBtu	1	-	9.88E-03	2.5E-03
			6363	MMBtu / yr	500	hr	Formaldehyde	7.89E-05	lb/MMBtu	1	-	1.00E-03	2.5E-04
			6363	MMBtu / yr	500	hr	Propylene	2.79E-03	lb/MMBtu	1	-	3.55E-02	8.9E-03
			6363	MMBtu / yr	500	hr	Toluene	2.81E-04	lb/MMBtu	1	-	3.58E-03	8.9E-04
			6363	MMBtu / yr	500	hr	Xylene	1.93E-04	lb/MMBtu	1	-	2.46E-03	6.1E-04
			6363	MMBtu / yr	500	hr	Total PAH[12]	2.12E-04	lb/MMBtu	1	-	2.70E-03	6.7E-04

Notes:

1	**Emission Factor source**: AP-42 Chapter 3.4 Large stationary diesel and all stationary dual-fuel engines (Tables 3.4-1, 3.4-2, 3.4-3)
2	Uncontrolled diesel engine; PM2.5 is assumed to equal 77.25% of PM10 value (consistent with filterable particulate ratios per Table 3.4-2)
3	TOC is by weight 9% methane and 91% nonmethane (0.09 TOC lb/mmBTU); VOC = TOC - Methane
4	Fuel consumption of the boilers is based on natural gas higher heating value of 1,020 Btu/scf (AP-42, Table 1.4-1)
5	Generators energy throughput (MMBtu/hr) is based on diesel average heating value of 140,000 Btu/gal (AP-42)
6	**Conversion factors**: Average 7000 Btu/hp-hr
	Sulfur content of diesel: 0.0015%
7	**CP** = Criteria Pollutant
8	**GWP** = Global Warming Potential--**Emission Factor Source**: 40 CFR Part 98
9	**HAPS** = Hazardous Air Pollutants
10	CO_2, CH_4 emission estimates are in CO_2 equivalent
11	No Emission Factor listed for N_2O in AP 42
12	Total PAH as listed on Table 3.4-4 of AP-42 Chapter 3.4 Large stationary diesel and all stationary dual-fuel engines. PAH's include: Napthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Benzo(k)flouranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, and Benzo(g,h,I)perylene

Needy Road Facility
Potential to Emit Calculations
Emergency Generator 3

Maximum Power Output - bhp	2172 bhp

Source Description and location	Source Fuel Type		Fuel Input Rate		Annual Operation		Pollutants	Emission Factors				Potential emission estimates	
			rate	unit	rate	unit		rate	unit	source	GWP[8]	lb/hr	tons/yr
One (1) Catterpillar Emergency Generator, 1,500 kW	Diesel	CP[7]	7602	MMBtu / yr	500	hr	NOx	3.2000	lb/MMBtu	1	-	48.65	12.16
			7602	MMBtu / yr	500	hr	CO	0.8500	lb/MMBtu	1	-	12.92	3.23
			7602	MMBtu / yr	500	hr	VOC	0.0819	lb/MMBtu	1	-	1.25	0.31
			7602	MMBtu / yr	500	hr	SO_2	0.0015	lb/MMBtu	1	-	0.023	0.0058
			7602	MMBtu / yr	500	hr	PM_{10}	0.0573	lb/MMBtu	1	-	0.87	0.22
			7602	MMBtu / yr	500	hr	$PM_{2.5}$	0.0443	lb/MMBtu	1	-	0.67	0.17
		GHG	7602	MMBtu / yr	500	hr	CO_2	1.65E+02	lb/MMBtu	8	1	2508.66	627.2
			7602	MMBtu / yr	500	hr	N_2O	--	--	--	--	--	--
			7602	MMBtu / yr	500	hr	CH_4	8.10E-03	lb/MMBtu	8	25	3.08	0.77
		HAPS	7602	MMBtu / yr	500	hr	Acetaldehyde	2.52E-05	lb/MMBtu	1	-	3.83E-04	9.6E-05
			7602	MMBtu / yr	500	hr	Acrolein	7.88E-06	lb/MMBtu	1	-	1.20E-04	3.0E-05
			7602	MMBtu / yr	500	hr	Benzene	7.76E-04	lb/MMBtu	1	-	1.18E-02	2.9E-03
			7602	MMBtu / yr	500	hr	Formaldehyde	7.89E-05	lb/MMBtu	1	-	1.20E-03	3.0E-04
			7602	MMBtu / yr	500	hr	Propylene	2.79E-03	lb/MMBtu	1	-	4.24E-02	1.1E-02
			7602	MMBtu / yr	500	hr	Toluene	2.81E-04	lb/MMBtu	1	-	4.27E-03	1.1E-03
			7602	MMBtu / yr	500	hr	Xylenes	1.93E-04	lb/MMBtu	1	-	2.93E-03	7.3E-04
			7602	MMBtu / yr	500	hr	Total PAH[12]	2.12E-04	lb/MMBtu	1	-	3.22E-03	8.1E-04

Notes:

1	**Emission Factor source**: AP-42 Chapter 3.4 Large stationary diesel and all stationary dual-fuel engines (Tables 3.4-1, 3.4-2, 3.4-3)
2	Uncontrolled diesel engine; PM2.5 is assumed to equal 77.25% of PM10 value (consistent with filterable particulate ratios per Table 3.4-2)
3	TOC is by weight 9% methane and 91% nonmethane (0.09 TOC lb/mmBTU); VOC = TOC - Methane
4	Fuel consumption of the boilers is based on natural gas higher heating value of 1,020 Btu/scf (AP-42, Table 1.4-1)
5	Generators energy throughput (MMBtu/hr) is based on diesel average heating value of 140,000 Btu/gal (AP-42)
6	**Conversion factors**: Average 7000 Btu/hp-hr
	Sulfur content of diesel: 0.0015%
7	**CP** = Criteria Pollutant
8	**GWP** = Global Warming Potential--**Emission Factor Source**: 40 CFR Part 98
9	**HAPS** = Hazardous Air Pollutants
10	CO_2, CH_4 emission estimates are in CO_2 equivalent
11	No Emission Factor listed for N_2O in AP 42
12	Total PAH as listed on Table 3.4-4 of AP-42 Chapter 3.4 Large stationary diesel and all stationary dual-fuel engines. PAH's include: Napthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Benzo(k)flouranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, and Benzo(g,h,I)perylene

Needy Road Facility
Potential to Emit Calculations
Emergency Generator 4

Maximum Power Output - bhp	2172 bhp

Source Description and location	Source Fuel Type		Fuel Input Rate		Annual Operation		Pollutants	Emission Factors				Potential emission estimates	
			rate	unit	rate	unit		rate	unit	source	GWP[8]	lb/hr	tons/yr
One (1) Catterpillar Emergency Generator, 1,500 kW	Diesel	CP[7]	7602	MMBtu / yr	500	hr	NOx	3.2000	lb/MMBtu	1	-	48.65	12.16
			7602	MMBtu / yr	500	hr	CO	0.8500	lb/MMBtu	1	-	12.92	3.23
			7602	MMBtu / yr	500	hr	VOC	0.0819	lb/MMBtu	1	-	1.25	0.31
			7602	MMBtu / yr	500	hr	SO_2	0.0015	lb/MMBtu	1	-	0.023	0.0058
			7602	MMBtu / yr	500	hr	PM_{10}	0.0573	lb/MMBtu	1	-	0.87	0.22
			7602	MMBtu / yr	500	hr	$PM_{2.5}$	0.0443	lb/MMBtu	1	-	0.67	0.17
		GHG	7602	MMBtu / yr	500	hr	CO_2	1.65E+02	lb/MMBtu	8	1	2508.66	627.2
			7602	MMBtu / yr	500	hr	N_2O	--	--	--	--	--	--
			7602	MMBtu / yr	500	hr	CH_4	8.10E-03	lb/MMBtu	8	25	3.08	0.77
		HAPS	7602	MMBtu / yr	500	hr	Acetaldehyde	2.52E-05	lb/MMBtu	1	-	3.83E-04	9.6E-05
			7602	MMBtu / yr	500	hr	Acrolein	7.88E-06	lb/MMBtu	1	-	1.20E-04	3.0E-05
			7602	MMBtu / yr	500	hr	Benzene	7.76E-04	lb/MMBtu	1	-	1.18E-02	2.9E-03
			7602	MMBtu / yr	500	hr	Formaldehyde	7.89E-05	lb/MMBtu	1	-	1.20E-03	3.0E-04
			7602	MMBtu / yr	500	hr	Propylene	2.79E-03	lb/MMBtu	1	-	4.24E-02	1.1E-02
			7602	MMBtu / yr	500	hr	Toluene	2.81E-04	lb/MMBtu	1	-	4.27E-03	1.1E-03
			7602	MMBtu / yr	500	hr	Xylenes	1.93E-04	lb/MMBtu	1	-	2.93E-03	7.3E-04
			7602	MMBtu / yr	500	hr	Total PAH[12]	2.12E-04	lb/MMBtu	1	-	3.22E-03	8.1E-04

Notes:

1	**Emission Factor source**: AP-42 Chapter 3.4 Large stationary diesel and all stationary dual-fuel engines (Tables 3.4-1, 3.4-2, 3.4-3)
2	Uncontrolled diesel engine; PM2.5 is assumed to equal 77.25% of PM10 value (consistent with filterable particulate ratios per Table 3.4-2)
3	TOC is by weight 9% methane and 91% nonmethane (0.09 TOC lb/mmBTU); VOC = TOC - Methane
4	Fuel consumption of the boilers is based on natural gas higher heating value of 1,020 Btu/scf (AP-42, Table 1.4-1)
5	Generators energy throughput (MMBtu/hr) is based on diesel average heating value of 140,000 Btu/gal (AP-42)
6	**Conversion factors**: Average 7000 Btu/hp-hr
	Sulfur content of diesel: 0.0015%
7	**CP** = Criteria Pollutant
8	**GWP** = Global Warming Potential--**Emission Factor Source**: 40 CFR Part 98
9	**HAPS** = Hazardous Air Pollutants
10	CO_2, CH_4 emission estimates are in CO_2 equivalent
11	No Emission Factor listed for N_2O in AP 42
12	Total PAH as listed on Table 3.4-4 of AP-42 Chapter 3.4 Large stationary diesel and all stationary dual-fuel engines. PAH's include: Napthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Benzo(k)flouranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, and Benzo(g,h,I)perylene

ATTACHMENT J

Class I Legal Advertisement

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that the General Services Administration has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for an Emergency Generators Class II General Permit Number G60-C for four emergency generators located on 244 Needy Road, in Martinsburg in Berkeley County, West Virginia.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: 43.42 tons per year nitrogen oxides, 11.53 tons per year carbon monoxide, 1.11 tons per year volatile organic compounds, 0.78 tons per year particulate matter, 0.021 tons per year sulfur dioxide, and 0.018 tons per year hazardous air pollutants.

The application for Emergency Generators Class II General Permit Number G60-C is for four existing sources. 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 DAQ at (304) 926-0499, extension 1227, during normal business hours.

Dated this the **(Day)** day of **(Month)**, **(Year)**.

By: General Services Administration
Jeffrey Smith
Charleston Field Office Manager (Acting)
300 Virginia St E, Room 1620
Charleston, WV 25301-2503

ATTACHMENT L

General Permit Registration Application Fee

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)

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:

1. **$500 for Class II General Permit (Construction) Registration**

ATTACHMENT O

Emissions Summary Sheets

EMERGENCY GENERATOR EMISSION SUMMARY SHEET FOR CRITERIA POLLUTANTS

Emergency Generator Location: 244 Needy Road, Martinsburg WV, 25405-9431

Registration Number (Agency Use) _____

	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	35.66	9.47	0.91	0.017	0.64	8.92	2.37	0.23	0.0042	0.16
EG-2	40.72	10.82	1.04	0.019	0.73	10.18	2.70	0.26	0.0048	0.18
EG-3	48.65	12.92	1.25	0.023	0.87	12.16	3.23	0.31	0.0058	0.22
EG-4	48.65	12.92	1.25	0.0230	0.87	12.16	3.23	0.31	0.0058	0.22
Total	173.68	46.13	4.45	0.082	3.11	43.42	11.53	1.11	0.021	0.78

EMERGENCY GENERATOR EMISSION SUMMARY SHEET FOR HAZARDOUS/TOXIC POLLUTANTS

Emergency Generator Location: 244 Needy Road, Martinsburg WV, 25405-9431

Registration Number (Agency Use) _____

	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	8.65E-03	NA	3.13E-03	2.15E-03	NA	8.79E-04	2.2E-03	NA	7.8E-04	5.4E-04	NA	2.2E-04
EG-2	9.88E-03	NA	3.58E-03	2.46E-03	NA	1.00E-03	2.5E-03	NA	8.9E-04	6.1E-04	NA	2.5E-04
EG-3	1.18E-02	NA	4.27E-03	2.93E-03	NA	1.20E-03	2.9E-03	NA	1.1E-03	7.3E-04	NA	3.0E-04
EG-4	1.18E-02	NA	4.27E-03	2.93E-03	NA	1.20E-03	2.9E-03	NA	1.1E-03	7.3E-04	NA	3.0E-04
Total	4.21E-02	NA	1.53E-02	1.05E-02	NA	4.28E-03	1.05E-02	NA	3.81E-03	2.62E-03	NA	1.07E-03