

PERMIT 297743 PROJECT 155872 COPY OF RECORD

PBR New Registration

Site Information (Regulated Entity)

What is the name of the site to be authorized?

SAT 09/10

Does the site have a physical address?

Yes

Physical Address

Number and Street

15434 LAMBDA DR

City

SAN ANTONIO

State

TX

ZIP

78245

County

MEDINA

Latitude (N) (##.#####)

29.418078

Longitude (W) (-###.#####)

-98.801155

Primary SIC Code

7376

Secondary SIC Code

Primary NAICS Code

541513

Secondary NAICS Code

Regulated Entity Site Information

What is the Regulated Entity's Number (RN)?

RN109260893

What is the name of the Regulated Entity (RE)?

RAFTER 138KV SUBSTATION

Does the RE site have a physical address?

Yes

Physical Address

Number and Street

15434 LAMBDA DR

City

SAN ANTONIO

State

TX

ZIP

78245

County

MEDINA

Latitude (N) (##.#####)

29.416506

Longitude (W) (-###.#####)

-98.80583

Facility NAICS Code

221119

What is the primary business of this entity?

ELECTRIC UTILITY

Customer (Applicant) Information

How is this applicant associated with this site?

Owner Operator

What is the applicant's Customer Number (CN)?

CN603222902

Type of Customer

Corporation

Full legal name of the applicant:

Legal Name

Microsoft Corporation

Texas SOS Filing Number

10404606

Federal Tax ID

State Franchise Tax ID

19111444428

State Sales Tax ID

Local Tax ID

DUNS Number

848630133

Number of Employees

Independently Owned and Operated?

No

I certify that the full legal name of the entity applying for this permit has been provided and is legally authorized to do business in Texas.

Yes

Responsible Authority Contact

Organization Name

Microsoft Corporation

Prefix

MR

First

Reuben

Middle

Last

Thissen

Suffix

Credentials

Title

CE/Ops Program Manager

Responsible Authority Mailing Address

Enter new address or copy one from list:

Site Physical Address

Address Type

Domestic

Mailing Address (include Suite or Bldg. here, if applicable)

15434 LAMBDA DR

Routing (such as Mail Code, Dept., or Attn:)

City

SAN ANTONIO

State

TX

ZIP

78245

Phone (###-###-####)

2109122435

Extension

Alternate Phone (###-###-####)

Fax (###-###-####)

E-mail

Responsible Official Contact

Person TCEQ should contact for questions about this application:

Same as another contact?

CN603222902, Microsoft Corporation

Organization Name

Microsoft Corporation

Prefix

MR

First

Reuben

Middle

Last

Thissen

Suffix

Credentials

Title

CE/Ops Program Manager

Enter new address or copy one from list:

Mailing Address

Address Type

Domestic

Mailing Address (include Suite or Bldg. here, if applicable)

15434 LAMBDA DR

Routing (such as Mail Code, Dept., or Attn:)

City

SAN ANTONIO

State

TX
ZIP
78245
Phone (###-###-####)
2109122435
Extension

Alternate Phone (###-###-####)

Fax (###-###-####)

E-mail
reubent@microsoft.com

Technical Contact
Person TCEQ should contact for questions about this application:

Same as another contact?

Organization Name
Versar, Inc

Prefix
MR

First
Isaac

Middle

Last
Jimenez

Suffix

Credentials

Title
Environmental Scientist

Enter new address or copy one from list:

Mailing Address

Address Type
Domestic

Mailing Address (include Suite or Bldg. here, if applicable)
20250 CENTURY BLVD STE 150

Routing (such as Mail Code, Dept., or Attn:)

City
GERMANTOWN

State
MD

ZIP
20874

Phone (###-###-####)
8307762315

Extension

Alternate Phone (###-###-####)

Fax (###-###-####)

E-mail

ijimenez@versar.com

PBR General Information - New Sites

1) To determine fee amount does this business qualify as a small business, non-profit organization, or small government entity?

No

2) Are there any other registered air authorizations at this site?

No

3) Is this project located at a major site?

No

4) Does this registration require certification or is certification being submitted voluntarily?

Yes

5) Is the facility in compliance with all PBRs claimed?

Yes

6) Is the facility in compliance with all other applicable state/federal rules and regulations?

Yes

7) Is the facility in compliance with all applicable distance requirements?

Yes

Section 1 Rule Selection

Select the type of unit that is being registered.

ENGINES AND TURBINES

Select the rule(s) associated to the unit specified.

106.511

file_section

Please attach one PDF with all required documents to complete the project.

file_name

Microsoft SAT 0910

PBR_25_7_2018_signed.pdf

file_hash

FB736D15C7F9CF72DC3A868B68F4D6FF528D6D8F43E08569F5B04B7BBBF2AB1D

mime-type

application/pdf

conf-flag

No

Please attach any other necessary information needed to complete the registration.

Certification

The electronic signature below indicates that the Responsible Official has knowledge of the facts herein set forth and that the same are true, accurate, and complete to the best of my knowledge and belief. By this signature, the maximum emission rates listed on this certification reflect the maximum anticipated emissions due to the operation of this facility, and all representations in this certification of emissions are conditions upon which the facilities and sources will operate. It is understood that it is unlawful to vary from these representations unless the certification is first revised. The signature certifies that to the best of the Responsible Official's knowledge and belief, the project will satisfy the conditions and limitations of the indicated exemption or permit by rule and the facility will operated in compliance with all regulations of the Texas Commission on Environmental Quality and with Federal U.S. Environmental Protection Agency regulations governing air pollution. The signature below certifies that, based on information and belief formed after reasonable inquiry, the statements and information above and contained in the attached document(s) are true, accurate, and complete. If you have any questions on how to fill out this form or about air permits, please call (512) 239-1250. Individuals are entitled to request and review their personal information that the agency gathers on its forms.

Signing Party: I am Terry Page, the owner of the STEERS account ER066603.

Authority Confirmation: I have the authority to sign this data on behalf of the applicant named above.

Information Accuracy: I have personally examined the foregoing and am familiar with its content and the content of any attachments, and based upon my personal knowledge and/or inquiry of any individual responsible for information contained herein, that this information is true, accurate, and complete.

Password Confirmation: I further certify that I have not violated any term in my TCEQ STEERS participation agreement and that I have no reason to believe that the confidentiality or use of my password has been compromised at any time.

Signing Action: I understand that use of my password constitutes an electronic signature legally equivalent to my written signature.

Attest Fact: I also understand that the attestations of fact contained herein pertain to the implementation, oversight and enforcement of a state and/or federal environmental program and must be true and complete to the best of my knowledge.

False Information: I am aware that criminal penalties may be imposed for statements or omissions that I know or have reason to believe are untrue or misleading.

Signing Intentionally: I am knowingly and intentionally signing PBR New Registration.

Information Agreement: My signature indicates that I am in agreement with the information on this form, and authorize its submittal to the TCEQ.

Customer Number: CN603222902

Legal Name: Microsoft Corporation

Signature: OWNER OPERATOR Signature: Terry Page OWNER OPERATOR

Account Number: ER066603

Signature Ip Address: 216.59.201.186

Signature Date: 2019-02-28

Signature Hash: 96D0BF84C684919DF91DBCBBB2BE3880FAF754D08176E600D698E01BB3A04D0A

Form Hash: 6E5D1336B82EAC155230E38EFABB02D46700323E1CFF03E97AE03BACF80A2C03

Reference Number: The application reference number is 266966

Submitted By: The application was submitted by ER059954/Isaac A Jimenez

Submitted Timestamp: The application was submitted on 2019-03-06 at 10:19:19 CST

Submitted From: The application was submitted from IP address 99.78.110.60

Confirmation Number: The confirmation number is 257739

Steers Version: The STEERS version is 6.24

Form Hash: 6E5D1336B82EAC155230E38EFABB02D46700323E1CFF03E97AE03BACF80A2C03

Application Creator: This account was created by Isaac A Jimenez



20250 CENTURY BOULEVARD STE#150 • GERMANTOWN, MARYLAND 20874 • PHONE: (301) 428-9898 • FAX: (301) 428-9482

07/30/2018

Air Permits Initial Review Team
MC 161, 12100 Park 35 Circle, Building C, Third Floor
Austin, Texas 78753
(512) 239-1250

Reference: Customer Reference Number: CN603222902
Subject: Certification and Registration of Microsoft SAT 09/10 Project under PBR 106.511

To whom it may concern,

On behalf of Microsoft Corporation, please find enclosed the complete application package requesting to register and establish federally enforceable emission limits for emission sources at Microsoft's SAT 09/10 Data Center located at 15434 Lambda Drive, San Antonio, TX 78245. Registration is being requested under Permit By Rule (PBR) 106.511 for a total of forty (40) diesel emergency generators consisting of thirty(30) 2 MW generators and ten (10) 2.5 MW generators. A fee of \$450 is included in the package to register the facility and receive an official letter from TCEQ confirming the facility has been registered. Certification of emission rates is being requested to allow the facility to remain a synthetic minor facility with NOx emissions at less than 100 tpy.

The application package consists of:

1. Form PI-7 Cert
2. Core Data Form
3. Process Description and Flow Diagram
4. PBR Full Checklist
5. Table 1(a) – Emission Point Summary
6. Table 29 – Reciprocating Engines (2 MW generators)
7. Table 29 – Reciprocating Engines (2.5 MW generators)
8. Certified emissions data and calculations
9. Manufacturer's data sheet (2 MW generators)
10. Manufacturer's data sheet (2.5 MW generators)
11. Facility Plot Plan

Copies will be submitted to the TCEQ regional office and local air pollution control office as required. Please do not hesitate to contact me should you require additional information or clarification.

Sincerely,

A handwritten signature in black ink, appearing to read 'Isaac Jimenez', written over a light blue grid background.

Isaac Jimenez
Versar, Inc.



20250 CENTURY BOULEVARD STE#150 • GERMANTOWN, MARYLAND 20874 • PHONE: (301) 428-9898 • FAX: (301) 428-9482

(Acting on behalf of Microsoft Corporation)

Mobile: (830) 776-2315

ijimenez@versar.com

Cc:

TCEQ Region 13 Office

Area Director: Susan Jablonski, P.E.,

MC 172, 12100 Park 35 Circle,

Austin, TX 78753

(512)-239-6731

Region 13 – San Antonio Office

Regional Director: Joel Anderson

14250 Judson Rd.

San Antonio,

TX 78233-4480

(210)-490-3096

City of San Antonio

Mr. Stephen Barschewski,

Sanitarian Services Manager, Food and Environment Division,

San Antonio Metropolitan Health District,

332 W. Commerce St.

San Antonio, Texas 78205-2489

(210)-207-4079

Electronic cc:

Buddha Manandhar, Microsoft Corporation, bumana@microsoft.com

Reuben Thissen, Microsoft Corporation, reubent@microsoft.com

Andrew Taylor, Microsoft Corporation, andrew.taylor@microsoft.com

Jorge Gonzalez, Corgan, jorge.gonzalez@corgan.com

**Texas Commission on Environmental Quality
Certification and Registration for Permits by Rule
Form PI-7-CERT
(Page 1)**

I. Registrant Information		
A. Company or Other Legal Customer Name:		
B. Company Official Contact Information (☒ Mr. ☐ Mrs. ☐ Ms. ☐ Other _____)		
Name: Reuben Thissen		
Title: Facility Responsible Official		
Mailing Address: 15434 Lambda Dr.		
City: San Antonio	State: TX	ZIP Code: 78245
Phone:	Fax:	
E-mail Address: reubent@microsoft.com		
<i>All PBR registration responses will be sent via e-mail.</i>		
C. Technical Contact Information (☒ Mr. ☐ Mrs. ☐ Ms. ☐ Other _____)		
Name: Bharvi Patel		
Title: Project Manager		
Company Name: Versar		
Mailing Address: 20250 Century Blvd. Suite 150		
City: Germantown	State: MD	ZIP Code: 20874
Phone: 480-273-5643	Fax:	
E-mail: bpatel@versar.com		
II. Facility and Site Information		
A. Name and Type of Facility		
Facility Name: SAT09/10		
Type of Facility: ☒ Permanent ☐ Temporary		
For portable units, please provide the serial number of the equipment being authorized below.		
Serial No:	Serial No:	
B. Facility Location Information		
Street Address: 15434 Lambda Drive		
If there is no street address, provide written driving directions to the site and provide the closest city or town, county, and ZIP code for the site (attach description if additional space is needed).		
City: San Antonio	County: Bexar	ZIP Code: 78245

**Texas Commission on Environmental Quality
Certification and Registration for Permits by Rule
Form PI-7-CERT
Page 2**

II. Facility and Site Information (continued)	
C. TCEQ Core Data Form	
Is the Core Data Form (TCEQ Form Number 10400) attached?	☒ YES ☐ NO
If "NO," provide customer reference number (CN) and regulated entity number (RN) below.	
Customer Reference Number (CN): CN603222902	
Regulated Entity Number (RN):	
D. TCEQ Account Identification Number (if known):	
E. Type of Action:	
☐ Initial Application ☐ Change to Registration	
For Change to Registration provide the Registration Number:	
F. PBR number(s) claimed under 30 TAC Chapter 106	
(List all the individual rule number(s) that are being claimed.)	
106. 511	106.
106.	106.
106.	106.
G. Historical Standard Exemption or PBR	
Are you claiming a historical standard exemption or PBR?	☐ YES ☒ NO
If "YES," enter rule number(s) and associated effective date in the spaces provided below.	
Rule Number(s)	Effective Date
H. Previous Standard Exemption or PBR Registration Number	
Is this authorization for a change to an existing facility previously authorized under a standard exemption or PBR?	☐ YES ☒ NO
If "YES," enter previous standard exemption number(s) and PBR registration number(s), and associated effective dates in the spaces provided below.	
Standard Exemption and PBR Registration Number(s)	Effective Date

**Texas Commission on Environmental Quality
Certification and Registration for Permits by Rule
Form PI-7-CERT
Page 3**

II. Facility and Site Information (continued)	
I. Other Facilities at this Site Authorized by Standard Exemption, PBR, or Standard Permit	
Are there any other facilities at this site that are authorized by an Air Standard Exemption, PBR, or Standard Permit?	☐ YES ☒ NO
If "YES," enter standard exemption number(s), PBR registration number(s), and Standard Permit registration number(s), and associated effective date in the spaces provided below.	
Standard Exemption, PBR Registration, and Standard Permit Registration Number(s)	Effective Date
J. Other Air Preconstruction Permits	
Are there any other air preconstruction permits at this site?	☐ YES ☒ NO
If "YES," enter permit number(s) in the spaces provided below.	
K. Affected Air Preconstruction Permits	
Does the PBR being claimed directly affect any permitted facility?	☐ YES ☒ NO
If "YES," enter the permit number(s) in the spaces provided below.	
L. Federal Operating Permit (FOP) Requirements (30 TAC Chapter 122 Applicability)	
1. Is this facility located at a site that is required to obtain an FOP pursuant to 30 TAC Chapter 122?	☐ YES ☒ NO ☐ To Be Determined
If the site currently has an existing FOP, enter the permit number:	
Check the requirements of 30 TAC Chapter 122 that will be triggered if this certification is accepted. (check all that apply)	
☐ Initial Application for an FOP ☐ Significant Revision for an SOP ☐ Minor Revision for an SOP ☐ Operational Flexibility/Off Permit Notification for an SOP ☐ Revision for a GOP ☐ To be Determined ☐ None	
2. Identify the type(s) of FOP issued and/or FOP application(s) submitted/pending for the site. (check all that apply)	
☐ SOP ☐ GOP ☐ GOP application/revision (submitted or under APD review) ☐ N/A ☐ SOP application/revision (submitted or under APD review)	

**Texas Commission on Environmental Quality
Certification and Registration for Permits by Rule
Form PI-7-CERT
Page 4**

III. Fee Information (See Section VII. for address to send fee or go to www.tceq.texas.gov/epay to pay online.)	
A. Fee Requirements	
Is a fee required per Title 30 TAC § 106.50?	☐ YES ☒ NO
If "NO," specify the exception. There are three exceptions to paying a PBR fee. (check all that apply)	
1. Registration is solely to establish a federally enforceable emission limit.	☒
2. Registration is within six months of an initial PBR review, and it is addressing deficiencies, administrative changes, or other allowed changes.	☐
3. Registration is for a remediation project (30 TAC § 106.533).	☐
B. Fee Amount	
1. A \$100 fee is required if any of the answers in III.B.1 are "YES."	
This business has less than 100 employees.	☐ YES ☒ NO
This business has less than 6 million dollars in annual gross receipts.	☐ YES ☒ NO
This registration is submitted by a governmental entity with a population of less than 10,000.	☐ YES ☒ NO
This registration is submitted by a non-profit organization.	☐ YES ☒ NO
2. A \$450 fee is required for all other registrations.	
C. Payment Information	
Check/money order/transaction or voucher number:	
Individual or company name on check:	
Fee Amount: \$	
Was fee paid online?	☐ YES ☐ NO
IV. Technical Information Including State And Federal Regulatory Requirements	
Check the appropriate box to indicate what is included in your submittal.	
NOTE: Any technical or essential information needed to confirm that facilities are meeting the requirements of the PBR must be provided. Not providing key information could result in an automatic deficiency and voiding of the project.	
A. PBR requirements (Checklists are optional; however, your review will go faster if you provide applicable checklists.)	
Did you demonstrate that the general requirements in 30 TAC § 106.4 are met?	☒ YES ☐ NO
Did you demonstrate that the individual requirements of the specific PBR are met?	☒ YES ☐ NO
B. Confidential Information Included (If confidential information is submitted with this registration, all confidential pages must be properly marked "CONFIDENTIAL.")	☐ YES ☒ NO

**Texas Commission on Environmental Quality
Certification and Registration for Permits by Rule
Form PI-7-CERT
Page 5**

IV. Technical Information Including State And Federal Regulatory Requirements
(continued)

Check the appropriate box to indicate what is included in your submittal.

Note: Any technical or essential information needed to confirm that facilities are meeting the requirements of the PBR must be provided. Not providing key information could result in an automatic deficiency and voiding of the project.

C. Process Flow Diagram	☒ YES ☐ NO
-------------------------	---

D. Process Description	☒ YES ☐ NO
------------------------	---

E. Maximum Emissions Data and Calculations	☒ YES ☐ NO
--	---

Note: If the facilities listed in this registration are subject to the Mass Emissions Cap & Trade program under 30 TAC Chapter 101, Subchapter H, Division 3, the owner/operator of these facilities must possess NO_x allowances equivalent to the actual NO_x emissions from these facilities.

F. Is this certification being submitted to certify the emissions for the entire site?	☒ YES ☐ NO
--	---

If "NO," include a summary of the specific facilities and emissions being certified.

G. Table 1(a) (Form 10153) Emission Point Summary	☒ YES ☐ NO
---	---

H. Distances from Property Line and Nearest Off-Property Structure

Distance from this facility's emission release point to the nearest property line: 262.47 feet

Distance from this facility's emission release point to the nearest off-property structure: _____ feet

I. Project Status

Has the company implemented the project or waiting on a response from TCEQ? ☐ Implemented ☒ Waiting

J. Projected Start of Construction and Projected Start of Operation Dates

Projected Start of Construction (provide date): _____

Projected Start of Operation (provide date): _____

V. Delinquent Fees

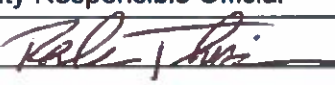
This form **will not be processed** until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ is paid in accordance with the Delinquent Fee and Penalty Protocol. For more information regarding Delinquent Fees and Penalties, go to the TCEQ website at: www.tceq.texas.gov/agency/delin/index.html.

**Texas Commission on Environmental Quality
Certification and Registration for Permits by Rule
Form PI-7-CERT
Page 6**

VI. Signature For Registration And Certification

The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which this application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7; the Texas Health and Safety Code, Chapter 382, the Texas Clean Air Act (TCAA); the air quality rules of the Texas Commission on Environmental Quality; or any local governmental ordinance or resolution enacted pursuant to the TCAA. I further state that I understand my signature indicates that this application meets all applicable nonattainment, prevention of significant deterioration, or major source of hazardous air pollutant permitting requirements. The signature further signifies awareness that intentionally or knowingly making or causing to be made false material statements or representations in the application is a criminal offense subject to criminal penalties.

Name (printed): Reuben Thissen, Facility Responsible Official

Signature (original signature required): 

Date: 07/24/18

VII. Submitting Copies of the Certification and Registration

Copies must be sent as listed below:

Processing delays may occur if copies are not sent as noted.

Who	Where	What
Air Permits Initial Review Team (APIRT)	Regular, Certified, Priority Mail MC 161, P.O. Box 13087 Austin, Texas 78711-3087 Hand Delivery, Overnight Mail MC 161, 12100 Park 35 Circle, Building C, Third Floor Austin, Texas 78753	Originals Form PI-7-CERT, Core Data Form, and all attachments. Not required if using ePermits ¹ .
Revenue Section, TCEQ	Regular, Certified, Priority Mail MC 214, P.O. Box 13088 Austin, Texas 78711-3088 Hand Delivery, Overnight Mail MC 214, 12100 Park 35 Circle, Building A, Third Floor Austin, Texas 78753	Original Money Order or Check, Copy of Form PI-7-CERT, and Core Data Form. Not required if fee was paid using ePay ² .
Appropriate TCEQ Regional Office	To find your Regional Office address, go to the TCEQ website at www.tceq.texas.gov/publications/gi/gi-002.html , or call (512) 239-1250.	Copy of Form PI-7-CERT, Core Data Form, and all attachments. Not required if using ePermits ¹
Appropriate Local Air Pollution Control Program(s)	To Find your local or Regional Air Pollution Control Programs go to the TCEQ, APD website at www.tceq.texas.gov/permitting/air/local_programs.html , or call (512)-239-1250	Copy of Form PI-7-CERT, Core Data Form, and all attachments.

¹ ePermits located at www3.tceq.texas.gov/steers/

² ePay located at www.tceq.texas.gov/epay

TCEQ-20182 (APDG 5379v21, Revised 03/18) PI-7-CERT

This form is for use by facilities subject to air quality permit requirements and may be revised periodically.



TCEQ Core Data Form

TCEQ Use Only

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission (If other is checked please describe in space provided.)		
☒ New Permit, Registration or Authorization (Core Data Form should be submitted with the program application.)		
☐ Renewal (Core Data Form should be submitted with the renewal form)		☐ Other
2. Customer Reference Number (if issued)	Follow this link to search for CN or RN numbers in Central Registry**	3. Regulated Entity Reference Number (if issued)
CN 603222902		RN

SECTION II: Customer Information

4. General Customer Information		5. Effective Date for Customer Information Updates (mm/dd/yyyy)	
☐ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership			
☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)			
The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).			
6. Customer Legal Name (If an individual, print last name first: e.g.: Doe, John)		If new Customer, enter previous Customer below:	
Microsoft Corporation			
7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number (if applicable)
0010404606	19111444428	911144442	08-146-6849
11. Type of Customer:	☒ Corporation	☐ Individual	Partnership: ☐ General ☐ Limited
Government: ☐ City ☐ County ☐ Federal ☐ State ☐ Other	☐ Sole Proprietorship	☐ Other:	
12. Number of Employees		13. Independently Owned and Operated?	
☐ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☒ 501 and higher		☐ Yes ☐ No	
14. Customer Role (Proposed or Actual) - as it relates to the Regulated Entity listed on this form. Please check one of the following			
☐ Owner ☐ Operator ☒ Owner & Operator			
☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other:			
15. Mailing Address:	15434 Lambda Dr.		
	City	San Antonio	State TX ZIP 78245 ZIP + 4
16. Country Mailing Information (if outside USA)		17. E-Mail Address (if applicable)	
		reubent@microsoft.com	
18. Telephone Number	19. Extension or Code	20. Fax Number (if applicable)	
(210) 912 - 2435		() -	

SECTION III: Regulated Entity Information

21. General Regulated Entity Information (If "New Regulated Entity" is selected below this form should be accompanied by a permit application)	
☒ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information	
The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC).	
22. Regulated Entity Name (Enter name of the site where the regulated action is taking place.)	
Microsoft SAT 09/10 Data Center	

23. Street Address of the Regulated Entity: (No PO Boxes)	15434 Lambda Drive						
	City	San Antonio	State	TX	ZIP	78245	ZIP + 4
24. County							

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:									
26. Nearest City					State		Nearest ZIP Code		
San Antonio					TX		78245		
27. Latitude (N) In Decimal:			29.418078		28. Longitude (W) In Decimal:			-98.801155	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds				
29	25	5.0808	-98	48	4.1574				
29. Primary SIC Code (4 digits)		30. Secondary SIC Code (4 digits)		31. Primary NAICS Code (5 or 6 digits)		32. Secondary NAICS Code (5 or 6 digits)			
7376				541513					
33. What is the Primary Business of this entity? (Do not repeat the SIC or NAICS description.)									
Data Center									
34. Mailing Address:		15434 Lambda Dr.							
		City	San Antonio	State	TX	ZIP	78245	ZIP + 4	
35. E-Mail Address:		reubent@microsoft.com							
36. Telephone Number			37. Extension or Code			38. Fax Number (if applicable)			
() -						() -			

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☒ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☒ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name: Isaac Jimenez			41. Title: Consultant		
42. Telephone Number		43. Ext./Code	44. Fax Number		45. E-Mail Address
(830) 776 - 2315			() -		ijimenez@versar.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

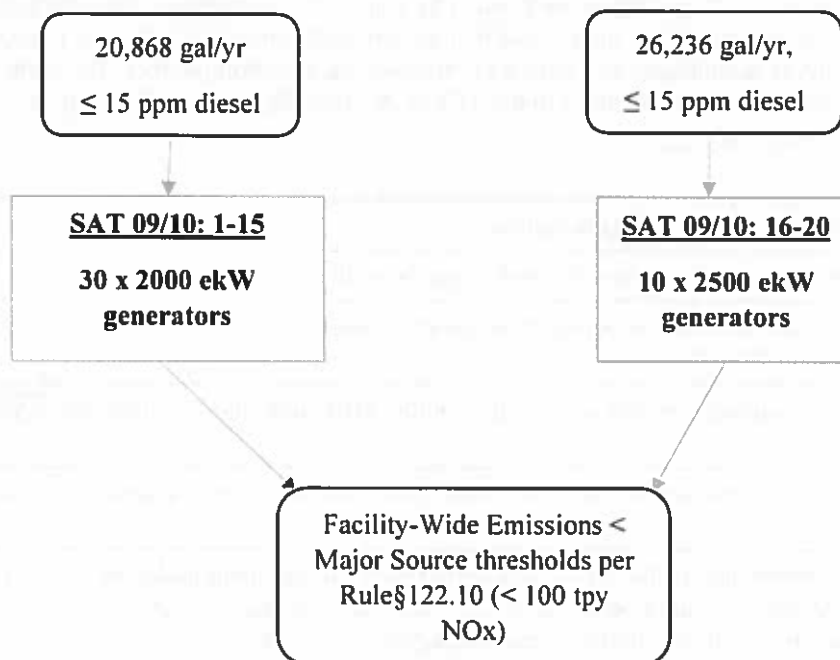
Company:	Microsoft	Job Title:	Facility Responsible Official
Name(In Print):	Reuben Thissen	Phone:	(210) 912 - 2435
Signature:		Date:	07/24/18

MICROSOFT SAT 09/10 DATA CENTER PROCESS DESCRIPTION & FLOWCHART

Microsoft Corporation's data center in San Antonio covered in this registration application consists of two adjacent buildings at the same location: 15434 Block Lambda Drive, San Antonio, Texas 78245 ("SAT09 and SAT10" projects).

The application is for a total of forty (40) diesel-fired emergency generators with twenty at each building. SAT09 has fifteen (15) generators that are rated at 2000 ekW (SAT09: 1-15) and the remaining five (5) are rated at 2500 ekW (SAT09: 16-20), SAT10 also has fifteen (15) generators that are rated at 2000 ekW (SAT10 1-15) and the remaining five (5) are rated at 2500 ekW (SAT10: 16-20).

All generators are 15 ppm sulfur diesel-fuel fired and conform to EPA Tier 2 emission standards, thus meeting the requirements of 40 CFR Part 60 Subpart IIII. The process flow diagram below captures the maximum fuel consumption to which each size-based generator group would be limited to maintain site-wide emissions below the federal threshold for Title V major sources.





Texas Commission on Environmental Quality
Permit by Rule Applicability Checklist
Title 30 Texas Administrative Code § 106.4

The following checklist was developed by the Texas Commission on Environmental Quality (TCEQ), Air Permits Division, to assist applicants in determining whether or not a facility meets all of the applicable requirements. Before claiming a specific Permit by Rule (PBR), a facility must first meet all of the requirements of Title 30 Texas Administrative Code § 106.4 (30 TAC § 106.4), "Requirements for Permitting by Rule." Only then can the applicant proceed with addressing requirements of the specific Permit by Rule being claimed.

The use of this checklist is not mandatory; however, it is the responsibility of each applicant to show how a facility being claimed under a PBR meets the general requirements of 30 TAC § 106.4 and also the specific requirements of the PBR being claimed. If all PBR requirements cannot be met, a facility will not be allowed to operate under the PBR and an application for a construction permit may be required under 30 TAC § 116.110(a).

Registration of a facility under a PBR can be performed by completing Form PI-7 (Registration for Permits by Rule) or Form PI-7-CERT (Certification and Registration for Permits by Rule). The appropriate checklist should accompany the registration form. Check the most appropriate answer and include any additional information in the spaces provided. If additional space is needed, please include an extra page and reference the question number. The PBR forms, tables, checklists, and guidance documents are available from the TCEQ, Air Permits Division Web site at:

www.tceq.texas.gov/permitting/air/nav/air_pbr.html.

1. 30 TAC § 106.4(a)(1) and (4): Emission limits	
List emissions in tpy for each facility (add additional pages or table if needed):	
• Are the SO ₂ , PM ₁₀ , VOC, or other air contaminant emissions claimed for each facility in this PBR submittal less than 25 tpy?	☒ YES ☐ NO
• Are the NO _x and CO emissions claimed for each facility in this PBR submittal less than 250 tpy?	☒ YES ☐ NO
<i>If the answer to both is "Yes," continue to the question below. If the answer to either question is "No," a PBR cannot be claimed.</i>	
Has any facility at the property had public notice and opportunity for comment under 30 TAC Section 116 for a regular permit or permit renewal? (This does not include public notice for voluntary emission reduction permits, grandfathered existing facility permits, or federal operating permits.)	☐ YES ☒ NO
<i>If "Yes," skip to Section 2. If "No," continue to the questions below.</i>	
If the site has had no public notice, please answer the following:	
• Are the SO ₂ , PM ₁₀ , VOC, or other emissions claimed for all facilities in this PBR submittal less than 25 tpy?	☒ YES ☐ NO
• Are the NO _x and CO emissions claimed for all facilities in this PBR submittal less than 250 tpy?	☒ YES ☐ NO
<i>If the answer to both questions is "Yes," continue to Section 2.</i>	
<i>If the answer to either question is "No," a PBR cannot be claimed. A permit will be required under Chapter 116.</i>	

**Permit by Rule Applicability Checklist
Title 30 Texas Administrative Code § 106**

2. 30 TAC § 106.4(a)(2): Nonattainment check	
§ Are the facilities to be claimed under this PBR located in a designated ozone nonattainment county?	☐ YES ☒ NO
<i>If "Yes," please indicate which county by checking the appropriate box to the right.</i>	
(Marginal) - Hardin, Jefferson, and Orange counties:	☐ BPA
(Moderate) - Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller counties:	☐ HGA
(Moderate) - Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant counties	☐ DFW
<i>If "Yes," to any of the above, continue to the next question. If "No," continue to Section 3.</i>	
• Does this project trigger a nonattainment review?	☐ YES ☐ NO
Does this project trigger a nonattainment review?	
• Is the project's potential to emit (PTE) for emissions of VOC or NO _x increasing by 100 tpy or more? <i>PTE is the maximum capacity of a stationary source to emit any air pollutant under its worst-case physical and operational design unless limited by a permit, rules, or made federally enforceable by a certification.</i>	☐ YES ☐ NO
• Is the site an existing major nonattainment site and are the emissions of VOC or NO _x increasing by 40 tpy or more?	☐ YES ☐ NO
<i>If needed, attach contemporaneous netting calculations per nonattainment guidance.</i>	
Additional information can be found at: www.tceq.texas.gov/permitting/air/forms/newsource/tables/nsr_table8.html and www.tceq.texas.gov/permitting/air/nav/air_docs_newsource.html	
<i>If "Yes," to any of the above, the project is a major source or a major modification and a PBR may not be used. A Nonattainment Permit review must be completed to authorize this project. If "No," continue to Section 3.</i>	
3. 30 TAC § 106.4(a)(3): Prevention of Significant Deterioration (PSD) check	
Does this project trigger a review under PSD rules?	
To determine the answer, review the information below:	
• Are emissions of any regulated criteria pollutant increasing by 100 tpy of any criteria pollutant at a named source?	☐ YES ☒ NO
• Are emissions of any criteria pollutant increasing by 250 tpy of any criteria pollutant at an unnamed source?	☐ YES ☒ NO
• Are emissions increasing above significance levels at an existing major site?	☐ YES ☒ NO
PSD information can be found at: www.tceq.texas.gov/assets/public/permitting/air/Forms/NewSourceReview/Tables/10173tbl.pdf and www.tceq.texas.gov/permitting/air/nav/air_docs_newsource.html	
<i>If "Yes," to any of the above, a PBR may not be used. A PSD Permit review must be completed to authorize the project. If "No," continue to Section 4.</i>	

**Permit by Rule Applicability Checklist
Title 30 Texas Administrative Code § 106**

4. 30 TAC § 106.4(a)(6): Federal Requirements	
\$ Will all facilities under this PBR meet applicable requirements of Title 40 Code of Federal Regulations (40 CFR) Part 60, New Source Performance Standards (NSPS)?	☒ YES ☐ NO ☐ NA
If "Yes," which Subparts are applicable?	40 CFR Part 60 Subpart IIII
• Will all facilities under this PBR meet applicable requirements of 40 CFR Part 63, Hazardous Air Pollutants Maximum Achievable Control Technology (MACT) standards?	☒ YES ☐ NO ☐ NA
If "Yes," which Subparts are applicable?	40 CFR Part 63 Subpart ZZZZ
• Will all facilities under this PBR meet applicable requirements of 40 CFR Part 61, National Emissions Standards for Hazardous Air Pollutants (NESHAPs)?	☐ YES ☐ NO ☒ NA
If "Yes," which Subparts are applicable?	
If "Yes" to any of the above, please attach a discussion of how the facilities will meet any applicable standards.	
5. 30 TAC § 106.4(a)(7): PBR prohibition check	
• Are there any air permits at the site containing conditions which prohibit or restrict the use of PBRs?	☐ YES ☒ NO
If "Yes," PBRs may not be used or their use must meet the restrictions of the permit. A new permit or permit amendment may be required.	
List permit number(s):	
6. 30 TAC § 106.4(a)(8): NO_x Cap and Trade	
• Is the facility located in Harris, Brazoria, Chambers, Fort Bend, Galveston, Liberty, Montgomery, or Waller County?	☐ YES ☒ NO
If "Yes," answer the question below. If "No," continue to Section 7.	
• Will the proposed facility or group of facilities obtain required allowances for NO _x if they are subject to 30 TAC Chapter 101, Subchapter H, Division 3 (relating to the Mass Emissions Cap and Trade Program)?	☐ YES ☐ NO

**Permit by Rule Applicability Checklist
Title 30 Texas Administrative Code § 106**

7. Highly Reactive Volatile Organic Compounds (HRVOC) check		
• Is the facility located in Harris County?	☐ YES ☒ NO	
<i>If "Yes," answer the next question. If "No," skip to the box below.</i>		
• Will the project be constructed after June 1, 2006?	☐ YES ☐ NO	
<i>If "Yes," answer the next question. If "No," skip to the box below.</i>		
• Will one or more of the following HRVOC be emitted as a part of this project?	☐ YES ☐ NO	
<i>If "Yes," complete the information below:</i>		
	lb/hr	tpy
▶ 1,3-butadiene		
▶ all isomers of butene (e.g., isobutene [2-methylpropene or isobutylene])		
▶ alpha-butylene (ethylethylene)		
▶ beta-butylene (dimethylethylene, including both cis- and trans-isomers)		
▶ ethylene		
▶ propylene		
• Is the facility located in Brazoria, Chambers, Fort Bend, Galveston, Liberty, Montgomery, or Waller County?	☐ YES ☒ NO	
<i>If "Yes," answer the next question. If "No," the checklist is complete.</i>		
• Will the project be constructed after June 1, 2006?	☐ YES ☐ NO	
<i>If "Yes," answer the next question. If "No," the checklist is complete.</i>		
• Will one or more of the following HRVOC be emitted as a part of this project?	☐ YES ☐ NO	
<i>If "Yes," complete the information below:</i>		
	lb/hr	tpy
▶ ethylene		
▶ propylene		

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 07/20/2016	Permit No.:	Regulated Entity No.:
Area Name:		Customer Reference No.: CN603222902

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA				
1. Emission Point			2. Component or Air Contaminant Name	
(A) EPN	(B) FIN	(C) Name	3. Air Contaminant Emission Rate	
			(A) Pound Per Hour	(B) TPY
SAT09/10 1-15	SAT09/10	SAT09/10 Gen1-15	PM	28.97
SAT09/10: 1-15	SAT09/10	SAT09/10 Gen1-15	PM-10	2.19
SAT09/10: 1-15	SAT09/10	SAT09/10 Gen1-15	SO2	2.19
SAT09/10: 1-15	SAT09/10	SAT09/10 Gen1-15	NOX	0.08
SAT09/10: 1-15	SAT09/10	SAT09/10 Gen1-15	CO	70.09
SAT09/10: 1-15	SAT09/10	SAT09/10 Gen1-15	VOC	38.33
SAT09/10: 1-15	SAT09/10	SAT09/10 Gen1-15	CO2	4.27
SAT09/10: 1-15	SAT09/10	SAT09/10 Gen1-15	CH4	93,155.84
SAT09/10: 1-15	SAT09/10	SAT09/10 Gen1-15	N2O	0.29
SAT09/10: 1-15	SAT09/10	SAT09/10 Gen1-15	Acetaldehyde	0.06
SAT09/10: 1-15	SAT09/10	SAT09/10 Gen1-15		0.0011

EPN = Emission Point Number
 FIN = Facility Identification Number
 TCEQ - 10153 (Revised 04/08) Table 1(a)
 This form is for use by sources subject to air quality permit requirements and may be revised periodically. (APDG 5178 v5)



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 07/20/2016	Permit No.:	Regulated Entity No.:
Area Name:		Customer Reference No.: CN603222902

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA				
1. Emission Point			2. Component or Air Contaminant Name	
(A) EPN	(B) FIN	(C) Name	3. Air Contaminant Emission Rate	
			(A) Pound Per Hour	(B) TPY
SAT09/10 1-15	SAT09/10	SAT09/10 Gen1-15	Acrolein	0.0003
SAT09/10 1-15	SAT09/10	SAT09/10 Gen1-15	Benzene	0.0335
SAT09/10 1-15	SAT09/10	SAT09/10 Gen1-15	Formaldehyde	0.0034
SAT09/10 1-15	SAT09/10	SAT09/10 Gen1-15	Naphthlene	0.0056
SAT09/10 1-15	SAT09/10	SAT09/10 Gen1-15	Toluene	0.0121
SAT09/10 1-15	SAT09/10	SAT09/10 Gen1-15	Xylene	0.0083
SAT09/10 16-20	SAT09/10	SAT09/10 Gen1-15	PM	0.9
SAT09/10 16-20	SAT09/10	SAT09/10 Gen1-15	PM10	0.9
SAT09/10 16-20	SAT09/10	SAT09/10 Gen1-15	SO2	0.03
SAT09/10 16-20	SAT09/10	SAT09/10 Gen1-15	NOX	28.91

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TCEQ - 10153 (Revised 04/08) Table 1(a)

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 07/20/2016	Permit No.:	Regulated Entity No.:
Area Name:		Customer Reference No.: CN603222902

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA

1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) Name		(A) Pound Per Hour	(B) TPY
SAT09/10 16-20	SAT09/10	SAT09/10 Gen16-20	CO	192.90	15.81
SAT09/10 16-20	SAT09/10	SAT09/10 Gen16-20	VOC	23.31	1.76
SAT09/10 16-20	SAT09/10	SAT09/10 Gen16-20	CO2	39,039.95	2951.70
SAT09/10 16-20	SAT09/10	SAT09/10 Gen16-20	CH4	1.58	0.12
SAT09/10 16-20	SAT09/10	SAT09/10 Gen16-20	N2O	0.32	0.0239
SAT09/10 16-20	SAT09/10	SAT09/10 Gen16-20	Acetaldehyde	0.01	0.0005
SAT09/10 16-20	SAT09/10	SAT09/10 Gen16-20	Acrolein	0.002	0.0001
SAT09/10 16-20	SAT09/10	SAT09/10 Gen16-20	Benzene	0.19	0.0140
SAT09/10 16-20	SAT09/10	SAT09/10 Gen16-20	Formaldehyde	0.02	0.0014
SAT09/10 16-20	SAT09/10	SAT09/10 Gen16-20	Naphthalen	0.03	0.0024

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TCEQ - 10153 (Revised 04/08) Table 1(a)

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Table 1(a) Emission Point Summary

Date: 07/20/2016	Permit No.:	Regulated Entity No.:
Area Name:		Customer Reference No.: CN603222902

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

[illegible]



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 07/20/2016	Permit No.:	Regulated Entity No.:
Area Name:		Customer Reference No.: CN603222902

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA				EMISSION POINT DISCHARGE PARAMETERS									
1. Emission Point		4. UTM Coordinates of Emission Point		Source									
(A) EPN	(B) FIN	(C) NAME	Zone	East (Meters)	North (Meters)	5. Building Height (Ft.)	6. Height Above Ground (Ft.)	7. Stack Exit Data	8. Fugitives				
								(A) Diameter (Ft.)	(B) Velocity (FPS)	(C) Temperature (°F)	(A) Length (Ft.)	(B) Width (Ft.)	(C) Axis Degrees
SAT09-01	SAT09	SAT9Gen1	14N	519088.0002	3253724	29.33				1,118.5			
SAT09-02	SAT09	SAT9Gen2	14N	519088.0002	3253717	29.33				1,118.5			
SAT09-03	SAT09	SAT9Gen3	14N	519088.0002	3253683	29.33				1,118.5			
SAT09-04	SAT09	SAT9Gen4	14N	519088.0002	3253676	29.33				1,118.5			
SAT09-05	SAT09	SAT9Gen5	14N	519088.0002	3253669	29.33				1,118.5			
SAT09-06	SAT09	SAT9Gen6	14N	519088.0002	3253639	29.33				1,118.5			
SAT09-07	SAT09	SAT9Gen7	14N	519088.0002	3253632	29.33				1,118.5			
SAT09-08	SAT09	SAT9Gen8	14N	519088.0002	3253625	29.33				1,118.5			
SAT09-09	SAT09	SAT9Gen9	14N	519088.0002	3253619	29.33				1,118.5			
SAT09-10	SAT09	SAT0Gen10	14N	519088.999	3253591	29.33				1,118.5			
SAT09-11	SAT09	SAT0Gen11	14N	519088.999	3253584	29.33				1,118.5			
SAT09-12	SAT09	SAT9Gen12	14N	519088.999	3253577	29.33				1,118.5			

EPN = Emission Point Number
FIN = Facility Identification Number

TCEQ - 10153 (Revised 04/08) Table 1(a)

This form is for use by sources subject to air quality permit requirements and may be revised periodically. (APDG 5178 v5)

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 07/20/2016	Permit No.:	Regulated Entity No.:
Area Name:		Customer Reference No.: CN603222902

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA					EMISSION POINT DISCHARGE PARAMETERS								
1. Emission Point		4. UTM Coordinates of Emission Point			Source								
(A) EPN	(B) FIN	(C) NAME	Zone	East (Meters)	North (Meters)	5. Building Height (Ft.)	6. Height Above Ground (Ft.)	7. Stack Exit Data		8. Fugitives		(C) Axis Degrees	
SAT09-13	SAT09	SAT9Gen13	14N	519088.9999	3253553	29.33		(A) Diameter (Ft.)	(B) Velocity (FPS)	(C) Temperature (°F)	(A) Length (Ft.)	(B) Width (Ft.)	
SAT09-14	SAT09	SAT9Gen14	14N	519088.9999	3253546	29.33				1,118.5			
SAT09-15	SAT09	SAT9Gen15	14N	519088.9999	3253539	29.33				1,118.5			
SAT09-16	SAT09	SAT9Gen16	14N	519087.0004	3253700	29.33				1,235.6			
SAT09-17	SAT09	SAT9Gen17	14N	519087.0004	3253663	29.33				1,235.6			
SAT09-18	SAT09	SAT9Gen18	14N	519087.0004	3253651	29.33				1,235.6			
SAT09-19	SAT09	SAT9Gen19	14N	519088.0002	3253571	29.33				1,235.6			
SAT09-20	SAT09	SAT9Gen20	14N	519088.0002	3253533	29.33				1,235.6			

EPN = Emission Point Number
FIN = Facility Identification Number

TCEQ - 10153 (Revised 04/08) Table 1(a)
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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 07/20/2016	Permit No.:	Regulated Entity No.:
Area Name:		Customer Reference No.: CN603222902

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA					EMISSION POINT DISCHARGE PARAMETERS										
1. Emission Point			4. UTM Coordinates of Emission Point		Source										
(A) EPN	(B) FIN	(C) NAME	Zone	East (Meters)	North (Meters)	5. Building Height (Ft.)	6. Height Above Ground (Ft.)	7. Stack Exit Data	(A) Diameter (Ft.)	(B) Velocity (FPS)	(C) Temperature (°F)	8. Fugitives	(A) Length (Ft.)	(B) Width (Ft.)	(C) Axis Degrees
SAT10-01	SAT10	SAT10Gen1	14N	518964.0014	3253723	29.33					1,118.5				
SAT10-02	SAT10	SAT10Gen2	14N	518964.0014	3253717	29.33					1,118.5				
SAT10-03	SAT10	SAT10Gen3	14N	518965.0012	3253683	29.33					1,118.5				
SAT10-04	SAT10	SAT10Gen4	14N	518965.0012	3253676	29.33					1,118.5				
SAT10-05	SAT10	SAT10Gen5	14N	518965.0012	3253669	29.33					1,118.5				
SAT10-06	SAT10	SAT10Gen6	14N	518965.0012	3253638	29.33					1,118.5				
SAT10-07	SAT10	SAT10Gen7	14N	518965.0012	3253632	29.33					1,118.5				
SAT10-08	SAT10	SAT10Gen8	14N	518965.0012	3253625	29.33					1,118.5				
SAT10-09	SAT10	SAT10Gen9	14N	518965.0012	3253618	29.33					1,118.5				
SAT10-10	SAT10	SAT10Gen10	14N	518965.0012	3253590	29.33					1,118.5				
SAT10-11	SAT10	SAT10Gen11	14N	518965.0012	3253584	29.33					1,118.5				
SAT10-12	SAT10	SAT10Gen12	14N	518965.0012	3253577	29.33					1,118.5				

EPN = Emission Point Number
FIN = Facility Identification Number

TCEQ - 10153 (Revised 04/08) Table 1(a)
This form is for use by sources subject to air quality permit requirements and may be revised periodically. (APDG 5178 v5)

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 07/20/2016	Permit No.:	Regulated Entity No.:
Area Name:		Customer Reference No.: CN603222902

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

EMISSION POINT DISCHARGE PARAMETERS													
AIR CONTAMINANT DATA				Source									
1. Emission Point			4. UTM Coordinates of Emission Point		5. Building			7. Stack Exit Data		8. Fugitives			
(A) EPN	(B) FIN	(C) NAME	Zone	East (Meters)	North (Meters)	Height (Ft.)	6. Height Above Ground (Ft.)	(A) Diameter (Ft.)	(B) Velocity (FPS)	(C) Temperature (°F)	(A) Length (Ft.)	(B) Width (Ft.)	(C) Axis Degrees
SAT10-13	SAT10	SAT10Gen13	14N	518965.0012	3253552	29.33				1,118.5			
SAT10-14	SAT10	SAT10Gen14	14N	518965.0012	3253546	29.33				1,118.5			
SAT10-15	SAT10	SAT10Gen15	14N	518965.0012	3253539	29.33				1,118.5			
SAT10-16	SAT10	SAT10Gen16	14N	518964.0014	3253700	29.33				1,235.6			
SAT10-17	SAT10	SAT10Gen17	14N	518964.0014	3253662	29.33				1,235.6			
SAT10-18	SAT10	SAT10Gen18	14N	518964.0014	3253650	29.33				1,235.6			
SAT10-19	SAT10	SAT10Gen19	14N	518964.0014	3253570	29.33				1,235.6			
SAT10-20	SAT10	SAT10Gen20	14N	518964.0014	3253539	29.33				1,235.6			

EPN = Emission Point Number
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TCEQ - 10153 (Revised 04/08) Table 1(a)
This form is for use by sources subject to air quality permit requirements and may be revised periodically. (APDG 5178 v5)

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Texas Commission on Environmental Quality
Table 29 Reciprocating Engines

I. Engine Data											
Manufacturer: Caterpillar			Model No. 3516C			Serial No.			Manufacture Date: 2016		
Rebuilds Date:			No. of Cylinders: 16			Compression Ratio: 14.7			EPN: SAT09 1-15, SAT10 1-15		
Application: ☐ Gas Compression ☐ Electric Generation ☐ Refrigeration ☒ Emergency/Stand by ☒ 4 Stroke Cycle ☐ 2 Stroke Cycle ☐ Carbureted ☐ Spark Ignited ☐ Dual Fuel ☐ Fuel Injected ☒ Diesel ☐ Naturally Aspirated ☐ Blower /Pump Scavenged ☐ Turbo Charged and I.C. ☐ Turbo Charged ☐ Intercooled ☐ I.C. Water Temperature ☐ Lean Burn ☐ Rich Burn											
Ignition/Injection Timing:			Fixed:			Variable:					
Manufacture Horsepower Rating: 2,937						Proposed Horsepower Rating: 2,937					
Discharge Parameters											
Stack Height (Feet)			Stack Diameter (Feet)			Stack Temperature (°F)			Exit Velocity (FPS)		
						1,118.5					
II. Fuel Data											
Type of Fuel: ☐ Field Gas ☐ Landfill Gas ☐ LP Gas ☐ Natural Gas ☐ Digester Gas ☒ Diesel											
Fuel Consumption (BTU/bhp-hr): 6484				Heat Value: 0.138 mmBtu (HHV)				(LHV)			
Sulfur Content (grains/100 scf - weight %): 15 ppm diesel											
III. Emission Factors (Before Control)											
NO_x		CO		SO₂		VOC		Formaldehyde		PM10	
g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv
4.8		2.6		5.5E-3		0.29		2.32E-4		0.15	
Source of Emission Factors: ☐ Manufacturer Data ☒ AP-42 ☒ Other (specify): EPA Tier 2											
IV. Emission Factors (Post Control)											
NO_x		CO		SO₂		VOC		Formaldehyde		PM10	
g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv
Method of Emission Control: ☐ NSCR Catalyst ☐ Lean Operation ☐ Parameter Adjustment ☐ Stratified Charge ☐ JLCC Catalyst ☐ Other (Specify): _____											
<i>Note: Must submit a copy of any manufacturer control information that demonstrates control efficiency.</i>											
Is Formaldehyde included in the VOCs?										☒ Yes ☐ No	
V. Federal and State Standards (Check all that apply)											
☐ NSPS JJJJ ☒ MACT ZZZZ ☒ NSPS IIII ☐ Title 30 Chapter 117 - List County: _____											
VI. Additional Information											
1. Submit a copy of the engine manufacturer's site rating or general rating specification data. Provided. 2. Submit a typical fuel gas analysis, including sulfur content and heating value. For gaseous fuels, provide mole percent of constituents. 3. Submit description of air/fuel ratio control system (manufacturer information is acceptable).											



**Texas Commission on Environmental Quality
Table 29 Reciprocating Engines**

I. Engine Data											
Manufacturer: Caterpillar			Model No. 3516C			Serial No.			Manufacture Date: 2016		
Rebuilds Date:			No. of Cylinders: 16			Compression Ratio: 14.7			EPN: SAT09 16-20, SAT 10 16-20		
Application: ☐ Gas Compression ☐ Electric Generation ☐ Refrigeration ☒ Emergency/Stand by											
☒ 4 Stroke Cycle ☐ 2 Stroke Cycle ☐ Carbureted ☐ Spark Ignited ☐ Dual Fuel ☐ Fuel Injected											
☒ Diesel ☐ Naturally Aspirated ☐ Blower /Pump Scavenged ☐ Turbo Charged and I.C. ☐ Turbo Charged											
☐ Intercooled ☐ I.C. Water Temperature ☐ Lean Burn ☐ Rich Burn											
Ignition/Injection Timing: Fixed:						Variable:					
Manufacture Horsepower Rating: 3,634						Proposed Horsepower Rating: 3,634					
Discharge Parameters											
Stack Height (Feet)			Stack Diameter (Feet)			Stack Temperature (°F)			Exit Velocity (FPS)		
						1235.6					
II. Fuel Data											
Type of Fuel: ☐ Field Gas ☐ Landfill Gas ☐ LP Gas ☐ Natural Gas ☐ Digester Gas ☒ Diesel											
Fuel Consumption (BTU/bhp-hr): 6589				Heat Value: 0.138 mm ³ (HHV)				(LHV)			
Sulfur Content (grains/100 scf - weight %): 15 ppm sulfur diesel											
III. Emission Factors (Before Control)											
NO _x		CO		SO ₂		VOC		Formaldehyde		PM10	
g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv
4.8		2.6		5.5E-3		0.29		2.36E-4		0.15	
Source of Emission Factors: ☐ Manufacturer Data ☒ AP-42 ☒ Other (specify): EPA Tier 2											
IV. Emission Factors (Post Control)											
NO _x		CO		SO ₂		VOC		Formaldehyde		PM10	
g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv
Method of Emission Control: ☐ NSCR Catalyst ☐ Lean Operation ☐ Parameter Adjustment											
☐ Stratified Charge ☐ JLCC Catalyst ☐ Other (Specify): _____											
<i>Note: Must submit a copy of any manufacturer control information that demonstrates control efficiency.</i>											
Is Formaldehyde included in the VOCs?										☒ Yes ☐ No	
V. Federal and State Standards (Check all that apply)											
☐ NSPS JJJJ ☒ MACT ZZZZ ☒ NSPS IIII ☐ Title 30 Chapter 117 - List County: _____											
VI. Additional Information											
1. Submit a copy of the engine manufacturer's site rating or general rating specification data. Provided 2. Submit a typical fuel gas analysis, including sulfur content and heating value. For gaseous fuels, provide mole percent of constituents. 3. Submit description of air/fuel ratio control system (manufacturer information is acceptable).											

Default Emission Factors

Conversion factors			
1 g =	0.0022046 lbs		
1 kg =	2.20462 lbs		
1 MW =	1.3410221 hp		
		1 ton =	2000 lbs
		Diesel HHV =	0.138
			(mmBtu/gal)

Operational limit			
Generators: 2000 cM^3/s	Total hrs/yr	4536 hr/yr	Total fuel/yr
Generators: 2500 cM^3/s	Total hrs/yr	1512 hr/yr	Total fuel/yr
Generators: 2500 cM^3/s	Total hrs/yr	26,236 gal/yr	Total fuel/yr
		20,968 gal/yr	9073 MWh/yr
			3780 MWh/yr

Generators SAT 09/10-15/2000-4W x 30										30	
Rated engine = Star rating		2190,12 kWm		2190,12 kWm		1310		No. of units =		CAT Engine Model:	
2937 bhp		2937 bhp		2937 bhp		1310		30		3510C	
Pollutant	PM	PM-10	SO2	NOx (as NO2)	CO	VOC	CO2	CH4	N2O	SF6	PFC
Per unit emissions:											
lb/hr	0.97	0.97	0.04	30.90	16.90	1.88	3105.19	0.13	2.52E-02	N/A	N/A
lb/yr	146.02	146.02	5.39	4672.77	2555.42	284.92	469549.87	19.05	3.81	N/A	N/A
kg/yr	0.67	0.67	2.49E-03	2.24	1.28	0.14	214.77	0.01	1.90E-03	N/A	N/A
Total emissions											
lb/hr	28.97	28.97	1.07	927.05	506.99	56.53	93155.84	3.78	0.76	N/A	N/A
lb/yr	4380.72	4380.72	161.68	140183.18	76662.67	8547.69	14086496.16	571.38	114E+02	N/A	N/A
kg/yr	2.19	2.19	0.08	20.09	38.33	4.27	7041.75	0.79	0.06	N/A	N/A

[illegible][illegible]

PERFORMANCE DATA [516DE9L]**OCTOBER 06, 2015**For Help Desk Phone Numbers [Click here](#)**Perf No: DM8263****Change Level: 03**

General

Heat Rejection

Emissions

Regulatory

Altitude Derate

Cross Reference

General Notes

Perf Param Ref

[View PDF](#)

SALES MODEL:	3516C	COMBUSTION:	DI
ENGINE POWER (BHP):	2,937	ENGINE SPEED (RPM):	1,800
GEN POWER WITH FAN (EKW):	2,000.0	HERTZ:	60
COMPRESSION RATIO:	14.7	FAN POWER (HP):	114.0
RATING LEVEL:	STANDBY	ASPIRATION:	TA
PUMP QUANTITY:	2	AFTERCOOLER TYPE:	ATAAC
FUEL TYPE:	DIESEL	AFTERCOOLER CIRCUIT TYPE:	JW+OC, ATAAC
MANIFOLD TYPE:	DRY	INLET MANIFOLD AIR TEMP (F):	122
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:	GTA5518BN-56T-1.12
INJECTOR TYPE:	EUI	CERTIFICATION YEAR:	2006
FUEL INJECTOR:	2664387	CRANKCASE BLOWBY RATE (FT3/HR):	2,937.9
REF EXH STACK DIAMETER (IN):	12	FUEL RATE (RATED RPM) NO LOAD (GAL/HR):	13.7
MAX OPERATING ALTITUDE (FT):	3,117	PISTON SPD @ RATED ENG SPD (FT/MIN):	2,244.1

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

General Performance Data [Top](#)

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	EXH MFLD PRES	ENGINE OUTLET TEMP
EKW	%	BHP	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	IN-HG	DEG F
2,000.0	100	2,937	307	0.329	138.0	78.3	121.2	1,118.5	71.5	752.1
1,800.0	90	2,641	276	0.331	124.9	73.1	119.6	1,067.5	65.7	716.0
1,600.0	80	2,353	246	0.337	113.1	68.0	118.2	1,027.0	60.0	693.3
1,500.0	75	2,212	231	0.340	107.5	65.2	117.5	1,008.1	57.2	684.6
1,400.0	70	2,071	216	0.344	101.8	62.3	116.8	989.4	54.4	676.9
1,200.0	60	1,795	188	0.352	90.1	55.5	115.4	952.0	48.0	662.8
1,000.0	50	1,521	159	0.357	77.5	46.5	113.7	913.4	40.1	654.0
800.0	40	1,250	131	0.357	63.8	34.8	111.8	863.8	30.3	655.0
600.0	30	977	102	0.365	50.9	24.2	110.6	803.8	22.0	650.0
500.0	25	839	88	0.374	44.8	19.7	110.2	767.0	18.7	641.7
400.0	20	699	73	0.388	38.8	15.7	109.8	724.6	15.7	629.0
200.0	10	411	43	0.450	26.4	9.0	109.1	596.9	10.9	552.8

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
2,000.0	100	2,937	83	454.3	6,548.9	15,292.8	28,512.8	29,478.4	6,205.0	5,738.7
1,800.0	90	2,641	77	428.8	6,318.7	14,243.0	27,390.5	28,264.7	5,956.5	5,533.7
1,600.0	80	2,353	72	404.5	6,073.3	13,331.0	26,220.6	27,012.9	5,685.0	5,301.6
1,500.0	75	2,212	69	392.7	5,932.2	12,897.9	25,568.0	26,319.7	5,542.0	5,176.6
1,400.0	70	2,071	66	380.9	5,777.2	12,448.0	24,862.1	25,573.8	5,384.8	5,037.5
1,200.0	60	1,795	59	353.9	5,397.2	11,422.5	23,141.0	23,771.1	5,003.4	4,694.0
1,000.0	50	1,521	50	318.8	4,857.3	10,138.7	20,731.5	21,274.5	4,476.2	4,208.4
800.0	40	1,250	38	271.1	4,090.0	8,488.8	17,357.1	17,803.6	3,744.5	3,524.2
600.0	30	977	27	225.0	3,394.1	6,989.6	14,328.5	14,684.4	3,097.0	2,920.6
500.0	25	839	22	204.1	3,103.5	6,328.1	13,075.2	13,388.4	2,825.1	2,668.8
400.0	20	699	18	184.1	2,840.4	5,696.0	11,947.2	12,218.4	2,572.5	2,435.7
200.0	10	411	11	148.5	2,409.4	4,478.2	10,105.7	10,290.7	2,174.6	2,076.8

Heat Rejection Data [Top](#)

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHAUST 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
2,000.0	100	2,937	43,150	7,564	101,696	49,615	15,778	38,240	124,558	296,234	315,563
1,800.0	90	2,641	40,179	7,175	92,069	43,106	14,280	34,105	111,977	268,102	285,596
1,600.0	80	2,353	37,427	6,907	84,225	38,510	12,931	30,201	99,774	242,774	258,615
1,500.0	75	2,212	36,092	6,791	80,632	36,523	12,286	28,303	93,784	230,664	245,715
1,400.0	70	2,071	34,737	6,671	77,064	34,629	11,640	26,432	87,835	218,548	232,809
1,200.0	60	1,795	31,877	6,341	69,432	30,722	10,302	22,179	76,103	193,426	206,048
1,000.0	50	1,521	28,631	6,026	60,835	26,675	8,865	17,129	64,508	166,434	177,294
800.0	40	1,250	24,910	5,810	50,784	22,387	7,288	11,280	53,005	136,837	145,766
600.0	30	977	21,252	5,496	41,420	18,139	5,820	6,677	41,431	109,268	116,397
500.0	25	839	19,405	5,303	37,082	16,055	5,124	4,986	35,574	96,210	102,488
400.0	20	699	17,492	5,098	32,738	13,986	4,431	3,593	29,634	83,193	88,622
200.0	10	411	13,286	4,670	23,481	8,473	3,022	1,516	17,448	56,745	60,447

Emissions Data [Top](#)Units Filter All Units [v](#)

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN	EKW	2,000.0	1,500.0	1,000.0	500.0	200.0
ENGINE POWER	BHP	2,937	2,212	1,521	839	411
PERCENT LOAD	%	100	75	50	25	10
TOTAL NOX (AS NO2)	G/HR	19,098	10,213	5,798	4,218	2,932
TOTAL CO	G/HR	1,564	847	905	1,772	1,794
TOTAL HC	G/HR	423	513	512	409	443
PART MATTER	G/HR	103.2	99.5	123.9	256.7	203.1
TOTAL NOX (AS NO2)	(CORR 5% O2) MG/NM3	3,299.4	2,320.1	1,852.8	2,379.4	2,855.8
TOTAL CO	(CORR 5% O2) MG/NM3	257.0	181.1	277.5	896.4	1,715.8
TOTAL HC	(CORR 5% O2) MG/NM3	60.1	93.7	132.1	194.2	379.5
PART MATTER	(CORR 5% O2) MG/NM3	14.4	18.5	35.1	120.0	161.3
TOTAL NOX (AS NO2)	(CORR 5% O2) PPM	1,607	1,130	902	1,159	1,391
TOTAL CO	(CORR 5% O2) PPM	206	145	222	717	1,373
TOTAL HC	(CORR 5% O2) PPM	112	175	247	363	708
TOTAL NOX (AS NO2)	G/HP-HR	6.54	4.64	3.82	5.04	7.13
TOTAL CO	G/HP-HR	0.54	0.38	0.60	2.12	4.36

GENSET POWER WITH FAN	EKW	2,000.0	1,500.0	1,000.0	500.0	200.0
ENGINE POWER	BHP	2,937	2,212	1,521	839	411
PERCENT LOAD	%	100	75	50	25	10
TOTAL HC	G/HP-HR	0.15	0.23	0.34	0.49	1.08
PART MATTER	G/HP-HR	0.04	0.05	0.08	0.31	0.49
TOTAL NOX (AS NO2)	LB/HR	42.10	22.52	12.78	9.30	6.46
TOTAL CO	LB/HR	3.45	1.87	2.00	3.91	3.95
TOTAL HC	LB/HR	0.93	1.13	1.13	0.90	0.98
PART MATTER	LB/HR	0.23	0.22	0.27	0.57	0.45

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN	EKW	2,000.0	1,500.0	1,000.0	500.0	200.0
ENGINE POWER	BHP	2,937	2,212	1,521	839	411
PERCENT LOAD	%	100	75	50	25	10
TOTAL NOX (AS NO2)	G/HR	15,915	8,511	4,832	3,515	2,443
TOTAL CO	G/HR	869	471	503	984	997
TOTAL HC	G/HR	318	385	385	308	333
TOTAL CO2	KG/HR	1,383	1,068	762	430	250
PART MATTER	G/HR	73.7	71.1	88.5	183.4	145.1
TOTAL NOX (AS NO2)	(CORR 5% O2) MG/NM3	2,749.5	1,933.4	1,544.0	1,982.8	2,379.8
TOTAL CO	(CORR 5% O2) MG/NM3	142.8	100.6	154.2	498.0	953.2
TOTAL HC	(CORR 5% O2) MG/NM3	45.2	70.4	99.3	146.0	285.3
PART MATTER	(CORR 5% O2) MG/NM3	10.3	13.2	25.1	85.7	115.2
TOTAL NOX (AS NO2)	(CORR 5% O2) PPM	1,339	942	752	966	1,159
TOTAL CO	(CORR 5% O2) PPM	114	80	123	398	763
TOTAL HC	(CORR 5% O2) PPM	84	131	185	273	533
TOTAL NOX (AS NO2)	G/HP-HR	5.45	3.87	3.19	4.20	5.94
TOTAL CO	G/HP-HR	0.30	0.21	0.33	1.18	2.42
TOTAL HC	G/HP-HR	0.11	0.18	0.25	0.37	0.81
PART MATTER	G/HP-HR	0.03	0.03	0.06	0.22	0.35
TOTAL NOX (AS NO2)	LB/HR	35.09	18.76	10.65	7.75	5.39
TOTAL CO	LB/HR	1.92	1.04	1.11	2.17	2.20
TOTAL HC	LB/HR	0.70	0.85	0.85	0.68	0.73
TOTAL CO2	LB/HR	3,049	2,356	1,681	947	551
PART MATTER	LB/HR	0.16	0.16	0.20	0.40	0.32
OXYGEN IN EXH	%	10.8	12.3	13.3	14.2	15.8
DRY SMOKE OPACITY	%	0.3	0.5	1.2	3.7	3.0
BOSCH SMOKE NUMBER		0.15	0.21	0.43	1.25	1.12

Regulatory Information [Top](#)**EPA TIER 2****2006 - 2010**

GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 89 SUBPART D AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	NON-ROAD	TIER 2	CO: 3.5 NOx + HC: 6.4 PM: 0.20

EPA EMERGENCY STATIONARY**2011 - ----**

GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 60 SUBPART IIII AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE EMERGENCY STATIONARY REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	STATIONARY	EMERGENCY STATIONARY	CO: 3.5 NOx + HC: 6.4 PM: 0.20

Altitude Derate Data [Top](#)**ALTITUDE CORRECTED POWER CAPABILITY (BHP)**

AMBIENT OPERATING TEMP (F)	50	60	70	80	90	100	110	120	130	NORMAL
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AMBIENT OPERATING TEMP (F)	50	60	70	80	90	100	110	120	130	NORMAL
ALTITUDE (FT)										
0	2,937	2,937	2,937	2,937	2,937	2,937	2,937	2,937	2,937	2,937
1,000	2,937	2,937	2,937	2,937	2,937	2,937	2,937	2,937	2,937	2,937
2,000	2,937	2,937	2,937	2,937	2,937	2,937	2,937	2,937	2,937	2,937
3,000	2,937	2,937	2,937	2,937	2,937	2,937	2,937	2,896	2,847	2,937
4,000	2,937	2,937	2,937	2,937	2,937	2,886	2,835	2,786	2,739	2,937
5,000	2,937	2,937	2,933	2,879	2,826	2,776	2,727	2,680	2,634	2,937
6,000	2,930	2,874	2,820	2,767	2,717	2,669	2,622	2,576	2,533	2,890
7,000	2,816	2,762	2,710	2,660	2,611	2,565	2,520	2,476	2,434	2,796
8,000	2,706	2,654	2,604	2,555	2,509	2,464	2,421	2,379	2,339	2,705
9,000	2,598	2,548	2,500	2,454	2,409	2,366	2,325	2,285	2,246	2,616
10,000	2,495	2,447	2,400	2,356	2,313	2,272	2,232	2,193	2,156	2,530
11,000	2,394	2,348	2,303	2,261	2,220	2,180	2,142	2,105	2,069	2,445
12,000	2,296	2,252	2,210	2,169	2,129	2,091	2,054	2,019	1,985	2,362
13,000	2,202	2,159	2,119	2,079	2,042	2,005	1,970	1,936	1,903	2,281
14,000	2,110	2,070	2,031	1,993	1,957	1,922	1,888	1,855	1,824	2,202
15,000	2,022	1,983	1,945	1,909	1,875	1,841	1,809	1,778	1,747	2,125

Cross Reference [Top](#)

Engine Arrangement

Arrangement Number	Effective Serial Number	Engineering Model	Engineering Model Version
2666137	SBJ00001	GS334	-
3994236	DD600001	GS717	-

General Notes [Top](#)

DM8263 - 03

SOUND PRESSURE DATA FOR THIS RATING CAN BE FOUND IN PERFORMANCE NUMBER - DM8779

Performance Parameter Reference [Top](#)

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.

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

PERFORMANCE DATA[DM9228]

November 27, 2013

Performance Number: DM9228

Change Level: 01

SALES MODEL: 3516C
ENGINE POWER (BHP): 3.634
GEN POWER WITH FAN (EKW): 2,500.0
COMPRESSION RATIO: 14.7
APPLICATION: PACKAGED GENSET
RATING LEVEL: MISSION CRITICAL STANDBY
SUB APPLICATION: STANDARD
PUMP QUANTITY: 2
FUEL TYPE: DIESEL
MANIFOLD TYPE: DRY
GOVERNOR TYPE: ADEM3
ELECTRONICS TYPE: ADEM3
CAMSHAFT TYPE: STANDARD
IGNITION TYPE: CI
INJECTOR TYPE: EUI
FUEL INJECTOR: 2501368
REF EXH STACK DIAMETER (IN): 12
MAX OPERATING ALTITUDE (FT): 2,953

COMBUSTION: DI
ENGINE SPEED (RPM): 1,800
HERTZ: 60
FAN POWER (HP): 130.1
ASPIRATION: TA
AFTERCOOLER TYPE: ATAAC
AFTERCOOLER CIRCUIT TYPE: JW+OC, ATAAC
INLET MANIFOLD AIR TEMP (F): 122
JACKET WATER TEMP (F): 210.2
TURBO CONFIGURATION: PARALLEL
TURBO QUANTITY: 4
TURBOCHARGER MODEL: GT6041BN-4BT-1, 10
CERTIFICATION YEAR: 2010
CRANKCASE BLOWBY RATE (FT3/HR): 3,619.4
FUEL RATE (RATED RPM) NO LOAD (GAL/HR): 16.2
PISTON SPD @ RATED ENG SPD (FT/MIN): 2,539.4

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	EXH MFLD PRES	ENGINE OUTLET TEMP
EKW	%	BHP	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	IN-HG	DEG F
2,500.0	100	3,633	336	0.334	173.5	78.1	121.9	1,235.6	67.6	915.2
2,250.0	90	3,283	303	0.335	157.1	71.3	119.4	1,190.0	61.3	881.2
2,000.0	80	2,935	271	0.339	142.3	64.3	116.9	1,158.9	55.3	864.0
1,875.0	75	2,760	255	0.342	134.9	60.7	115.8	1,145.6	52.3	858.5
1,750.0	70	2,586	239	0.346	127.6	57.0	114.7	1,133.3	49.3	854.6
1,500.0	60	2,237	207	0.354	113.0	49.5	112.7	1,112.4	43.2	851.2
1,250.0	50	1,889	174	0.365	98.4	41.3	111.0	1,091.8	36.8	850.7
1,000.0	40	1,547	143	0.373	82.5	31.4	109.4	1,061.5	29.3	856.6
750.0	30	1,203	111	0.385	66.2	21.7	107.9	1,010.3	22.1	848.2
625.0	25	1,029	95	0.394	57.9	17.2	107.2	968.3	18.7	831.1
500.0	20	854	79	0.403	49.2	12.7	106.4	902.0	15.5	796.1
250.0	10	497	46	0.441	31.3	4.8	104.1	700.7	9.8	647.3

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
2,500.0	100	3,633	85	466.7	7,212.2	19,578.8	32,046.3	33,260.4	7,001.7	6,362.4
2,250.0	90	3,283	78	443.0	6,831.8	17,980.7	30,219.3	31,318.8	6,593.0	6,013.7
2,000.0	80	2,935	70	417.8	6,404.5	16,560.6	28,284.6	29,277.2	6,151.5	5,625.4
1,875.0	75	2,760	66	404.7	6,173.3	15,893.2	27,261.3	28,202.4	5,928.1	5,427.1
1,750.0	70	2,586	63	391.2	5,929.9	15,232.6	26,196.0	27,086.8	5,698.4	5,222.0
1,500.0	60	2,237	55	363.5	5,411.9	13,879.0	23,947.5	24,739.5	5,205.5	4,779.1
1,250.0	50	1,889	46	334.6	4,843.3	12,413.0	21,444.3	22,133.2	4,657.5	4,283.2
1,000.0	40	1,547	36	297.5	4,121.4	10,609.5	18,262.0	18,840.0	3,963.0	3,647.2
750.0	30	1,203	25	249.8	3,423.0	8,763.8	15,175.3	15,640.3	3,294.6	3,037.8
625.0	25	1,029	21	223.4	3,104.6	7,844.6	13,765.1	14,171.8	2,988.1	2,760.8
500.0	20	854	16	197.2	2,791.2	6,823.5	12,376.2	12,722.2	2,671.7	2,476.1
250.0	10	497	7	152.3	2,237.9	4,800.2	9,917.6	10,136.8	2,132.0	1,999.8

Heat Rejection Data

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHUAUST 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
2 500.0	100	3 633	46 992	9 146	142 266	79 907	19 835	44 723	154 077	372 403	396 702
2 250.0	90	3 283	44 242	8 557	127 929	70 449	17 960	39 380	139 243	337 204	359 207
2 000.0	80	2 935	41 477	8 162	116 879	63 561	16 262	34 167	124 444	305 311	325 233
1 875.0	75	2 760	40 076	8 007	111 588	60 518	15 425	31 612	117 053	289 608	308 505
1 750.0	70	2 586	38 657	7 874	106 293	57 637	14 588	29 085	109 651	273 881	291 752
1 500.0	60	2 237	35 755	7 684	95 729	52 220	12 915	24 201	94 874	242 485	258 307
1 250.0	50	1 889	32 626	7 527	85 184	46 628	11 245	19 401	80 109	211 118	224 893
1 000.0	40	1 547	29 235	7 282	72 693	40 153	9 427	13 873	65 583	178 995	188 544
750.0	30	1 203	25 476	6 784	59 425	32 726	7 565	8 706	51 005	142 037	151 305
625.0	25	1 029	23 394	6 435	52 542	28 568	6 621	6 496	43 653	124 317	132 429
500.0	20	854	21 006	5 995	44 739	23 683	5 624	4 534	36 223	105 594	112 484
250.0	10	497	15 737	5 026	27 795	12 371	3 578	1 916	21 071	67 181	71 564

Emissions Data

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN	EKW	2,500.0	1,875.0	1,250.0	625.0	250.0
PERCENT LOAD	%	100	75	50	25	10
ENGINE POWER	BHP	3,633	2,760	1,889	1,029	497
TOTAL NOX (AS NO2)	G/HR	22.948	14.101	7.004	3.568	3.185
TOTAL CO	G/HR	2,726	1,304	1,092	1,496	2,098
TOTAL HC	G/HR	500	499	543	408	437
PART MATTER	G/HR	185.5	123.7	132.1	139.5	141.0
TOTAL NOX (AS NO2)	(CORR 5% O2) MG/NM3	2,818.9	2,229.5	1,544.3	1,352.7	2,230.2
TOTAL CO	(CORR 5% O2) MG/NM3	351.8	213.9	252.3	594.6	1,552.7
TOTAL HC	(CORR 5% O2) MG/NM3	55.9	72.8	108.8	140.7	282.4
PART MATTER	(CORR 5% O2) MG/NM3	19.7	16.5	25.8	48.5	88.2
TOTAL NOX (AS NO2)	(CORR 5% O2) PPM	1,373	1,086	752	659	1,086
TOTAL CO	(CORR 5% O2) PPM	281	171	202	476	1,242
TOTAL HC	(CORR 5% O2) PPM	104	136	203	263	527
TOTAL NOX (AS NO2)	G/HP-HR	6.38	5.15	3.74	3.50	6.47
TOTAL CO	G/HP-HR	0.76	0.48	0.58	1.47	4.26
TOTAL HC	G/HP-HR	0.14	0.18	0.29	0.40	0.89
PART MATTER	G/HP-HR	0.05	0.05	0.07	0.14	0.29
TOTAL NOX (AS NO2)	LB/HR	50.59	31.09	15.44	7.87	7.02
TOTAL CO	LB/HR	6.01	2.88	2.41	3.30	4.62
TOTAL HC	LB/HR	1.10	1.10	1.20	0.90	0.96
PART MATTER	LB/HR	0.41	0.27	0.29	0.31	0.31

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN	EKW	2,500.0	1,875.0	1,250.0	625.0	250.0
PERCENT LOAD	%	100	75	50	25	10
ENGINE POWER	BHP	3,633	2,760	1,889	1,029	497
TOTAL NOX (AS NO2)	G/HR	19.123	11.751	5.837	2.974	2.654
TOTAL CO	G/HR	1,515	725	607	831	1,165
TOTAL HC	G/HR	376	375	408	307	329
TOTAL CO2	KG/HR	1,740	1,340	966	559	296
PART MATTER	G/HR	132.5	88.4	94.3	99.6	100.7
TOTAL NOX (AS NO2)	(CORR 5% O2) MG/NM3	2,349.1	1,857.9	1,286.9	1,127.3	1,858.5
TOTAL CO	(CORR 5% O2) MG/NM3	195.4	118.8	140.1	330.3	862.6
TOTAL HC	(CORR 5% O2) MG/NM3	42.1	54.8	81.8	105.8	212.3
PART MATTER	(CORR 5% O2) MG/NM3	14.1	11.8	18.4	34.7	63.0
TOTAL NOX (AS NO2)	(CORR 5% O2) PPM	1,144	905	627	549	905
TOTAL CO	(CORR 5% O2) PPM	156	95	112	264	690
TOTAL HC	(CORR 5% O2) PPM	79	102	153	197	396
TOTAL NOX (AS NO2)	G/HP-HR	5.32	4.30	3.12	2.92	5.39
TOTAL CO	G/HP-HR	0.42	0.26	0.32	0.82	2.37
TOTAL HC	G/HP-HR	0.10	0.14	0.22	0.30	0.67
PART MATTER	G/HP-HR	0.04	0.03	0.05	0.10	0.20
TOTAL NOX (AS NO2)	LB/HR	42.16	25.91	12.87	6.56	5.85
TOTAL CO	LB/HR	3.34	1.60	1.34	1.83	2.57
TOTAL HC	LB/HR	0.83	0.83	0.90	0.68	0.72
TOTAL CO2	LB/HR	3.836	2.955	2.130	1.233	654
PART MATTER	LB/HR	0.29	0.19	0.21	0.22	0.22
OXYGEN IN EXH	%	9.4	10.4	11.3	12.2	14.4
DRY SMOKE OPACITY	%	1.7	1.4	1.9	2.5	3.8
BOSCH SMOKE NUMBER		0.58	0.49	0.62	0.92	1.27

Regulatory Information

EPA TIER 2		2008 - 2010		
GASEOUS EMISSIONS DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 89 SUBPART D AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. GASEOUS EMISSIONS VALUES ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.				
Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	NON-ROAD	TIER 2	CO: 3.5 NOx + HC: 6.4 PM: 0.20

EPA EMERGENCY STATIONARY		2011 - —		
GASEOUS EMISSIONS DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 60 SUBPART IIII AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. GASEOUS EMISSIONS LIMIT VALUES ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.				
Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	STATIONARY	EMERGENCY STATIONARY	CO: 3.5 NOx + HC: 6.4 PM: 0.20

Altitude Derate Data

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	50	60	70	80	90	100	110	120	130	NORMAL
ALTITUDE (FT)										
0	3.634	3.634	3.634	3.634	3.634	3.634	3.634	3.634	3.634	3.634
1,000	3.634	3.634	3.634	3.634	3.634	3.634	3.634	3.625	3.563	3.634
2,000	3.634	3.634	3.634	3.634	3.634	3.614	3.551	3.490	3.430	3.634
3,000	3.634	3.634	3.634	3.607	3.542	3.478	3.417	3.358	3.301	3.634
4,000	3.634	3.604	3.536	3.470	3.407	3.346	3.288	3.231	3.176	3.574
5,000	3.534	3.466	3.401	3.338	3.277	3.218	3.162	3.107	3.055	3.461
6,000	3.398	3.332	3.270	3.209	3.151	3.094	3.040	2.987	2.937	3.351
7,000	3.266	3.203	3.142	3.084	3.028	2.974	2.922	2.871	2.823	3.243
8,000	3.137	3.077	3.019	2.963	2.909	2.857	2.807	2.758	2.712	3.137
9,000	3.013	2.955	2.899	2.845	2.794	2.744	2.696	2.649	2.604	3.034
10,000	2.892	2.837	2.783	2.732	2.682	2.634	2.588	2.543	2.500	2.933
11,000	2.776	2.722	2.671	2.621	2.574	2.528	2.483	2.441	2.399	2.835
12,000	2.663	2.611	2.562	2.515	2.469	2.425	2.382	2.341	2.301	2.739
13,000	2.553	2.504	2.457	2.411	2.367	2.325	2.284	2.245	2.207	2.645
14,000	2.447	2.400	2.354	2.311	2.269	2.228	2.189	2.151	2.115	2.554
15,000	2.344	2.299	2.256	2.214	2.174	2.135	2.097	2.061	2.026	2.465

Cross Reference

Arrangement Number		Engine Arrangement	
Arrangement Number	Effective Serial Number	Engineering Model	Engineering Model Version
2666136	SBK00001	GS336	-
3994249	DD500001	GS716	-

Test Spec		Test Specification Data			
Test Spec	Setting	Effective Serial Number	Engine Arrangement	Governor Type	Default Low Idle Speed
37D4726	LL6306	SBK00001	2666136	ADEM3	
37D4980	GG0623	DD500001	3994249	ADEM3	

Supplementary Data

Type	Classification	Performance Number
SOUND	SOUND PRESSURE	DM8779

General Notes

General Notes DM9228 - 01
SOUND PRESSURE DATA FOR THIS RATING CAN BE FOUND IN PERFORMANCE NUMBER - DM8779

Performance Parameter Reference

Parameters Reference:DM9600-05 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 ISO90012000 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, 3046-12002E, 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%
Heat rejection	+/- 5%
Heat rejection exhaust only	+/- 10%

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 reference atmospheric pressure is 100 KPA (29.61 in hg) and standard temperature is 25 (77) at 60% relative humidity.

FOR 3600 ENGINES

Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JAN90 standard reference conditions of 25, 100 KPA 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.

PERFORMANCE DATA[DM9228]

November 27, 2013

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 output power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators.

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.

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. Log on to the <https://pdgl.cat.com/cda/layout> Technology and Solutions Divisions (T&SD) web page (<https://pdgl.cat.com/cda/layout>) for information including federal regulation applicability and time lines for implementation. Information for labeling and tagging requirements is also provided.

NOTES:

Regulation watch covers regulations in effect and future regulation changes for world, federal, state and local. This page includes items on the watch list where a regulation change or product change might be pending and may need attention of the engine product group. For additional emissions information log on to the TMI web page.

Additional product information for specific market application is available.

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

HEAT REJECTION DEFINITIONS

Diesel Circuit Type and HHV Balance DM9500

EMISSIONS DEFINITIONS:

Emissions : DM1176

PERFORMANCE DATA[DM9228]

November 27, 2013

SOUND DEFINITIONS:

Sound Power : DM8702

Sound Pressure : TM7080

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

Date Released : 11/23/11

