MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

July 25, 2016

PERMIT TO INSTALL
612-96B

ISSUED TO
Breitburn Operating, LP

LOCATED AT
NW/4, SW/4 Section 35, T20N, R9W
Sherman Township, Michigan

IN THE COUNTY OF
Osceola

STATE REGISTRATION NUMBER
N6060

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environmental Quality. This permit is hereby issued in accordance with and subject to Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.1201(6).

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203: **June 13, 2016**	
DATE PERMIT TO INSTALL APPROVED: **July 25, 2016**	SIGNATURE:
DATE PERMIT VOIDED:	SIGNATURE:
DATE PERMIT REVOKED:	SIGNATURE:

PERMIT TO INSTALL

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Common Abbreviations / Acronyms

Common Acronyms		Pollutant / Measurement Abbreviations	
AQD	Air Quality Division	acfm	Actual cubic feet per minute
BACT	Best Available Control Technology	BTU	British Thermal Unit
CAA	Clean Air Act	°C	Degrees Celsius
CAM	Compliance Assurance Monitoring	CO	Carbon Monoxide
CEM	Continuous Emission Monitoring	CO_2e	Carbon Dioxide Equivalent
CFR	Code of Federal Regulations	dscf	Dry standard cubic foot
COM	Continuous Opacity Monitoring	dscm	Dry standard cubic meter
Department/ department	Michigan Department of Environmental Quality	°F	Degrees Fahrenheit
		gr	Grains
EU	Emission Unit	HAP	Hazardous Air Pollutant
FG	Flexible Group	Hg	Mercury
GACS	Gallons of Applied Coating Solids	hr	Hour
GC	General Condition	HP	Horsepower
GHGs	Greenhouse Gases	H_2S	Hydrogen Sulfide
HVLP	High Volume Low Pressure*	kW	Kilowatt
ID	Identification	lb	Pound
IRSL	Initial Risk Screening Level	m	Meter
ITSL	Initial Threshold Screening Level	mg	Milligram
LAER	Lowest Achievable Emission Rate	mm	Millimeter
MACT	Maximum Achievable Control Technology	MM	Million
MAERS	Michigan Air Emissions Reporting System	MW	Megawatts
MAP	Malfunction Abatement Plan	NMOC	Non-methane Organic Compounds
MDEQ	Michigan Department of Environmental Quality	NO_x	Oxides of Nitrogen
		ng	Nanogram
MSDS	Material Safety Data Sheet	PM	Particulate Matter
NA	Not Applicable	PM10	Particulate Matter equal to or less than 10 microns in diameter
NAAQS	National Ambient Air Quality Standards		
NESHAP	National Emission Standard for Hazardous Air Pollutants	PM2.5	Particulate Matter equal to or less than 2.5 microns in diameter
NSPS	New Source Performance Standards	pph	Pounds per hour
NSR	New Source Review	ppm	Parts per million
PS	Performance Specification	ppmv	Parts per million by volume
PSD	Prevention of Significant Deterioration	ppmw	Parts per million by weight
PTE	Permanent Total Enclosure	psia	Pounds per square inch absolute
PTI	Permit to Install	psig	Pounds per square inch gauge
RACT	Reasonable Available Control Technology	scf	Standard cubic feet
ROP	Renewable Operating Permit	sec	Seconds
SC	Special Condition	SO_2	Sulfur Dioxide
SCR	Selective Catalytic Reduction	TAC	Toxic Air Contaminant
SNCR	Selective Non-Catalytic Reduction	Temp	Temperature
SRN	State Registration Number	THC	Total Hydrocarbons
TEQ	Toxicity Equivalence Quotient	tpy	Tons per year
USEPA/EPA	United States Environmental Protection Agency	µg	Microgram
		µm	Micrometer or Micron
VE	Visible Emissions	VOC	Volatile Organic Compounds
		yr	Year

*For HVLP applicators, the pressure measured at the gun air cap shall not exceed 10 psig.

GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **(R 336.1201(1))**

2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environmental Quality, P.O. Box 30260, Lansing, Michigan 48909-7760, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **(R 336.1201(4))**

3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to R 336.1210, operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **(R 336.1201(6)(b))**

4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **(R 336.1201(8), Section 5510 of Act 451, PA 1994)**

5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to R 336.1219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of R 336.1219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environmental Quality. **(R 336.1219)**

6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **(R 336.1901)**

7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **(R 336.1912)**

8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.

9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.

10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.

11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of R 336.1301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with R 336.1303. **(R 336.1301)**
    a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
    b) A visible emission limit specified by an applicable federal new source performance standard.
    c) A visible emission limit specified as a condition of this Permit to Install.

12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in R 336.1370(2). **(R 336.1370)**

13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with R 336.2001 and R 336.2003, under any of the conditions listed in R 336.2001. **(R 336.2001)**

SPECIAL CONDITIONS

EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Installation Date / Modification Date	Flexible Group ID
EUDEHY	Glycol dehydration system processing gas from the PDC zone.		FGFACILITY
EUENGINE	Natural gas fired reciprocating engine	NA	FGFACILITY
Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1290.			

The following conditions apply to: EUDEHY

DESCRIPTION: Glycol dehydration system processing gas from the PDC zone.

Flexible Group ID: FGFACILITY

POLLUTION CONTROL EQUIPMENT: NA

I. EMISSION LIMITS

NA

II. MATERIAL LIMITS

NA

III. PROCESS/OPERATIONAL RESTRICTIONS

NA

IV. DESIGN/EQUIPMENT PARAMETERS

NA

V. TESTING/SAMPLING

NA

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. If EUDEHY meets the exemption criteria in 40 CFR 63.764(e)(1)(i) for glycol dehydrators with actual annual average flow rate of natural gas less than 85,000 cubic meters per day, the actual flow rate of natural gas shall be determined using either of the procedures below:
   a) The permittee shall install and operate a monitoring instrument that directly measures natural gas flow rate to the glycol dehydration unit with an accuracy of plus or minus 2 percent or better. The permittee shall convert annual natural gas flow rate to a daily average by dividing the annual flow rate by the number of days per year the glycol dehydration unit processed natural gas. **(40 CFR 63.772(b)(1)(i))**
   b) The permittee shall document, to the AQD District Supervisor's satisfaction, that the actual annual average natural gas flow rate to the glycol dehydration unit is less than 85,000 cubic meters per day. **(40 CFR 63.772(b)(1)(ii))**

   As an alternative, if EUDEHY meets the exemption criteria in 40 CFR 63.764(e)(1)(ii) for glycol dehydrators with actual average benzene emissions less than 0.90 megagram per year, the emissions shall be determined either uncontrolled, or with federally enforceable controls in place and using either of the procedures below:
   c) The permittee shall determine actual average benzene emissions using the model GRI-GLYCalc™, Version 3.0 or higher, and the procedures presented in the associated GRI-GLYCalc™ Technical Reference Manual. Inputs to the model shall be representative of actual operating conditions of the glycol dehydration unit and may be determined using the procedures documented in the Gas Research Institute (GRI) report entitled "Atmospheric Rich/Lean Method for Determining Glycol Dehydrator Emissions" (GRI–95/0368.1). **(40 CFR 63.772(b)(2)(i))**
   d) The permittee shall determine an average mass rate of benzene emissions in kilograms per hour through direct measurement using the methods in 40 CFR 63.772(a)(1)(i) or (ii), or an alternative method according to 40 CFR 63.7(f). Annual emissions in kilograms per year shall be determined by multiplying the mass rate by the number of hours the unit is operated per year. This result shall be converted to megagrams per year. **(40 CFR 63.772(b)(2)(ii))**

2. If EUDEHY complies with the exemption criteria in 40 CFR 63.764(e)(1)(i) for glycol dehydrators with actual annual average flow rate of natural gas less than 85,000 cubic meters per day, the permittee shall keep records of the actual annual average natural gas throughput (in terms of natural gas flow rate to the glycol dehydration unit per day) as determined in accordance with SC VI.5. The permittee shall keep all records on file at the facility/a location approved by the AQD District Supervisor and make them available to the Department upon request. **(40 CFR 63.774(d)(1)(i))**

3. As an alternative to SC VI.14, if EUDEHY complies with the exemption criteria in 40 CFR 63.764(e)(1)(ii) for glycol dehydrators with actual average benzene emissions less than 0.90 megagram per year, the permittee shall keep records of the actual average benzene emissions (in terms of benzene emissions per year) as determined in accordance with SC VI.5. The permittee shall keep all records on file at the facility / a location approved by the AQD District Supervisor and make them available to the Department upon request. **(40 CFR 63.774(d)(1)(ii))**

VII. REPORTING

1. The permittee shall submit all applicable notifications and reports required by 40 CFR 63.775 by the dates specified in 40 CFR 63.775. **(40 CFR 63.775)**

VIII. STACK/VENT RESTRICTIONS

NA

IX. OTHER REQUIREMENTS

1. The permittee shall comply with all provisions of the National Emission Standards for Hazardous Air Pollutants, 40 CFR Part 63, Subpart HH, as they apply to EUDEHY. **(40 CFR Part 63, Subpart HH)**

The following conditions apply to: EUENGINE

DESCRIPTION: Natural gas fired reciprocating engine.

Flexible Group ID: FGFACILITY

POLLUTION CONTROL EQUIPMENT: NA

I. EMISSION LIMITS

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. NO_x	17 tpy	12-month rolling time period as determined at the end of each calendar month.	EUENGINE	SC VI.5 and Appendix A	R 336.1205 40 CFR 52.21(c) & (d)
2. CO	65 tpy	12-month rolling time period as determined at the end of each calendar month.	EUENGINE	SC VI.6 and Appendix A	R 336.1205 40 CFR 52.21(d)

II. MATERIAL LIMITS

NA

III. PROCESS/OPERATIONAL RESTRICTIONS

1. No later than 60 days after issuance of this permit, the permittee shall submit to the AQD District Supervisor, for review and approval, a malfunction abatement plan (MAP) for EUENGINE. After approval of the MAP by the AQD District Supervisor, the permittee shall not operate EUENGINE unless the MAP, or an alternate plan approved by the AQD District Supervisor, is implemented and maintained. The plan shall incorporate procedures recommended by the equipment manufacturer as well as incorporating standard industry practices. At a minimum the plan shall include:
   a) Identification of the equipment and, if applicable, air-cleaning device and the supervisory personnel responsible for overseeing the inspection, maintenance, and repair
   b) Description of the items or conditions to be inspected and frequency of the inspections or repairs
   c) Identification of the equipment and, if applicable, air-cleaning device, operating parameters that shall be monitored to detect a malfunction or failure, the normal operating range of these parameters and a description of the method of monitoring or surveillance procedures
   d) Identification of the major replacement parts that shall be maintained in inventory for quick replacement
   e) A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits

   If the plan fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the owner or operator shall revise the plan within 45 days after such an event occurs and submit the revised plan for approval to the AQD District Supervisor. Should the AQD determine the MAP to be inadequate, the AQD District Supervisor may request modification of the plan to address those inadequacies. **(R 336.1205, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912, 40 CFR 52.21 (c) & (d))**

2. The permittee shall not operate any engine equipped with an add-on control device for more than 200 hours per engine per year without that control device consistent with the MAP (pursuant to SC III.1). The 200 hours shall include times after an engine change-out occurs and general maintenance performed as allowed by the MAP. The hours per year limit is based on a 12-month rolling time period as determined at the end of each calendar month. **(R 336.1205, R 336.1702(a), 40 CFR 52.21 (c) & (d))**

IV. DESIGN/EQUIPMENT PARAMETERS

1. The permittee shall not operate any engine that contains an add-on control device unless that device is installed, maintained, and operated in a satisfactory manner, except as specified in SC III.2. Satisfactory operation includes performing the manufacturer's recommended maintenance on the control device and operating in conjunction with the MAP specified in SC III.1. **(R 336.1205, R 336.1702(a), R 336.1910, 40 CFR 52.21 (c) & (d))**

2. The permittee shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor the natural gas usage for EUENGINE on a continuous basis. **(R 336.1205, 40 CFR 52.21 (c) & (d))**

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. Upon request by the AQD District Supervisor, the permittee shall verify NO_x and CO emission factors used to calculate emissions from EUENGINE, by testing at owner's expense, in accordance with Department requirements. If a test has been conducted, any resulting increase in an emission factor shall be implemented to calculate NO_x and CO. No less than 60 days prior to testing, the permittee shall submit a complete test plan to the AQD. The AQD must approve the final plan prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test. **(R 336.1205, R 336.2001, R 336.2003, 40 CFR 52.21 (c) & (d))**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall complete all required calculations in a format acceptable to the AQD District Supervisor and make them available by the last day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition. **(R 336.1205, R 336.1702(a))**

2. The permittee shall monitor in a satisfactory manner, the natural gas usage for EUENGINE on a continuous basis. **(R 336.1205, 40 CFR 52.21 (c) & (d))**

3. The permittee shall maintain a log of all maintenance activities conducted according to the MAP (pursuant to SC III.1). The permittee shall keep this log on file at a location approved by the AQD District Supervisor and make it available to the Department upon request. **(R 336.1205, R 336.1702(a), R 336.1911, 40 CFR 52.21 (c) & (d))**

4. The permittee shall keep, in a satisfactory manner, for any engine equipped with an add-on control device, monthly and 12-month rolling time period records of the hours that the engine is operated without the control device. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available to the Department upon request. **(R 336.1205, R 336.1702(a), 40 CFR 52.21 (c) & (d))**

5. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period NO_x emission calculation records for EUENGINE, as required by SC I.1 and Appendix A. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available to the Department upon request. **(R 336.1205, 40 CFR 52.21 (c) & (d))**

6. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period CO emission calculation records for EUENGINE, as required by SC I.2 and Appendix A. The permittee shall keep all records on file at a location approved by the AQD District Supervisor and make them available to the Department upon request. **(R 336.1205, 40 CFR 52.21(d))**

VII. REPORTING

1. Except as provided in R 336.1285, if EUENGINE is replaced with an equivalent-emitting or lower-emitting engine, the permittee shall notify the AQD District Supervisor of such change-out and submit acceptable emissions data to show that the alternate engine is equivalent-emitting or lower-emitting. The data shall be submitted within 30-days of the engine change out. **(R 336.1205, R 336.1702(a), R 336.1911, 40 CFR 52.21 (c) & (d))**

VIII. STACK/VENT RESTRICTIONS

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter/ Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVENGINE	8	14	40 CFR 52.21 (c) & (d)

IX. OTHER REQUIREMENTS

1. The permittee shall comply with all provisions of the National Emission Standards for Hazardous Air Pollutants as specified in 40 CFR Part 63 Subparts A and ZZZZ, as they apply to EUENGINE **(40 CFR Part 63 Subparts A & ZZZZ)**

FLEXIBLE GROUP SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FGFACILITY	All process equipment source-wide including equipment covered by other permits, grand-fathered equipment and exempt equipment.	NA

The following conditions apply Source-Wide to: FGFACILITY

I. EMISSION LIMITS

NA

II. MATERIAL LIMITS

1. The permittee shall not burn any sour natural gas in FGFACILITY. Sour gas is defined as any gas containing more than 1 grain of hydrogen sulfide or more than 10 grains of total sulfur per 100 standard cubic feet. **(R 336.1205(3))**

III. PROCESS/OPERATIONAL RESTRICTIONS

NA

IV. DESIGN/EQUIPMENT PARAMETERS

NA

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. Verification of H_2S and/or sulfur content of the natural gas burned in FGFACILITY may be required upon request by the AQD District Supervisor. This condition is necessary to ensure compliance with SC II.1. **(R 336.1205(3))**

VI. MONITORING/RECORDKEEPING

NA

VII. REPORTING

NA

VIII. STACK/VENT RESTRICTIONS

NA

IX. OTHER REQUIREMENTS

1. The permittee shall comply with all provisions, including recordkeeping and reporting, of the federal Standards of Performance for New Stationary Sources as specified in 40 CFR Part 60 Subparts A and KKK, as they apply to FGFACILITY. **(40 CFR Part 60 Subparts A & KKK)**

Malfunction Abatement Plan (MAP)
Content Checklist for Engines Required to Submit a MAP

	MAP Content	Location	
		Page	Section / Table
1	Contact Person		
	Engines		
2	Engine Identification: Include the engine make / model and type of engine (i.e. rich or lean burn). Identify engines with add on control and AFRC. If add on control is present, identify type of control.		
3	Engine Operating Variables To Be Monitored. Include a copy of the normal engine maintenance log.		
4	Corrective procedures or operational changes that will be taken in the event of a malfunction.		
5	Major parts replacement inventory for engines.		
	Add-On Controls		
6	Catalytic Converter operating variables to be monitored. Include the method and frequency of monitoring these variables; provide the normal operating range of these variables.		
7	Corrective actions to be taken in event of malfunction of the catalytic converter.		
8	AFRC O_2 Sensor replacement schedule or operating variables to be monitored		
9	Corrective actions to be taken in event of malfunction of the AFRC		
10	Emission testing utilizing portable analyzer		
11	Scheduled maintenance of control equipment		
12	Major parts replacement inventory for add on control.		
13	Identify supervisory personnel responsible for overseeing inspection, maintenance and repair of add on controls.		
14	Recordkeeping and retention of records.		
15	Updates of MAP as necessary.		

Guidance Document For
Malfunction Abatement Plan (MAP) Checklist

1. Contact Person: Include the name, title, telephone number (extension if applicable) and e-mail address for the person that may be contacted with questions regarding this Malfunction Abatement Plan (MAP) with the transmittal letter accompanying the MAP rather than within the body of the MAP.

Engines

2. Engine Identification: For each engine at the facility, list the engine manufacturer, model and type of engine (rich burn or lean burn) and the type of add-on control equipment used (oxidation catalyst, three-way catalyst), if any. Also, identify each engine with an air to fuel ratio controller (AFRC).

3. Engine operating variables to be monitored: Provide the normal engine maintenance log.

4. Corrective procedures in the event of an engine malfunction: Provide a brief summary of the procedures that will take place in the event of an engine malfunction. A malfunction is defined in Rule 113(d) of the State of Michigan Air Pollution Control Rules which states, in part, 'any sudden, infrequent and not reasonable preventable failure of the equipment to operate in a normal or usual manner. Failures caused in part by poor maintenance or careless operations are not malfunctions.'

5. Major parts replacement inventory: Provide a list of major replacement parts that shall be maintained in inventory for quick replacement. If no replacement parts are kept on site provide a statement that no parts shall be kept.

Add-On Controls

6. Catalytic converter operating variables to be monitored: Provide the following:
   a. A list of variables that will be monitored to measure catalytic converter performance including the catalytic converter inlet and outlet temperature, pressure differential across the catalytic converter, and any other relevant catalytic converter variables that are monitored.
   b. The normal operating range that has been developed for each variable; acceptable ranges shall include documentation as to how the range was determined (i.e. manufacturer's recommendations or determined in the field with documentation or testing).
   c. The method of monitoring the variables, and
   d. The frequency of monitoring the variables.

7. Corrective procedures in the event of a malfunction of the catalytic converter: Malfunction is defined in number four above. Provide information on what steps shall be taken when a variable is out of range. This could include monitoring of emissions or cleaning and/or replacement of the catalytic converter.

8. AFRC O_2 sensor replacement schedule or operating variables to be monitored: Chose either (a) or (b).
   a. O_2 sensor replacement interval or sensor life detector
   b. If monitoring, provide:
      i. A list of variables monitored to measure AFRC performance (i.e. millivolt output, O_2, and/or any other relevant AFRC variables that are monitored).
      ii. The normal operating range that has been developed for each variable; acceptable ranges shall include documentation as to how the range was determined (i.e. manufacturer's recommendations or determined in the field with documentation or testing).
      iii. The method of monitoring the variables.
      iv. The frequency of monitoring the variables.

9. Corrective procedures in the event of a malfunction of the AFRC: Malfunction is defined in number 4 above. If choosing monitoring in paragraph 8.b above, provide information on what steps shall be taken when a variable is out of range.

10. Emission checks: Describe when a portable analyzer would be used and how it will be used.
    a. Calibration of the analyzer will be conducted as required by manufacturer's specifications. Records shall be kept on file and made available to the Air Quality Division upon request.
    b. Checks for both CO and NO_x.
    c. Checks to be used to:
        i. Check performance if monitored parameter is out of normal range, e.g. low inlet temperature (an engine specific minimum inlet temperature could then be established).
        ii. When vendor cleaned catalyst is installed. This check will normally occur in the 12-18 month window as specified for routine cleaning.
    d. Companies may choose to perform any of following the three valid methods:
        i. Inlet and outlet checks and estimate destruction efficiency.
        ii. Outlet testing and check for g/hp-hr compared to levels used for permitting.
        iii. Outlet testing and use the uncontrolled vendor data to establish destruction efficiency.

11. Scheduled maintenance: Describe the scheduled cleaning and/or replacement of the catalytic converter.
    a. Frequency of catalytic converter inspection and field catalyst media cleaning (vacuum catalyst face): Follow vendor recommendations, typically 12-18 months unless parameters (pressure drop, temperature deviations, etc) indicate otherwise.
    b. Catalyst media removal and wash in chemical solution by manufacturer (if catalyst media does not respond to field cleaning). A replacement catalyst media will be used during the cleaning process.
    c. Catalytic converter gasket replacement: Follow vendor recommendations, typically 12-18 months when catalyst is serviced.
    d. Replace catalyst media if not functioning properly after vendor cleaning, or in lieu of vendor cleaning.

12. Major parts replacement inventory: Provide a list of major replacement parts that shall be maintained in inventory for quick replacement. If no replacement parts are kept on site provide a statement that no parts shall be kept.

13. Supervisory personnel responsible for maintenance of the control equipment: Include the contact information. This person or position can be a company employee or contractor and may or may not be the same person / position listed in number one above.

14. Retention of records: Records shall be kept on file and retained as described in the permit.

15. Updates of MAP: Any updates to the plan shall be submitted to the AQD District Supervisor for written approval as required in the permit (the Department of Environmental Quality recommends the MAP be reviewed annually).

APPENDIX A
Procedures for Calculating NOx and CO Emissions

The permittee shall demonstrate compliance with the NOx and CO emission limits by keeping track of all fuel usage for each engine and multiplying that fuel usage by an equipment-specific emission factor. The emission factors are typically expressed as the mass of pollutant per unit of fuel.

EUENGINE:
The permittee shall use emission factors from vendor data or from source specific testing (stack testing), as available for each engine included in EUENGINE. This also applies to engine(s) from engine change-out(s). If emission factors from other sources are used, the permittee shall obtain the approval of the AQD District Supervisor before using the emission factors to calculate emissions.

The permittee shall document the source of each emission factor used in the calculations.