

## Statement of Basis

**Freebird Gas Storage, LLC  
East Detroit Storage Facility  
Lamar County  
Facility/Permit No. 408-0009**

This draft Major Source Operating Permit (MSOP) 2<sup>nd</sup> renewal is prepared under the provisions of ADEM Admin. Code r. 335-3-16. The above named applicant has requested authorization to perform the work or operate the facility shown on the application and drawing, plans, and other documents attached hereto or on file with the Air Division of the Alabama Department of Environmental Management, in accordance with the terms and conditions of this permit. This will be the second renewal of the Major Source Operating Permit (MSOP) for this facility. The current MSOP (First Renewal) was originally issued on February 12, 2016, and is scheduled to expire on January 31, 2020. There have been no modifications to or additions of significant emission sources at this facility since the issuance of the first renewal.

Freebird Gas Storage, L.L.C. (Freebird) is a depleted reservoir natural gas storage facility which operates compressor engines to move gas from the reservoir, process the gas to remove entrained water, and reintroduce the gas into the natural gas transmission pipeline. The significant sources of air pollutants at this facility are three (3) 1,340 hp Caterpillar G3516, 4-stroke, lean-burn (4SLB) natural gas-fired reciprocating internal combustion engines (RICE) (Emission Unit Nos. 001 - 003); three (3) 2,370 hp Caterpillar G3608 4SLB, natural gas-fired RICE with oxidation catalysts (Emission Unit Nos. 004 - 006); one 468 hp Generac 13.3 GTA 4-stroke, rich-burn (4SRB) natural gas-fired RICE equipped with a non-selective catalytic reduction unit (NSCR) operating as an emergency generator (Emission Unit No. 010); and one 1.0 MMBtu/hr ETI dehydrator/heater equipped with a condenser/thermal oxidizer (Emission Unit No. 009). Insignificant emission sources at this station include four lube oil storage tanks (<1,000 gallons each), one glycol storage tank (<1,000 gallons), one used oil storage tank (<1,000 gallons), one coolant storage tank (<1,000 gallons), one crankcase oil storage tank (1,000 gallons), and one process liquid “slop” tank (<1,000 gallons).

### **Applicability: Federal Regulations**

#### **Title V**

This facility is a major source under Title V regulations because the potential emissions for nitrogen oxides (NO<sub>x</sub>) exceed the 100 TPY major source threshold. It is also a major source of Hazardous Air Pollutants (HAP) because individual HAP potential emissions are greater than 10 TPY (17.60 TPY for Formaldehyde) and the total HAP potential emissions are greater than 25 TPY (25.30 TPY).

#### **Prevention of Significant Deterioration (PSD)**

This facility is located in an attainment area for all criteria pollutants and the facility operations are not one of the listed major source categories. Therefore, the applicable major source threshold is 250 TPY. It is not a major source for PSD because the facility-wide potential emissions of criteria pollutants do not exceed 250 TPY.

#### **NSPS**

40 CFR Part 60, Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

The reciprocating engines (Emission Unit Nos. 001 – 006) are not subject to 40 CFR Part 60, Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines [Adopted by reference in ADEM Admin. Code r. 335-3-10-.02(88)] based on the date that these engines were manufactured.

Emission Unit No. 010 is subject to Subpart JJJJ because the unit was ordered in April 2011, and was manufactured in August 2011, after the applicability date for this subpart. The applicable requirements are:

Emission Limitations

In accordance with 40 CFR §60.4233(e), the emergency engine must meet a NO<sub>x</sub> emission standard of 2.0 g/hp-hr (or 160 ppmvd at 15% O<sub>2</sub>), a CO emission standard of 4.0 g/hp-hr (or 540 ppmvd at 15% O<sub>2</sub>), and a VOC emission standard of 1.0 g/hp-hr (or 86 ppmvd at 15% O<sub>2</sub>). According to 40 CFR §60.4234, Freebird must operate and maintain the emergency engine in a manner that meets these emission standards over the entire life of the engine.

Compliance Requirements

40 CFR §60.4243(d) requires the emergency generator to be operated according to the requirements in 40 CFR §60.4243(d)(1) through (3). To be considered an emergency stationary ICE, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations (not to exceed 50 hours per year), is prohibited. If the engine is not operated according to the requirements in 40 CFR §60.4243(d)(1) through (3), the engine will not be considered an emergency engine and must meet all requirements for non-emergency engines. The emergency generator, Emission Unit No. 10, is equipped with a NSCR unit. 40 CFR §60.4243(g) requires 4SRB engines using NSCR to operate the air-to-fuel controller appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times. 40 CFR §60.4237(a) requires the installation of a non-resettable hour meter on the emergency engine because it does not meet the standards applicable to non-emergency engines of the same size and model year. Emission Unit No. 010 is a certified engine. 40 CFR §60.4243(b)(1) requires certified engines to be operated according to the manufacturer's emission related written instructions and records of all maintenance must be maintained along with documentation from the manufacturer that the engine is certified to demonstrate compliance with the emission standard.

Testing Requirements

Since the emergency engine is a certified engine, it would not have to undergo an initial compliance test or subsequent tests as long as Freebird operates the engine and the control device according to the manufacturer's emission-related written instructions. However, if Freebird does not operate and maintain the engine and the control device according to the manufacturer's emission-related written instructions, then Freebird would have to demonstrate compliance by performing an initial performance test.

### Notification, Reports, and Records

40 CFR §60.4245(a) requires that owners and operators of all stationary SI ICE that are subject to Subpart JJJJ keep records of: (1) all notifications submitted along with supporting documentation, (2) all maintenance conducted on the engine, and (3) documentation from the manufacturer that the engine is certified to meet the emission standards. In addition, 40 CFR §60.4245(b) requires that Freebird keep records of the hours of operation for the emergency engine that are recorded through the non-resettable hour meter. All records required under this Subpart must be retained for at least five years from the date of generation and made available for inspection upon request.

The compressors associated with Emission Unit Nos. 001 – 006 were installed prior to the August 23, 2011, applicability of 40 CFR Part 60, Subpart OOOO, Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distributions [Adopted by reference in ADEM Admin. Code r. 335-3-10-.02(91)]; therefore, these units are not subject to this subpart.

The East Detroit Storage Facility is considered a natural gas compressor and storage facility, however, it is not subject to 40 CFR Part 60, Subpart OOOOa, Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification, or Reconstruction Commenced After September 18, 2015 [Adopted by reference in ADEM Admin. Code r. 335-3-10-.02(91)(a)]. All equipment and processes potentially subject to this regulation were installed and modified prior to the applicability date, therefore, this facility is not subject to this subpart.

### **NESHAP Part 63**

#### 40 CFR Part 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE MACT)

Emission Unit Nos. 001 – 003 are considered existing affected sources under the RICE MACT [Adopted by reference in ADEM Admin. Code r. 335-3-11-.06(103)]. Since these engines were constructed prior to the major source applicability dates and they are four-stroke lean-burn engines (4SLB), these engines do not have any applicable requirements under this rule.

Emission Unit Nos. 004 – 006 are considered new affected sources under the RICE MACT. The applicable requirements are:

#### *1. Emission Limitation*

The applicable emission limitations are found in Table 2a to Subpart ZZZZ. New 4SLB engines are required to either reduce CO emissions by 93% or more or limit the formaldehyde exhaust concentration to 14 ppmvd or less at 15% O<sub>2</sub>. The standard must be achieved at 100% load (± 10%). Freebird has chosen to demonstrate compliance by reducing the CO emissions by utilizing an oxidation catalyst for each of these engines instead of limiting the formaldehyde exhaust concentration.

#### *2. Operating Limitations*

The applicable operating limitations are found in Table 2b to Subpart ZZZZ. Since Freebird utilizes an oxidation catalyst to comply with the standard, the catalyst must be maintained such that the pressure drop across the catalyst does not change by more than 2 inches of water at 100% load ( $\pm 10\%$ ) from the pressure drop that was measured during the initial performance test. In addition, the temperature of the engines' exhaust must be maintained such that the catalyst inlet temperature is  $\geq 450$  °F and  $\leq 1350$  °F.

### *3. Performance Testing*

Performance testing requirements are outlined in Table 4 to Subpart ZZZZ. Freebird is required to test CO emissions to determine if the required 93% reduction emission limitation is being achieved. To comply with the RICE MACT, an initial performance test was required within 180 days of startup of each engine. Freebird conducted the initial compliance test and demonstrated compliance for these units on August 22 and 23, 2007. Freebird is also required to perform subsequent semiannual performance tests to demonstrate compliance with the CO emission limitation. Since Freebird has demonstrated compliance for two consecutive semiannual performance tests, the frequency of subsequent performance tests has been reduced to annually. However, if performance tests in the future indicate that an engine is not in compliance with the CO emission limitation, or the engine has deviated from any operational limitation, Freebird must resume semiannual performance testing.

### *4. Continuous Compliance*

Freebird has proposed to meet the CO reduction requirements and implement a continuous parameter monitoring system (CPMS). In accordance with Table 6 to Subpart ZZZZ, Freebird is required to collect catalyst inlet temperature data (record a reading every 15 minutes) in accordance with the monitoring requirements of 40 CFR §63.6625(b) and reduce the data to 4-hour rolling averages. In addition, Freebird is required to measure the pressure drop across the catalyst once per month.

### *5. Notifications*

Freebird is required to submit a Notification of Intent at least 60 days prior to conducting each performance test. Following each test, Freebird is required to submit a Notification of Compliance Status, including the performance test results, within 60 days of completing each performance test.

### *6. Reports*

The reporting requirements are outlined in Table 7 to Subpart ZZZZ. Freebird is required to submit a semiannual compliance report based on calendar year periods January – June and July – December. Once the MSOP is issued, Freebird would submit the semiannual compliance report as part of their Semiannual Monitoring Report as required by General Permit Proviso No. 21. The compliance report must contain the information outlined in 40 CFR §63.6650(c) and (e). An immediate startup, shutdown, and malfunction (SSM) report must also be submitted when actions addressing a startup, shutdown, and malfunction are inconsistent with the facility's SSM plan.

## 7. Recordkeeping

All notifications and reports (and supporting documentation) as well as records pertaining to initial and continuous compliance must be maintained for a period of 5 years from the date of each record or report. They must be maintained on-site for at least 2 years and may be kept off-site for the remaining 3 years.

## 8. General Provisions (40 CFR Part 63, Subpart A)

Freebird is required to comply with all applicable general provisions of 40 CFR Part 63, Subpart A, except the provisions related to opacity or visible emission standards and COMS since Subpart ZZZZ does not contain these standards or requirements. Table 8 to Subpart ZZZZ also specifies what sections of the subpart have additional or more stringent requirements than the general provisions.

As mentioned previously, Emission Unit No. 010 is an affected source under the RICE MACT; however, because this engine is a new affected source constructed after the June 12, 2006, applicability date, Freebird must meet the requirements of the RICE MACT for this engine by meeting the requirements of 40 CFR Part 60, Subpart JJJJ. No further requirements would apply to the emergency engine under Subpart ZZZZ.

### 40 CFR Part 63, Subpart HHH, National Emissions Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities (Subpart HHH)

Unit No. 009 is an affected source under 40 CFR Part 63, Subpart HHH [Adopted by reference in ADEM Admin. Code r. 335-3-11-.06(59)]. 40 CFR §63.1271 defines a control device as any equipment used for recovering or oxidizing HAP or volatile organic compound (VOC) vapors. Such equipment includes, but is not limited to, absorbers, carbon absorbers, condensers, incinerators, flares, boilers, and process heaters. For the purposes of this subpart, if gas or vapor from regulated equipment is used, reused (i.e., injected into the flame zone of an enclosed combustion device), returned back to the process, or sold, then the recovery system used, including piping, connections, and flow inducing devices, is not considered to be a control device or a closed-vent system. Freebird plans to continue using the condenser and sell the condensate produced by the condenser. Therefore, the condenser would not meet the definition of a control device. However, if Freebird does not sell the condensate or discontinues selling the condensate, the condenser would be considered a control device and subject to the requirements of this Subpart.

This unit meets the definition of an existing small glycol dehydration unit according to 40 CFR §63.1271, since the average benzene emissions are less than 0.90 Mg/yr. The applicable requirements are:

### 1. Emission Limitation

Freebird must limit their BTEX (benzene, toluene, ethyl benzene, and xylene) emissions below the calculated allowable emissions rate using Equation 1 found in 40 CFR §63.1275(b)(iii) for existing small glycol dehydrators.

$$EL_{\text{BTEX}} = 3.10 \times 10^{-4} \times \text{Throughput} \times C_{\text{LBTEX}} \times 365 \text{ days/yr} \times 1 \text{Mg}/1 \times 10^6 \text{ gr}.$$

Where:

$EL_{\text{BTEX}}$  = Unit specific BTEX emission limit (megagrams/yr)

$3.10 \times 10^{-4}$  = BTEX emission limit (gr BTEX/scm-ppmv)

Throughput = annual average daily natural gas throughput (scm/day)

$C_{\text{LBTEX}}$  = annual average BTEX concentration of the natural gas at the inlet to the glycol dehydration unit (ppmv)

Freebird has chosen to meet this requirement by installing a thermal oxidizer in conjunction with the existing condenser associated with this unit.

## 2. Performance Testing

To demonstrated that the thermal oxidizer achieves the reduction in BTEX emissions Freebird performed an initial performance test on January 29, 2016. Freebird is required to perform subsequent performance tests no more than 60 months after the previous test. Therefore, Freebird is required to perform the 1st subsequent performance test no later than January 29, 2021.

This unit is required to be a closed vent system with no detectable emissions by routing all gases, vapors, and fumes to the control device. Freebird is required to demonstrate this in accordance with 40 CFR §63.1282(b), and by performing annual visual inspections for defects that could result in air emissions.

## 3. Continuous Compliance/Operating Limitations

Freebird will monitor the thermal oxidizer (and the condenser, if the condenser meets the definition of a control device) with their CPMS. Freebird is required to establish specific site minimum or maximum parameter values for the thermal oxidizer as specified in 40 CFR §63.1283(d)(5)(i) during the 1<sup>st</sup> subsequent performance test. Using data collected by the CPMS, Freebird must calculate a daily average for each monitored operating parameter for each operating day to ensure that the unit is operating in compliance as specified in 40 CFR §63.1283(d)(4). Compliance is achieved when the daily average of the monitoring value is either equal to or greater than the minimum value or equal to or less than the maximum value.

## 4. Notifications

Freebird is required to submit a Notification of Intent at least 60 days prior to conducting each performance test. Following each test, Freebird is required to submit a Notification of Compliance Status, including the performance test results, within 60 days of completing each performance test.

## 5. Reports

Freebird is required to submit Periodic Reports containing the information in 40 CFR §63.1285(e)(2)(i) through (xiii), semiannually based on the calendar year periods of January – June and July – December. If a malfunction during the reporting period occurs, the Periodic Report shall include the number, duration, and a brief description for each type of malfunction which occurred during the reporting period and which caused or may have caused any applicable emission limitation to be exceeded and include a description of actions taken.

## 6. Recordkeeping

All notifications and reports (and supporting documentation) as well as records pertaining to initial and continuous compliance must be maintained for a period of at least 5 years following the date of each occurrence, measurement, maintenance, corrective action, report or period. The most recent 12 months of records shall be retained on site or shall be accessible from a central location by hardcopy, computer or other means. The following 4 years of records may be retained offsite. All applicable records shall be maintained in such a manner that they can be readily accessed.

### **As a control device, the condenser would have to meet the following requirements:**

Freebird is required to notify the Air Division within 30 days if Freebird discontinues selling the condensate from the condenser. Within 180 days of Freebird discontinuing selling the condensate, Freebird would be required to establish a performance curve for the condenser showing the relationship between the condenser outlet temperature and condenser control efficiency. 40 CFR §63.1283(d)(5)(ii) gives Freebird the option to either:

- (i) Conduct a performance test to establish the performance curve based on the values measured during the test;
- (ii) Use a control device design analysis in accordance with the requirements of 40 CFR §63.1282(d)(4)(i) to demonstrate that the condenser achieves the applicable performance requirements and then base the condenser performance curve on the design analysis; or,
- (iii) As an alternative to using a control device design analysis, Freebird may elect to use the procedures documented in the GRI report entitled “Atmospheric Rich/Lean Method for Determining Glycol Dehydrator Emissions” as inputs for the model GRI-GLYCalc, Version 3.0 or higher, to generate a condenser performance curve.

Freebird has the option to determine compliance by either the method specified in 40 CFR §63.1282(e) or 40 CFR §63.1282(f). Freebird may switch between the two options only after at least one year of operation in compliance with the selected approach.

- (i) 40 CFR §63.1282(e) requires Freebird to demonstrate compliance by using data collected by the CPMS during the establishment of the site specific performance curve

and calculate a daily average for each monitored operating parameter for each operating day to ensure that the unit is in compliance as specified in 40 CFR §63.1283(d)(4). Compliance would be achieved when the daily average of the monitoring value is either equal to or greater than the minimum value or equal to or less than the maximum value; or

- (ii) 40 CFR §63.1282(f) requires Freebird to use the site specific performance curve to identify the minimum percent reduction necessary to meet the BTEX limit. Freebird would calculate the daily average condenser outlet temperature and determine the condenser efficiency for the current operating day using the daily average condenser outlet temperature and the condenser performance curve. At the end of each operating day, Freebird would calculate the 30-day average BTEX emission reduction from the condenser efficiency for the preceding 30 operating days.

### **Applicability: State Regulations**

Although the reciprocating engines and the natural gas-fired emergency generator at this facility are fuel combustion sources, they are not subject to any particulate matter (as TSP) emission limitation of ADEM Admin. Code chap. 335-3-4 or any sulfur dioxide (SO<sub>2</sub>) emission limitation of ADEM Admin. Code chap. 335-3-5 because they do not meet the definition of fuel burning equipment nor is this facility considered one of the process industries, general or specific. The engines and generator are, however, subject to the visible emissions standards of ADEM Admin. Code r. 335-3-4-.01(1). Since the engines and generator are fired exclusively with natural gas, they would be expected to be able to comply with this standard.

The glycol dehydrator is subject to the particulate matter (as TSP) emission limitation of ADEM Admin. Code chap. 335-3-4, the sulfur dioxide (SO<sub>2</sub>) emission limitation of ADEM Admin. Code chap. 335-3-5. It is also subject to the visible emissions standards of ADEM Admin. Code r. 335-3-4-.01(1) because the glycol dehydrator is considered fuel burning equipment. However, because this unit is fired exclusively with natural gas, it would be expected to be able to comply with these standards.

### **Emission Testing and Monitoring**

In addition to the testing required to comply with 40 CFR Part 63, Subpart ZZZZ for Emission Unit Nos. 004 – 006, Freebird is required to certify on a semiannual basis that only natural gas was burned in the six reciprocating engines and the emergency generator as a method for monitoring compliance with the visible emission requirements of ADEM Admin. Code r. 335-3-4-.01(1). In addition the glycol dehydrator is required to certify on a semiannual basis that only natural gas was fired in the glycol dehydrator/heater and that natural gas was fired in the thermal oxidizer with the exception of the waste gases generated by the glycol dehydration/heater unit operations that are combusted and destroyed by the thermal oxidizer as a method for monitoring compliance with the visible emission requirements of ADEM Admin. Code r. 335-3-4-.01(1).



### **Compliance Assurance Monitoring (CAM)**

Although Emission Unit Nos. 004 - 006 and 010 utilize an active control device to meet an emission standard, these units are not subject to CAM because 40 CFR §64.2(b)(i) exempts units subject to an emission standard proposed after November 15, 1990, pursuant to section 111 or 112 of the Clean Air Act. These units are subject to the RICE MACT, which is a standard that meets this exemption.

### **Recordkeeping and Reporting Requirements**

In addition to the recordkeeping and reporting required to comply with 40 CFR Part 63, Subpart ZZZZ for Emission Unit Nos. 004 – 006, 40 CFR Part 60, Subpart JJJJ for Emission Unit No. 010, and 40 CFR Part 63, Subpart HHH for Emission Unit No. 9, Freebird would be required to submit a certification semiannually that only natural gas was fired in the engines, the emergency generator, and the glycol dehydrator.

### **Recommendation**

Based on the above analysis, I recommend that the Major Source Operating Permit (408-0009) be issued with the requirements above pending resolution of any comments received during a 30-day public comment period and a 45-day EPA review.



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Brandon R. Cranford  
Chemical Branch  
Air Division

October 24, 2019  
Date

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