



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

AUG 17 2011

Ms. Kathleen C. Antoine, Environmental Director
HOVENSA L.L.C.
1 Estate Hope
Christiansted, Virgin Islands 00820-5652

Re: Gas Turbine-13 (GT-13) Nitrogen Oxides (NO_x) Performance Study and Low Sulfur Gasoline (LSG) Heater Startup/Shutdown Related Final Modifications to the GT-13 Low Sulfur Fuels Project (GT13-LSF) Prevention of Significant Deterioration (PSD) Permit

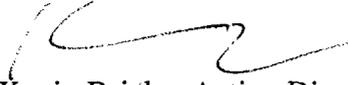
Dear Ms. Antoine:

On February 25, 2011, and March 8, 2011, the U.S. Environmental Protection Agency's Region 2 Office (EPA) received HOVENSA's applications requesting to modify the February 5, 2010, GT13-LSF Project PSD permit. The February 2011 application requested a lower NO_x emission limit when firing oil as fuel, allowing for a different NO_x limit from the main stack while switching from the bypass stack to the main stack and while conducting on-line maintenance of the steam injection system. The March 2011 application requested revisions to the LSG Heater's permitted number of startup and shutdown cycles and to the permitted number of hours of such cycles. On July 5, 2011, EPA issued proposed modifications to the GT13-LSF Project PSD permit. A public notice seeking comments was published on July 12, 2011, in the Virgin Islands Daily News. EPA did not receive any comments during the public comment period which ended on August 10, 2011. Therefore, today EPA is issuing the final modified permit without any changes to the proposed modified permit.

This final modified PSD permit will require HOVENSA to meet the lower NO_x emission limit when firing oil as fuel and will also provide for flexibilities in the operational area. EPA has determined that this final modified permit meets all applicable requirements of the PSD regulations codified at 40 CFR § 52.21 and the Clean Air Act (the Act). Accordingly, EPA hereby approves modifications to the HOVENSA's GT13-LSF Project PSD permit. This letter and its enclosures represent EPA's final permit decision. A summary of the changes are described in the attached Fact Sheet. The final modified PSD permit can be found in Enclosure I. This final permit decision becomes effective today. Since no comments were received during the public comment period, and EPA did not make any changes from the proposal to the final permit modification, this permit may not be challenged under the Consolidated Permit Regulations, codified at 40 CFR Part 124, that apply to EPA's processing of this permit decision and no judicial review is available. Notice of the Agency's final action with respect to this permit will be published in the Federal Register. Under Section 307(b) of the Act, this final Agency action shall not be subject to judicial review in civil or criminal proceedings for enforcement.

If you have any questions regarding this letter, please call Mr. Steven C. Riva, Chief, Permitting Section, Air Programs Branch, at (212) 637-4074.

Sincerely,



Kevin Bricke, Acting Director
Division of Environmental Planning and Protection

Enclosures

cc: Verline Marcellin, Virgin Islands Department of Planning and Natural Resources, w/
Angela Arnold, Virgin Islands Department of Planning and Natural Resources, w/

Fact Sheet

Clean Air Act

Prevention of Significant Deterioration of Air Quality (PSD) Final Modified Permit – Gas Turbine No.13/Low Sulfur Fuels Project (August, 2011- Supersedes February 5, 2010, Amended PSD Permit)

<p style="text-align: center;">HOVENSA, L.L.C. ST. CROIX, U.S. VIRGIN ISLANDS</p>

HOVENSA operates an oil refinery on the south shore of St. Croix in the Virgin Islands. This fact sheet was developed under provisions of the Clean Air Act (CAA) for the final PSD permit which the EPA Region 2 is issuing to HOVENSA, L.L.C. for a modification to their Gas Turbine No.13 (GT-13) and the Low Sulfur Gasoline (LSG) heater at its refinery. Today, this permit is being revised to lower the NOx emission limit and provide operational flexibility.

- July 21, 2005- HOVENSA received a PSD permit to modify its existing petroleum refinery to meet the new Tier 2 low sulfur gasoline and ultra low sulfur diesel (ULSD) requirements. The permit was subsequently modified or amended on November 27, 2007, June 5, 2008, October 13, 2008, February 5, 2010 and February 28, 2011.
- February 25, 2011- HOVENSA requested revision of the GT-13 NOx emission limit during fuel oil firing and other PSD permit conditions to allow operational flexibility during the fuel switching and maintenance activities. [Affected Permit Conditions: VI.A.4, VI.A.5.c. and add VI. A. 5.d, and VIII.A.5.b. and c.]
- March 2, 2011- HOVENSA requested that the LSG heater's startup shutdown cycle times be revised and also to revise PSD permit conditions to allow for on-line maintenance. [Affected Permit Conditions VI.B. 3, VI. B. 5 and VIII.B. 3].
- July 5, 2011- Based on the information HOVENSA provided, EPA determined that there will be no increase in annual emissions, the emission limits in pounds per hour, ppmvd and lbs/MMBtu will not change and that the air quality impact will also not change. The Best Available Control Technology determination will also not change. However, since these changes affected the operational conditions, in this case EPA had determined that HOVENSA's PSD permit should be revised after providing an opportunity for public review. The proposed modifications to the PSD permit were issued on July 5, 2011.
- July 12, 2011- The Public Notice was published in the Virgin Islands Daily News on July 12, 2011, providing the public a 30-day comment period.
- August 10, 2011- The public comment period ended August 10, 2011. EPA did not receive any comments therefore the final permit is being issued without making any changes to the proposed modified permit.

Administrative Procedures

The PSD regulations specify procedural requirements (40 CFR § 52.21(q)) which include administrative review of the final permit decision. Procedural requirements for administrative review are defined in the Consolidated Permit Regulations codified at 40 CFR Part 124. Only those persons who filed comments or participate in the public hearing on the preliminary determination may petition for administrative review except to the extent changes are made from the draft to final permit decision. EPA did not receive any comments during the public comment period, therefore, EPA finalized the permit modification without making any changes to the proposed modification to the permit. There is no judicial review available for this action.

August, 2011- Current and Final Modified Conditions for GT-13 and LSG Heater (The modified and added conditions are indicated in bold below)

A. GT-13

Current Condition VIII.A.5.c.-

HOVENSA shall conduct a performance demonstration study of the SCR system to determine the lowest NO_x concentration from GT No. 13 and the associated duct burner that is feasible. Such study shall commence immediately after the initial performance test for NO_x and shall be completed within 18 months. Within 60 days of study completion, HOVENSA shall submit a report with the results of the demonstration and propose a new NO_x limit which will be less than or equal to the limits established above in VIII.A.5.b. If approved by EPA, EPA will administratively amend this permit to reflect the new NO_x limit(s). If EPA determines that a lower limit is appropriate, EPA will repropose the permit for purposes of modifying this condition.

Revised Condition VIII.A.5.c.-

HOVENSA shall conduct a performance demonstration study of the SCR system to determine the lowest NO_x concentration from GT No. 13 and the associated duct burner that is feasible. Such study shall commence immediately after the initial performance test for NO_x and shall be completed within 18 months. Within 60 days of study completion, HOVENSA shall submit a report with the results of the demonstration and propose a new NO_x limit which will be less than or equal to the limits established above in VIII.A.5.b. If approved by EPA, EPA will administratively amend this permit to reflect the new NO_x limit(s). If EPA determines that a lower limit is appropriate, EPA will repropose the permit for purposes of modifying this condition. **(On February 25, 2011, HOVENSA submitted a report under this provision. EPA is proposing to grant the request to lower the NO_x emission limit).**

Current Condition VIII.A.5.b.-

The concentration of NO_x in the exhaust gas during fuel oil firing shall not exceed 20 ppmvd, corrected to 15% oxygen and 0.0761 lbs/mmBtu.

Revised Condition VIII.A.5.b.-

The concentration of NO_x in the exhaust gas during fuel oil firing shall not exceed **13 ppmvd**, corrected to 15% oxygen and **0.0640 lbs/mmBtu**.

Current Condition VI.A.4.-

The HRSG shall not be bypassed more than 720 hours per year, as calculated on a 12-month rolling basis.

Revised Condition VI.A.4.-

The HRSG shall not be bypassed more than 720 hours per year, as calculated on a 12-month rolling basis. **During a switch from the bypass stack to the main stack while the turbine unit is online, and is not in start up/shut down mode under condition VI.A.5 , the NO_x emissions from the main stack shall not exceed 42ppmdv (corrected to 15%) and 0.1601 lbs/mmBtu for a maximum period of 4 hours. The total time needed to return the NO_x emissions to the lower limit of 13 ppmvd in Sections VIII.A.5.a and b of this permit shall be subtracted from the permitted 720 hour limit for the bypass stack.**

Current Condition VI.A.5.c.-

During startup and shutdown of GT No. 13, HOVENSA shall comply with all mass emission limits except for NO_x which shall be limited to 95 ppmvd at 15% oxygen averaged over a 4 hour time period for cold starts, a 2 hour time period for warm starts, a 1.5 hour time period for hot starts and a 1 hour time period for shutdowns. HOVENSA shall also comply with the opacity limit during each startup and shutdown. The total number of cold, warm and hot startup-shutdown cycles for GT No. 13 shall be limited to 12, 24 and 72 respectively, during any consecutive 12-month period.

Revised Condition VI.A.5.c.-

During startup and shutdown of GT No. 13, HOVENSA shall comply with all mass emission limits except for NO_x which shall be limited to 95 ppmvd at 15% oxygen averaged over a 4 hour time period for cold starts, a 2 hour time period for warm starts, a 1.5 hour time period for hot starts and a 1 hour time period for shutdowns. HOVENSA shall also comply with the opacity limit during each startup and shutdown. The total number of cold, warm and hot startup-shutdown cycles for GT No. 13 shall be limited to 12, 24 and **68** respectively, during any consecutive 12-month period.

Add Condition VI.A.5.d-

While the turbine unit is in normal operating mode, GT-13 may avail six 1-hour maintenance periods in a calendar year during which NO_x emissions shall not exceed 95 ppmdv corrected to 15% oxygen over a 1-hour period. Records shall be kept of all instances in which the 1-hour maintenance allowance is used.

B. LSG Heater

Current Condition VI.B.5-

On and after the date of initial performance testing required by this permit the total number of startup cycles for the LSG Unit heater shall not exceed 12 starts during any consecutive 365 day rolling period. The duration of each startup and shutdown shall not exceed 76 hours and 24 hours, respectively.

Revised Condition VI.B.5-

On and after the date of initial performance testing required by this permit the total number of startup cycles for the LSG Unit heater shall not exceed **25 starts** during any consecutive 365 day rolling period. The duration of each startup and shutdown shall not exceed **24 hours** and **11.5 hours**, respectively.

Current Condition VI.B.3-

The LSG Unit heater shall be equipped with ultra low NO_x burners and SCR to control NO_x emissions. These control devices shall be utilized at all times the heater is operating except during startup and shutdown.

Revised Condition VI.B.3-

The LSG Unit heater shall be equipped with ultra low NO_x burners and SCR to control NO_x emissions. These control devices shall be utilized at all times the heater is operating except during startup and shutdown. **HOVENSA may operate the LSG Unit without the SCR during on-line maintenance for no more than 312 hours on a 365-day rolling basis provided the alternate startup/shutdown NO_x limit of 2.4 pounds per hour, as required in VIII.B.3.a, is not exceeded.**

Current Condition VIII.B.3-

NO_x emissions from the LSG Unit heater shall not exceed 0.61 lbs/hr and 0.007 lb/mmBtu averaged over any 3-hour period, 2.4 lbs/hr during periods of SCR system startup and shutdown, and 2.7 tons/year as calculated on a 365-day rolling basis.

Revised Condition VIII.B.3-

NO_x emissions from the LSG Unit heater shall not exceed 0.61 lbs/hr and 0.007 lb/mmBtu averaged over any 3-hour period **during normal operation. NO_x emissions shall not exceed 2.4 lbs/hr during the period of SCR system startup and shutdown and during the 312 -hour on-line maintenance. During the startup and shutdown and on-line maintenance periods, the NO_x emissions shall not exceed 2.7 tons/year on a 365-day rolling basis. HOVENSA shall record all startup-shutdown and on-line maintenance hours and their associated NO_x emissions.**

Enclosure I

HOVENSA, L.L.C. Final Modified Permit

FINAL MODIFIED PERMIT- AUGUST, 2011 (GT-13, Process Heaters and Fluid Catalytic Cracking Unit Complex)

This permit supersedes and replaces the July 21, 2005, November 27, 2007, June 5, 2008, October 13, 2008, and February 5, 2010 and February 28, 2011 GT 13-LSF Project permits. In addition, this permit supersedes and replaces Section I of the December 12, 1997 PSD permit. All other conditions in Sections II through V of the December 12, 1997 permit remain in effect.

I. Permit Expiration

This PSD Permit shall become invalid if construction:

- A. has not commenced (as defined in 40 CFR Part 52.21(b)(9)) within 18 months of the effective date of this permit;
- B. is discontinued for a period of 18 months or more; or
- C. is not completed within a reasonable time.

II. Notification of Commencement of Construction and Startup

The Regional Administrator (RA) shall be notified in writing of the anticipated date of initial startup (as defined in 40 CFR Part 60.2) of each facility of the source not more than sixty (60) days nor less than thirty (30) days prior to such date. The RA shall be notified in writing of the actual date of both the commencement of construction and startup within fifteen (15) days after such date.

III. Plant Operations

All equipment, facilities, and systems installed or used to achieve compliance with the terms and conditions of this PSD Permit, shall at all times be maintained in good working order and be operated as efficiently as possible so as to minimize air pollutant emissions. The continuous emission monitoring systems required by this permit shall be on-line and in operation 95% of the time when the emissions sources are operating. HOVENSA shall demonstrate initial and continuous compliance with the operating, emission and other limits according to the performance testing and compliance assurance and all other requirements of this permit.

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IV. Right to Entry

Pursuant to Section 114 of the Clean Air Act (Act), 42 U.S.C. §7414, the Administrator and/or his/her authorized representatives have the right to enter and inspect for all purposes authorized under Section 114 of the Act. The permittee acknowledges that the Regional Administrator and/or his/her authorized representatives, upon the presentation of credentials shall be permitted:

- A. to enter at any time upon the premises where the source is located or in which any records are required to be kept under the terms and conditions of this PSD Permit;
- B. at reasonable times to access and to copy any records required to be kept under the terms and conditions of this PSD Permit;
- C. to inspect any equipment, operation, or method required in this PSD Permit; and
- D. to sample emissions from the source relevant to this permit

V. Transfer of Ownership

In the event of any changes in control or ownership of facilities to be constructed, this PSD Permit shall be binding on all subsequent owners and operators. The applicant shall notify the succeeding owner and operator of the existence of this PSD Permit and its conditions by letter, a copy of which shall be forwarded to the Regional Administrator.

VI. Operating Requirements and Stack Parameters

A. GT No. 13 and Duct Burner

1. Combustion turbine No. 13 (GT No. 13 or the "combustion turbine") shall have a maximum design heat input rate of 356.0 million British Thermal Units per hour (mmBtu/hr), based on the higher heating value (HHV) of the fuel.
2. Startup of GT No. 13 and the associated duct burner shall not commence until the existing compressor engines in the Nos. 2 and 4 Distillate Desulfurizer Units (C-800A, C-800B, C-800C, C-2201A, C-2201B, and C-2201C) are permanently removed from service.

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3. The Heat Recovery Steam Generator (HRSG) duct burner shall combust refinery gas and/or LPG and shall have a maximum design heat input rate of 270.1 mmBtu/hr, HHV.
4. The HRSG shall not be bypassed more than 720 hours per year, as calculated on a 12-month rolling basis. During a switch from the bypass stack to the main stack while the turbine unit is online, and is not in startup/shut down mode under condition VI.A.5, the NO_x emissions from the main stack shall not exceed 42ppmdv (corrected to 15%) and 0.1601 lbs/mmBtu for a maximum period of 4 hours. The total time needed to return the NO_x emissions to the lower limit of 13 ppmdv in Sections VIII.A.5.a and b of this permit shall be subtracted from the permitted 720 hour limit for the bypass stack.
5. For the purposes of this PSD permit, startup and shutdown shall be defined as:
 - a. Startup for GT No. 13 is defined as the period beginning with the initial firing of fuel in the combustion turbine combustor and ending at the time when the load has increased to 60% of peak rated load and, with the exception of HRSG bypass, the SCR system has reached its design operating temperature. The duration of the startup shall not exceed 4 hours for any given cold startup (>72 hours since shutdown), 2 hours for any given warm startup (10 to 72 hours since shutdown) and 1.5 hours for any given hot startup (<10 hours since shutdown).
 - b. Shutdown for GT No. 13 is defined as the period of time beginning with the load decreasing from 60% of peak rated load and ending with the cessation of operation of fuel flow to the combustion turbine. The duration of any shutdown shall not exceed one hour.
 - c. During startup and shutdown of GT No. 13, HOVENSA shall comply with all mass emission limits except for NO_x which shall be limited to 95 ppmvd at 15% oxygen averaged over a 4 hour time period for cold starts, a 2 hour time period for warm starts, a 1.5 hour time period for hot starts and a 1 hour time period for shutdowns. HOVENSA shall also comply with the opacity limit during each startup and shutdown. The total number of cold, warm and hot startup-shutdown cycles for GT No. 13 shall be limited to 12, 24 and **68** respectively, during any consecutive 12-month period.
 - d. While the turbine unit is in normal operating mode, GT-13 may avail six 1-hour maintenance periods in a calendar year during which NO_x emissions shall not exceed 95 ppmdv corrected to 15% oxygen over a 1-hour period. Records shall be kept of all instances in which the 1-hour maintenance allowance is used.

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6. At all times, including periods of startup, shutdown, and malfunction, HOVENSA shall, to the extent practicable, maintain and operate the combustion turbine including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to EPA and/or VIDPNR which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the plant.
7. The GT No. 13 HRSG stack shall be 79 feet above grade with a flue diameter of 9.9 feet.
8. The GT. No. 13 bypass stack shall be 76 feet above grade with a flue diameter of 10.6 feet.

B. Process Heater (LSG Unit Heater)

1. The LSG unit heater shall have a maximum design heat input rate of 87.3 million British Thermal Units per hour (mmBtu/hr) based on the higher heating value (HHV) of the fuel.
2. Startup of the LSG Unit heater shall not commence until the existing compressor engines in the Nos. 2 and 4 Distillate Desulfurizer Units (C-800A, C-800B, C-800C, C-2201A, C-2201B, and C-2201C) are permanently removed from service.
3. The LSG Unit heater shall be equipped with ultra low NO_x burners and SCR to control NO_x emissions. These control devices shall be utilized at all times the heater is operating except during startup and shutdown. HOVENSA may operate the LSG Unit without the SCR during on-line maintenance for no more than 312 hours on a 365-day rolling basis provided the alternate startup/shutdown NO_x limit of 2.4 pounds per hour, as required in VIII.B.3.a, is not exceeded.
4. For the purpose of this PSD permit, startup and shutdown for the LSG Unit heater shall be defined as:
 - a. Startup shall be defined as the period of time beginning with the initial firing of the equipment after its refractory dry-out operation has been completed and ending when the inlet temperature to the SCR has been maintained at 435 °F or above for a period of two hours.

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- b. Shutdown is defined as the period of time beginning with the SCR inlet temperature falling below 435°F and ending with the cessation of fuel firing in the unit's burners.
5. On and after the date of initial performance testing required by this permit the total number of startup cycles for the LSG Unit heater shall not exceed 25 starts during any consecutive 365 day rolling period. The duration of each startup and shutdown shall not exceed 24 hours and 11.5 hours, respectively.
6. Exhaust gases from the LSG unit heater shall be directed to a single stack that rises 212.8 feet above grade with a flue diameter of 4.8 feet.

C. Fluid Catalytic Cracking Unit (FCCU) Complex

1. The maximum annual throughput to the FCCU shall not exceed 58,400,000 barrels as calculated on a 365-day rolling basis.
2. The maximum daily throughput to the FCCU shall not exceed 165,000 barrels per calendar day.
3. The maximum coke burn-off rate shall be limited to 115,500 pounds per hour.

VII. Fuel Requirements

A. GT No. 13 and Duct Burner

1. GT No. 13 shall only burn refinery gas and/or LPG and/or distillate oil.
2. The duct burner associated with GT No. 13 shall only burn refinery gas and/or LPG as fuel.
3. The refinery gas and LPG burned in GT No. 13 and the duct burner shall have a maximum hydrogen sulfide content of 0.1 grains per dry standard cubic foot (gr/dscf) averaged over any 3-hour period and 75 ppmvd averaged over any 24-hour period.
4. The sulfur content of the distillate oil burned in GT No. 13 shall not exceed 0.05 percent by weight.
5. The maximum amount of distillate oil burned in GT No. 13 shall not exceed 74,947 barrels during any consecutive 12-month period.

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B. Process Heater (LSG Unit Heater)

1. The LSG unit heater shall only burn refinery gas and/or LPG with a maximum hydrogen sulfide content of 0.1 grains per dry standard cubic foot (gr/dscf) averaged over any 3-hour period and 75 ppmvd averaged over any 24-hour period.

C. Fluid Catalytic Cracking Unit (FCCU) Complex

1. The FCCU shall only use low sulfur content feedstock with a maximum sulfur content of 0.6 percent by weight. (*effective date: 12/12/97*)

VIII. Emission Limitations

A. GT No. 13 and Duct Burner

1. Particulate Matter (PM)
 - a. The gas fired mass emission rate of PM in the exhaust gas during supplemental firing of the HRSG shall not exceed 9.6 lb/hr and 0.018 lb/mmBtu.
 - b. The gas fired mass emission rate of PM in the exhaust gas with no supplemental firing of the HRSG shall not exceed 1.6 lb/hr and 0.0090 lb/mmBtu.
 - c. The oil fired mass emission rate of PM in the exhaust gas during supplemental firing of the HRSG shall not exceed 12.3 lb/hr and 0.023 lb/mmBtu.
 - d. The oil fired mass emission rate of PM in the exhaust gas with no supplemental firing of the HRSG shall not exceed 3.2 lb/hr and 0.012 lb/mmBtu.
2. Particulate Matter with an aerodynamic diameter of less than or equal to 10 micrometers (PM-10)
 - a. The gas fired mass emission rate of PM-10 in the exhaust gas during supplemental firing of the HRSG shall not exceed 11.9 lb/hr and 0.023 lb/mmBtu.
 - b. The gas fired mass emission rate of PM-10 in the exhaust gas with no supplemental firing of the HRSG shall not exceed 2.6 lb/hr and 0.0153 lb/mmBtu.

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- c. The oil fired mass emission rate of PM-10 in the exhaust gas during supplemental firing of the HRSG shall not exceed 14.4 lb/hr and 0.027 lb/mmBtu.
 - d. The oil fired mass emission rate of PM-10 in the exhaust gas with no supplemental firing of the HRSG shall not exceed 5.6 lb/hr and 0.025 lb/mmBtu.
3. Sulfur Dioxide (SO₂)
- a. The gas fired mass emission rate of SO₂ in the exhaust gas during supplemental firing of the HRSG shall not exceed 15.0 lb/hr and 0.024 lb/mmBtu averaged over any 3-hour period and 6.9 lb/hr and 0.011 lb/mmBtu averaged over any 24-hour period.
 - b. The gas fired mass emission rate of SO₂ in the exhaust gas with no supplemental firing of the HRSG shall not exceed 8.5 lb/hr and 0.024 lb/mmBtu averaged over any 3-hour period and 3.9 lb/hr and 0.011 lb/mmBtu averaged over any 24-hour period.
 - c. The oil fired mass emission rate of SO₂ in the exhaust gas during supplemental firing of the HRSG shall not exceed 25.4 lb/hr and 0.041 lb/mmBtu averaged over any 3-hour period and 21.9 lb/hr and 0.035 lb/mmBtu averaged over any 24-hour period.
 - d. The oil fired mass emission rate of SO₂ in the exhaust gas with no supplemental firing of the HRSG shall not exceed 18.9 lb/hr and 0.053 lb/mmBtu averaged over any 3-hour period.
5. Oxides of Nitrogen (NO_x) (3-hour rolling average)
- a. The concentration of NO_x in the exhaust gas during gaseous fuel firing shall not exceed 13 parts-per-million by volume on a dry basis (ppmvd), corrected to 15% oxygen and 0.0497 lbs/mmBtu.
 - b. The concentration of NO_x in the exhaust gas during fuel oil firing shall not exceed 13 ppmvd, corrected to 15% oxygen and 0.0640 lbs/mmBtu.
 - c. HOVENSA shall conduct a performance demonstration study of the SCR system to determine the lowest NO_x concentration from GT No. 13 and the associated duct burner that is feasible. Such study shall commence immediately after the initial performance test for NO_x and shall be completed within 18 months. Within 60 days of study completion, HOVENSA shall submit a report with the

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results of the demonstration and propose a new NO_x limit which will be less than or equal to the limits established above in VIII.A.5.b. If approved by EPA, EPA will administratively amend this permit to reflect the new NO_x limit(s). If EPA determines that a lower limit is appropriate, EPA will re-propose the permit for purposes of modifying this condition. (On February 25, 2011, HOVENSA submitted a report under this provision. EPA is proposing to grant the request to lower the NO_x emission limit).

- d. The concentration of NO_x in the exhaust gas during periods when the HRSG is bypassed shall not exceed 42 ppmvd, corrected to 15% oxygen and 0.1601 lbs/mmBtu.

6. Sulfuric Acid Mist (H₂SO₄)

- a. The mass emission rate of H₂SO₄ in the exhaust gas during gaseous fuel firing shall not exceed 14.5 lb/hr and 0.023 lb/mmBtu.
- b. The mass emission rate of H₂SO₄ in the exhaust gas during oil firing shall not exceed 28.3 lb/hr and 0.045 lb/mmBtu.

7. Carbon Monoxide (CO)

Total CO emissions from GT No. 13 and its associated duct burner shall not exceed 196 tons per year as calculated on a 365-day rolling basis.

8. Opacity

Opacity of emissions shall not exceed 10% except for one period of not more than 6 minutes in any 60-minute interval when the opacity shall not exceed 25%.

B. Process Heater (LSG Unit Heater)

1. Particulate Matter/Particulate Matter with an aerodynamic diameter of less than or equal to 10 micrometers (PM/PM-10)

PM/PM-10 emissions from the LSG Unit heater shall not exceed 0.82 lbs/hr and 3.6 tons/year.

1. Sulfur Dioxide (SO₂)

SO₂ emissions from the LSG Unit heater shall not exceed 2.1 lbs/hr averaged over any 3-hour period, 23.0 lbs over any 24-hour period and 4.2 tons/year.

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3. Oxides of Nitrogen (NO_x)

NO_x emissions from the LSG Unit heater shall not exceed 0.61 lbs/hr and 0.007 lb/mmBtu averaged over any 3-hour period during normal operation. NO_x emissions shall not exceed 2.4 lbs/hr during the period of SCR system startup and shutdown and during the 312 -hour on-line maintenance. During the startup and shutdown and on-line maintenance periods, the NO_x emissions shall not exceed 2.7 tons/year on a 365-day rolling basis. HOVENSA shall record all startup-shutdown and on-line maintenance hours and their associated NO_x emissions.

4. Carbon Monoxide (CO)

CO emissions from the LSG Unit heater shall not exceed 0.04 lb/mmBtu.

C. Fluid Catalytic Cracking Unit (FCCU) Complex

1. Particulate Matter (PM)

PM emissions shall not exceed 0.5 pound per 1,000 pounds of coke burn-off, 57.75 lbs/hr and 252.9 tons/year.

2. Particulate Matter with an aerodynamic diameter of less than or equal to 10 micrometers (PM-10)

PM-10 emissions from the FCCU regenerator exhaust shall not exceed 1.0 pound per 1,000 pounds of coke burn-off, 115.5 lbs/hr and 505.9 tons/year.

3. Sulfur Dioxide (SO₂)

- a. The concentration of SO₂ in the FCCU stack shall not exceed 16 ppmv on a dry basis, corrected to 0% oxygen, when averaged over any consecutive 365-day period.
- b. The concentration of SO₂ in the FCCU stack shall not exceed 25 ppmv on a dry basis, corrected to 0% oxygen, when averaged over any consecutive 7-day period.

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- c. The venturi scrubber must reduce SO₂ emissions to the atmosphere by at least 90%. *(effective date: 12/12/97)*
 - d. The emission rate of SO₂ from the FCCU shall not exceed 214.9 lb/hr on a rolling 3-hour basis and 237 tons/year during each consecutive 12-month period.
4. Oxides of Nitrogen (NO_x)
- a. The maximum concentration of NO_x in the FCCU exhaust, as determined by continuous monitoring, shall not exceed 25 ppmvd corrected to 0% oxygen, when averaged over any consecutive 365-day period.
 - b. The emission rate of NO_x from the FCCU shall not exceed 266 tons per year.
5. Carbon Monoxide (CO)
- a. HOVENSA shall limit CO emissions to 432 ppmv on a dry basis corrected to 7% oxygen, as determined by continuous monitoring. *(effective date: 12/12/97)*
 - b. For any 1-hour period the emission rate of CO from the FCCU shall not exceed 738.6 pounds per hour and 3235.0 tons per year. *(effective date: 12/12/97)*
6. Volatile Organic Compounds (VOC)
- a. HOVENSA shall limit VOC emissions to 20 ppmv on a dry basis corrected to 7% oxygen, 12.1 pounds per hour and 52.7 tons per year. *(effective date: 12/12/97)*
 - b. EPA reserves the right to require continuous emission monitoring for VOC. *(effective date: 12/12/97)*
7. Opacity
- a. HOVENSA shall assure efficient scrubber operation by measuring and maintaining the pressure drop across the venturi scrubber throat. *(effective date: 12/12/97)*
 - b. The average opacity as measured by a visual observation shall not exceed 20 percent, except for one six minute period in any one-hour. *(effective date: 12/12/97)*
8. The FCCU is exempt from the concentration limits for CO and VOC, as described above, for a maximum of 8-hours during startup of the unit. This exemption shall be

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afforded 3 times per year (based on a 365-day rolling average). Startup of the FCCU begins with the introduction of feed to the reactor and concludes when a stable regenerator combustion temperature of 1,280 degrees Fahrenheit has been achieved. (*effective date: 12/12/97*)

IX. Pollution Control Equipment and Opacity Measurement

1. Each unit shall continuously operate in accordance with its design specified parameters. This includes continuously operating all proposed control devices in a manner consistent with good air pollution control practice for minimizing emissions.

2. For GT No. 13, HOVENSA shall install and continuously operate (except during startup and shutdown periods) a steam injection system and monitor the steam to fuel ratio to ensure proper control of NO_x emissions. In addition to steam injection, when the HRSG is operating, HOVENSA shall operate a Selective Catalytic Reduction (SCR) system for NO_x control except during startup and shutdown. The duct burner associated with GT No. 13 shall utilize low NO_x burner(s) and SCR to control NO_x emissions.

3. HOVENSA shall install and continuously operate ultra low NO_x burners and SCR to control NO_x emissions from the LSG Unit Heater at all times except during startup and shutdown.

4. While firing gaseous fuels, HOVENSA shall conduct monthly opacity observations at the turbine's and heaters' emission points in accordance with 40 CFR Part 60, Method 9. The opacity observations shall be made at the point of greatest opacity in that portion of the plume where condensed water vapor is not present. Alternatively, HOVENSA may install and operate a Continuous Opacity Monitoring System that meets the requirements of 40 CFR Part 60.

5. While firing distillate fuel oil, HOVENSA shall conduct daily opacity observations at the turbine's and heaters' emission points in accordance with 40 CFR Part 60, Method 9. The opacity observations shall be made at the point of greatest opacity in that portion of the plume where condensed water vapor is not present. Alternatively, HOVENSA may install and operate a Continuous Opacity Monitoring System that meets the requirements of 40 CFR Part 60.

X. Continuous Emission Monitoring (CEM) Requirements

1. The FCCU complex shall be equipped with operable continuous emission monitors to measure the following pollutants and/or operating parameters: CO, O₂, NO_x, SO₂ (inlet and outlet of the venturi gas scrubber), regenerator temperature and pressure across the venturi scrubber throat. These monitors must comply with EPA performance and siting

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specifications pursuant to 40 CFR Part 60, Appendix B, Performance Specifications 1-4. EPA reserves the right to require the auditing of the CEMS by independent agents.
(effective date: 12/12/97)

2. The FCCU coke burn-off rate shall be calculated from the FCCU regenerator flue gas composition. The flue gas will be analyzed daily by EPA RM 3/3A or an equivalent analytical method approved by EPA. The flue gas will be analyzed for the following parameters: CO, CO₂, O₂ and inerts (Ar, N₂). The water content will be determined by a psychrometric chart. This data shall be input to the unit's computer and be used to calculate the coke burn-off rate by the following steps:
 - a. Continuously measure the air flow to the regenerator.
 - b. Calculate dry air flow rate with psychrometric chart.
 - c. Adjust the regenerator flue gas oxygen analysis for argon (if gc method used). Argon is inert and should not be included in the oxygen balance calculations (see step e. below)
 - d. Calculate the coke carbon content by knowing that 1 mol carbon is burned for each mol of CO or CO₂ produced. The CO and CO₂ concentrations are determined daily by analysis of flue gas.
 - e. Calculate coke hydrogen content by an oxygen balance between the regenerator air concentration and the flue gas excess oxygen content.
 - f. Calculate the hourly coke burn-off rate by adding the coke carbon and hydrogen contents. The daily average coke burn-off shall be calculated and reported as a rolling average for any 24-hour period. (effective date: 12/12/97)
3. Prior to conducting the initial performance tests required by Section XI of this permit and thereafter, HOVENSA shall install, calibrate, maintain, and operate a CEM to measure and record stack gas carbon monoxide concentrations from GT No. 13. The system shall meet all applicable EPA monitoring performance specifications (including but not limited to 40 CFR Part 60.13 and 40 CFR Part 60, Appendix B, Performance Specifications 4, and Appendix F).
4. Prior to conducting the initial performance tests required by Section XI of this permit and thereafter, HOVENSA shall install, calibrate, maintain, and operate a CEM to measure and record stack gas NO_x (as measured as NO₂) concentrations on the GT No. 13/HRSG stack, and the LSG unit heater stack. These systems shall meet all applicable EPA

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monitoring performance specifications (including but not limited to 40 CFR Part 60.13 and 40 CFR Part 60, Appendix B, Performance Specification 2, and Appendix F).

5. Prior to conducting the initial performance tests required by Section XI of this permit and thereafter, HOVENSA shall install, calibrate, maintain, and operate a continuous monitoring system to measure and record fuel flow rate and steam to fuel ratios from the combustion turbine. These systems shall meet all applicable EPA monitoring performance specifications.
6. Not less than 90 days prior to the date of startup of the combustion turbine, HOVENSA shall submit a written report to EPA of a Quality Assurance Project Plan for the certification of the combustion turbine's monitoring systems. Performance evaluation of the monitoring systems may not begin until the Quality Assurance Project Plan has been approved by EPA.
7. HOVENSA shall conduct performance evaluations of the continuous monitoring systems during the initial performance testings required under this Permit or within 30 days thereafter in accordance with the applicable performance specifications in 40 CFR Part 60, Appendix B, and 40 CFR Part 52, Appendix E. HOVENSA shall notify the Regional Administrator (RA) at least 15 days in advance of the date upon which demonstration of the monitoring system(s) performance will commence.
8. HOVENSA shall submit a written report to EPA of the results of all monitor performance specification evaluations conducted on the monitoring system(s) within 60 days of the completion of the tests. The monitoring systems must meet all the requirements of the applicable performance specification test in order for the monitors to be certified.

XI. Performance Testing Requirements

A. Combustion Units

1. HOVENSA shall conduct performance tests for GT No. 13 and the LSG Unit Heater. Within 60 days after achieving the maximum production rate of each unit, but no later than 180 days after initial startup as defined in 40 CFR Part 60.2, and once every five years thereafter (with the exception of those pollutants for which a CEM is required), HOVENSA shall submit the results of the performance tests for PM, PM-10, NO_x, CO, SO₂ and H₂SO₄. All performance tests shall be conducted at base load conditions, with and without supplemental firing of the HRSG (for GT No. 13), 60% load conditions and/or other loads specified by EPA.
2. Three test runs shall be conducted for each load condition and compliance for each operating mode shall be based on the average emission rate of these runs.

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3. At least 60 days prior to actual testing, HOVENSA shall submit to the EPA a Quality Assurance Project Plan detailing methods and procedures to be used during the performance stack testing. A Quality Assurance Project Plan that does not have EPA approval may be grounds to invalidate any test and require a re-test.
4. HOVENSA shall use the following test methods, or a test method which would be applicable at the time of the test and detailed in a test protocol approved by EPA:
 - a. Performance tests to determine the stack gas velocity, sample area, volumetric flow rate, molecular composition, excess air of flue gases, and moisture content of flue gas shall be conducted using 40 CFR Part 60, Appendix A, Methods 1, 2, 3, and 4.
 - b. Performance tests for the emissions of PM shall be conducted using 40 CFR Part 60, Appendix A, Method 5.
 - c. Performance tests for the emissions of PM-10 shall be conducted using 40 CFR Part 51, Appendix M, Method 201 (exhaust gas recycle), Method 201A (constant flow rate) or Method 5, and Method 202. PM-10 emissions shall be the sum of noncondensable emissions determined using Method 201, 201A or Method 5 and condensable emissions determined using Method 202.
 - d. Performance tests for the emissions of CO shall be conducted using 40 CFR Part 60, Appendix A, Method 10.
 - e. Performance tests for the emissions of NO_x shall be conducted using 40 CFR Part 60, Appendix A, Method 7E.
 - f. Performance tests for the emissions of SO₂ shall be conducted using 40 CFR Part 60, Appendix A, Method 6 or 6C.
 - g. Performance tests for the emissions of H₂SO₄ shall be conducted using 40 CFR Part 60, Appendix A, Method 8.
 - h. Performance tests for the visual determination of the opacity of emissions from the stack shall be conducted using 40 CFR Part 60, Appendix A, Method 9 and the procedures stated in 40 CFR Part 60.11, or using a Continuous Opacity Monitoring system meeting the requirements of 40 CFR Part 60.
5. Test results indicating that emissions are below the limits of detection shall be deemed to be in compliance.

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6. Additional performance tests may be required at the discretion of the EPA or VIDPNR for any or all of the above pollutants.
7. For performance test purposes, sampling ports, platforms and access shall be provided by HOVENSA on each unit in accordance with 40 CFR Part 60.8(e).
8. HOVENSA shall submit a written report to EPA of the results of all emission testing within 60 days of the completion of the performance test, but in any event, no later than 180 days after initial startup of each unit.
9. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test.

B. Fluid Catalytic Cracking Unit (FCCU) Complex

1. Within 60 days after achieving the maximum production rate of the FCCU, but no later than 180 days after the compressor engines in the Nos. 2 and 4 Distillate Desulfurizer Units are permanently removed from service, and once every five years thereafter HOVENSA shall conduct and submit the results of the performance tests for SO₂, PM and PM-10 in accordance with the following test methods (or a test method which would be applicable at the time of the test and detailed in a test protocol approved by EPA).
 - a. Performance tests for the emissions of SO₂ shall be conducted using 40 CFR Part 60, Method 6 or 6C. Such tests shall be conducted simultaneously, upstream and downstream of the venturi scrubber.
 - b. Performance tests for the emissions of PM shall be conducted using 40 CFR Part 60, Appendix A, Method 5B or 5F.
 - c. Performance tests for the emissions of PM-10 shall be conducted using 40 CFR Part 60, Appendix A, Method 5B or 5F or Method 201 or 201A in Part 51, Appendix M; and Part 51, Appendix M, Method 202. PM-10 emissions shall be the sum of noncondensable emissions determined using Method 5B, 5F, 201 or 201A and condensable emissions determined using Method 202.
 - d. Performance tests for the visual determination of the opacity of emissions from the stack shall be conducted using 40 CFR Part 60, Appendix A, Method 9 and the procedures stated in 40 CFR Part 60.11.

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2. Three test runs shall be conducted and compliance shall be based on the average emission rate of these runs.
3. At least 60 days prior to actual testing, HOVENSA shall submit to the EPA a Quality Assurance Project Plan detailing methods and procedures to be used during the performance stack testing. A Quality Assurance Project Plan that does not have EPA approval may be grounds to invalidate any test and require a re-test.
4. Test results indicating that emissions are below the limits of detection shall be deemed to be in compliance.
5. Additional performance tests may be required at the discretion of the EPA or VIDPNR for any or all of the above pollutants.
6. For performance test purposes, sampling ports, platforms and access shall be provided by HOVENSA on each unit in accordance with 40 CFR Part 60.8(e).
7. HOVENSA shall submit a written report to EPA of the results of all emission testing within 60 days of the completion of the performance test, but in any event, no later than 180 days after startup.
8. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test.

XII. Fuel Sampling Requirements

1. HOVENSA shall verify that the sulfur content of the fuels being burned meets the specifications outlined in Section VII of this permit.
2. Compliance with the sulfur content standards for liquid and gaseous fuels shall be determined using the testing methods established in 40 CFR 60.335(b)(10) except for refinery fuel gas which shall be monitored for H₂S using the methodology specified in 40 CFR Part 60 Subpart J.
3. Compliance with the sulfur content standard for the FCCU feed shall be determined using the testing methods established in 40 CFR 60.106(j).

XIII. Record keeping Requirements

1. Logs shall be kept and updated daily to record the following:

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- a. the daily fresh feed rate (barrels) and the sulfur content of the feed to the FCCU complex (*effective date: 12/12/97*);
 - b. the daily coke burn-off rate (1000 pounds per hour) and hours of operation for the FCCU regenerator (*effective date: 12/12/97*);
 - c. the FCCU scrubber water feed rate (*effective date: 12/12/97*);
 - d. the beginning, duration and completion of start-up episodes for the FCCU complex, along with the reason(s) for the prior shutdown (*effective date: 12/12/97*);
 - e. the daily barrels of No. 2 fuel oil fired in the combustion turbine totaled with the barrels of oil fired in the combustion turbine for the last 364 consecutive days;
 - f. all fuel sampling results verifying that the sulfur content meets the requirements in Condition VII;
 - g. the beginning, duration and completion of each startup and shutdown for GT No. 13;
 - h. the total pounds of NO_x, as measured by the CEM, for each startup and shutdown of GT No. 13;
 - i. any adjustments and maintenance performed on the combustion turbine unit, the heaters and/or the FCCU;
 - j. any adjustments and maintenance performed on monitoring systems;
2. All monitoring records, fuel sampling test results, calibration test results and logs must be maintained for a period of five years after the date of record, and made available upon request. All rolling averages shall be computed as required in this permit.

XIV. Reporting Requirements

1. HOVENSA shall submit a written report of all excess emissions to EPA for every calendar quarter. All quarterly reports shall be postmarked by the 30th day following the end of each quarter and shall include the information specified below:
 - a. The magnitude of excess emissions computed in accordance with 40 CFR Part 60.13(h), any conversion factor(s) used, and the date and time of commencement and completion of each time period of excess emissions.

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- b. Specific identification of each period of excess emissions that occurs during startups, shutdowns, and malfunctions for the combustion units. The nature and cause of any malfunction (if known) and the corrective action taken or preventive measures adopted shall also be reported.
- c. The date and time identifying each period during which the continuous monitoring system was inoperative except for zero and span checks and the nature of the system repairs or adjustments.
- d. When no excess emissions have occurred or the monitoring systems have not been inoperative, repaired, or adjusted, such information shall be stated in the report.
- e. Results of quarterly monitor performance audits, as required in 40 CFR Part 60, Appendix F (including the Data Assessment Report) and all information required by the reporting requirements in 40 CFR 60.7 including excess emissions and CEMS downtime summary sheets.
- f. For the purposes of this PSD Permit, excess emissions indicated by monitoring systems shall be considered violations of the applicable emission limits.
- g. Any failure of air pollution control equipment, process equipment, or of a process to operate in a normal manner which results in an increase in emissions above any allowable emission limit stated in this permit and any corrective actions and/or preventative measures taken on any unit must be reported by telephone within 24 hours to:

Director, Caribbean Environmental Protection Division
U.S. Environmental Protection Agency
Centro Europa Building, Suite 417
Ponce de Leon Avenue
San Juan, Puerto Rico 00907

- h. In addition, the U.S. EPA's Air Compliance Branch shall be notified in writing within fifteen (15) days of any such failure. This notification shall include a description of the malfunctioning equipment or abnormal operation; the date of the initial failure; the period of time over which emissions were increased due to the failure; the cause of the failure; the estimated resultant emissions in excess of those allowed under this permit; and the methods utilized to restore normal operations. Compliance with this malfunction notification provision shall not excuse or otherwise constitute a defense to any violations of this permit or of any law or regulations which such malfunction may cause.

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2. All reports and Quality Assurance Project Plans required by this permit shall be submitted to:

Director, Caribbean Environmental Protection Division
U.S. Environmental Protection Agency
Centro Europa Building, Suite 417
Ponce de Leon Avenue
San Juan, Puerto Rico 00907

3. Copies of all reports and Quality Assurance Project Plans shall also be submitted to:

Chief, Air Programs Branch - Permitting Section
U.S. Environmental Protection Agency
Region 2
290 Broadway
New York, NY 10007

Director, Division of Environmental Protection
Virgin Islands Department of Planning and Natural Resources
45 Mars Hill
Frederiksted, VI 00840-4744

XV. Other Requirements

1. HOVENSA shall meet all other applicable federal, state and local requirements, including but not limited to those contained in the Virgin Islands State Implementation Plan (VISIP), the New Source Performance Standards (NSPS) (40 CFR Part 60, Subparts A, Db, GG, and GGG), and the National Emission Standards for Hazardous Air Pollutants (NESHAPS), (40 CFR Part 61, Subparts A and FF, 40 CFR Part 63, Subparts A, CC, UUU, YYYYY, and DDDDD).
2. HOVENSA shall determine, on a rolling 12-month basis, annual CO, VOC, fluorine (F), and lead (Pb) emissions from all modified and affected units attributable to the Low Sulfur Fuels Project. These units include the following: oil fired heaters and boilers, turbines, gas recovery units, amine treating units, DD2, DU3, DD7, DD6, DD9, FCCU, Nos. 3 and 4 Hydrobon Units' combined feed exchanger, No. 2 hydrobon unit, Nos. 3 and 4 sulfur recovery units, Nos. 4 and 5 distillate desulfurizer and Nos. 2 and 4 distillate desulfurizer compressors. The actual annual emissions along with baseline actual emissions and projected actual emissions must be maintained on site for a period of five years. If calculated post-change actual emissions are greater than the projected actual emissions by an amount greater than the pollutant's respective PSD threshold,

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HOVENSA must report this increase to the EPA for re-evaluation of applicability pursuant to 40 CFR 51.21.

3. HOVENSA shall replace the existing compressor engines in the Nos. 2 and 4 Distillate Desulfurizer Units (C-800A, C-800B, C-800C, C-2201A, C-2201B, and C-2201C) with electric motor drives.
4. Upon modification of DD3, DD6, and/or DD7 as described in the May 2004 application, the throughput limits (averaged monthly over a 12-month period) shall be limited as follows:
 - a. No. 3 Distillate Desulfurizer: 12.2 MBPD
 - b. No. 6 Distillate Desulfurizer: 36.5 MBPD
 - c. No. 7 Distillate Desulfurizer: 43.6 MBPD

These limits shall remain in effect until the existing compressor engines in the Nos. 2 and 4 Distillate Desulfurizer Units are permanently removed from service.

5. Upon replacement of the existing direct fired reheaters in Nos. 3 and 4 SRU with indirect fired reheaters, the East Sulfur Plant shall be limited to 238 LTPD, based on a 12-month rolling average. This limit shall remain in effect until the existing compressor engines in the Nos. 2 and 4 Distillate Desulfurizer Units (C-800A, C-800B, C-800C, C-2201A, C-2201B, and C-2201C) are permanently removed from service.
6. Modifications to DD2, DD4, DD5, DD9, Nos. 2, 3, and 4 Hydrobon and the increase in throughput under Section VI.C. to the FCCU may not commence until the existing compressor engines in the Nos. 2 and 4 Distillate Desulfurizer Units (C-800A, C-800B, C-800C, C-2201A, C-2201B, and C-2201C) are permanently removed from service.